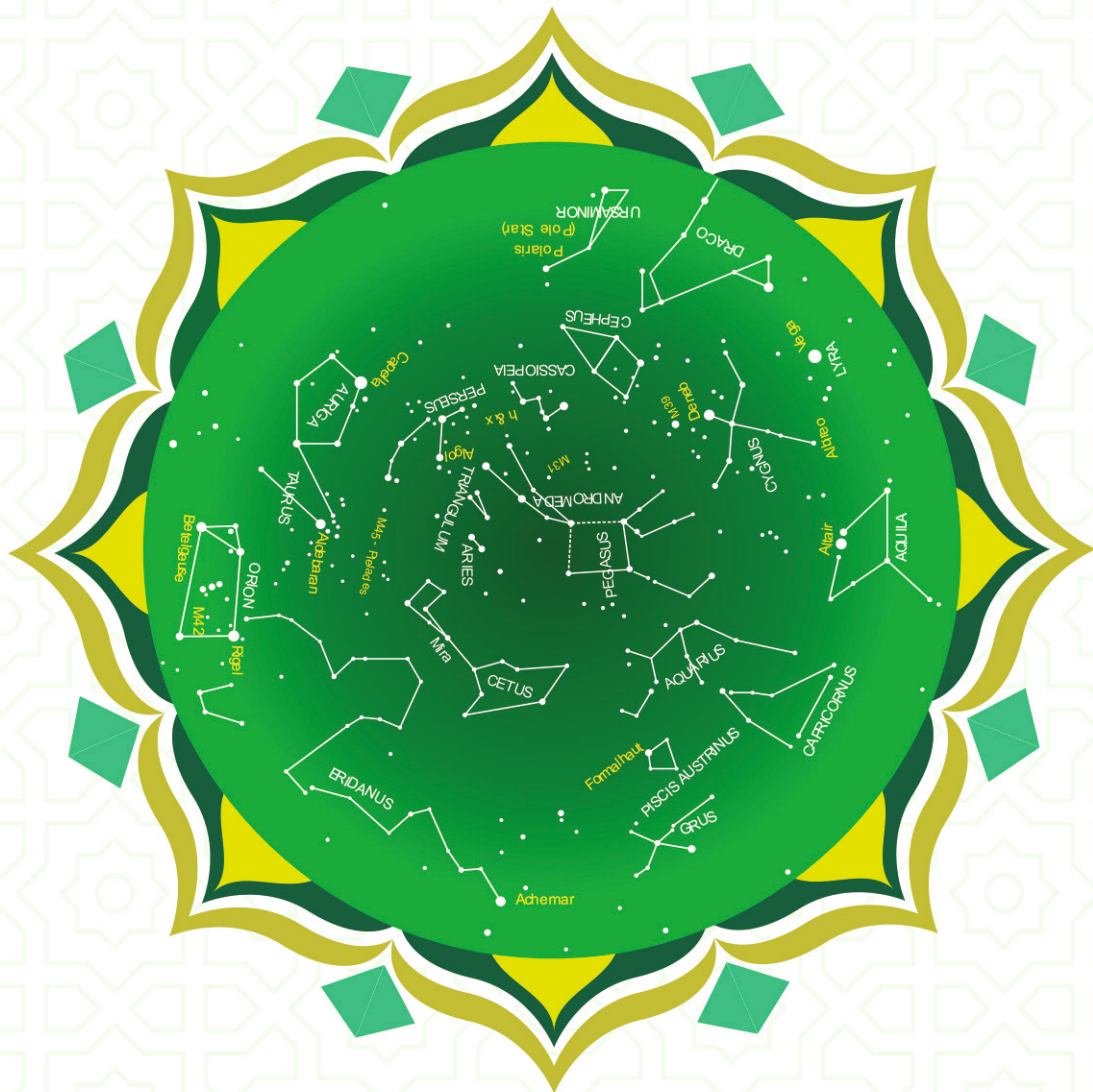
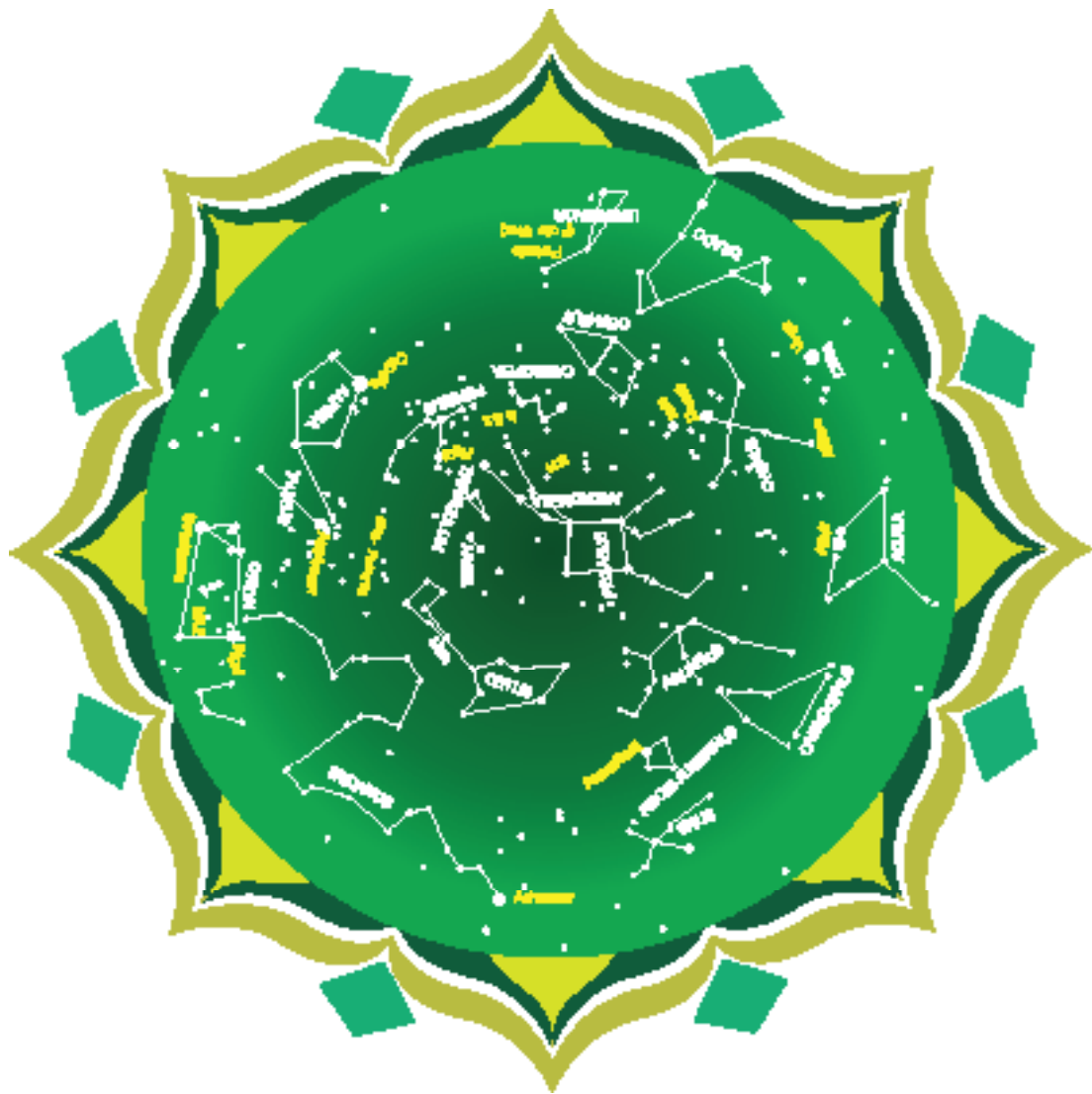


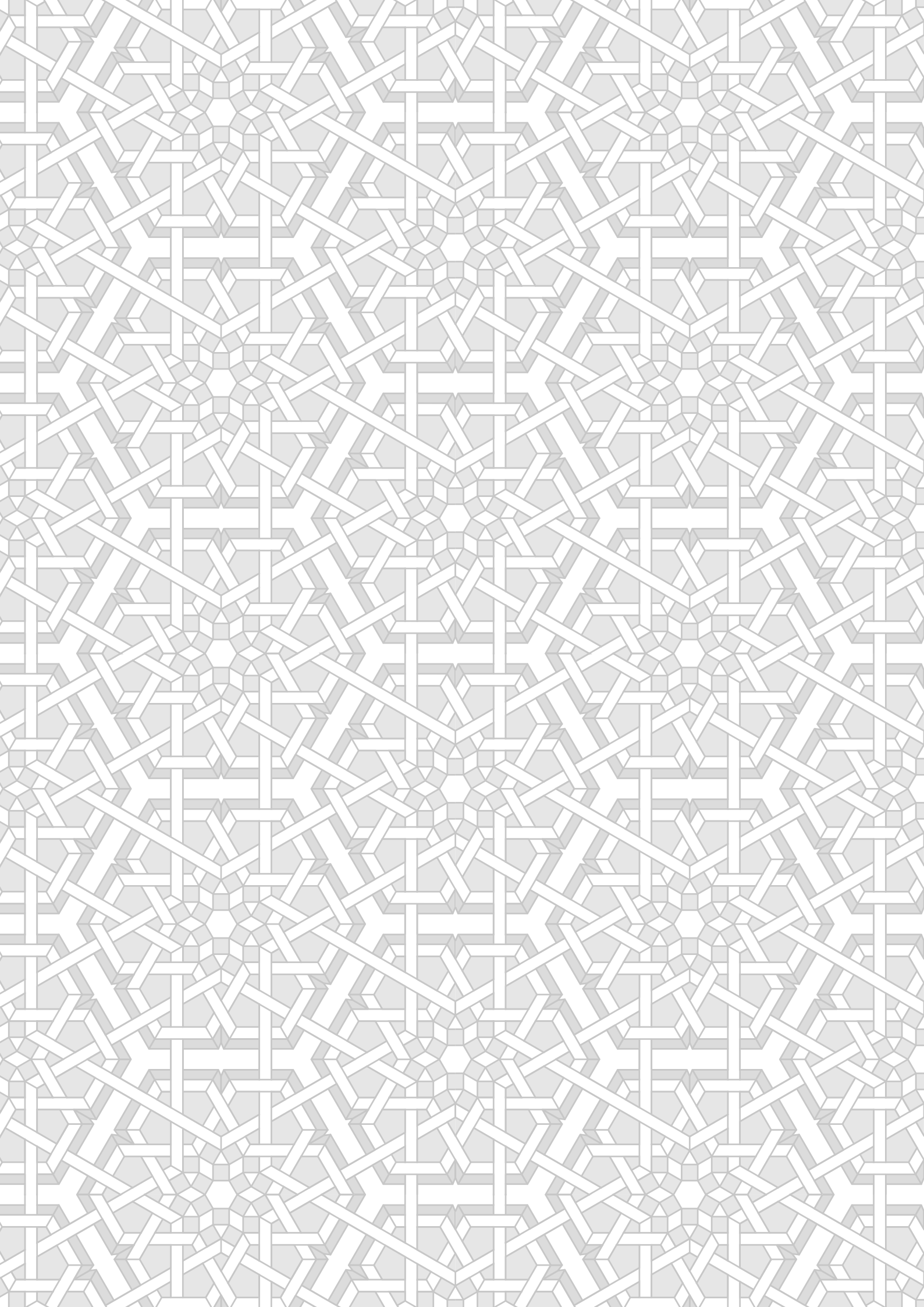
EPHEMERIS HISAB RUKYAT 2021



EPHEMERIS HISAB RUKYAT 2021



DIREKTORAT URUSAN AGAMA ISLAM DAN PEMBINAAN SYARIAH
DIREKTORAT JENDERAL BIMBINGAN MASYARAKAT ISLAM
KEMENTERIAN AGAMA RI



KATA PENGANTAR

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

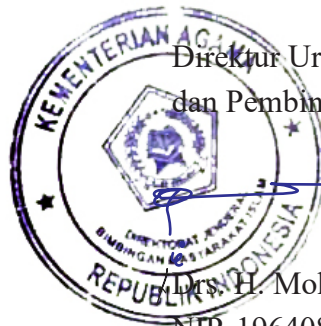
Alhamdulillah, puji dan syukur kita panjatkan kehadirat Allah SWT bahwa Direktorat Urusan Agama Islam dan Pembinaan Syariah Ditjen Bimas Islam Kementerian Agama pada anggaran tahun 2020 ini dapat menerbitkan “EPHEMERIS HISAB RUKYAT 2021”

Buku EPHEMERIS HISAB RUKYAT 2021 ini memuat data matahari dan bulan secara lengkap. Selain itu, disertai daftar gerhana matahari dan bulan, waktu ijtima' dan tinggi hilal, data posisi matahari dan bulan, serta lampiran-lampiran yang terdiri dari Keputusan Presiden RI Nomor 41 Tahun 1987 tentang Pembagian Wilayah RI Menjadi 3 (tiga) Wilayah Waktu, Kebijakan Pemerintah dalam Menetapkan Awal Bulan Qamariyah, Fatwa MUI Nomor 2 Tahun 2004 tentang Penetapan Awal Bulan Ramadhan, Syawal dan Dzulhijjah, Fatwa MUI Nomor 5 Tahun 2010 tentang Arah Kiblat, Daftar Refraksi, Daftar Kerendahan Ufuk, Magnetic Variation Epoch tahun 2015, Perhitungan Waktu Salat, dan Perhitungan Awal Bulan Qamariyah.

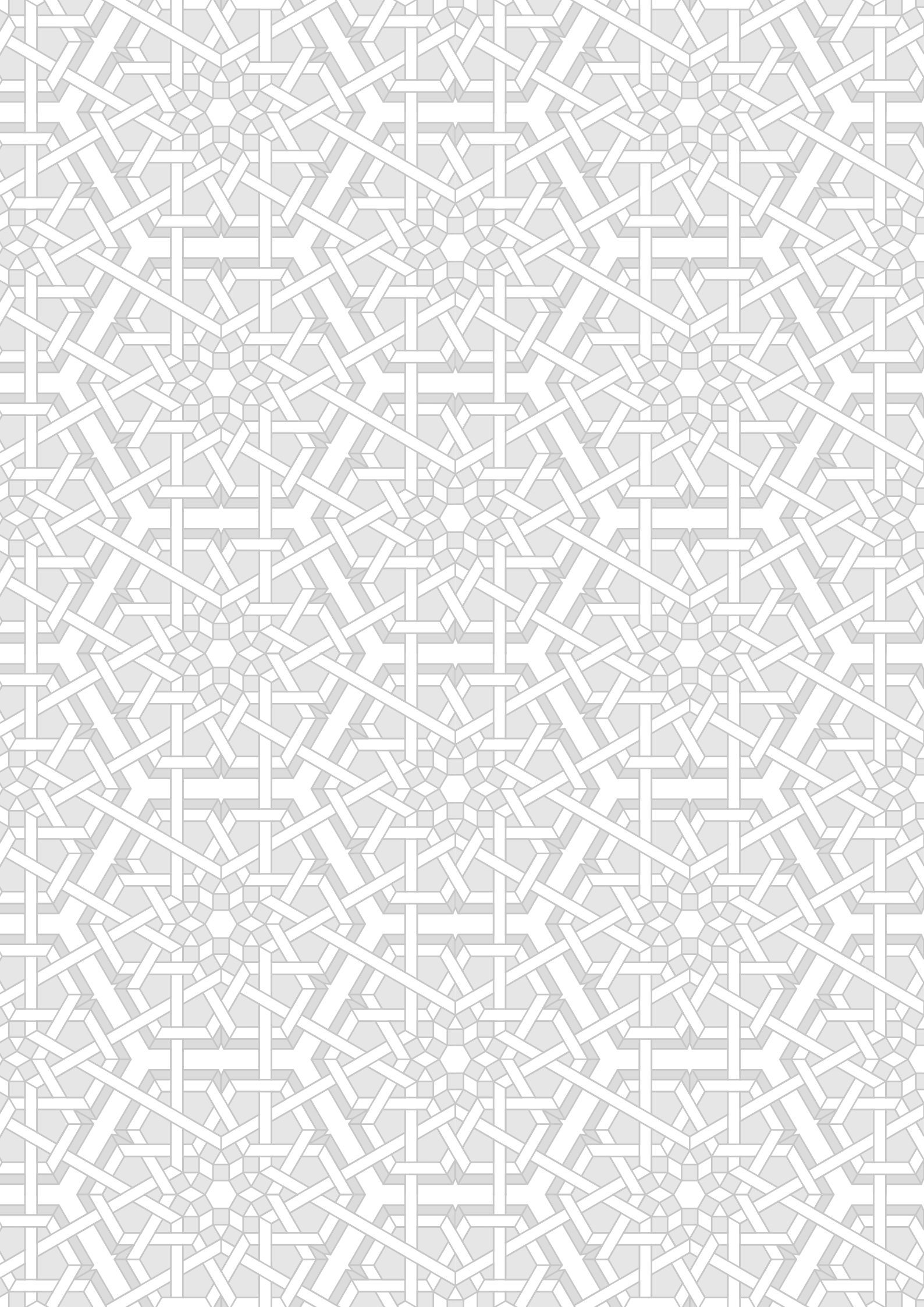
Kami mengharapkan agar buku EPHEMERIS HISAB RUKYAT 2021 ini dapat dimanfaatkan dan menjadi salah satu rujukan bagi para ahli dan peminat hisab rukyat serta pegawai kantor Kementerian Agama se-Indonesia. Dengan senang hati kami menerima saran dan masukan dari pembaca dan ahli hisab rukyat agar dapat lebih menyempurnakan substansi/isi buku EPHEMERIS HISAB RUKYAT di masa yang akan datang.

Jakarta, Rabi'ul Awwal 1442 H
November 2020 M

Direktur Urusan Agama Islam
dan Pembinaan Syariah



Drs. H. Moh. Agus Salim, M.Pd
NIP. 196408171989031002



**SAMBUTAN DIREKTUR JENDERAL
BIMBINGAN MASYARAKAT ISLAM**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Alhamdulillah, segala puja dan puji kami persembahkan kehadirat Allah SWT, Tuhan yang menciptakan langit dan bumi beserta isinya, atas perkenanNya buku “Ephemeris Hisab Rukyat 2021” dapat diterbitkan. Shalawat dan salam semoga selalu tercurah kepada hambaNya yang terbaik, Nabi Muhammad SAW, beserta keluarga dan para sahabatnya.

Semenjak Undang-Undang Nomor 4 Tahun 2004 tentang Kekuasaan Kehakiman, Peradilan Agama yang semula menjadi tugas dan tanggung jawab Kementerian Agama beralih ke Mahkamah Agung. Sedangkan terkait persoalan hisab rukyat dibina oleh Menteri Agama RI. Berdasarkan Peraturan Menteri Agama Nomor 42 Tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama, Direktorat Urusan Agama Islam dan Pembinaan Syariah antara lain mempunyai tugas melaksanakan penyiapan perumusan dan pelaksanaan kebijakan, penyusunan norma, standar prosedur, kriteria bimbingan teknis, dan evaluasi di bidang hisab rukyat. Sebagai bentuk kehadiran pemerintah dalam melayani masyarakat akan kebutuhan data-data hisab rukyat Direktorat Jenderal Bimbingan Masyarakat Islam Kementerian Agama perlu mengadakan buku Ephemeris Hisab Rukyat 2021.

Buku “Ephemeris Hisab Rukyat 2021” yang ada di hadapan pembaca ini menjadi hal yang sangat penting karena menjadi buku acuan dan buku standar dalam melakukan perhitungan posisi matahari dan bulan di lingkungan Kementerian Agama. Diharapkan buku ini menjadi referensi bagi ormas-ormas Islam, lembaga falak, dan peminat falak individu dalam melakukan hisab/perhitungan falak.

Akhirnya, kami selaku Direktur Jenderal Bimbingan Masyarakat Islam menyampaikan apresiasi kepada Tim Penyusun yang telah berupaya mewujudkan buku Ephemeris Hisab Rukyat ini. Semoga upaya kita dalam memberikan pelayanan terbaik kepada umat Islam menjadi catatan amal baik di sisi Allah *Subhanahu wa ta'ala*. Amin.

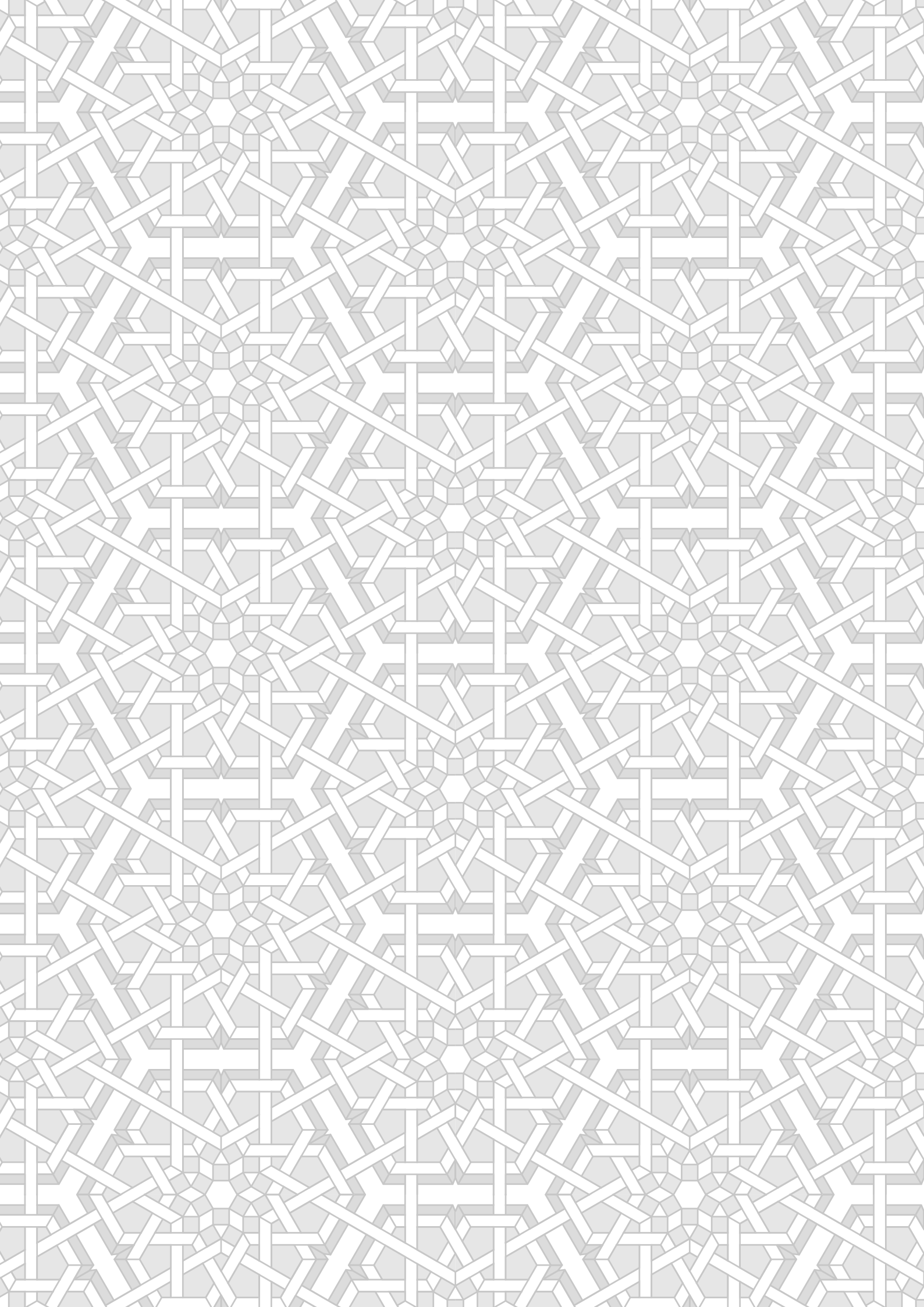
Jakarta, Rabi'ul Awwal 1442 H
November 2020 M



Direktur Jenderal
Bimbingan Masyarakat Islam

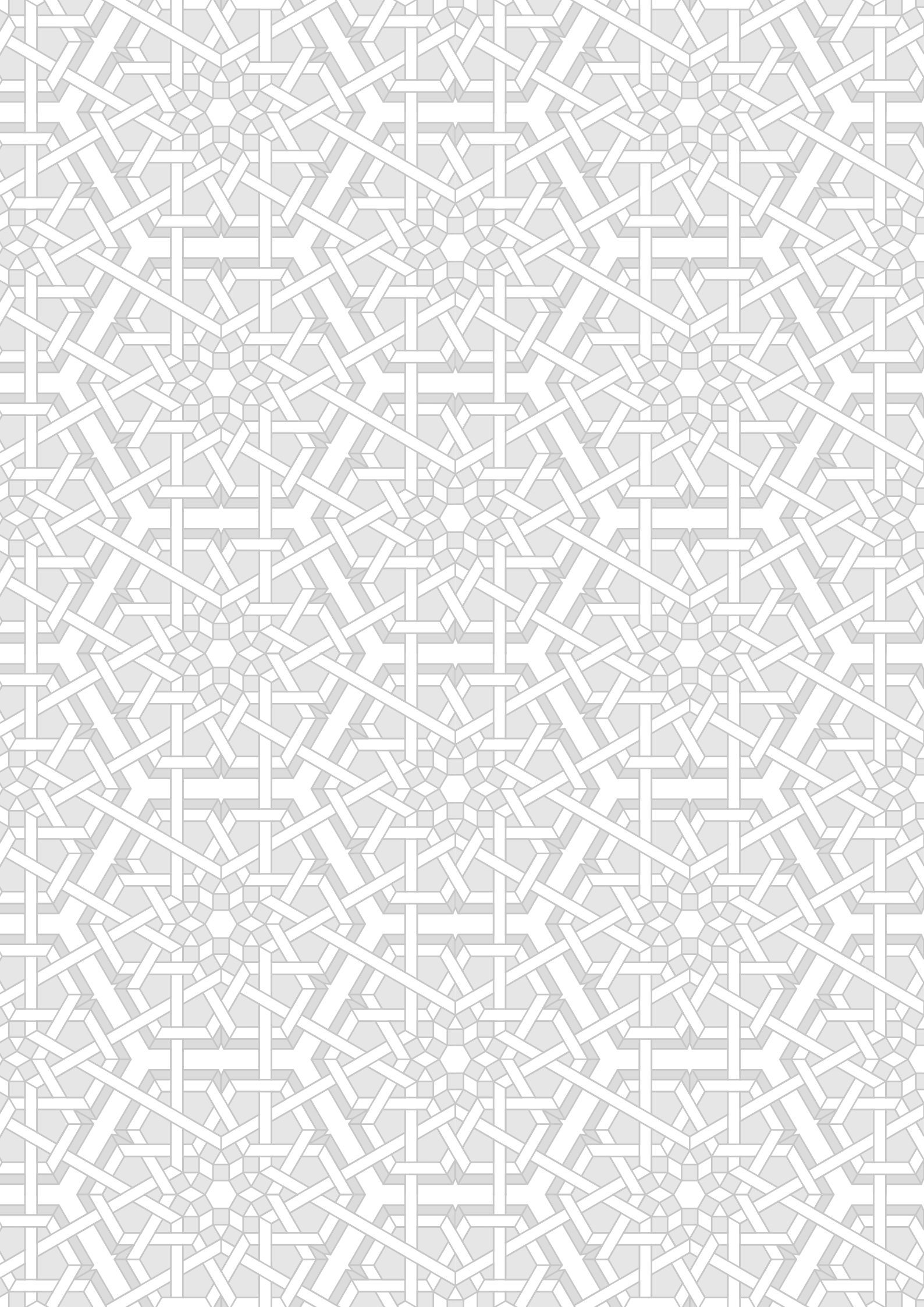
Prof. Dr. Phil. Kamaruddin Amin, MA

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PENJELASAN DATA EPHEMERIS

I. UMUM

Ephemeris Hisab Rukyat ini menyediakan beberapa data mengenai Matahari dan Bulan yang dapat digunakan untuk kegiatan hisab maupun rukyat, menentukan arah kiblat, waktu-waktu salat, awal bulan qamariyah, dan gerhana.

Data Matahari yang disediakan adalah Bujur Astronomi, Lintang Astronomi, Asensio Rekta, Deklinasi, Jarak Geosentris, Semi Diameter, Kemiringan Ekliptika dan Perata Waktu. Sedangkan data Bulan yang disediakan adalah Bujur Astronomi, Lintang Astronomi, Asensio Rekta, Deklinasi, Horizontal Paralaks, Semi Diameter, Sudut Kemiringan Bulan, dan Luas Cahaya Bulan.

II. DATA MATAHARI

1. Ecliptic Longitude

Ecliptic Longitude dikenal dalam bahasa Indonesia dengan Bujur Astronomi yang dikenal pula dengan istilah *Taqwim* atau *Thul* (التقويم = الطول) *Thulus Syams* (طول الشمس) adalah jarak Matahari dari titik Aries (Vernal Equinox = الحمل) diukur sepanjang lingkaran Ekliptika (Lihat gambar 1).

2. Ecliptic Latitude

Ecliptic Latitude dikenal dalam bahasa Indonesia dengan Lintang Astronomi yang dikenal pula dengan *Ardlusy Syams* (عرض الشمس). Data ini adalah jarak titik pusat Matahari dari Lingkaran Ekliptika. Sebetulnya Ekliptika itu sendiri adalah jarak yang ditempuh oleh gerak semu Matahari secara tahunan. Oleh karena itu, Matahari seolah-olah selalu berada di Lingkaran Ekliptika. Sebenarnya, jalannya tidak rata persis, namun ada sedikit geseran. Keadaan seperti ini dapat dilihat pada nilai Ecliptic Latitude yang selalu mendekati nol. Karena nilainya yang sangat kecil sehingga banyak sistem perhitungan yang mengabaikan nilai data ini.

3. Apparent Right Ascension

Apparent Right Ascension dikenal dalam bahasa Indonesia dengan Asensio Rekta. Data ini dikenal juga dengan istilah panjatan Tegak atau *Ash-shu'udul Mustaqim* atau *al-Mathali'ul Baladiyah* (الصعود المستقيم = المطالع البلدية) adalah jarak Matahari dari titik Aries (Hamal) diukur sepanjang Lingkaran Equator (Lihat gambar 1).

4. Apparent Declination

Apparent Declination dikenal dalam bahasa Indonesia dengan Deklinasi Matahari yang terlihat (bukan Matahari Hakiki), atau dikenal pula dengan istilah *Mail al-Syams* (ميل الشمس) adalah jarak Matahari dari Equator (Lihat gambar 1 dan 2). Bila nilai Deklinasi

positif berarti Matahari berada di sebelah utara Equator; tapi bila nilai Deklinasi negatif berarti Matahari berada disebelah selatan Equator.

5. True Geocentric Distance

True Geocentric Distance dikenal dalam bahasa Indonesia dengan istilah Jarak Geocentric. Data ini menggambarkan jarak antara Bumi dan Matahari dalam satuan AU (*Astronomical Unit*). Oleh karena Bumi mengelilingi Matahari tidak merupakan bulat bola, melainkan berbentuk ellips (menyerupai bulat telur), sehingga terkadang dekat dan terkadang jauh. Jarak terdekat antara Bumi dengan Matahari disebut *Perigee* atau *al-Hadhidh* (الحضيض), sedangkan jarak terjauhnya disebut *Apogee* atau *al-Auj* (الأوج).

6. Semi Diameter

Semi Diameter dikenal dalam bahasa Indonesia dengan jari-jari yang dikenal pula dengan *Nisfu Quthr al-Syams* (نصف قطر الشمس) adalah jarak titik pusat Matahari dengan piringan luarnya.

7. True Obliquity

True Obliquity dikenal dalam bahasa Indonesia dengan Kemiringan Ekliptika yang dikenal pula dengan istilah *al-Mail al-Kulli* (الميل الكلي) atau *al-Mail A'dham* (الميل الاعظم) adalah Kemiringan Ekliptika dari Equator (lihat gambar 1).

8. Equation of Time

Equation of Time dikenal dalam bahasa Indonesia dengan Perata Waktu yang dikenal pula dengan *Ta'dil Waqt atau Ta'dil Zaman* (تعديل الزمن = تعديل الوقت) adalah selisih antara waktu kulminasi Matahari Hakiki dengan waktu kulminasi Matahari Rata-rata. Data ini biasanya dinyatakan dengan huruf "e" kecil.

III. DATA BULAN

1. Apparent Longitude

Apparent Longitude yaitu Bujur Astronomi Bulan (yang terlihat) yang dalam bahasa Arab dikenal dengan *Thul al-Qamar* (طول القمر). Data ini adalah jarak antara titik Aries sampai Bulan diukur sepanjang Lingkaran Ekliptika (Lihat gambar 1).

2. Apparent Latitude

Apparent Latitude diterjemahkan dengan Lintang Astronomi Bulan (yang terlihat) yang dalam istilah Arab disebut *Ardlual-Qomar* (عرض القمر). Data ini adalah jarak antara Bulan dengan Lingkaran Ekliptika diukur sepanjang Lingkaran Kutub Ekliptika. Nilai maksimum Lintang Astronomi Bulan adalah $5^{\circ} 8'$ (lima derajat delapan menit). Nilai positif berarti bulan berada di utara Ekliptika, dan nilai negatif berarti Bulan berada di sebelah selatan Ekliptika.

3. Apparent Right Ascension

Apparent Right Ascension dikenal dalam bahasa Indonesia dengan Asensio Rekta Bulan (yang terlihat) yang dikenal pula dengan istilah Panjang Tegakatau *Ash-shu'udu*

al-Mustaqim atau *Al-Matholi'u al-Baladiyah* (المطالع المستقيم = المطالع البلادية). Data ini adalah jarak titik pusat Bulan dari titik Aries diukur sepanjang lingkaran Equator (Lihat gambar 1).

4. Apparent Declination

Apparent Declination disini adalah Deklinasi Bulan yang dikenal pula dengan istilah *Mailual-Qamar* (ميل القمر). Data ini adalah jarak Bulan dari Equator (Lihat gambar 1 dan 2). Nilai Deklinasi positif jika Bulan di sebelah utara Equator, dan negatif jika di sebelah selatan Equator.

5. Horizontal Parallax

Parallax dikenal dalam bahasa Indonesia dengan “Benda Lihai” atau dalam bahasa Arab *Ikhtilafu al-Mandhar* (اختلاف المنظر). Sedangkan Horizontal Parallax adalah besaran sudut yang ditarik dari titik pusat Bulan ketika di ufuk (horizon) ke titik pusat Bumi dan garis yang ditarik dari titik pusat Bulan ketika itu ke permukaan Bumi.

6. Semi Diameter

Semi Diameter di sini adalah jari-jari Bulan atau *Nisfu Quthri al-Qamar* (نصف قطر القمر) adalah jarak antara titik pusat Bulan dengan piringan luarnya (Lihat gambar 4).

7. Angle Bright Limb

Angle Bright Limb dikenal dalam bahasa Indonesia dengan sudut kemiringan hilal, adalah sudut kemiringan piringan hilal yang memancarkan sinar sebagai akibat arah posisi hilal dari Matahari. Sudut ini diukur dari garis yang menghubungkan titik pusat hilal dengan titik Zenith (سمت الرأس) ke garis yang menghubungkan titik pusat hilal dengan titik pusat Matahari dengan arah sesuai perputaran jarum jam (lihat gambar 5).

8. Fraction Illumination

Fraction Illumination adalah besar atau luas piringan Bulan yang menerima sinar Matahari yang tampak dari Bumi. Jika seluruh piringan Bulan yang menerima sinar Matahari terlihat dari Bumi maka bentuknya akan berupa “bulatan penuh”. Dalam keadaan seperti ini nilai Fraction Illumination Bulan adalah 1 (satu), yaitu persis pada saat puncak Bulan Purnama. Sedangkan jika Bumi, Bulan dan Matahari sedang persis berada pada satu garis lurus, maka akan terjadi Gerhana Matahari Total. Dalam keadaan seperti ini nilai Fraction Illumination Bulan adalah nol. Setelah Bulan Purnama, nilai Fraction Illumination akan semakin mengecil sampai pada nilai yang paling kecil, yaitu pada saat ijtima dan setelah itu nilai Fraction Illumination ini akan kembali membesar sampai mencapai nilai satu, pada saat Bulan Purnama. Dengan demikian, data Fraction Illumination ini dapat dijadikan pedoman untuk mengetahui kapan terjadinya ijtima’ dan kapan bulan purnama (*istiqbal* = الإستقبال). Demikian pula saat first quarter (التربيع الأول) dan last quarter (التربيع الثاني) dari bulan dapat diketahui, yaitu dengan mencari nilai Fraction Illumination sebesar 0.5 (setengah).

IV. WAKTU YANG DIPERGUNAKAN

Data Matahari dan Bulan dalam Ephemeris ini disajikan berdasarkan waktu Greenwich atau Greenwich Mean Time (GMT). Sehingga untuk mencari data Matahari dan Bulan bagi wilayah Indonesia, maka waktu-waktu daerah di Indonesia terlebih dahulu harus diubah menjadi GMT, dengan cara :

GMT = WIB - 7 jam

GMT = WITA - 8 jam

GMT = WIT - 9 jam

V. CONTOH PENGGUNAAN

Misalnya mencari Deklinasi Matahari dan Bulan pada pukul 18:00 WIB tanggal 17 Agustus 2021.

Mengubah WIB menjadi GMT, dengan cara :

GMT = WIB - 7 jam, sehingga jam 18.00 WIB = jam 11.00 GMT

Dilihat data Matahari dan Bulan pada tanggal 17 Agustus 2021.

Dalam kolom jam (paling kiri) pada angka 11 ditarik ke kanan hingga kolom

“Apparent Declination”

Lihat angka yang ada pada baris dan kolom itu, yaitu :

Deklinasi Matahari = 13° 16' 00”

Deklinasi Bulan = 23° 56' 32”

VI. PENYISIPAN ATAU INTERPOLASI

Oleh karena data Matahari dan Bulan dalam Ephemeris ini disajikan pada setiap jam, maka untuk memperoleh data pada pecahan jam (menit dan detik), diperlukan langkah-langkah penyisipan atau interpolasi atau ta'dil.

Contoh :

Mencari Bujur Astronomi Bulan pada pukul 17:47:8.89 WIB tanggal 5 Mei 2021

Langkah 1 :

Mengubah WIB menjadi GMT dengan cara :

GMT = WIB - 7 jam, sehingga jam 17:47:8.89 WIB => 10:47:8.89 GMT

Langkah 2 :

Melacak data Bujur Astronomi Bulan pada kolom Apparent Longitude Bulan sebagai berikut :

Data pada pukul 10 GMT = 334° 10' 21”

Data pada pukul 11 GMT = 334° 42' 03”

Perubahan 1 jam = 334° 42' 03” - 334° 10' 21” = 00° 31' 42”

Perubahan selama 47 menit 8.89 detik = 00° 47' 8.89” x 00° 31' 42” = 00° 24' 54.06”

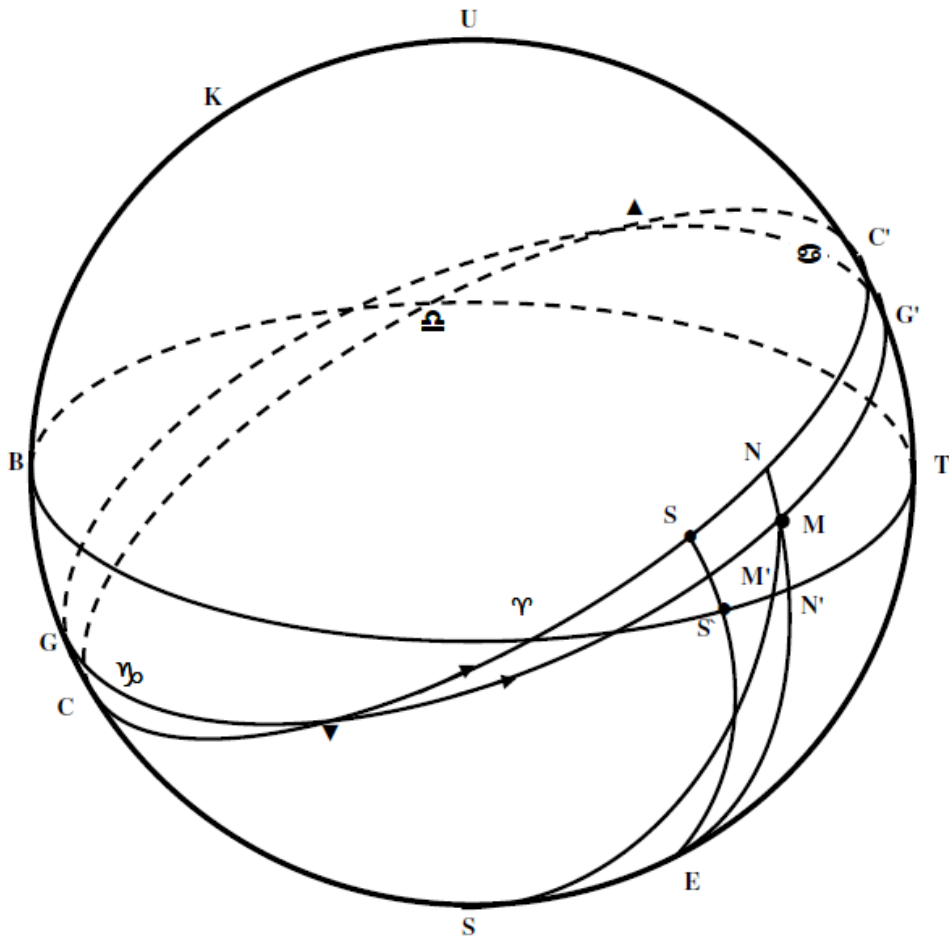
Maka Bujur Astronomi Bulan pada pukul 10:47:08.89 GMT =
 $334^{\circ} 10' 21'' + 00^{\circ} 24' 54.06'' = 334^{\circ} 35' 15.06''$

Atau dapat digunakan cara sbb :

Bujur Astronomi Bulan jam 10	= $334^{\circ} 10' 21''$	→	$334^{\circ} 10' 21''$
Bujur Astronomi Bulan jam 11	= $334^{\circ} 42' 03''$ -		
	$-00^{\circ} 31' 42''$		
	<u>$00^{\circ} 47' 08.89''$</u> x		
	$00^{\circ} 24' 54.06''$	→	<u>$00^{\circ} 24' 54.06''$</u> -
Bujur Astronomi Bulan jam 10:47:08.89 =			$334^{\circ} 35' 15.06''$

VII. GAMBAR-GAMBAR

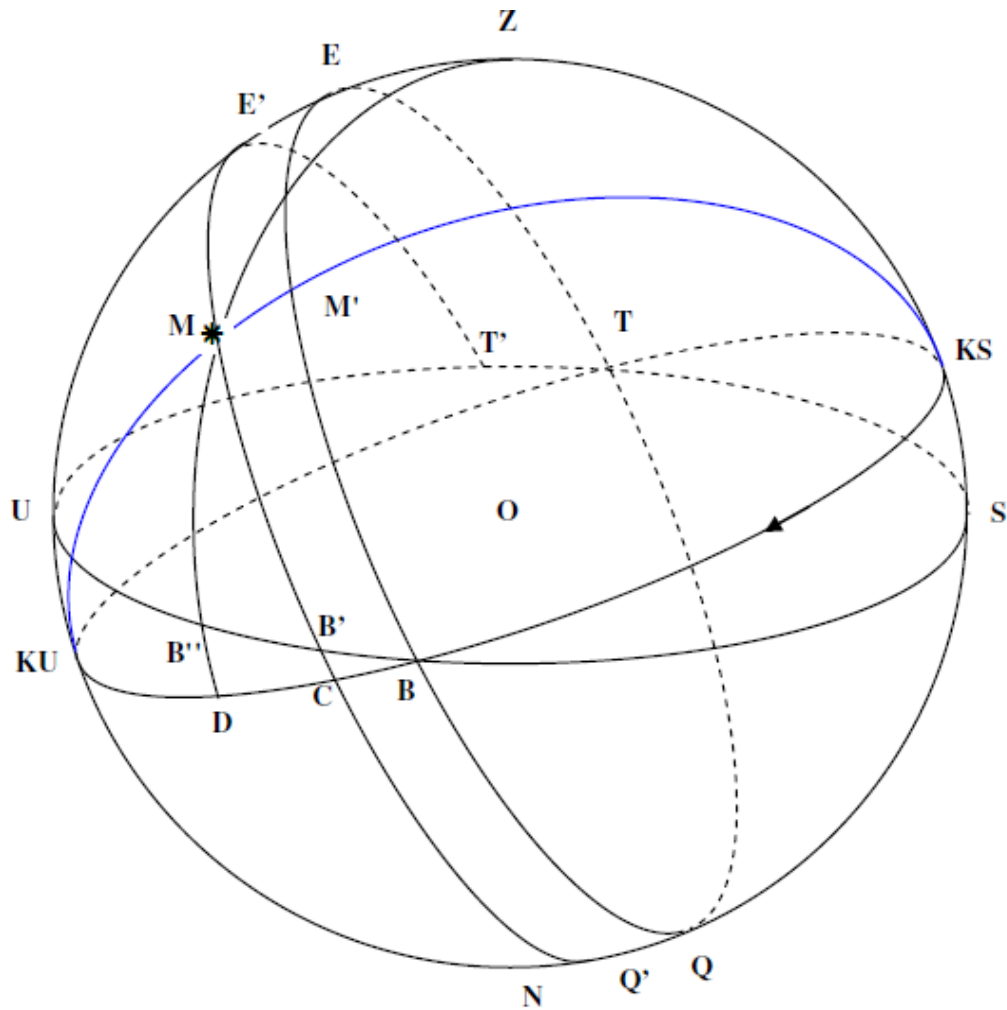
1. BOLA LANGIT PADA 0° DILIHAT DARI ZENITH



- BUTS = Barat, Utara, Timur, Selatan = Lingkaran Horizon = دائرة الأفق
- γ = Titik Aries = Titik musim semi = Vernal Aquinox = حمل
- ♋ = Titik Cancer = سرطان

♎	= Titik Libra = Titik musim dingin = Authomnal Aquinox = ميزان
♏	= Titik Capricorn = جدي
▼	= Simpul Turun = Decending Node = العقدة النازلة
▲	= Simpul Naik = Ascending Node = العقدة الصاعدة
♁ T♁	= Katulistiwa Langit = Equator = معدل النهار
♁ C'♁	= Ekliptika = Lingkaran Zodiak = منطقة البروج
♁ G'♁	= Orbit Bulan = Falak Bulan = فلك القمر
KE	= Kutub Ekliptika = قطب دائرة البروج = قطب منطقة البروج =
S	= Sun = Matahari = الشمس
♁S	= Takwim Matahari = Longitude of the Sun = طول الشمس
M	= Moon = Bulan = القمر
♁N	= Takwim Bulan = Longitude of the Moon = طول القمر
♁S'	= Panjang Tegak Matahari = Right Ascension of the sun = Asensio Rekta = المطالع البلادية = الصعود المستقيم
♁M'	= Panjang Tegak Bulan = Right Ascension of the Moon = Asensio Rekta = المطالع البلادية = الصعود المستقيم
SS'	= Deklinasi Matahari = Declination of the sun = ميل الشمس
MM'	= Deklinasi Bulan = Declination of the moon = ميل القمر = الميل الأول =
MN'	= Deklinasi Kedua Bulan = الميل الثاني للقمر
BC	= TC' = Maksimum Deklinasi Matahari = 23° 27' = الميل الأعظم = الميل الكلي
MN	= Lintang Astronomis Bulan = عرض القمر
GC	= G'C' = Maksimum 'Ard Bulan = 5° 8' = عرض القمر الكلي
→	= Arah ke Timur = Retrogradee = المخالف

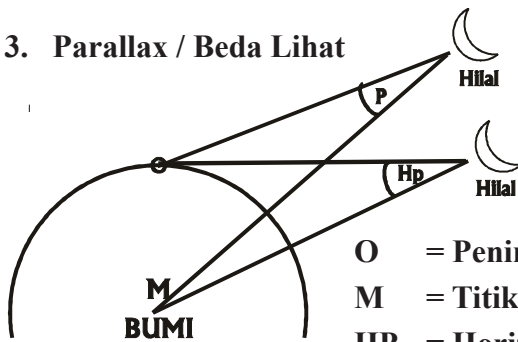
2. BOLA LANGIT PADA 20° LINTANG SELATAN DILIHAT DARI BARAT



O	= Observer, Pengamat di Bumi
Z	= Zenit = Puncak Langit = سمت الرأس
N	= Nadir = Titil terbawah dari Bola Langit = سمت القدم
SBUT	= Selatan, Barat, Utara dan Timur = Cakrawala = Horizon = دائرة الأفق
KS	= Kutub Langit Selatan
KU	= Kutub Langit Utara
ZE	= Lintang Tempat = Latitude = عرض البلاد
ZUNS	= Meridian Langit = دائرة نصف النهار
EBQT	= Khatulistiwa Langit = Equator = معدل النهار
M	= Suatu Benda Langit = الجرم
ZM	= Jarak Zenit = Zenith Distance = بعد السمات
E'MB'Q	= Lingkaran Perjalanan Harian Benda Langit = المدار
KUMM'KS	= Lingkaran Waktu/Lingkaran Deklinasi = دائرة الميل
MM'	= Deklinasi = Declination = الميل

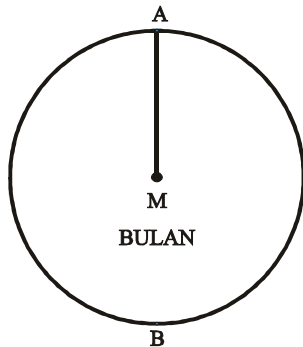
- E' = Titik Kulminasi atas
- E'MB' = Setengah Busur Siang = نصف قوس النهار
- E'M = Sudut Waktu = Hour Angle = t = فضل الدائر
- MB' = Dair = الدائر
- B'C = 90° - Setengah Busur Siang = نصف الفضلة
- E'U = Tinggi Kulminasi = غاية الإرتفاع
- E'KU = Ashal Hakiki = الأصل المطلق
- UTSBB'' = Azimuth = السمّت
- MB'' = Tinggi = Altitude = الإرتفاع
- ← = Arah Ke barat = Prograde = التوالي

3. Parallax / Beda Lihat



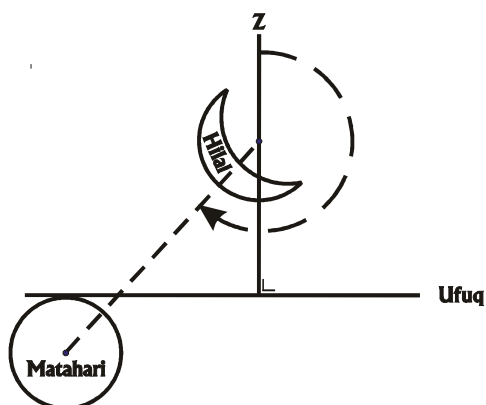
- O = Peninjau, Observer
- M = Titik Pusat Bumi = مركز الأرض
- HP = Horizontal Paraalax
- P = Beda Langit = Parralax = إختلاف المنظر

4. Semi Diameter



- A = Titik teratas pada Piringan Atas, Upper Limb
- M = Titik Pusat Bulan = مركز القمر
- B = Titik terbawah pada Piringan Bawah, Lower Limb
- AM = Jari-jari = Semi diameter Bulan = نصف قطر القمر (rata-rata $0^\circ 16'$)

5. Sudut Kemiringan Hilal



GERHANA MATAHARI DAN BULAN TAHUN 2021

Dalam tahun 2021 M terjadi 4 (empat) kali gerhana, yaitu 2 (dua) kali gerhana matahari dan 2 (dua) kali gerhana bulan :

- 1. Gerhana Bulan Total 26 Mei 2021** Tengah Bulan Syawal 1442 Hijriah. Teramati dari seluruh wilayah Indonesia. Jalur gerhana melewati :

Asia bagian timur, Australia, Samudra Pasifik, Amerika.

Magnitudo Penumbra	: 1.9540	
Magnitudo Umbra	: 1.0095	
Kontak Penumbra 1 (P1)	: 08:47:39 UT	15:47:39 WIB
Kontak Umbra 1 (U1)	: 09:44:57 UT	16:44:57 WIB
Kontak Umbra 2 (U2)	: 11:11:25 UT	18:11:25 WIB
Maksimum Gerhana	: 11:18:40 UT	18:18:40 WIB
Kontak Umbra 3 (U3)	: 11:25:56 UT	18:25:56 WIB
Kontak Ubra 4 (U4)	: 12:55:22 UT	19:55:22 WIB
Kontak Penumbra 4 (P4)	: 13:49:41 UT	20:49:41 WIB

- 2. Gerhana Matahari Annular (Cincin) 10 Juni 2021** Menjelang awal bulan Zulqa'dah 1442 Hijriah. Tidak teramati dari wilayah Indonesia. Jalur gerhana melewati: Amerika bagian utara, Asia.

Kontak Penumbra1 (P1)	: 08:12:15 UT	15:12:15 WIB
Kontak Umbra1 (U1)	: 09:49:43 UT	16:49:43 WIB
Kontak Umbra2 (U2)	: 10:00:36 UT	17:00:36 WIB
Maksimum Gerhana	: 10:41:51 UT	17:41:51 WIB
Kontak Umbra3 (U3)	: 11:22:53 UT	18:22:53 WIB
Kotak Umbra4 (U4)	: 11:33:44 UT	18:33:44 WIB
Kotak Penumbra4 (P4)	: 13:11:15 UT	20:11:15 WIB
Magnitudo Gerhana	: 0.9435	
Lebar maksimum lintasan Gerhana Cincin	: 527.1 Km	
Durasi maksimum Gerhana Cincin	: 03 ^m 51.2 ^d	

- 3. Gerhana Bulan Parsial 19 November 2021** Tengah Bulan Rabi'ul Akhir 1443 Hijriah. Termati dari wilayah sebagian barat, tengah dan timur Indonesia. Jalur gerhana melewati: Amerika, Eropa bagian utara, Asia bagian timur, Australia, dan Samudra Pasifik.

Magnitudo Penumbra	: 2.0720	
Magnitudo Umbra	: 0.9742	
Kontak Penumbra1 (P1)	: 06:02:09 UT	13:02:09 WIB
Kontak Umbra 1 (U1)	: 07:18:41 UT	14:18:41 WIB
Maksimum Gerhana	: 09:02:53 UT	16:02:53 WIB
Kontak Umbra 4 (U4)	: 10:47:04 UT	17:47:04 WIB
Kontak Penumbra4 (P4)	: 12:03:38 UT	19:03:38 WIB

4. Gerhana Matahari Total 04 Desember 2021 Menjelang awal bulan Jumadil Awal 1443 Hijriah. Tidak teramati dari wilayah Indonesia. Jalur gerhana melewati: Antartika, Afrika Selatan, Samudera Atlantik bagian Selatan.

Kontak Penumbra1 (P1)	: 05:29:11 UT	12:29:11 WIB
Kontak Umbra1 (U1)	: 07:00:01 UT	14:00:01 WIB
Kontak Umbra2 (U2)	: 07:05:48 UT	14:05:48 WIB
Maksimum Gerhana	: 07:33:22 UT	14:33:22 WIB
Kontak Umbra3 (U3)	: 08:00:40 UT	15:00:40 WIB
Kotak Umbra4 (U4)	: 08:06:29 UT	15:06:29 WIB
Kotak Penumbra4 (P4)	: 09:37:23 UT	16:37:23 WIB
Magnitudo Gerhana		: 1.0367
Lebar maksimum lintasan Gerhana Total		: 418.6 Km
Durasi maksimum Gerhana Total		: 01 ^m 54.4 ^d

Total Lunar Eclipse of 2021 May 26

Ecliptic Conjunction = 11:15:02.4 TD (= 11:13:50.1 UT)
 Greatest Eclipse = 11:19:52.7 TD (= 11:18:40.3 UT)

Penumbral Magnitude = 1.9540 P. Radius = 1.2981° Gamma = 0.4774
 Umbral Magnitude = 1.0095 U. Radius = 0.7719° Axis = 0.4880°

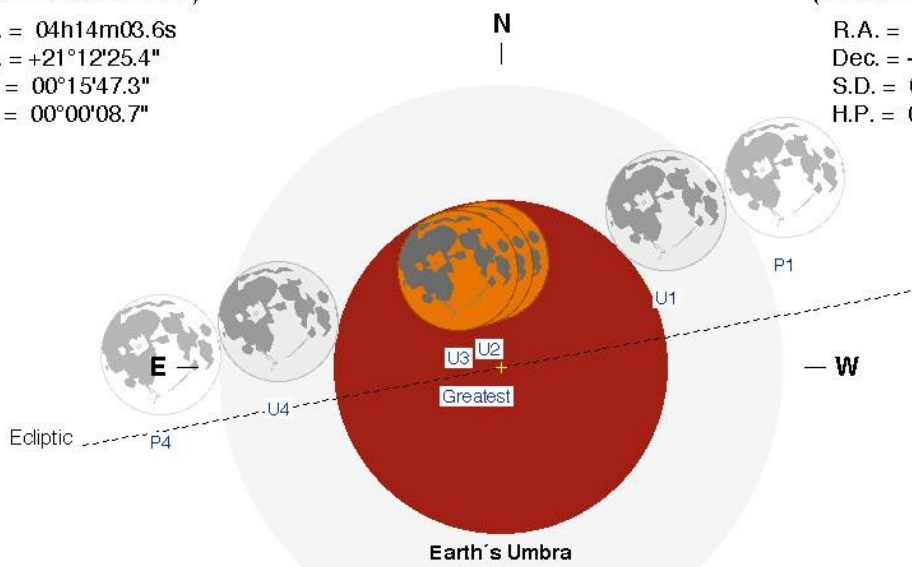
Saros Series = 121 Member = 56 of 84

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 04h14m03.6s
 Dec. = +21°12'25.4"
 S.D. = 00°15'47.3"
 H.P. = 00°00'08.7"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 16h14m37.8s
 Dec. = -20°44'14.9"
 S.D. = 00°16'42.9"
 H.P. = 01°01'20.5"

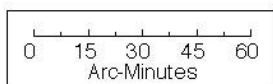


Eclipse Durations

Penumbral = 05h02m02s
 Umbral = 03h07m25s
 Total = 00h14m30s

$\Delta T = 72 \text{ s}$
 Rule = CdT (Danjon)
 Eph. = VSOP87/ELP2000-85

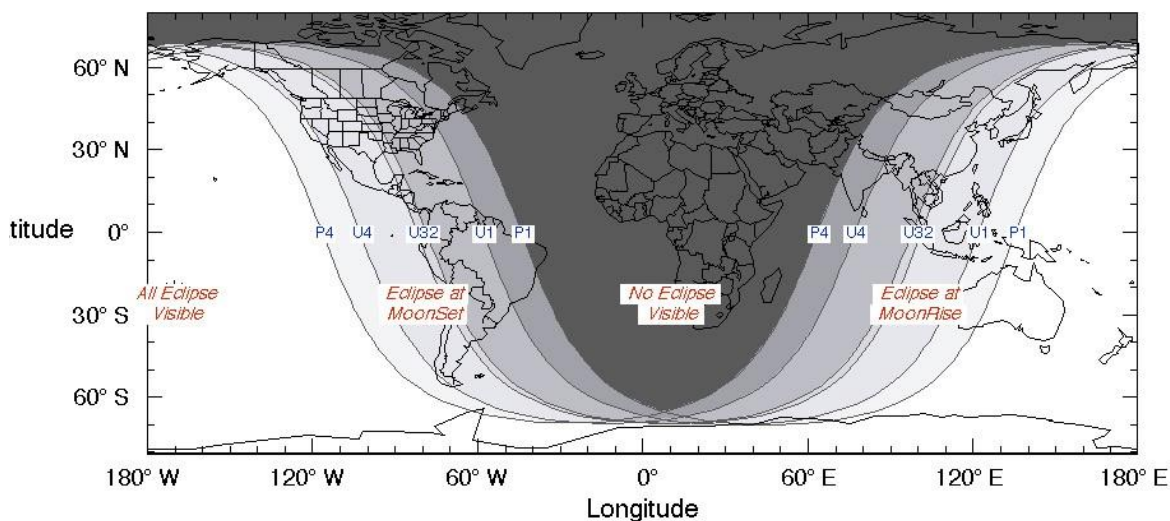
Earth's Penumbra



F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html

Eclipse Contacts

P1 = 08:47:39 UT
 U1 = 09:44:57 UT
 U2 = 11:11:25 UT
 U3 = 11:25:55 UT
 U4 = 12:52:22 UT
 P4 = 13:49:41 UT



2009 Apr 29

Annular Solar Eclipse of 2021 Jun 10

Geocentric Conjunction = 11:00:58.7 UT J.D. = 2459375.959013
 Greatest Eclipse = 10:41:51.0 UT J.D. = 2459375.945730

Eclipse Magnitude = 0.9435 Gamma = 0.9152

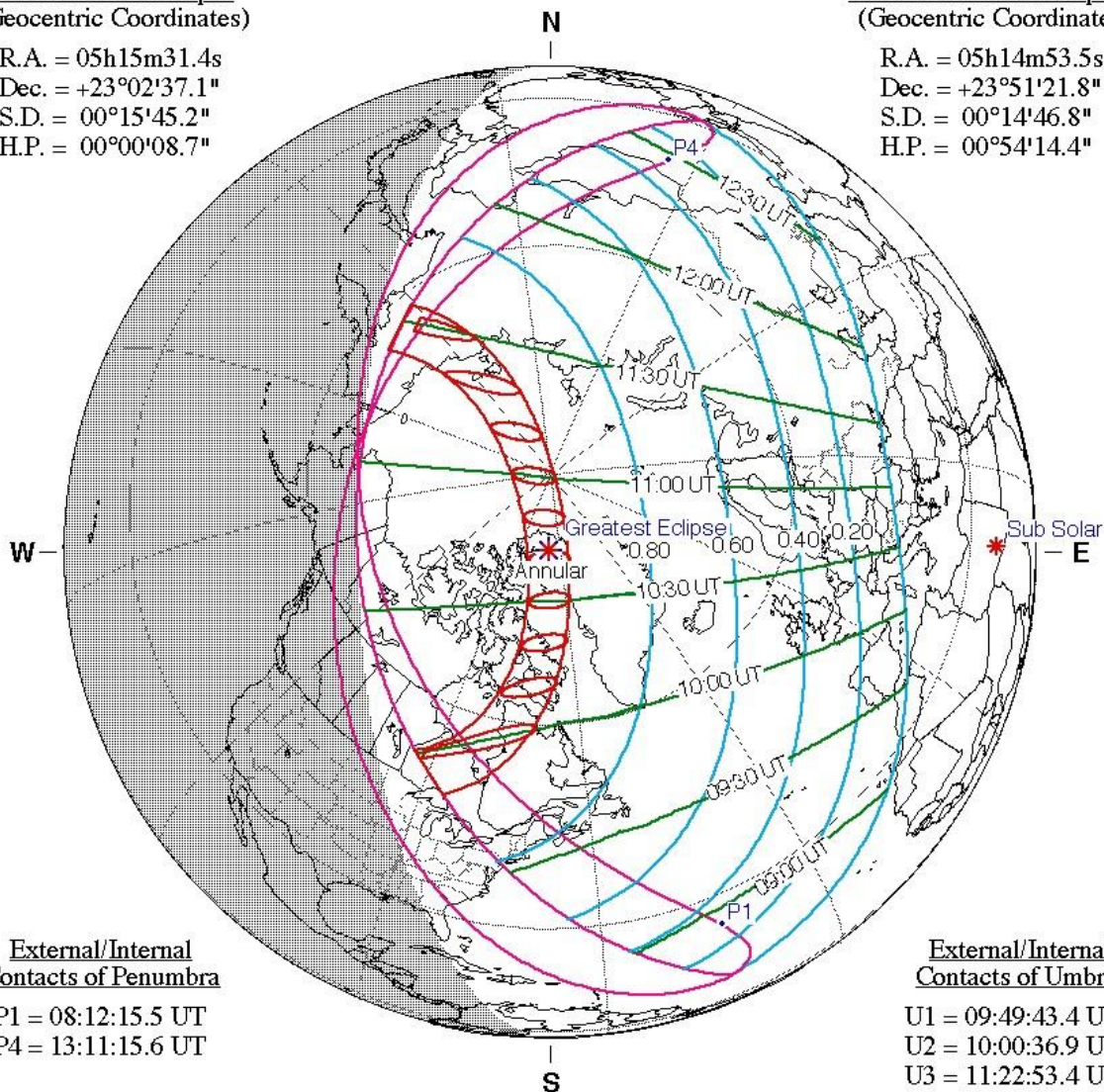
Saros Series = 147 Member = 23 of 80

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 05h15m31.4s
 Dec. = +23°02'37.1"
 S.D. = 00°15'45.2"
 H.P. = 00°00'08.7"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 05h14m53.5s
 Dec. = +23°51'21.8"
 S.D. = 00°14'46.8"
 H.P. = 00°54'14.4"



External/Internal Contacts of Penumbra

P1 = 08:12:15.5 UT
 P4 = 13:11:15.6 UT

External/Internal Contacts of Umbra

U1 = 09:49:43.4 UT
 U2 = 10:00:36.9 UT
 U3 = 11:22:53.4 UT
 U4 = 11:33:44.7 UT

Local Circumstances at Greatest Eclipse

Lat. = 80°48.9'N Sun Alt. = 23.3°
 Long. = 066°48.3'W Sun Azm. = 89.8°
 Path Width = 527.1 km Duration = 03m51.2s

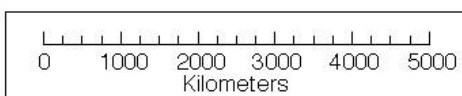
Ephemeris & Constants

Eph. = Newcomb/ILE
 $\Delta T = 78.2$ s
 $k_1 = 0.2724880$
 $k_2 = 0.2722810$
 $\Delta b = 0.0''$ $\Delta l = 0.0''$

Geocentric Libration
(Optical + Physical)

$l = -2.30''$
 $b = -1.06''$
 $c = -2.93''$

Brown Lun. No. = 1218



*F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html*

Partial Lunar Eclipse of 2021 Nov 19

Ecliptic Conjunction = 08:58:37.0 TD (= 08:57:24.4 UT)
 Greatest Eclipse = 09:04:05.7 TD (= 09:02:53.1 UT)

Penumbral Magnitude = 2.0720 P. Radius = 1.1829° Gamma = -0.4552
 Umbral Magnitude = 0.9742 U. Radius = 0.6434° Axis = 0.4104°

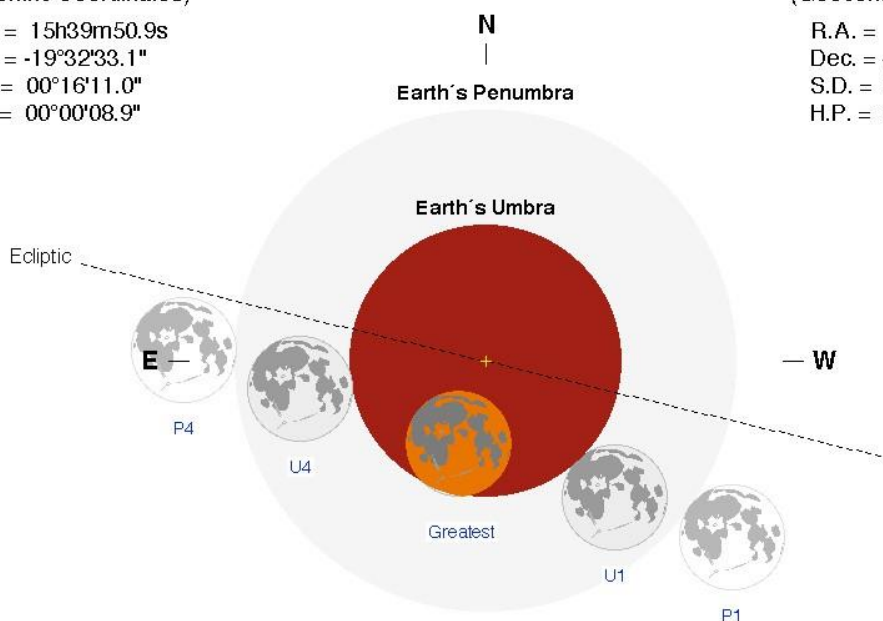
Saros Series = 126 Member = 46 of 72

Sun at Greatest Eclipse
 (Geocentric Coordinates)

R.A. = 15h39m50.9s
 Dec. = -19°32'33.1"
 S.D. = 00°16'11.0"
 H.P. = 00°00'08.9"

Moon at Greatest Eclipse
 (Geocentric Coordinates)

R.A. = 03h40m24.8s
 Dec. = +19°09'15.5"
 S.D. = 00°14'44.5"
 H.P. = 00°54'06.1"

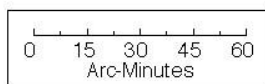


Eclipse Durations

Penumbral = 06h01m29s
 Umbral = 03h28m23s

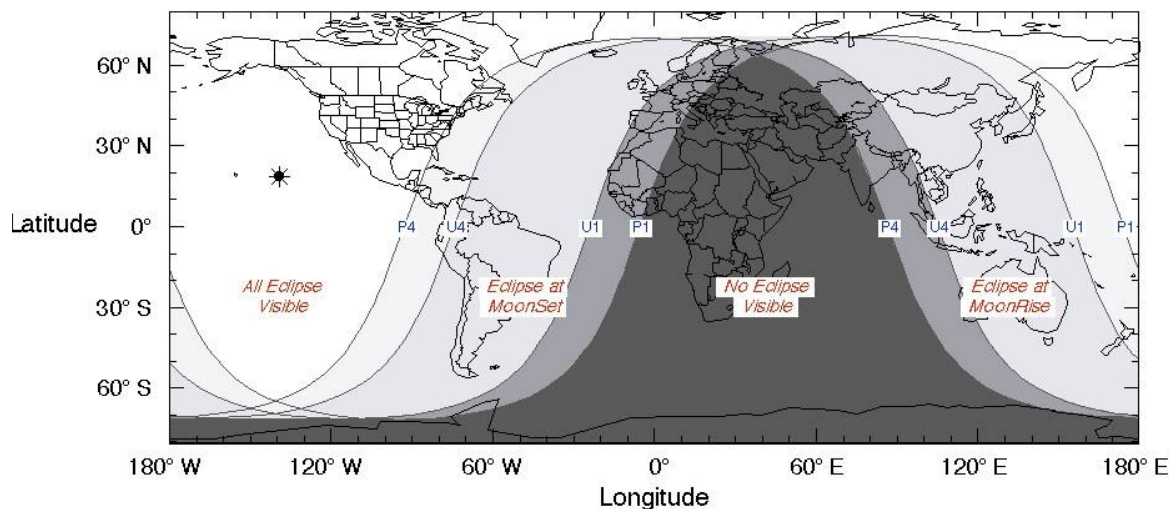
Eclipse Contacts

P1 = 06:02:09 UT
 U1 = 07:18:41 UT
 U4 = 10:47:04 UT
 P4 = 12:03:38 UT



AT = 73 s
 Rule = CdT (Danjon)
 Eph. = VSOP87/ELP2000-85

F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html



Total Solar Eclipse of 2021 Dec 04

Geocentric Conjunction = 07:56:04.9 UT J.D. = 2459552.830612
 Greatest Eclipse = 07:33:22.5 UT J.D. = 2459552.814844

Eclipse Magnitude = 1.0367 Gamma = -0.9526

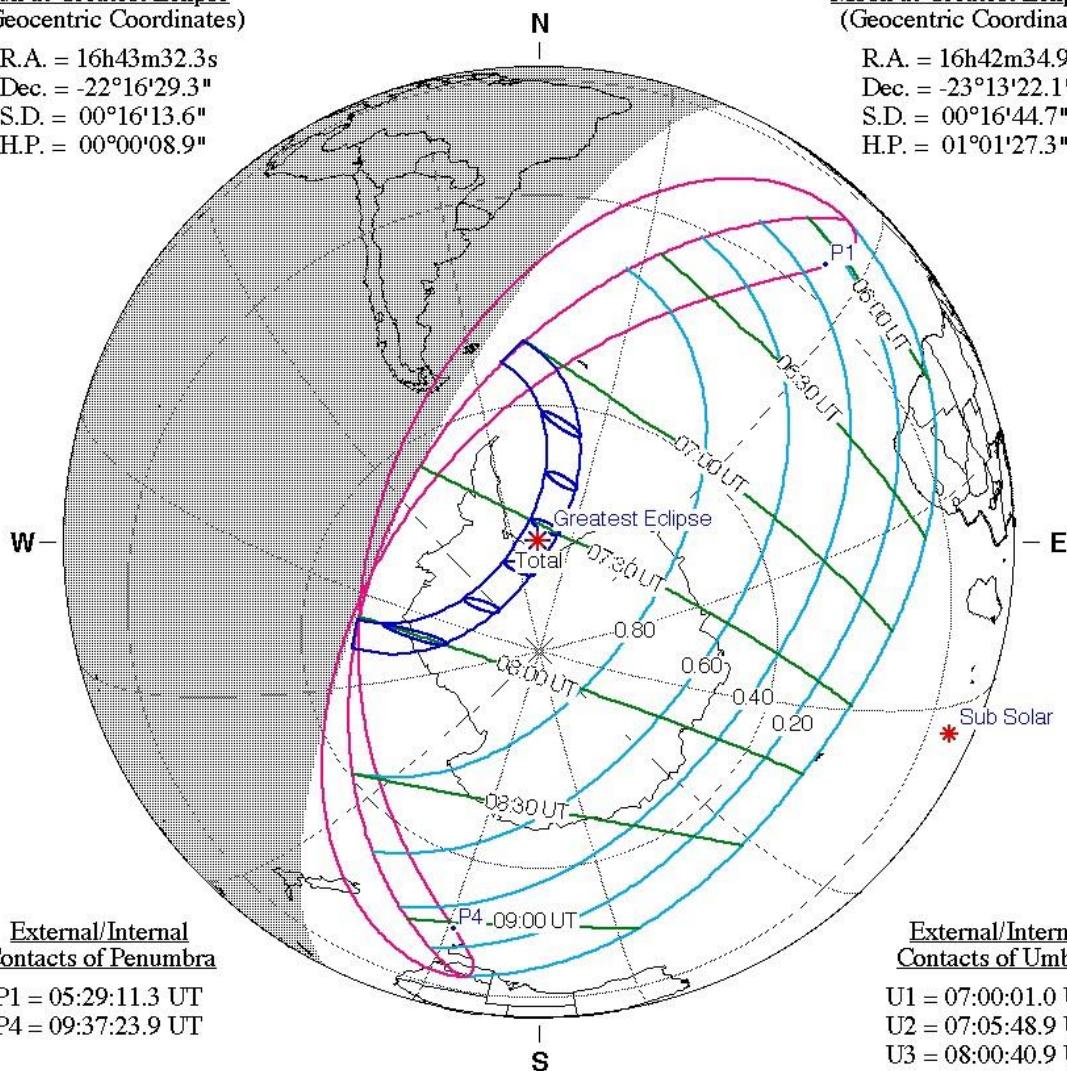
Saros Series = 152 Member = 13 of 70

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 16h43m32.3s
 Dec. = -22°16'29.3"
 S.D. = 00°16'13.6"
 H.P. = 00°00'08.9"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 16h42m34.9s
 Dec. = -23°13'22.1"
 S.D. = 00°16'44.7"
 H.P. = 01°01'27.3"



External/Internal Contacts of Penumbra

P1 = 05:29:11.3 UT
 P4 = 09:37:23.9 UT

External/Internal Contacts of Umbra

U1 = 07:00:01.0 UT
 U2 = 07:05:48.9 UT
 U3 = 08:00:40.9 UT
 U4 = 08:06:29.2 UT

Local Circumstances at Greatest Eclipse

Lat. = 76°46.7'S Sun Alt. = 17.2°
 Long. = 046°11.9'W Sun Azm. = 114.8°
 Path Width = 418.6 km Duration = 01m54.4s

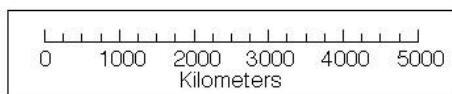
Ephemeris & Constants

Eph. = Newcomb/ILE
 $\Delta T = 78.8$ s
 $k_1 = 0.2724880$
 $k_2 = 0.2722810$
 $\Delta b = 0.0''$ $\Delta l = 0.0''$

Geocentric Libration
(Optical + Physical)

$l = -0.23^\circ$
 $b = 1.26^\circ$
 $c = 6.09^\circ$

Brown Lun. No. = 1224



*F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html*

DAFTAR WAKTU IJTIMA' DAN TINGGI HILAL PENENTU AWAL BULAN HIJRIYAH TAHUN 2021 M

No	Bulan	IJTIMA'			TINGGI HILAL DI INDONESIA		PREDIKSI AWAL BULAN	
		HARI	TANGGAL	JAM WIB	HARI	TANGGAL		
1	Jumadil Akhirah 1442 H	Rabu	13 Januari 2021	12.00	01° 17.02' s.d 02° 17.59'	Kamis	14 Januari 2021 M	
2	Rajab 1442 H	Jumat	12 Februari 2021	2.05	06° 38.57' s.d 07° 41.25'	Sabtu	13 Februari 2021 M	
3	Sya'ban 1442 H	Sabtu	13 Maret 2021	17.21	00° 16.95' s.d 00° 51.80'	Senin	15 Maret 2021 M	
4	Ramadan 1442 H	Senin	12 April 2021	9.30	02° 37.08' s.d 03° 33.06'	Selasa	13 April 2021 M	
5	Syawal 1442 H	Rabu	12 Mei 2021	1.59	-05° 36.52' s.d -04° 38.03'	Kamis	13 Mei 2021 M	
6	Zulqad'ah 1442 H	Kamis	10 Juni 2021	17.52	-02° 29.87' s.d -00° 36.61'	Sabtu	12 Juni 2021 M	
7	Zulhijjah 1442 H	Sabtu	10 Juli 2021	8.16	02° 21.94' s.d 04° 14.11'	Ahad	11 Juli 2021 M	
8	Muharram 1443 H	Ahad	08 Agustus 2021	20.50	-02° 46.56' s.d -00° 12.92'	Selasa	10 Agustus 2021 M	
9	Safar 1443 H	Selasa	07 September 2021	7.51	03° 58.48' s.d 05° 45.24'	Rabu	8 September 2021 M	
10	Rabi'ul Awal 1443 H	Rabu	06 Oktober 2021	18.05	-01° 10.75' s.d 00° 39.91'	Jumat	8 Oktober 2021 M	
11	Rabi'ul Akhir 1443 H	Jumat	05 November 2021	4.14	04° 56.35' s.d 06° 14.26'	Sabtu	6 November 2021 M	
12	Jumadil Ua 1443 H	Sabtu	04 Desember 2021	14.42	-00° 46.09' s.d 00° 29.14'	Senin	6 Desember 2021 M	

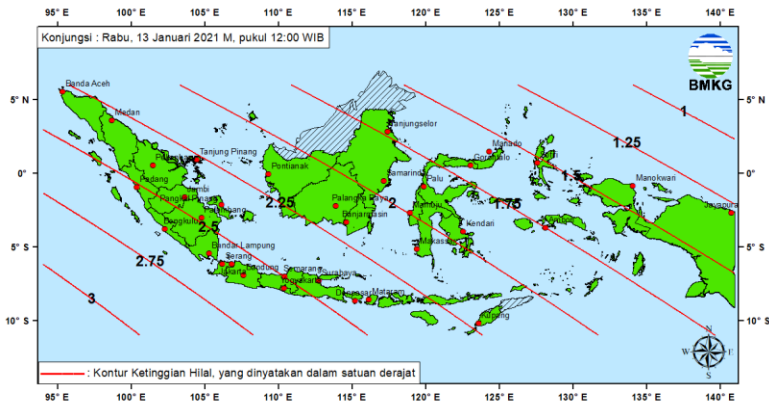
Keterangan:

- 1 Data ini diambil dari Keputusan Musyawarah Jawatankuasa Penyelarasan Rukyat dan Taqvim Islam MABIMS tanggal 1 s/d 5 Juli 1994 di Jakarta dan Hasil Temu Kerja Hisab Rukyat Tahun 2019 tanggal 24 s/d 26 Juli 2019 bertepatan tanggal 21 s/d 23 Zulqad'ah 1440 H di Belitung, Provinsi Bangka Belitung
- 2 Penetapan tanggal 1 Ramadan, 1 Syawal, 1 Zulhijjah 1442 H untuk pelaksanaan ibadah menunggu pengumuman Menteri Agama RI.

DATA POSISI HILAL SELURUH INDONESIA
RABU, 13 JANUARI 2021 M
PENENTU AWAL BULAN JUMADIL AKHIRAH 1442 H
KONJUNGSI: RABU, 13 JANUARI 2021 M, PUKUL 12:00 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN								
		MATAHARI		BULAN												
		j	m	°	'				°	'	°	'	%			
1	Banda Aceh	18	: 42	WIB	18	: 55	WIB	248	35.27	245	41.11	2	17.59	4	3.82	0.13
2	Medan	18	: 32	WIB	18	: 44	WIB	248	37.05	245	51.31	2	18.27	3	58.41	0.12
3	Padang	18	: 32	WIB	18	: 46	WIB	248	35.28	246	9.46	2	30.75	3	55.34	0.12
4	Pekanbaru	18	: 25	WIB	18	: 39	WIB	248	36.71	246	4.04	2	23.63	3	53.84	0.12
5	Bengkulu	18	: 29	WIB	18	: 43	WIB	248	29.76	246	16.96	2	36.29	3	52.31	0.11
6	Jambi	18	: 20	WIB	18	: 34	WIB	248	34.22	246	10.64	2	26.49	3	50.38	0.11
7	Tanjung Pinang	18	: 13	WIB	18	: 25	WIB	248	36.88	246	1.89	2	16.25	3	49.46	0.11
8	Palembang	18	: 18	WIB	18	: 31	WIB	248	31.58	246	14.07	2	28.73	3	48.55	0.11
9	Bandar Lampung	18	: 19	WIB	18	: 34	WIB	248	25.05	246	18.90	2	35.33	3	47.72	0.11
10	Pangkal Pinang	18	: 11	WIB	18	: 24	WIB	248	33.24	246	11.38	2	23.26	3	46.61	0.11
11	Serang	18	: 17	WIB	18	: 31	WIB	248	22.73	246	19.50	2	35.61	3	46.37	0.11
12	Jakarta	18	: 14	WIB	18	: 29	WIB	248	22.53	246	19.25	2	34.43	3	45.35	0.11
13	Bandung	18	: 12	WIB	18	: 27	WIB	248	19.75	246	19.74	2	35.10	3	44.18	0.11
14	Semarang	18	: 1	WIB	18	: 15	WIB	248	19.43	246	18.33	2	29.71	3	39.95	0.10
15	Yogyakarta	18	: 3	WIB	18	: 17	WIB	248	16.20	246	18.97	2	32.17	3	40.07	0.10
16	Surabaya	17	: 53	WIB	18	: 6	WIB	248	17.98	246	17.41	2	26.28	3	36.61	0.10
17	Pontianak	17	: 55	WIB	18	: 7	WIB	248	36.01	246	4.22	2	9.84	3	42.25	0.10
18	Palangka Raya	17	: 40	WIB	17	: 52	WIB	248	32.83	246	9.09	2	8.15	3	35.46	0.10
19	Banjarmasin	18	: 39	WITA	18	: 51	WITA	248	30.56	246	11.21	2	10.29	3	34.30	0.10
20	Samarinda	18	: 24	WITA	18	: 35	WITA	248	35.31	246	3.67	1	56.00	3	31.45	0.10
21	Tanjungselor	18	: 18	WITA	18	: 28	WITA	248	36.80	245	52.44	1	43.84	3	32.13	0.10
22	Denpasar	18	: 45	WITA	18	: 58	WITA	248	12.23	246	16.52	2	25.19	3	32.96	0.10
23	Mataram	18	: 41	WITA	18	: 55	WITA	248	12.57	246	16.00	2	23.24	3	31.69	0.10
24	Kupang	18	: 14	WITA	18	: 26	WITA	248	4.58	246	10.87	2	13.23	3	21.19	0.09
25	Mamuju	18	: 20	WITA	18	: 32	WITA	248	31.83	246	8.38	1	59.75	3	28.58	0.09
26	Makassar	18	: 22	WITA	18	: 34	WITA	248	25.57	246	12.10	2	6.51	3	27.40	0.09
27	Palu	18	: 14	WITA	18	: 25	WITA	248	34.76	246	3.99	1	51.95	3	27.77	0.09
28	Kendari	18	: 8	WITA	18	: 19	WITA	248	28.75	246	9.27	1	56.79	3	23.54	0.09
29	Gorontalo	18	: 59	WITA	18	: 9	WITA	248	36.10	245	59.28	1	40.77	3	24.18	0.09
30	Manado	17	: 50	WITA	18	: 59	WITA	248	36.53	245	56.06	1	33.99	3	22.38	0.09
31	Sofifi	18	: 40	WIT	18	: 49	WIT	248	36.10	245	57.76	1	31.31	3	18.89	0.08
32	Ambon	18	: 45	WIT	18	: 55	WIT	248	29.27	246	6.68	1	44.90	3	16.55	0.08
33	Manokwari	18	: 17	WIT	18	: 25	WIT	248	34.39	246	0.03	1	24.15	3	10.96	0.08
34	Jayapura	17	: 53	WIT	18	: 1	WIT	248	31.46	246	0.70	1	17.02	3	3.43	0.07

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
RABU, 13 JANUARI 2021 M
PENENTU AWAL BULAN JUMADILAKHIR 1442 H



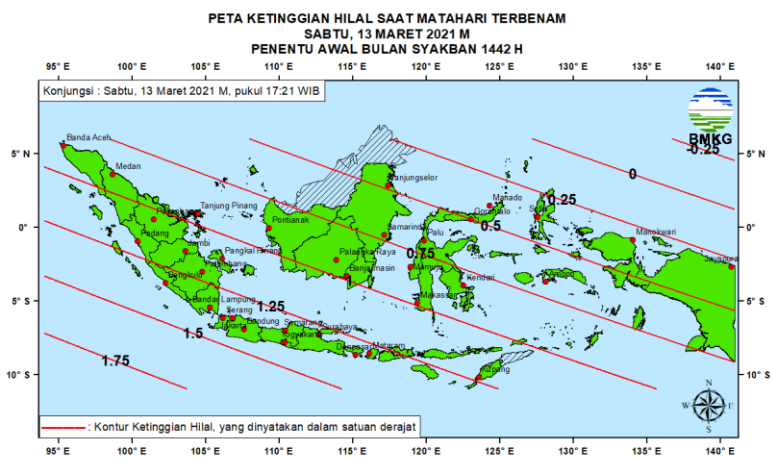
DATA POSISI HILAL SELURUH INDONESIA
JUMAT, 12 FEBRUARI 2021 M
PENENTU AWAL BULAN RAJAB 1442 H
 KONJUNGS: JUMAT, 12 FEBRUARI 2021 M, PUKUL 02:05 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 51 WIB	19 : 27 WIB	256 29.51	253 44.50	7 41.25	8 50.73	0.60
2	Medan	18 : 39 WIB	19 : 15 WIB	256 29.85	254 3.53	7 41.14	8 45.15	0.59
3	Padang	18 : 37 WIB	19 : 13 WIB	256 27.27	254 46.50	7 49.90	8 43.07	0.58
4	Pekanbaru	18 : 31 WIB	19 : 7 WIB	256 28.57	254 32.07	7 44.39	8 40.88	0.58
5	Bengkulu	18 : 32 WIB	19 : 9 WIB	256 22.90	255 10.93	7 52.08	8 40.51	0.58
6	Jambi	18 : 24 WIB	19 : 1 WIB	256 26.29	254 50.34	7 45.30	8 37.60	0.57
7	Tanjung Pinang	18 : 18 WIB	18 : 54 WIB	256 28.68	254 26.30	7 37.70	8 35.63	0.56
8	Palembang	18 : 21 WIB	18 : 57 WIB	256 24.18	255 1.89	7 46.00	8 35.94	0.57
9	Bandar Lampung	18 : 21 WIB	18 : 58 WIB	256 19.37	255 22.16	7 49.19	8 35.78	0.56
10	Pangkal Pinang	18 : 15 WIB	18 : 51 WIB	256 25.42	254 53.30	7 41.78	8 33.39	0.56
11	Serang	18 : 18 WIB	18 : 55 WIB	256 17.70	255 26.96	7 48.54	8 34.44	0.56
12	Jakarta	18 : 16 WIB	18 : 52 WIB	256 17.53	255 26.79	7 47.39	8 33.29	0.56
13	Bandung	18 : 13 WIB	18 : 50 WIB	256 15.56	255 32.02	7 46.95	8 32.19	0.56
14	Semarang	18 : 2 WIB	18 : 38 WIB	256 15.23	255 29.92	7 41.95	8 27.29	0.55
15	Yogyakarta	18 : 3 WIB	18 : 40 WIB	256 13.00	255 36.07	7 43.02	8 27.70	0.55
16	Surabaya	17 : 53 WIB	18 : 29 WIB	256 14.14	255 30.52	7 38.32	8 23.48	0.54
17	Pontianak	18 : 0 WIB	18 : 35 WIB	256 27.66	254 32.17	7 30.96	8 27.39	0.55
18	Palangka Raya	17 : 44 WIB	18 : 19 WIB	256 24.84	254 48.38	7 27.55	8 20.02	0.53
19	Banjarmasin	18 : 42 WITA	19 : 17 WITA	256 23.07	254 57.05	7 28.50	8 19.07	0.53
20	Samarinda	18 : 29 WITA	19 : 3 WITA	256 26.79	254 31.02	7 17.48	8 14.16	0.52
21	Tanjungselor	18 : 25 WITA	18 : 59 WITA	256 28.75	254 0.30	7 7.66	8 13.26	0.52
22	Denpasar	18 : 45 WITA	19 : 21 WITA	256 10.09	255 37.83	7 35.36	8 19.63	0.53
23	Mataram	18 : 41 WITA	19 : 17 WITA	256 10.29	255 36.42	7 33.71	8 18.07	0.53
24	Kupang	18 : 13 WITA	18 : 48 WITA	256 4.59	255 39.80	7 22.11	8 5.79	0.50
25	Mamuju	18 : 24 WITA	18 : 59 WITA	256 23.89	254 48.36	7 19.24	8 11.58	0.51
26	Makassar	18 : 24 WITA	18 : 59 WITA	256 19.25	255 7.71	7 23.00	8 11.27	0.51
27	Palu	18 : 19 WITA	18 : 53 WITA	256 26.22	254 32.55	7 13.34	8 9.58	0.51
28	Kendari	18 : 11 WITA	18 : 45 WITA	256 21.46	254 56.01	7 15.20	8 5.69	0.50
29	Gorontalo	18 : 4 WITA	18 : 38 WITA	256 27.37	254 17.88	7 3.58	8 3.92	0.50
30	Manado	17 : 56 WITA	18 : 29 WITA	256 27.87	254 8.33	6 57.51	8 0.80	0.49
31	Sofifi	18 : 46 WIT	19 : 19 WIT	256 27.27	254 13.24	6 54.53	7 56.33	0.48
32	Ambon	18 : 48 WIT	19 : 21 WIT	256 21.64	254 49.36	7 4.26	7 56.04	0.48
33	Manokwari	18 : 22 WIT	18 : 54 WIT	256 25.46	254 22.34	6 46.65	7 45.66	0.46
34	Jayapura	17 : 57 WIT	18 : 28 WIT	256 22.88	254 30.78	6 38.57	7 34.91	0.44



DATA POSISI HILAL SELURUH INDONESIA
SABTU, 13 MARET 2021 M
PENENTU AWAL BULAN SYA'BAN 1442 H
KONJUNGI: SABTU, 13 MARET 2021 M, PUKUL 17:21 WIB

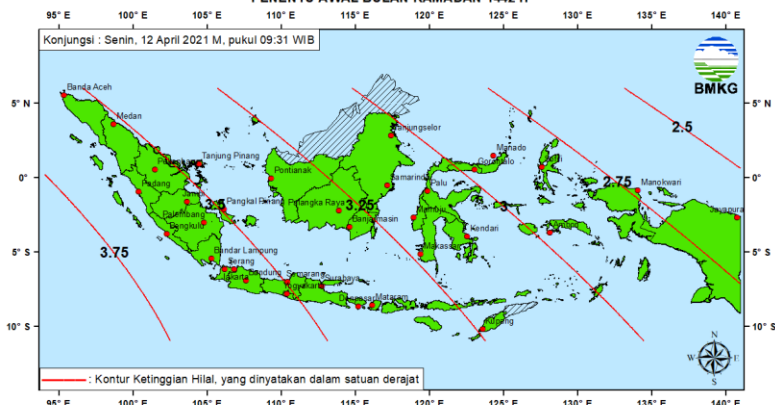
NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 50 WIB	18 : 55 WIB	267 20.25	262 51.32	0 51.80	4 39.47	0.17
2	Medan	18 : 37 WIB	18 : 42 WIB	267 18.75	262 52.29	0 54.74	4 38.03	0.16
3	Padang	18 : 31 WIB	18 : 38 WIB	267 15.01	262 58.71	1 10.64	4 34.16	0.16
4	Pekanbaru	18 : 26 WIB	18 : 32 WIB	267 16.22	262 55.26	1 3.03	4 35.64	0.16
5	Bengkulu	18 : 24 WIB	18 : 31 WIB	267 12.04	263 2.12	1 19.32	4 31.88	0.16
6	Jambi	18 : 18 WIB	18 : 25 WIB	267 14.17	262 57.00	1 8.37	4 34.08	0.16
7	Tanjung Pinang	18 : 14 WIB	18 : 20 WIB	267 16.36	262 52.14	0 56.74	4 36.55	0.16
8	Palembang	18 : 14 WIB	18 : 21 WIB	267 12.72	262 58.32	1 12.27	4 33.04	0.16
9	Bandar Lampung	18 : 12 WIB	18 : 20 WIB	267 10.03	263 2.06	1 21.29	4 30.96	0.16
10	Pangkal Pinang	18 : 8 WIB	18 : 15 WIB	267 13.49	262 55.63	1 6.73	4 34.10	0.16
11	Serang	18 : 9 WIB	18 : 17 WIB	267 9.17	263 2.35	1 22.67	4 30.53	0.16
12	Jakarta	18 : 6 WIB	18 : 14 WIB	267 9.06	263 1.75	1 21.88	4 30.62	0.16
13	Bandung	18 : 3 WIB	18 : 11 WIB	267 8.09	263 2.24	1 23.70	4 30.12	0.16
14	Semarang	17 : 52 WIB	17 : 59 WIB	267 7.83	262 59.35	1 19.77	4 30.75	0.16
15	Yogyakarta	17 : 52 WIB	18 : 0 WIB	267 6.82	263 0.76	1 23.05	4 30.01	0.15
16	Surabaya	17 : 43 WIB	17 : 50 WIB	267 7.24	262 57.52	1 17.84	4 31.05	0.16
17	Pontianak	17 : 55 WIB	18 : 0 WIB	267 15.21	262 49.54	0 53.23	4 36.78	0.16
18	Palangka Raya	17 : 37 WIB	17 : 43 WIB	267 12.88	262 48.69	0 55.36	4 36.06	0.16
19	Banjarmasin	18 : 35 WITA	18 : 40 WITA	267 11.73	262 49.58	0 58.79	4 35.28	0.16
20	Samarinda	18 : 24 WITA	18 : 28 WITA	267 14.29	262 43.51	0 43.30	4 38.77	0.17
21	Tanjungselor	18 : 22 WITA	18 : 26 WITA	267 17.00	262 39.33	0 28.83	4 42.05	0.17
22	Denpasar	18 : 33 WITA	18 : 41 WITA	267 5.36	262 56.89	1 19.47	4 30.61	0.16
23	Mataram	18 : 30 WITA	18 : 37 WITA	267 5.40	262 55.79	1 17.88	4 30.96	0.16
24	Kupang	18 : 0 WITA	18 : 7 WITA	267 2.72	262 49.67	1 13.54	4 32.31	0.16
25	Mamuju	18 : 17 WITA	18 : 22 WITA	267 12.11	262 44.68	0 49.71	4 37.38	0.16
26	Makassar	18 : 16 WITA	18 : 21 WITA	267 9.44	262 47.37	0 59.07	4 35.28	0.16
27	Palu	18 : 13 WITA	18 : 17 WITA	267 13.76	262 41.62	0 40.82	4 39.43	0.17
28	Kendari	18 : 3 WITA	18 : 8 WITA	267 10.52	262 42.85	0 49.69	4 37.61	0.16
29	Gorontalo	18 : 0 WITA	18 : 3 WITA	267 14.81	262 37.29	0 29.94	4 42.13	0.17
30	Manado	17 : 53 WITA	17 : 56 WITA	267 15.47	262 34.89	0 23.20	4 43.84	0.17
31	Sofifi	18 : 42 WIT	18 : 45 WIT	267 14.68	262 33.38	0 22.32	4 44.41	0.17
32	Ambon	18 : 40 WIT	18 : 45 WIT	267 10.44	262 37.10	0 40.23	4 40.44	0.17
33	Manokwari	18 : 16 WIT	18 : 19 WIT	267 12.85	262 29.16	0 19.44	4 46.30	0.17
34	Jayapura	17 : 50 WIT	17 : 52 WIT	267 10.80	262 24.36	0 16.95	4 48.64	0.18



DATA POSISI HILAL SELURUH INDONESIA
SENIN, 12 APRIL 2021 M
PENENTU AWAL BULAN RAMADAN 1442 H
KONJUNGS: SENIN, 12 APRIL 2021 M, PUKUL 9:30 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 46 WIB	19 : 3 WIB	278 59.28	276 41.54	3 33.06	4 45.73	0.17
2	Medan	18 : 31 WIB	18 : 48 WIB	278 55.81	276 46.29	3 31.50	4 40.42	0.17
3	Padang	18 : 22 WIB	18 : 39 WIB	278 50.71	277 3.70	3 36.71	4 35.76	0.16
4	Pekanbaru	18 : 18 WIB	18 : 35 WIB	278 51.89	276 56.35	3 32.60	4 35.29	0.16
5	Bengkulu	18 : 12 WIB	18 : 30 WIB	278 49.13	277 15.80	3 37.95	4 31.96	0.16
6	Jambi	18 : 8 WIB	18 : 25 WIB	278 50.05	277 3.90	3 32.66	4 31.54	0.16
7	Tanjung Pinang	18 : 6 WIB	18 : 23 WIB	278 52.12	276 52.20	3 27.13	4 32.01	0.16
8	Palembang	18 : 3 WIB	18 : 20 WIB	278 49.26	277 9.43	3 32.96	4 29.43	0.15
9	Bandar Lampung	17 : 59 WIB	18 : 17 WIB	278 48.72	277 21.27	3 35.50	4 27.59	0.15
10	Pangkal Pinang	17 : 58 WIB	18 : 15 WIB	278 49.58	277 4.12	3 29.58	4 28.32	0.15
11	Serang	17 : 55 WIB	18 : 13 WIB	278 48.69	277 24.02	3 34.99	4 26.20	0.15
12	Jakarta	17 : 52 WIB	18 : 10 WIB	278 48.66	277 23.61	3 34.05	4 25.38	0.15
13	Bandung	17 : 49 WIB	18 : 6 WIB	278 48.74	277 26.88	3 33.78	4 24.11	0.15
14	Semarang	17 : 38 WIB	17 : 55 WIB	278 48.58	277 24.25	3 29.65	4 20.80	0.14
15	Yogyakarta	17 : 37 WIB	17 : 55 WIB	278 48.84	277 28.73	3 30.69	4 20.51	0.14
16	Surabaya	17 : 28 WIB	17 : 45 WIB	278 48.54	277 23.78	3 26.72	4 18.05	0.14
17	Pontianak	17 : 46 WIB	18 : 3 WIB	278 50.88	276 52.12	3 21.08	4 25.83	0.15
18	Palangka Raya	17 : 27 WIB	17 : 43 WIB	278 49.06	276 57.50	3 17.67	4 19.47	0.14
19	Banjarmasin	18 : 23 WITA	18 : 39 WITA	278 48.53	277 1.77	3 18.34	4 18.08	0.14
20	Samarinda	18 : 15 WITA	18 : 30 WITA	278 50.02	276 47.35	3 9.64	4 17.00	0.14
21	Tanjungselor	18 : 16 WITA	18 : 31 WITA	278 53.64	276 34.85	3 2.73	4 18.90	0.14
22	Denpasar	18 : 17 WITA	18 : 34 WITA	278 48.94	277 28.36	3 24.61	4 14.62	0.14
23	Mataram	18 : 14 WITA	18 : 31 WITA	278 48.84	277 26.95	3 23.24	4 13.67	0.14
24	Kupang	17 : 43 WITA	17 : 59 WITA	278 49.40	277 27.51	3 14.34	4 4.87	0.13
25	Mamuju	18 : 6 WITA	18 : 22 WITA	278 48.53	276 54.87	3 10.69	4 13.81	0.14
26	Makassar	18 : 3 WITA	18 : 19 WITA	278 47.86	277 5.63	3 13.77	4 11.85	0.13
27	Palu	18 : 4 WITA	18 : 19 WITA	278 49.55	276 46.55	3 6.08	4 13.88	0.14
28	Kendari	17 : 51 WITA	18 : 7 WITA	278 47.86	276 57.18	3 7.27	4 9.27	0.13
29	Gorontalo	17 : 52 WITA	18 : 6 WITA	278 50.59	276 38.36	2 58.32	4 11.49	0.13
30	Manado	17 : 45 WITA	18 : 0 WITA	278 51.49	276 33.57	2 53.59	4 10.34	0.13
31	Sofifi	18 : 34 WIT	18 : 48 WIT	278 50.52	276 33.93	2 50.83	4 7.18	0.13
32	Ambon	18 : 29 WIT	18 : 43 WIT	278 47.58	276 50.58	2 58.22	4 3.74	0.13
33	Manokwari	18 : 7 WIT	18 : 20 WIT	278 48.71	276 34.03	2 43.88	4 0.01	0.12
34	Jayapura	17 : 39 WIT	17 : 52 WIT	278 47.27	276 34.23	2 37.04	3 53.09	0.12

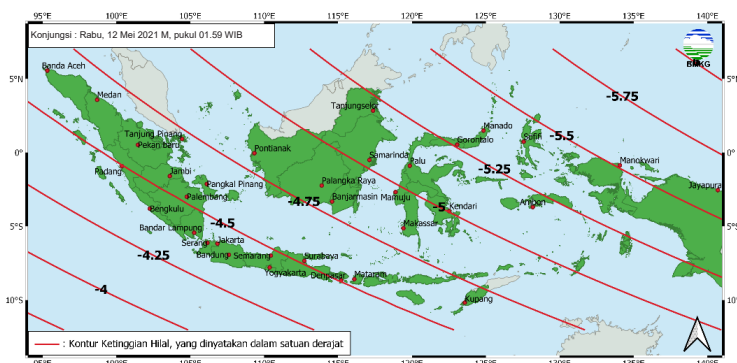
PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SENIN, 12 APRIL 2021 M
PENENTU AWAL BULAN RAMADAN 1442 H



DATA POSISI HILAL SELURUH INDONESIA
SELASA, 11 MEI 2021 M
PENENTU AWAL BULAN SYAWAL 1442 H
KONJUNGI: RABU, 12 MEI 2021 M, PUKUL 01:59 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 45 WIB	18 : 29 WIB	288 10,93	285 37,75	-4 38,03	4 33,58	0,16
2	Medan	18 : 29 WIB	18 : 13 WIB	288 5,84	285 24,35	-4 39,46	4 39,36	0,17
3	Padang	18 : 17 WIB	18 : 1 WIB	287 59,53	285 2,08	-4 29,68	4 42,11	0,17
4	Pekanbaru	18 : 14 WIB	17 : 58 WIB	288 0,74	285 7,40	-4 36,23	4 44,05	0,17
5	Bengkulu	18 : 5 WIB	17 : 50 WIB	287 59,08	284 50,98	-4 24,76	4 45,20	0,17
6	Jambi	18 : 3 WIB	17 : 47 WIB	287 59,06	284 57,20	-4 33,87	4 47,68	0,18
7	Tanjung Pinang	18 : 3 WIB	17 : 46 WIB	288 1,09	285 7,28	-4 43,01	4 49,22	0,18
8	Palembang	17 : 56 WIB	17 : 41 WIB	287 58,80	284 51,49	-4 31,50	4 49,59	0,18
9	Bandar Lampung	17 : 51 WIB	17 : 36 WIB	287 60,00	284 44,33	-4 24,81	4 50,27	0,18
10	Pangkal Pinang	17 : 52 WIB	17 : 36 WIB	287 58,79	284 53,40	-4 36,87	4 51,98	0,18
11	Serang	17 : 47 WIB	17 : 31 WIB	288 0,68	284 42,07	-4 24,13	4 51,76	0,18
12	Jakarta	17 : 44 WIB	17 : 29 WIB	288 0,71	284 41,37	-4 25,05	4 52,93	0,18
13	Bandung	17 : 40 WIB	17 : 25 WIB	288 1,66	284 39,25	-4 23,93	4 54,21	0,18
14	Semarang	17 : 29 WIB	17 : 13 WIB	288 1,63	284 36,61	-4 28,27	4 59,14	0,19
15	Yogyakarta	17 : 28 WIB	17 : 12 WIB	288 2,91	284 35,33	-4 25,53	4 58,93	0,19
16	Surabaya	17 : 19 WIB	17 : 3 WIB	288 2,07	284 33,93	-4 30,89	5 3,07	0,20
17	Pontianak	17 : 42 WIB	17 : 25 WIB	287 59,83	284 59,55	-4 49,20	4 57,65	0,19
18	Palangka Raya	17 : 21 WIB	17 : 4 WITA	287 58,44	284 47,21	-4 50,70	5 5,48	0,20
19	Banjarmasin	18 : 17 WITA	18 : 0 WITA	287 58,42	284 42,76	-4 48,43	5 6,65	0,20
20	Samarinda	18 : 10 WITA	17 : 53 WITA	287 59,11	284 52,11	-5 1,89	5 11,15	0,21
21	Tanjungselor	18 : 14 WITA	17 : 55 WITA	288 3,56	285 9,38	-5 12,06	5 11,58	0,21
22	Denpasar	18 : 7 WITA	17 : 51 WITA	288 4,36	284 29,60	-4 30,31	5 7,30	0,20
23	Mataram	18 : 4 WITA	17 : 48 WITA	288 4,16	284 28,87	-4 32,29	5 8,86	0,20
24	Kupang	17 : 32 WITA	17 : 15 WITA	288 7,49	284 19,86	-4 39,09	5 21,81	0,22
25	Mamuju	18 : 0 WITA	17 : 43 WITA	287 58,19	284 41,75	-4 58,17	5 14,16	0,21
26	Makassar	17 : 55 WITA	17 : 38 WITA	287 59,14	284 33,19	-4 50,82	5 14,96	0,21
27	Palu	17 : 59 WITA	17 : 41 WITA	287 58,73	284 48,42	-5 5,56	5 15,90	0,21
28	Kendari	17 : 44 WITA	17 : 27 WITA	287 58,29	284 34,28	-5 0,25	5 20,44	0,22
29	Gorontalo	17 : 48 WITA	17 : 29 WITA	287 59,84	284 53,12	-5 15,64	5 21,50	0,22
30	Manado	17 : 42 WITA	17 : 23 WITA	288 0,97	284 57,06	-5 21,64	5 24,60	0,22
31	Sofifi	18 : 30 WIT	18 : 11 WIT	287 59,87	284 51,19	-5 24,23	5 29,34	0,23
32	Ambon	18 : 22 WIT	18 : 4 WIT	287 57,95	284 30,71	-5 11,01	5 30,35	0,23
33	Manokwari	18 : 2 WIT	17 : 42 WIT	287 58,14	284 38,49	-5 30,67	5 40,74	0,25
34	Jayapura	17 : 33 WIT	17 : 13 WIT	287 57,26	284 25,67	-5 36,52	5 52,35	0,26

PETA KETINGGIAN HILAL SAAT MATAHARI TERBENAM
SELASA, 11 MEI 2021 M
PENENTU AWAL BULAN SYAWAL 1442 H



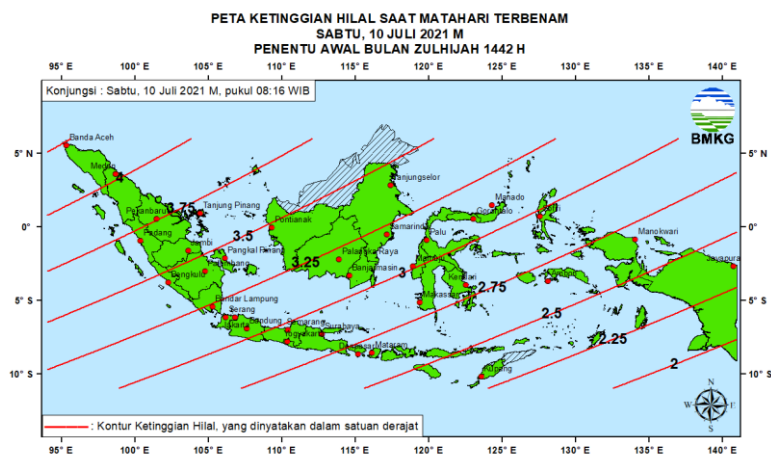
DATA POSISI HILAL SELURUH INDONESIA
KAMIS, 10 JUNI 2021 M
PENENTU AWAL BULAN ZULQA'DAH 1442 H
KONJUNGS: KAMIS, 10 JUNI 2021 M, PUKUL 17:52 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 51 WIB	18 : 49 WIB	293 15.18	294 6.83	0 -36.61	0 57.47	0.01
2	Medan	18 : 34 WIB	18 : 31 WIB	293 9.19	294 1.09	0 -45.93	1 2.53	0.01
3	Padang	18 : 20 WIB	18 : 16 WIB	293 2.20	293 54.30	0 -57.04	1 9.40	0.01
4	Pekanbaru	18 : 18 WIB	18 : 14 WIB	293 3.45	293 55.17	0 -56.44	1 8.74	0.01
5	Bengkulu	18 : 7 WIB	18 : 3 WIB	293 2.46	293 53.54	-1 6.02	1 14.52	0.01
6	Jambi	18 : 5 WIB	18 : 1 WIB	293 1.90	293 52.81	-1 4.50	1 13.39	0.01
7	Tanjung Pinang	18 : 6 WIB	18 : 3 WIB	293 3.92	293 54.80	-1 1.42	1 11.33	0.01
8	Palembang	17 : 59 WIB	18 : 54 WIB	293 1.98	293 52.17	-1 9.41	1 16.20	0.01
9	Bandar Lampung	17 : 52 WIB	18 : 48 WIB	293 4.23	293 53.44	-1 15.09	1 19.45	0.01
10	Pangkal Pinang	17 : 55 WIB	18 : 50 WIB	293 1.80	293 51.67	-1 10.47	1 16.71	0.01
11	Serang	17 : 48 WIB	17 : 43 WIB	293 5.34	293 53.82	-1 18.24	1 21.18	0.01
12	Jakarta	17 : 45 WIB	17 : 40 WIB	293 5.43	293 53.53	-1 19.73	1 21.98	0.01
13	Bandung	17 : 40 WIB	17 : 35 WIB	293 6.91	293 54.23	-1 22.80	1 23.67	0.01
14	Semarang	17 : 29 WIB	17 : 23 WIB	293 7.00	293 52.75	-1 28.87	1 27.05	0.02
15	Yogyakarta	17 : 28 WIB	17 : 22 WIB	293 8.91	293 54.18	-1 30.29	1 27.80	0.02
16	Surabaya	17 : 19 WIB	17 : 13 WIB	293 7.78	293 52.03	-1 34.43	1 30.21	0.02
17	Pontianak	17 : 45 WIB	17 : 41 WIB	293 2.75	293 52.03	-1 12.99	1 18.06	0.01
18	Palangka Raya	17 : 23 WIB	17 : 18 WIB	293 1.71	293 48.55	-1 26.86	1 26.24	0.02
19	Banjarmasin	18 : 19 WITA	18 : 13 WITA	293 2.01	293 47.96	-1 30.55	1 28.34	0.02
20	Samarinda	18 : 13 WITA	18 : 8 WITA	293 2.27	293 48.88	-1 30.45	1 28.61	0.02
21	Tanjungselor	18 : 18 WITA	18 : 13 WITA	293 7.21	293 55.35	-1 24.24	1 25.13	0.02
22	Denpasar	18 : 7 WITA	18 : 0 WITA	293 11.25	293 53.01	-1 42.49	1 34.73	0.02
23	Mataram	18 : 4 WITA	17 : 57 WITA	293 11.01	293 52.31	-1 44.29	1 35.80	0.02
24	Kupang	17 : 31 WITA	17 : 23 WITA	293 16.13	293 51.11	-2 4.15	1 47.52	0.02
25	Mamuju	18 : 3 WITA	17 : 56 WITA	293 1.71	293 46.31	-1 38.77	1 33.42	0.02
26	Makassar	17 : 56 WITA	17 : 50 WITA	293 3.63	293 46.10	-1 44.90	1 36.74	0.02
27	Palu	18 : 2 WITA	17 : 55 WITA	293 1.98	293 47.45	-1 37.33	1 32.83	0.02
28	Kendari	17 : 46 WITA	17 : 39 WITA	293 2.34	293 44.38	-1 49.63	1 39.87	0.02
29	Gorontalo	17 : 51 WITA	17 : 45 WITA	293 3.19	293 48.62	-1 41.69	1 35.84	0.02
30	Manado	17 : 46 WITA	17 : 39 WITA	293 4.51	293 50.13	-1 43.82	1 37.41	0.02
31	Sofifi	18 : 34 WIT	18 : 27 WIT	293 3.39	293 47.67	-1 51.73	1 42.30	0.02
32	Ambon	18 : 24 WIT	18 : 16 WIT	293 2.07	293 41.87	-2 2.28	1 47.87	0.02
33	Manokwari	18 : 5 WIT	17 : 57 WIT	293 1.82	293 42.47	-2 10.58	1 53.99	0.03
34	Jayapura	17 : 35 WIT	17 : 26 WIT	293 1.41	293 37.43	-2 29.87	2 6.15	0.03



DATA POSISI HILAL SELURUH INDONESIA
SABTU, 10 JULI 2021 M
PENENTU AWAL BULAN ZULHIJAH 1442 H
 KONJUNGS: SABTU, 10 JULI 2021 M, PUKUL 08:16 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN								
		MATAHARI		BULAN												
		j	m	j	m				°	'	°	'	%			
1	Banda Aceh	18	: 56	WIB	19	: 19	WIB	292	22.01	294	34.62	4	14.11	5	21.56	0.22
2	Medan	18	: 40	WIB	19	: 1	WIB	292	16.34	294	42.96	4	1.39	5	15.87	0.21
3	Padang	18	: 26	WIB	18	: 45	WIB	292	9.61	295	4.43	3	41.78	5	12.80	0.21
4	Pekanbaru	18	: 24	WIB	18	: 44	WIB	292	10.87	294	57.10	3	45.35	5	11.22	0.21
5	Bengkulu	18	: 13	WIB	18	: 32	WIB	292	9.87	295	21.44	3	26.60	5	9.87	0.20
6	Jambi	18	: 12	WIB	18	: 30	WIB	292	9.42	295	8.45	3	33.16	5	7.83	0.20
7	Tanjung Pinang	18	: 12	WIB	18	: 32	WIB	292	11.44	294	55.72	3	41.35	5	6.67	0.20
8	Palembang	18	: 5	WIB	18	: 23	WIB	292	9.50	295	16.54	3	25.39	5	6.09	0.20
9	Bandar Lampung	17	: 59	WIB	18	: 16	WIB	292	11.63	295	32.03	3	14.12	5	5.44	0.20
10	Pangkal Pinang	18	: 1	WIB	18	: 19	WIB	292	9.40	295	11.66	3	26.41	5	4.05	0.20
11	Serang	17	: 54	WIB	18	: 11	WIB	292	12.71	295	36.68	3	9.47	5	4.16	0.20
12	Jakarta	17	: 51	WIB	18	: 8	WIB	292	12.81	295	37.01	3	8.01	5	3.16	0.20
13	Bandung	17	: 47	WIB	18	: 4	WIB	292	14.24	295	42.24	3	3.25	5	2.09	0.19
14	Semarang	17	: 35	WIB	17	: 52	WIB	292	14.43	295	42.40	2	57.81	4	57.94	0.19
15	Yogyakarta	17	: 34	WIB	17	: 50	WIB	292	16.23	295	48.20	2	54.33	4	58.16	0.19
16	Surabaya	17	: 26	WIB	17	: 42	WIB	292	15.24	295	44.67	2	52.11	4	54.70	0.18
17	Pontianak	17	: 51	WIB	17	: 10	WIB	292	10.45	295	1.14	3	28.70	4	59.23	0.19
18	Palangka Raya	17	: 29	WIB	17	: 47	WIB	292	9.57	295	12.79	3	11.75	4	52.51	0.18
19	Banjarmasin	18	: 25	WITA	18	: 42	WITA	292	9.85	295	18.86	3	6.02	4	51.56	0.18
20	Samarinda	18	: 19	WITA	18	: 37	WITA	292	10.24	295	4.45	3	12.68	4	47.73	0.18
21	Tanjungselor	18	: 24	WITA	18	: 42	WITA	292	15.05	294	50.75	3	24.67	4	47.40	0.18
22	Denpasar	18	: 13	WITA	18	: 29	WITA	292	18.62	295	53.96	2	41.61	4	51.33	0.18
23	Mataram	18	: 10	WITA	18	: 25	WITA	292	18.42	295	53.24	2	40.37	4	50.06	0.18
24	Kupang	17	: 38	WITA	17	: 51	WITA	292	23.56	296	3.82	2	19.71	4	40.01	0.17
25	Mamuju	18	: 9	WITA	18	: 25	WITA	292	9.72	295	15.50	3	0.83	4	45.31	0.17
26	Makassar	18	: 2	WITA	18	: 18	WITA	292	11.54	295	29.58	2	49.62	4	44.82	0.17
27	Palu	18	: 8	WITA	18	: 24	WITA	292	10.05	295	6.64	3	6.17	4	43.80	0.17
28	Kendari	17	: 52	WITA	18	: 7	WITA	292	10.43	295	22.69	2	48.91	4	40.30	0.17
29	Gorontalo	17	: 57	WITA	18	: 14	WITA	292	11.35	295	0.79	3	5.84	4	39.13	0.17
30	Manado	17	: 52	WITA	18	: 8	WITA	292	12.69	294	57.41	3	6.15	4	36.55	0.16
31	Sofifi	18	: 39	WIT	18	: 56	WIT	292	11.69	295	0.79	2	58.42	4	32.75	0.16
32	Ambon	18	: 30	WIT	18	: 45	WIT	292	10.36	295	21.30	2	39.79	4	32.41	0.16
33	Manokwari	18	: 11	WIT	18	: 26	WIT	292	10.38	295	8.22	2	40.51	4	23.97	0.15
34	Jayapura	17	: 42	WIT	17	: 55	WIT	292	10.17	295	16.12	2	21.94	4	15.55	0.14



DATA POSISI HILAL SELURUH INDONESIA
AHAD, 8 AGUSTUS 2021 M
PENENTU AWAL BULAN MUHARRAM 1443 H
KONJUNGS: AHAD, 8 AGUSTUS 2021 M, PUKUL 20:50 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 54 WIB	18 : 54 WIB	286 9.35	290 47.88	0 -12.92	4 38.50	0.16
2	Medan	18 : 38 WIB	18 : 37 WIB	286 5.01	290 48.01	0 -28.51	4 43.44	0.17
3	Padang	18 : 26 WIB	18 : 23 WIB	285 59.26	290 46.04	0 -56.61	4 50.30	0.18
4	Pekanbaru	18 : 23 WIB	18 : 20 WIB	286 0.52	290 47.30	0 -50.22	4 49.39	0.18
5	Bengkulu	18 : 15 WIB	18 : 10 WIB	285 58.81	290 46.86	-1 18.96	4 55.37	0.19
6	Jambi	18 : 12 WIB	18 : 8 WIB	285 59.07	290 47.61	-1 7.49	4 53.78	0.18
7	Tanjung Pinang	18 : 12 WIB	18 : 9 WIB	286 1.11	290 49.40	0 -53.71	4 51.36	0.18
8	Palembang	18 : 6 WIB	18 : 1 WIB	285 58.83	290 47.97	-1 19.19	4 56.47	0.19
9	Bandar Lampung	18 : 1 WIB	17 : 55 WIB	285 59.76	290 48.59	-1 37.51	4 59.89	0.19
10	Pangkal Pinang	18 : 2 WIB	17 : 57 WIB	285 59.01	290 48.77	-1 16.48	4 56.57	0.19
11	Serang	17 : 57 WIB	17 : 50 WIB	286 0.38	290 49.23	-1 44.79	5 1.51	0.19
12	Jakarta	17 : 54 WIB	17 : 48 WIB	286 0.47	290 49.50	-1 46.90	5 2.17	0.19
13	Bandung	17 : 50 WIB	17 : 43 WIB	286 1.32	290 50.17	-1 54.56	5 3.77	0.20
14	Semarang	17 : 39 WIB	17 : 31 WIB	286 1.53	290 51.17	-2 2.42	5 6.41	0.20
15	Yogyakarta	17 : 38 WIB	17 : 30 WIB	286 2.60	290 51.60	-2 8.43	5 7.32	0.20
16	Surabaya	17 : 29 WIB	17 : 21 WIB	286 2.09	290 52.09	-2 11.14	5 8.95	0.20
17	Pontianak	17 : 51 WIB	17 : 47 WIB	286 0.35	290 51.59	-1 9.79	4 56.82	0.19
18	Palangka Raya	17 : 30 WIB	17 : 25 WIB	285 59.35	290 52.67	-1 35.33	5 3.76	0.20
19	Banjarmasin	18 : 26 WITA	18 : 20 WITA	285 59.32	290 52.55	-1 45.12	5 5.78	0.20
20	Samarinda	18 : 20 WITA	18 : 14 WITA	286 0.35	290 55.66	-1 30.51	5 4.70	0.20
21	Tanjungselor	18 : 22 WITA	18 : 18 WITA	286 4.53	291 0.02	-1 8.06	5 0.69	0.19
22	Denpasar	18 : 18 WITA	18 : 9 WITA	286 4.23	290 53.59	-2 28.10	5 12.94	0.21
23	Mataram	18 : 14 WITA	18 : 5 WITA	286 4.14	290 53.78	-2 29.85	5 13.71	0.21
24	Kupang	17 : 43 WITA	17 : 32 WITA	286 7.61	290 56.64	-3 1.71	5 23.19	0.22
25	Mamuju	18 : 10 WITA	18 : 3 WITA	285 59.52	290 54.91	-1 51.05	5 9.17	0.20
26	Makassar	18 : 5 WITA	17 : 57 WITA	286 0.23	290 54.18	-2 11.56	5 12.76	0.21
27	Palu	18 : 8 WITA	18 : 2 WITA	286 0.21	290 56.81	-1 39.95	5 7.90	0.20
28	Kendari	17 : 54 WITA	17 : 46 WITA	285 59.83	290 55.88	-2 10.49	5 14.47	0.21
29	Gorontalo	17 : 57 WITA	17 : 51 WITA	286 1.56	291 0.32	-1 37.02	5 9.35	0.20
30	Manado	17 : 51 WITA	17 : 45 WITA	286 2.79	291 2.81	-1 34.21	5 10.00	0.20
31	Sofifi	18 : 39 WIT	18 : 33 WIT	286 1.99	291 3.32	-1 46.46	5 13.84	0.21
32	Ambon	18 : 32 WIT	18 : 23 WIT	286 0.03	290 58.58	-2 23.20	5 20.12	0.22
33	Manokwari	18 : 11 WIT	18 : 3 WIT	286 0.90	291 4.69	-2 15.72	5 23.06	0.22
34	Jayapura	17 : 43 WIT	17 : 33 WIT	286 0.58	291 5.73	-2 46.56	5 32.87	0.24



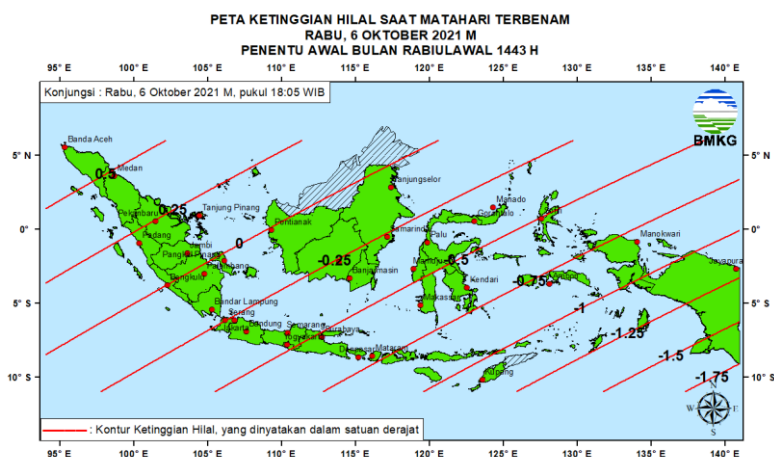
DATA POSISI HILAL SELURUH INDONESIA
SELASA, 7 SEPTEMBER 2021 M
PENENTU AWAL BULAN SAFAR 1443 H
 KONJUNGSI: SELASA, 7 SEPTEMBER 2021 M, PUKUL 7:51 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '			
1	Banda Aceh	18 : 42 WIB	19 : 9 WIB	275 59.43	277 29.54	5 45.24	6 36.92	0.33
2	Medan	18 : 28 WIB	18 : 54 WIB	275 56.92	277 46.03	5 35.24	6 31.82	0.33
3	Padang	18 : 19 WIB	18 : 44 WIB	275 52.46	278 17.36	5 21.35	6 30.00	0.32
4	Pekanbaru	18 : 15 WIB	18 : 41 WIB	275 53.76	278 8.75	5 23.02	6 28.04	0.32
5	Bengkulu	18 : 10 WIB	18 : 35 WIB	275 50.80	278 38.37	5 9.36	6 27.85	0.32
6	Jambi	18 : 6 WIB	18 : 30 WIB	275 52.17	278 24.73	5 13.22	6 25.24	0.32
7	Tanjung Pinang	18 : 3 WIB	18 : 28 WIB	275 54.33	278 9.02	5 18.32	6 23.43	0.31
8	Palembang	18 : 1 WIB	18 : 25 WIB	275 51.37	278 34.97	5 6.91	6 23.89	0.31
9	Bandar Lampung	17 : 58 WIB	18 : 21 WIB	275 50.37	278 51.72	4 58.23	6 23.88	0.31
10	Pangkal Pinang	17 : 55 WIB	18 : 20 WIB	275 51.96	278 30.45	5 6.81	6 21.64	0.31
11	Serang	17 : 54 WIB	18 : 17 WIB	275 50.26	278 57.01	4 54.14	6 22.79	0.31
12	Jakarta	17 : 51 WIB	18 : 14 WIB	275 50.29	278 57.85	4 52.61	6 21.82	0.31
13	Bandung	17 : 48 WIB	18 : 11 WIB	275 50.21	279 3.45	4 48.46	6 20.95	0.31
14	Semarang	17 : 36 WIB	17 : 59 WIB	275 50.38	279 5.82	4 42.57	6 16.88	0.30
15	Yogyakarta	17 : 36 WIB	17 : 59 WIB	275 50.32	279 11.10	4 39.84	6 17.30	0.30
16	Surabaya	17 : 27 WIB	17 : 49 WIB	275 50.49	279 9.70	4 36.77	6 13.78	0.30
17	Pontianak	17 : 43 WIB	18 : 8 WIB	275 53.74	278 19.88	5 6.45	6 16.35	0.30
18	Palangka Raya	17 : 24 WIB	17 : 47 WIB	275 52.38	278 37.80	4 51.39	6 10.33	0.29
19	Banjarmasin	17 : 21 WITA	18 : 44 WITA	275 51.81	278 45.25	4 46.65	6 9.68	0.29
20	Samarinda	18 : 12 WITA	18 : 35 WITA	275 53.84	278 29.97	4 50.24	6 5.23	0.28
21	Tanjungselor	18 : 13 WITA	18 : 36 WITA	275 57.20	278 10.15	4 58.71	6 4.03	0.28
22	Denpasar	18 : 16 WITA	18 : 38 WITA	275 50.64	279 19.96	4 26.89	6 10.81	0.29
23	Mataram	18 : 13 WITA	18 : 34 WITA	275 50.69	279 20.01	4 25.40	6 9.55	0.29
24	Kupang	17 : 42 WITA	18 : 2 WITA	275 51.39	279 34.60	4 4.20	6 0.14	0.28
25	Mamuju	18 : 4 WITA	18 : 27 WITA	275 52.43	278 44.81	4 40.30	6 3.42	0.28
26	Makassar	18 : 1 WITA	18 : 23 WITA	275 51.35	279 0.41	4 31.20	6 3.56	0.28
27	Palu	18 : 1 WITA	18 : 24 WITA	275 53.70	278 34.83	4 43.86	6 1.50	0.28
28	Kendari	17 : 49 WITA	18 : 11 WITA	275 51.99	278 55.66	4 29.04	5 58.88	0.27
29	Gorontalo	17 : 49 WITA	18 : 11 WITA	275 55.12	278 29.34	4 41.86	5 56.63	0.27
30	Manado	17 : 42 WITA	18 : 4 WITA	275 56.16	278 25.58	4 41.14	5 53.90	0.27
31	Sofifi	18 : 31 WIT	18 : 53 WIT	275 55.59	278 32.50	4 33.90	5 50.44	0.26
32	Ambon	18 : 27 WIT	18 : 47 WIT	275 52.47	278 58.58	4 18.87	5 51.20	0.26
33	Manokwari	18 : 4 WIT	18 : 25 WIT	275 54.61	278 47.51	4 16.70	5 42.45	0.25
34	Jayapura	17 : 37 WIT	17 : 56 WIT	275 53.87	279 2.45	3 58.48	5 34.88	0.24



DATA POSISI HILAL SELURUH INDONESIA
RABU, 6 OKTOBER 2021 M
PENENTU AWAL BULAN RABIUL AWAL 1443 H
KONJUNGS: RABU, 6 OKTOBER 2021 M, PUKUL 18:05 WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 28 WIB	18 : 32 WIB	264 45.32	268 4.03	0 39.91	3 28.27	0.09
2	Medan	18 : 15 WIB	18 : 18 WIB	264 44.66	268 11.04	0 28.54	3 32.16	0.10
3	Padang	18 : 10 WIB	18 : 12 WIB	264 41.37	268 16.86	0 12.13	3 37.57	0.10
4	Pekanbaru	18 : 5 WIB	18 : 7 WIB	264 42.75	268 17.14	0 14.70	3 36.92	0.10
5	Bengkulu	18 : 3 WIB	18 : 4 WIB	264 38.28	268 19.40	0 -0.15	3 41.66	0.10
6	Jambi	17 : 57 WIB	17 : 59 WIB	264 40.90	268 20.43	0 4.41	3 40.52	0.10
7	Tanjung Pinang	17 : 53 WIB	17 : 55 WIB	264 43.26	268 20.13	0 10.81	3 38.73	0.10
8	Palembang	17 : 53 WIB	17 : 54 WIB	264 39.43	268 21.76	0 -2.02	3 42.73	0.11
9	Bandar Lampung	17 : 52 WIB	17 : 52 WIB	264 36.29	268 21.75	0 -10.79	3 45.46	0.11
10	Pangkal Pinang	17 : 47 WIB	17 : 48 WIB	264 40.49	268 23.02	0 -1.68	3 42.95	0.11
11	Serang	17 : 49 WIB	17 : 49 WIB	264 35.35	268 22.19	0 -14.70	3 46.82	0.11
12	Jakarta	17 : 46 WIB	17 : 46 WIB	264 35.31	268 22.73	0 -16.12	3 47.40	0.11
13	Bandung	17 : 43 WIB	17 : 43 WIB	264 34.21	268 22.87	0 -20.10	3 48.75	0.11
14	Semarang	17 : 32 WIB	17 : 31 WIB	264 34.29	268 25.13	0 -25.70	3 51.19	0.11
15	Yogyakarta	17 : 32 WIB	17 : 31 WIB	264 32.98	268 24.33	0 -28.35	3 51.89	0.11
16	Surabaya	17 : 23 WIB	17 : 22 WIB	264 33.87	268 26.63	0 -31.34	3 53.54	0.12
17	Pontianak	17 : 34 WIB	17 : 35 WIB	264 42.76	268 25.88	0 -0.64	3 43.62	0.11
18	Palangka Raya	17 : 16 WIB	17 : 16 WIB	264 40.88	268 30.68	0 -15.84	3 49.79	0.11
19	Banjarmasin	18 : 14 WITA	18 : 13 WITA	264 39.67	268 31.04	0 -20.82	3 51.48	0.11
20	Samarinda	18 : 3 WITA	18 : 3 WITA	264 42.84	268 34.14	0 -15.77	3 51.29	0.11
21	Tanjungselor	18 : 0 WITA	18 : 1 WITA	264 45.43	268 33.61	0 -5.01	3 48.38	0.11
22	Denpasar	18 : 13 WITA	18 : 11 WITA	264 31.80	268 27.03	0 -41.20	3 57.09	0.12
23	Mataram	18 : 10 WITA	18 : 8 WITA	264 32.00	268 27.80	0 -42.74	3 57.87	0.12
24	Kupang	17 : 40 WITA	17 : 37 WITA	264 29.58	268 30.64	-1 5.69	4 6.97	0.13
25	Mamuju	17 : 56 WITA	17 : 55 WITA	264 40.70	268 35.41	0 -26.53	3 55.12	0.12
26	Makassar	17 : 55 WITA	17 : 54 WITA	264 37.62	268 34.30	0 -36.47	3 57.96	0.12
27	Palu	17 : 52 WITA	17 : 51 WITA	264 42.64	268 36.94	0 -22.02	3 54.45	0.12
28	Kendari	17 : 42 WITA	17 : 41 WITA	264 39.37	268 38.04	0 -38.21	4 0.14	0.12
29	Gorontalo	17 : 38 WITA	17 : 38 WITA	264 44.14	268 40.50	0 -22.76	3 56.55	0.12
30	Manado	17 : 31 WITA	17 : 30 WITA	264 45.00	268 42.48	0 -22.56	3 57.65	0.12
31	Sofifi	18 : 20 WIT	18 : 19 WIT	264 44.59	268 45.40	0 -30.19	4 1.48	0.12
32	Ambon	18 : 20 WIT	18 : 17 WIT	264 40.07	268 43.51	0 -48.56	4 6.27	0.13
33	Manokwari	17 : 55 WIT	18 : 52 WIT	264 43.58	268 51.60	0 -48.98	4 10.86	0.13
34	Jayapura	17 : 29 WIT	17 : 25 WIT	264 42.24	268 56.65	-1 10.75	4 20.99	0.14



DATA POSISI HILAL SELURUH INDONESIA
JUMAT, 5 NOVEMBER 2021 M
PENENTU AWAL BULAN RABIUL AKHIR 1443 H
 KONJUNGSI: JUM'AT, 5 NOVEMBER 2021 M, PUKUL 04:14 WIB

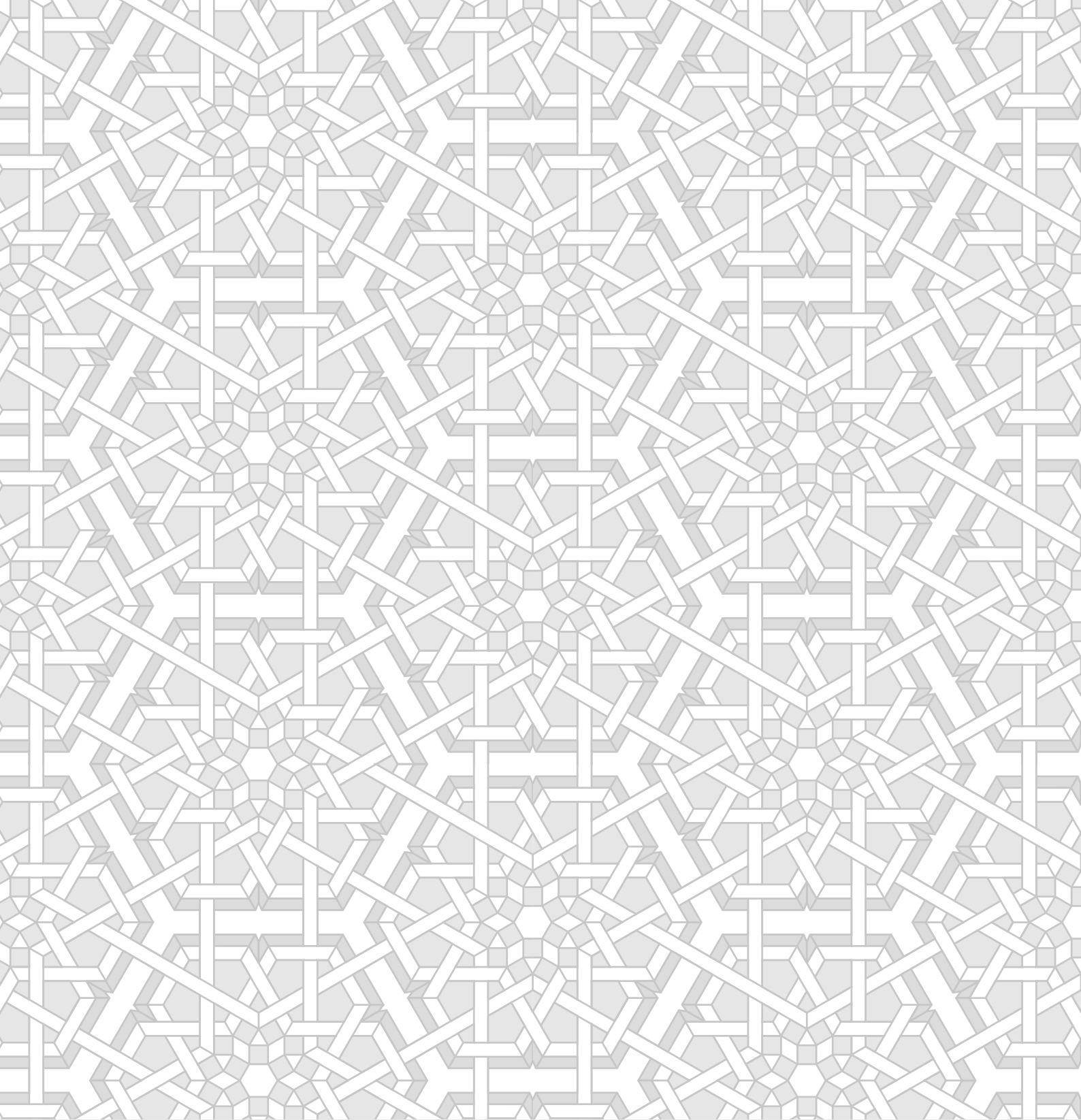
NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN								
		MATAHARI		BULAN												
		j	m	°	'				°	'						
						°	'	%								
1	Banda Aceh	18	: 19	WIB	18	: 49	WIB	254	11.30	251	49.13	6	14.26	7	19.73	0.41
2	Medan	18	: 8	WIB	18	: 38	WIB	254	12.33	252	10.38	6	13.16	7	12.56	0.40
3	Padang	18	: 6	WIB	18	: 37	WIB	254	10.04	252	47.75	6	20.51	7	10.47	0.39
4	Pekanbaru	18	: 0	WIB	18	: 30	WIB	254	11.51	252	37.90	6	15.03	7	7.32	0.39
5	Bengkulu	18	: 2	WIB	18	: 33	WIB	254	5.45	253	9.40	6	21.72	7	7.47	0.39
6	Jambi	17	: 54	WIB	18	: 24	WIB	254	9.33	252	55.54	6	14.86	7	3.26	0.38
7	Tanjung Pinang	17	: 48	WIB	18	: 18	WIB	254	11.95	252	37.81	6	7.77	7	0.23	0.37
8	Palembang	17	: 51	WIB	18	: 21	WIB	254	7.15	253	6.11	6	14.89	7	1.27	0.38
9	Bandar Lampung	17	: 52	WIB	18	: 22	WIB	254	1.85	253	21.95	6	17.53	7	1.41	0.38
10	Pangkal Pinang	17	: 45	WIB	18	: 15	WIB	254	8.67	253	1.49	6	10.44	6	57.73	0.37
11	Serang	17	: 49	WIB	18	: 19	WIB	254	0.06	253	26.65	6	16.43	6	59.74	0.37
12	Jakarta	17	: 46	WIB	18	: 17	WIB	253	59.95	253	27.44	6	15.00	6	58.21	0.37
13	Bandung	17	: 44	WIB	18	: 15	WIB	253	57.81	253	32.20	6	14.14	6	56.86	0.37
14	Semarang	17	: 33	WIB	18	: 3	WIB	253	57.77	253	34.46	6	7.88	6	50.36	0.36
15	Yogyakarta	17	: 34	WIB	18	: 4	WIB	253	55.22	253	38.62	6	8.86	6	51.03	0.36
16	Surabaya	17	: 24	WIB	17	: 54	WIB	253	56.79	253	37.84	6	3.18	6	45.35	0.35
17	Pontianak	17	: 29	WIB	17	: 58	WIB	254	11.43	252	49.81	5	59.47	6	49.31	0.36
18	Palangka Raya	17	: 14	WIB	17	: 42	WIB	254	8.90	253	8.98	5	53.78	6	39.82	0.34
19	Banjarmasin	18	: 12	WITA	18	: 41	WITA	254	7.03	253	16.46	5	54.00	6	38.75	0.34
20	Samarinda	17	: 59	WITA	18	: 27	WITA	254	11.36	253	0.46	5	43.77	6	31.55	0.33
21	Tanjungselor	17	: 54	WITA	18	: 21	WITA	254	13.30	252	36.64	5	36.27	6	29.58	0.32
22	Denpasar	18	: 16	WITA	18	: 45	WITA	253	52.48	253	45.94	5	58.75	6	40.44	0.34
23	Mataram	18	: 12	WITA	18	: 41	WITA	253	52.81	253	46.11	5	56.70	6	38.35	0.34
24	Kupang	17	: 44	WITA	18	: 12	WITA	253	47.17	253	57.21	5	40.87	6	22.27	0.31
25	Mamuju	17	: 54	WITA	18	: 22	WITA	254	8.42	253	16.11	5	43.67	6	28.52	0.32
26	Makassar	17	: 55	WITA	18	: 23	WITA	254	3.31	253	30.85	5	45.89	6	28.61	0.32
27	Palu	17	: 48	WITA	18	: 16	WITA	254	11.05	253	5.63	5	38.64	6	25.43	0.32
28	Kendari	17	: 41	WITA	18	: 9	WITA	254	6.13	253	26.77	5	37.62	6	20.85	0.31
29	Gorontalo	17	: 34	WITA	18	: 1	WITA	254	12.61	252	59.12	5	29.18	6	17.39	0.30
30	Manado	17	: 26	WITA	17	: 52	WITA	254	13.29	252	54.36	5	23.58	6	12.87	0.30
31	Sofifi	18	: 15	WIT	18	: 42	WIT	254	12.98	253	2.22	5	19.31	6	6.94	0.29
32	Ambon	18	: 18	WIT	18	: 45	WIT	254	6.97	253	29.84	5	24.93	6	7.70	0.29
33	Manokwari	17	: 51	WIT	18	: 17	WIT	254	11.81	253	18.63	5	8.21	5	52.72	0.26
34	Jayapura	17	: 27	WIT	17	: 51	WIT	254	9.74	253	34.08	4	56.35	5	38.41	0.24



DATA POSISI HILAL SELURUH INDONESIA
SABTU, 4 DESEMBER 2021 M
PENENTU AWAL BULAN JUMADIL AWAL 1443 H
 KONJUNGI: SABTU, 4 DESEMBER 2021 M, PUKUL 14:42. WIB

NO.	NAMA LOKASI	WAKTU TERBENAM		AZIMUTH		TINGGI BULAN	ELONGASI	FI BULAN
		MATAHARI	BULAN	MATAHARI	BULAN			
		j m	j m	° '	° '	° '	° '	%
1	Banda Aceh	18 : 23 WIB	18 : 27 WIB	247 40.71	246 1.47	0 29.14	1 51.09	0.03
2	Medan	18 : 13 WIB	18 : 16 WIB	247 42.79	246 9.48	0 27.23	1 44.80	0.02
3	Padang	18 : 13 WIB	18 : 18 WIB	247 41.10	246 17.25	0 34.05	1 40.63	0.02
4	Pekanbaru	18 : 7 WIB	18 : 10 WIB	247 42.63	246 16.53	0 28.67	1 39.25	0.02
5	Bengkulu	18 : 11 WIB	18 : 15 WIB	247 35.46	246 18.31	0 36.38	1 36.72	0.02
6	Jambi	18 : 2 WIB	18 : 5 WIB	247 40.16	246 19.13	0 28.96	1 35.08	0.02
7	Tanjung Pinang	17 : 54 WIB	17 : 57 WIB	247 42.95	246 17.79	0 21.82	1 34.69	0.02
8	Palembang	17 : 59 WIB	18 : 3 WIB	247 37.49	246 19.61	0 29.59	1 32.79	0.02
9	Bandar Lampung	18 : 1 WIB	18 : 5 WIB	247 30.72	246 17.92	0 33.62	1 31.32	0.02
10	Pangkal Pinang	17 : 52 WIB	17 : 56 WIB	247 39.28	246 20.34	0 25.05	1 30.96	0.02
11	Serang	17 : 59 WIB	18 : 3 WIB	247 28.35	246 17.22	0 33.18	1 29.69	0.02
12	Jakarta	17 : 56 WIB	18 : 0 WIB	247 28.17	246 17.32	0 31.91	1 28.57	0.02
13	Bandung	17 : 54 WIB	17 : 58 WIB	247 25.32	246 16.19	0 31.81	1 27.14	0.02
14	Semarang	17 : 43 WIB	17 : 47 WIB	247 25.14	246 16.73	0 26.14	1 22.69	0.01
15	Yogyakarta	17 : 45 WIB	17 : 48 WIB	247 21.77	246 14.93	0 27.86	1 22.56	0.01
16	Surabaya	17 : 35 WIB	17 : 38 WIB	247 23.74	246 16.46	0 22.20	1 19.24	0.01
17	Pontianak	17 : 36 WIB	17 : 39 WIB	247 42.32	246 21.37	0 14.18	1 27.22	0.02
18	Palangka Raya	17 : 21 WIB	17 : 24 WIB	247 39.26	246 23.78	0 9.63	1 20.22	0.01
19	Banjarmasin	18 : 20 WITA	18 : 23 WITA	247 36.93	246 23.37	0 10.43	1 18.74	0.01
20	Samarinda	18 : 6 WITA	18 : 7 WITA	247 41.99	246 25.64	0 -0.39	1 17.90	0.01
21	Tanjungselor	17 : 59 WITA	18 : 0 WITA	247 43.51	246 23.53	0 -7.87	1 20.26	0.01
22	Denpasar	18 : 27 WITA	18 : 30 WITA	247 17.88	246 13.46	0 19.65	1 15.25	0.01
23	Mataram	18 : 23 WITA	18 : 26 WITA	247 18.28	246 13.83	0 17.69	1 14.11	0.01
24	Kupang	17 : 56 WITA	17 : 58 WITA	247 10.34	246 9.30	0 5.43	1 4.97	0.01
25	Mamuju	18 : 2 WITA	18 : 3 WITA	247 38.48	246 25.67	0 0.48	1 14.64	0.01
26	Makassar	18 : 4 WITA	18 : 6 WITA	247 32.00	246 22.72	0 4.28	1 12.36	0.01
27	Palu	17 : 55 WITA	17 : 56 WITA	247 41.56	246 27.02	0 -5.08	1 15.21	0.01
28	Kendari	17 : 50 WITA	17 : 51 WITA	247 35.47	246 25.65	0 -4.30	1 10.67	0.01
29	Gorontalo	17 : 40 WITA	17 : 40 WITA	247 43.11	246 28.74	0 -14.51	1 14.37	0.01
30	Manado	17 : 32 WITA	17 : 31 WITA	247 43.64	246 29.48	0 -20.12	1 14.50	0.01
31	Sofifi	18 : 22 WIT	18 : 21 WIT	247 43.34	246 31.28	0 -24.19	1 13.00	0.01
32	Ambon	18 : 27 WIT	18 : 26 WIT	247 36.30	246 28.17	0 -16.46	1 8.19	0.01
33	Manokwari	17 : 58 WIT	17 : 57 WIT	247 41.92	246 34.21	0 -34.75	1 11.58	0.01
34	Jayapura	17 : 35 WIT	17 : 32 WIT	247 39.23	246 35.18	0 -46.09	1 13.00	0.01





**POSISI MATAHARI DAN
BULAN TAHUN 2021 M**



1 Januari 2021

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	280° 47' 20"	0.31"	281° 43' 20"	-22° 59' 58"	0.9832639	16' 15.96"	23° 26' 13"	-3 m 27 s
1	280° 49' 53"	0.31"	281° 46' 06"	-22° 59' 45"	0.9832635	16' 15.96"	23° 26' 13"	-3 m 28 s
2	280° 52' 26"	0.32"	281° 48' 51"	-22° 59' 33"	0.9832631	16' 15.96"	23° 26' 13"	-3 m 29 s
3	280° 54' 59"	0.32"	281° 51' 37"	-22° 59' 20"	0.9832627	16' 15.97"	23° 26' 13"	-3 m 30 s
4	280° 57' 32"	0.32"	281° 54' 22"	-22° 59' 08"	0.9832623	16' 15.97"	23° 26' 13"	-3 m 31 s
5	281° 00' 05"	0.33"	281° 57' 07"	-22° 58' 55"	0.9832620	16' 15.97"	23° 26' 13"	-3 m 32 s
6	281° 02' 38"	0.33"	281° 59' 53"	-22° 58' 43"	0.9832616	16' 15.97"	23° 26' 13"	-3 m 34 s
7	281° 05' 10"	0.34"	282° 02' 38"	-22° 58' 30"	0.9832613	16' 15.97"	23° 26' 13"	-3 m 35 s
8	281° 07' 43"	0.34"	282° 05' 24"	-22° 58' 17"	0.9832609	16' 15.97"	23° 26' 13"	-3 m 36 s
9	281° 10' 16"	0.34"	282° 08' 09"	-22° 58' 04"	0.9832606	16' 15.97"	23° 26' 13"	-3 m 37 s
10	281° 12' 49"	0.35"	282° 10' 55"	-22° 57' 52"	0.9832603	16' 15.97"	23° 26' 13"	-3 m 38 s
11	281° 15' 22"	0.35"	282° 13' 40"	-22° 57' 39"	0.9832600	16' 15.97"	23° 26' 13"	-3 m 39 s
12	281° 17' 55"	0.35"	282° 16' 25"	-22° 57' 26"	0.9832597	16' 15.97"	23° 26' 13"	-3 m 41 s
13	281° 20' 27"	0.36"	282° 19' 11"	-22° 57' 13"	0.9832594	16' 15.97"	23° 26' 13"	-3 m 42 s
14	281° 23' 00"	0.36"	282° 21' 56"	-22° 56' 60"	0.9832592	16' 15.97"	23° 26' 13"	-3 m 43 s
15	281° 25' 33"	0.36"	282° 24' 42"	-22° 56' 47"	0.9832589	16' 15.97"	23° 26' 13"	-3 m 44 s
16	281° 28' 06"	0.37"	282° 27' 27"	-22° 56' 34"	0.9832587	16' 15.97"	23° 26' 13"	-3 m 45 s
17	281° 30' 39"	0.37"	282° 30' 12"	-22° 56' 21"	0.9832584	16' 15.97"	23° 26' 13"	-3 m 46 s
18	281° 33' 12"	0.37"	282° 32' 58"	-22° 56' 07"	0.9832582	16' 15.97"	23° 26' 13"	-3 m 48 s
19	281° 35' 44"	0.37"	282° 35' 43"	-22° 55' 54"	0.9832580	16' 15.97"	23° 26' 13"	-3 m 49 s
20	281° 38' 17"	0.38"	282° 38' 28"	-22° 55' 41"	0.9832578	16' 15.97"	23° 26' 13"	-3 m 50 s
21	281° 40' 50"	0.38"	282° 41' 14"	-22° 55' 28"	0.9832576	16' 15.97"	23° 26' 13"	-3 m 51 s
22	281° 43' 23"	0.38"	282° 43' 59"	-22° 55' 14"	0.9832574	16' 15.97"	23° 26' 13"	-3 m 52 s
23	281° 45' 56"	0.39"	282° 46' 44"	-22° 55' 01"	0.9832573	16' 15.97"	23° 26' 13"	-3 m 53 s
24	281° 48' 29"	0.39"	282° 49' 30"	-22° 54' 47"	0.9832571	16' 15.97"	23° 26' 13"	-3 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	122° 43' 12"	3° 34' 27"	125° 53' 14"	23° 01' 39"	0° 56' 44"	15' 27.67"	94° 42' 30"	0.96308
1	123° 15' 53"	3° 36' 38"	126° 28' 13"	22° 56' 06"	0° 56' 46"	15' 28.00"	95° 1' 51"	0.96142
2	123° 48' 35"	3° 38' 47"	127° 03' 12"	22° 50' 25"	0° 56' 47"	15' 28.33"	95° 20' 53"	0.95972
3	124° 21' 19"	3° 40' 56"	127° 38' 08"	22° 44' 35"	0° 56' 48"	15' 28.66"	95° 39' 36"	0.95798
4	124° 54' 05"	3° 43' 04"	128° 13' 03"	22° 38' 39"	0° 56' 49"	15' 28.99"	95° 58' 03"	0.95621
5	125° 26' 52"	3° 45' 10"	128° 47' 57"	22° 32' 34"	0° 56' 50"	15' 29.32"	96° 16' 13"	0.95440
6	125° 59' 40"	3° 47' 15"	129° 22' 48"	22° 26' 22"	0° 56' 52"	15' 29.65"	96° 34' 08"	0.95256
7	126° 32' 30"	3° 49' 19"	129° 57' 38"	22° 20' 02"	0° 56' 53"	15' 29.98"	96° 51' 47"	0.95068
8	127° 05' 21"	3° 51' 22"	130° 32' 26"	22° 13' 34"	0° 56' 54"	15' 30.31"	97° 9' 11"	0.94876
9	127° 38' 13"	3° 53' 24"	131° 07' 12"	22° 06' 58"	0° 56' 55"	15' 30.63"	97° 26' 22"	0.94680
10	128° 11' 07"	3° 55' 24"	131° 41' 56"	22° 00' 15"	0° 56' 56"	15' 30.96"	97° 43' 18"	0.94482
11	128° 44' 03"	3° 57' 24"	132° 16' 38"	21° 53' 24"	0° 56' 58"	15' 31.29"	98° 0' 01"	0.94279
12	129° 16' 60"	3° 59' 22"	132° 51' 18"	21° 46' 26"	0° 56' 59"	15' 31.61"	98° 16' 31"	0.94073
13	129° 49' 58"	4° 01' 19"	133° 25' 56"	21° 39' 21"	0° 56' 60"	15' 31.94"	98° 32' 49"	0.93863
14	130° 22' 57"	4° 03' 14"	134° 00' 32"	21° 32' 07"	0° 57' 01"	15' 32.27"	98° 48' 54"	0.93650
15	130° 55' 58"	4° 05' 08"	134° 35' 05"	21° 24' 47"	0° 57' 02"	15' 32.59"	99° 4' 47"	0.93433
16	131° 29' 01"	4° 07' 01"	135° 09' 37"	21° 17' 19"	0° 57' 04"	15' 32.91"	99° 20' 28"	0.93213
17	132° 02' 05"	4° 08' 53"	135° 44' 06"	21° 09' 44"	0° 57' 05"	15' 33.24"	99° 35' 58"	0.92989
18	132° 35' 10"	4° 10' 43"	136° 18' 33"	21° 02' 01"	0° 57' 06"	15' 33.56"	99° 51' 16"	0.92761
19	133° 08' 16"	4° 12' 32"	136° 52' 57"	20° 54' 12"	0° 57' 07"	15' 33.88"	100° 6' 24"	0.92530
20	133° 41' 24"	4° 14' 20"	137° 27' 19"	20° 46' 15"	0° 57' 08"	15' 34.21"	100° 21' 20"	0.92296
21	134° 14' 34"	4° 16' 06"	138° 01' 39"	20° 38' 11"	0° 57' 09"	15' 34.53"	100° 36' 06"	0.92058
22	134° 47' 44"	4° 17' 51"	138° 35' 57"	20° 29' 59"	0° 57' 11"	15' 34.85"	100° 50' 41"	0.91817
23	135° 20' 56"	4° 19' 34"	139° 10' 12"	20° 21' 41"	0° 57' 12"	15' 35.17"	101° 5' 06"	0.91572
24	135° 54' 10"	4° 21' 17"	139° 44' 24"	20° 13' 16"	0° 57' 13"	15' 35.49"	101° 19' 20"	0.91324

2 Januari 2021

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	281° 48' 29"	0.39"	282° 49' 30"	-22° 54' 47"	0.9832571	16' 15.97"	23° 26' 13"	-3 m 55 s
1	281° 51' 02"	0.39"	282° 52' 15"	-22° 54' 34"	0.9832570	16' 15.97"	23° 26' 13"	-3 m 56 s
2	281° 53' 34"	0.39"	282° 55' 00"	-22° 54' 20"	0.9832568	16' 15.97"	23° 26' 13"	-3 m 57 s
3	281° 56' 07"	0.40"	282° 57' 45"	-22° 54' 07"	0.9832567	16' 15.97"	23° 26' 13"	-3 m 58 s
4	281° 58' 40"	0.40"	283° 00' 31"	-22° 53' 53"	0.9832566	16' 15.97"	23° 26' 13"	-3 m 59 s
5	282° 01' 13"	0.40"	283° 03' 16"	-22° 53' 39"	0.9832565	16' 15.97"	23° 26' 13"	-4 m 00 s
6	282° 03' 46"	0.40"	283° 06' 01"	-22° 53' 26"	0.9832564	16' 15.97"	23° 26' 13"	-4 m 02 s
7	282° 06' 19"	0.41"	283° 08' 47"	-22° 53' 12"	0.9832563	16' 15.97"	23° 26' 13"	-4 m 03 s
8	282° 08' 52"	0.41"	283° 11' 32"	-22° 52' 58"	0.9832563	16' 15.97"	23° 26' 13"	-4 m 04 s
9	282° 11' 24"	0.41"	283° 14' 17"	-22° 52' 44"	0.9832562	16' 15.97"	23° 26' 13"	-4 m 05 s
10	282° 13' 57"	0.41"	283° 17' 02"	-22° 52' 30"	0.9832562	16' 15.97"	23° 26' 13"	-4 m 06 s
11	282° 16' 30"	0.42"	283° 19' 47"	-22° 52' 16"	0.9832561	16' 15.97"	23° 26' 13"	-4 m 07 s
12	282° 19' 03"	0.42"	283° 22' 33"	-22° 52' 02"	0.9832561	16' 15.97"	23° 26' 13"	-4 m 09 s
13	282° 21' 36"	0.42"	283° 25' 18"	-22° 51' 48"	0.9832561	16' 15.97"	23° 26' 13"	-4 m 10 s
14	282° 24' 09"	0.42"	283° 28' 03"	-22° 51' 34"	0.9832561	16' 15.97"	23° 26' 13"	-4 m 11 s
15	282° 26' 41"	0.42"	283° 30' 48"	-22° 51' 20"	0.9832561	16' 15.97"	23° 26' 13"	-4 m 12 s
16	282° 29' 14"	0.43"	283° 33' 33"	-22° 51' 05"	0.9832561	16' 15.97"	23° 26' 13"	-4 m 13 s
17	282° 31' 47"	0.43"	283° 36' 18"	-22° 50' 51"	0.9832561	16' 15.97"	23° 26' 13"	-4 m 14 s
18	282° 34' 20"	0.43"	283° 39' 04"	-22° 50' 37"	0.9832562	16' 15.97"	23° 26' 13"	-4 m 15 s
19	282° 36' 53"	0.43"	283° 41' 49"	-22° 50' 22"	0.9832562	16' 15.97"	23° 26' 13"	-4 m 17 s
20	282° 39' 26"	0.43"	283° 44' 34"	-22° 50' 08"	0.9832563	16' 15.97"	23° 26' 13"	-4 m 18 s
21	282° 41' 59"	0.44"	283° 47' 19"	-22° 49' 54"	0.9832564	16' 15.97"	23° 26' 13"	-4 m 19 s
22	282° 44' 31"	0.44"	283° 50' 04"	-22° 49' 39"	0.9832564	16' 15.97"	23° 26' 13"	-4 m 20 s
23	282° 47' 04"	0.44"	283° 52' 49"	-22° 49' 24"	0.9832565	16' 15.97"	23° 26' 13"	-4 m 21 s
24	282° 49' 37"	0.44"	283° 55' 34"	-22° 49' 10"	0.9832566	16' 15.97"	23° 26' 13"	-4 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	135° 54' 10"	4° 21' 17"	139° 44' 24"	20° 13' 16"	0° 57' 13"	15' 35.49"	101° 19' 20"	0.91324
1	136° 27' 24"	4° 22' 57"	140° 18' 34"	20° 04' 44"	0° 57' 14"	15' 35.81"	101° 33' 24"	0.91072
2	137° 00' 40"	4° 24' 37"	140° 52' 42"	19° 56' 05"	0° 57' 15"	15' 36.13"	101° 47' 19"	0.90817
3	137° 33' 58"	4° 26' 15"	141° 26' 47"	19° 47' 19"	0° 57' 17"	15' 36.45"	102° 1' 03"	0.90558
4	138° 07' 17"	4° 27' 51"	142° 00' 49"	19° 38' 27"	0° 57' 18"	15' 36.76"	102° 14' 38"	0.90296
5	138° 40' 37"	4° 29' 26"	142° 34' 49"	19° 29' 27"	0° 57' 19"	15' 37.08"	102° 28' 03"	0.90031
6	139° 13' 58"	4° 30' 59"	143° 08' 46"	19° 20' 21"	0° 57' 20"	15' 37.40"	102° 41' 18"	0.89762
7	139° 47' 21"	4° 32' 32"	143° 42' 41"	19° 11' 09"	0° 57' 21"	15' 37.71"	102° 54' 24"	0.89490
8	140° 20' 45"	4° 34' 02"	144° 16' 33"	19° 01' 50"	0° 57' 22"	15' 38.03"	103° 7' 20"	0.89215
9	140° 54' 11"	4° 35' 31"	144° 50' 22"	18° 52' 24"	0° 57' 23"	15' 38.34"	103° 20' 07"	0.88936
10	141° 27' 37"	4° 36' 59"	145° 24' 09"	18° 42' 52"	0° 57' 25"	15' 38.66"	103° 32' 45"	0.88654
11	142° 01' 06"	4° 38' 25"	145° 57' 53"	18° 33' 14"	0° 57' 26"	15' 38.97"	103° 45' 13"	0.88369
12	142° 34' 35"	4° 39' 49"	146° 31' 35"	18° 23' 29"	0° 57' 27"	15' 39.29"	103° 57' 32"	0.88080
13	143° 08' 06"	4° 41' 12"	147° 05' 14"	18° 13' 38"	0° 57' 28"	15' 39.60"	104° 9' 43"	0.87788
14	143° 41' 38"	4° 42' 33"	147° 38' 50"	18° 03' 40"	0° 57' 29"	15' 39.91"	104° 21' 43"	0.87493
15	144° 15' 11"	4° 43' 53"	148° 12' 23"	17° 53' 37"	0° 57' 30"	15' 40.22"	104° 33' 35"	0.87195
16	144° 48' 46"	4° 45' 11"	148° 45' 54"	17° 43' 27"	0° 57' 32"	15' 40.53"	104° 45' 18"	0.86894
17	145° 22' 21"	4° 46' 28"	149° 19' 23"	17° 33' 12"	0° 57' 33"	15' 40.84"	104° 56' 52"	0.86589
18	145° 55' 59"	4° 47' 43"	149° 52' 48"	17° 22' 50"	0° 57' 34"	15' 41.15"	105° 8' 17"	0.86281
19	146° 29' 37"	4° 48' 56"	150° 26' 11"	17° 12' 23"	0° 57' 35"	15' 41.46"	105° 19' 33"	0.85971
20	147° 03' 17"	4° 50' 08"	150° 59' 31"	17° 01' 49"	0° 57' 36"	15' 41.77"	105° 30' 40"	0.85657
21	147° 36' 58"	4° 51' 18"	151° 32' 49"	16° 51' 10"	0° 57' 37"	15' 42.08"	105° 41' 38"	0.85339
22	148° 10' 40"	4° 52' 27"	152° 06' 04"	16° 40' 25"	0° 57' 38"	15' 42.38"	105° 52' 28"	0.85019
23	148° 44' 24"	4° 53' 34"	152° 39' 16"	16° 29' 35"	0° 57' 39"	15' 42.69"	106° 3' 08"	0.84696
24	149° 18' 08"	4° 54' 39"	153° 12' 26"	16° 18' 39"	0° 57' 41"	15' 43.00"	106° 13' 40"	0.84370

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	282° 49' 37"	0.44"	283° 55' 34"	-22° 49' 10"	0.9832566	16' 15.97"	23° 26' 13"	-4 m 22 s
1	282° 52' 10"	0.44"	283° 58' 19"	-22° 48' 55"	0.9832568	16' 15.97"	23° 26' 13"	-4 m 24 s
2	282° 54' 43"	0.44"	284° 01' 04"	-22° 48' 40"	0.9832569	16' 15.97"	23° 26' 13"	-4 m 25 s
3	282° 57' 16"	0.45"	284° 03' 49"	-22° 48' 26"	0.9832570	16' 15.97"	23° 26' 13"	-4 m 26 s
4	282° 59' 49"	0.45"	284° 06' 34"	-22° 48' 11"	0.9832572	16' 15.97"	23° 26' 13"	-4 m 27 s
5	283° 02' 21"	0.45"	284° 09' 19"	-22° 47' 56"	0.9832573	16' 15.97"	23° 26' 13"	-4 m 28 s
6	283° 04' 54"	0.45"	284° 12' 04"	-22° 47' 41"	0.9832575	16' 15.97"	23° 26' 13"	-4 m 29 s
7	283° 07' 27"	0.45"	284° 14' 49"	-22° 47' 26"	0.9832577	16' 15.97"	23° 26' 13"	-4 m 30 s
8	283° 10' 00"	0.45"	284° 17' 34"	-22° 47' 11"	0.9832579	16' 15.97"	23° 26' 13"	-4 m 32 s
9	283° 12' 33"	0.45"	284° 20' 19"	-22° 46' 56"	0.9832581	16' 15.97"	23° 26' 13"	-4 m 33 s
10	283° 15' 06"	0.45"	284° 23' 04"	-22° 46' 41"	0.9832583	16' 15.97"	23° 26' 13"	-4 m 34 s
11	283° 17' 39"	0.46"	284° 25' 49"	-22° 46' 26"	0.9832585	16' 15.97"	23° 26' 13"	-4 m 35 s
12	283° 20' 11"	0.46"	284° 28' 33"	-22° 46' 11"	0.9832587	16' 15.97"	23° 26' 13"	-4 m 36 s
13	283° 22' 43"	0.46"	284° 31' 18"	-22° 45' 56"	0.9832590	16' 15.97"	23° 26' 13"	-4 m 37 s
14	283° 25' 16"	0.46"	284° 34' 03"	-22° 45' 40"	0.9832592	16' 15.97"	23° 26' 13"	-4 m 38 s
15	283° 27' 49"	0.46"	284° 36' 48"	-22° 45' 25"	0.9832595	16' 15.97"	23° 26' 13"	-4 m 40 s
16	283° 30' 22"	0.46"	284° 39' 33"	-22° 45' 10"	0.9832598	16' 15.97"	23° 26' 13"	-4 m 41 s
17	283° 32' 55"	0.46"	284° 42' 18"	-22° 44' 54"	0.9832600	16' 15.97"	23° 26' 13"	-4 m 42 s
18	283° 35' 28"	0.46"	284° 45' 03"	-22° 44' 39"	0.9832603	16' 15.97"	23° 26' 13"	-4 m 43 s
19	283° 38' 01"	0.46"	284° 47' 48"	-22° 44' 23"	0.9832606	16' 15.97"	23° 26' 13"	-4 m 44 s
20	283° 40' 33"	0.46"	284° 50' 33"	-22° 44' 08"	0.9832609	16' 15.97"	23° 26' 13"	-4 m 45 s
21	283° 43' 06"	0.46"	284° 53' 18"	-22° 43' 52"	0.9832613	16' 15.97"	23° 26' 13"	-4 m 46 s
22	283° 45' 39"	0.46"	284° 56' 02"	-22° 43' 37"	0.9832616	16' 15.97"	23° 26' 13"	-4 m 48 s
23	283° 48' 12"	0.46"	284° 58' 47"	-22° 43' 21"	0.9832619	16' 15.97"	23° 26' 13"	-4 m 49 s
24	283° 50' 45"	0.46"	285° 01' 32"	-22° 43' 05"	0.9832623	16' 15.97"	23° 26' 13"	-4 m 50 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	149° 18' 08"	4° 54' 39"	153° 12' 26"	16° 18' 39"	0° 57' 41"	15' 43.00"	106° 13' 40"	0.84370
1	149° 51' 54"	4° 55' 42"	153° 45' 33"	16° 07' 37"	0° 57' 42"	15' 43.30"	106° 24' 03"	0.84041
2	150° 25' 42"	4° 56' 44"	154° 18' 38"	15° 56' 30"	0° 57' 43"	15' 43.61"	106° 34' 18"	0.83708
3	150° 59' 30"	4° 57' 44"	154° 51' 40"	15° 45' 17"	0° 57' 44"	15' 43.91"	106° 44' 23"	0.83373
4	151° 33' 20"	4° 58' 43"	155° 24' 39"	15° 33' 59"	0° 57' 45"	15' 44.21"	106° 54' 20"	0.83035
5	152° 07' 11"	4° 59' 40"	155° 57' 36"	15° 22' 36"	0° 57' 46"	15' 44.51"	107° 4' 08"	0.82694
6	152° 41' 03"	5° 00' 35"	156° 30' 31"	15° 11' 07"	0° 57' 47"	15' 44.82"	107° 13' 48"	0.82350
7	153° 14' 57"	5° 01' 28"	157° 03' 23"	14° 59' 34"	0° 57' 48"	15' 45.12"	107° 23' 19"	0.82003
8	153° 48' 51"	5° 02' 20"	157° 36' 12"	14° 47' 55"	0° 57' 49"	15' 45.42"	107° 32' 41"	0.81654
9	154° 22' 47"	5° 03' 10"	158° 08' 59"	14° 36' 11"	0° 57' 51"	15' 45.72"	107° 41' 54"	0.81301
10	154° 56' 44"	5° 03' 58"	158° 41' 44"	14° 24' 22"	0° 57' 52"	15' 46.02"	107° 50' 59"	0.80946
11	155° 30' 43"	5° 04' 44"	159° 14' 26"	14° 12' 29"	0° 57' 53"	15' 46.32"	107° 59' 55"	0.80588
12	156° 04' 42"	5° 05' 29"	159° 47' 06"	14° 00' 30"	0° 57' 54"	15' 46.61"	108° 8' 43"	0.80227
13	156° 38' 43"	5° 06' 12"	160° 19' 43"	13° 48' 27"	0° 57' 55"	15' 46.91"	108° 17' 22"	0.79863
14	157° 12' 45"	5° 06' 53"	160° 52' 18"	13° 36' 19"	0° 57' 56"	15' 47.21"	108° 25' 52"	0.79497
15	157° 46' 48"	5° 07' 32"	161° 24' 51"	13° 24' 06"	0° 57' 57"	15' 47.50"	108° 34' 14"	0.79128
16	158° 20' 52"	5° 08' 09"	161° 57' 22"	13° 11' 49"	0° 57' 58"	15' 47.80"	108° 42' 27"	0.78757
17	158° 54' 58"	5° 08' 45"	162° 29' 50"	12° 59' 27"	0° 57' 59"	15' 48.09"	108° 50' 31"	0.78382
18	159° 29' 04"	5° 09' 19"	163° 02' 17"	12° 47' 01"	0° 58' 00"	15' 48.39"	108° 58' 27"	0.78006
19	160° 03' 12"	5° 09' 51"	163° 34' 41"	12° 34' 31"	0° 58' 01"	15' 48.68"	109° 6' 15"	0.77626
20	160° 37' 21"	5° 10' 22"	164° 07' 03"	12° 21' 56"	0° 58' 02"	15' 48.97"	109° 13' 54"	0.77245
21	161° 11' 31"	5° 10' 50"	164° 39' 23"	12° 09' 17"	0° 58' 04"	15' 49.27"	109° 21' 24"	0.76860
22	161° 45' 43"	5° 11' 17"	165° 11' 40"	11° 56' 34"	0° 58' 05"	15' 49.56"	109° 28' 45"	0.76473
23	162° 19' 55"	5° 11' 41"	165° 43' 56"	11° 43' 46"	0° 58' 06"	15' 49.85"	109° 35' 58"	0.76084
24	162° 54' 09"	5° 12' 04"	166° 16' 10"	11° 30' 55"	0° 58' 07"	15' 50.14"	109° 43' 03"	0.75692

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	283° 50' 45"	0.46"	285° 01' 32"	-22° 43' 05"	0.9832623	16' 15.97"	23° 26' 13"	-4 m 50 s
1	283° 53' 18"	0.46"	285° 04' 17"	-22° 42' 49"	0.9832627	16' 15.97"	23° 26' 13"	-4 m 51 s
2	283° 55' 51"	0.46"	285° 07' 02"	-22° 42' 34"	0.9832630	16' 15.96"	23° 26' 13"	-4 m 52 s
3	283° 58' 24"	0.46"	285° 09' 47"	-22° 42' 18"	0.9832634	16' 15.96"	23° 26' 13"	-4 m 53 s
4	284° 00' 56"	0.46"	285° 12' 31"	-22° 42' 02"	0.9832638	16' 15.96"	23° 26' 13"	-4 m 54 s
5	284° 03' 29"	0.47"	285° 15' 16"	-22° 41' 46"	0.9832642	16' 15.96"	23° 26' 13"	-4 m 55 s
6	284° 06' 02"	0.47"	285° 18' 01"	-22° 41' 30"	0.9832646	16' 15.96"	23° 26' 13"	-4 m 57 s
7	284° 08' 35"	0.47"	285° 20' 46"	-22° 41' 14"	0.9832651	16' 15.96"	23° 26' 13"	-4 m 58 s
8	284° 11' 08"	0.46"	285° 23' 31"	-22° 40' 58"	0.9832655	16' 15.96"	23° 26' 13"	-4 m 59 s
9	284° 13' 41"	0.46"	285° 26' 15"	-22° 40' 41"	0.9832659	16' 15.96"	23° 26' 13"	-4 m 60 s
10	284° 16' 14"	0.46"	285° 29' 00"	-22° 40' 25"	0.9832664	16' 15.96"	23° 26' 13"	-5 m 01 s
11	284° 18' 47"	0.46"	285° 31' 45"	-22° 40' 09"	0.9832669	16' 15.96"	23° 26' 13"	-5 m 02 s
12	284° 21' 19"	0.46"	285° 34' 30"	-22° 39' 53"	0.9832673	16' 15.96"	23° 26' 13"	-5 m 03 s
13	284° 23' 52"	0.46"	285° 37' 14"	-22° 39' 36"	0.9832678	16' 15.96"	23° 26' 13"	-5 m 04 s
14	284° 26' 25"	0.46"	285° 39' 59"	-22° 39' 20"	0.9832683	16' 15.96"	23° 26' 13"	-5 m 06 s
15	284° 28' 58"	0.46"	285° 42' 44"	-22° 39' 03"	0.9832688	16' 15.96"	23° 26' 13"	-5 m 07 s
16	284° 31' 31"	0.46"	285° 45' 28"	-22° 38' 47"	0.9832693	16' 15.96"	23° 26' 13"	-5 m 08 s
17	284° 34' 04"	0.46"	285° 48' 13"	-22° 38' 30"	0.9832699	16' 15.96"	23° 26' 13"	-5 m 09 s
18	284° 36' 37"	0.46"	285° 50' 58"	-22° 38' 14"	0.9832704	16' 15.96"	23° 26' 13"	-5 m 10 s
19	284° 39' 10"	0.46"	285° 53' 42"	-22° 37' 57"	0.9832709	16' 15.96"	23° 26' 13"	-5 m 11 s
20	284° 41' 42"	0.46"	285° 56' 27"	-22° 37' 41"	0.9832715	16' 15.96"	23° 26' 13"	-5 m 12 s
21	284° 44' 15"	0.46"	285° 59' 12"	-22° 37' 24"	0.9832721	16' 15.96"	23° 26' 13"	-5 m 13 s
22	284° 46' 48"	0.46"	286° 01' 56"	-22° 37' 07"	0.9832726	16' 15.96"	23° 26' 13"	-5 m 15 s
23	284° 49' 21"	0.46"	286° 04' 41"	-22° 36' 50"	0.9832732	16' 15.95"	23° 26' 13"	-5 m 16 s
24	284° 51' 54"	0.46"	286° 07' 25"	-22° 36' 33"	0.9832738	16' 15.95"	23° 26' 13"	-5 m 17 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	162° 54' 09"	5° 12' 04"	166° 16' 10"	11° 30' 55"	0° 58' 07"	15' 50.14"	109° 43' 03"	0.75692
1	163° 28' 23"	5° 12' 26"	166° 48' 22"	11° 17' 60"	0° 58' 08"	15' 50.43"	109° 49' 59"	0.75298
2	164° 02' 39"	5° 12' 45"	167° 20' 32"	11° 05' 00"	0° 58' 09"	15' 50.72"	109° 56' 46"	0.74902
3	164° 36' 56"	5° 13' 02"	167° 52' 41"	10° 51' 57"	0° 58' 10"	15' 51.00"	110° 3' 25"	0.74503
4	165° 11' 14"	5° 13' 18"	168° 24' 47"	10° 38' 51"	0° 58' 11"	15' 51.29"	110° 9' 55"	0.74102
5	165° 45' 34"	5° 13' 32"	168° 56' 52"	10° 25' 40"	0° 58' 12"	15' 51.58"	110° 16' 16"	0.73698
6	166° 19' 54"	5° 13' 43"	169° 28' 55"	10° 12' 26"	0° 58' 13"	15' 51.86"	110° 22' 29"	0.73293
7	166° 54' 16"	5° 13' 53"	170° 00' 56"	9° 59' 08"	0° 58' 14"	15' 52.15"	110° 28' 34"	0.72885
8	167° 28' 38"	5° 14' 02"	170° 32' 56"	9° 45' 47"	0° 58' 15"	15' 52.43"	110° 34' 29"	0.72475
9	168° 03' 02"	5° 14' 08"	171° 04' 54"	9° 32' 23"	0° 58' 16"	15' 52.71"	110° 40' 17"	0.72063
10	168° 37' 27"	5° 14' 12"	171° 36' 51"	9° 18' 55"	0° 58' 17"	15' 53.00"	110° 45' 55"	0.71649
11	169° 11' 53"	5° 14' 15"	172° 08' 46"	9° 05' 23"	0° 58' 18"	15' 53.28"	110° 51' 25"	0.71232
12	169° 46' 20"	5° 14' 15"	172° 40' 40"	8° 51' 49"	0° 58' 19"	15' 53.56"	110° 56' 47"	0.70814
13	170° 20' 48"	5° 14' 14"	173° 12' 33"	8° 38' 12"	0° 58' 20"	15' 53.84"	111° 1' 60"	0.70393
14	170° 55' 17"	5° 14' 11"	173° 44' 24"	8° 24' 31"	0° 58' 21"	15' 54.12"	111° 7' 04"	0.69971
15	171° 29' 47"	5° 14' 06"	174° 16' 14"	8° 10' 47"	0° 58' 22"	15' 54.40"	111° 11' 60"	0.69547
16	172° 04' 19"	5° 13' 59"	174° 48' 03"	7° 57' 01"	0° 58' 23"	15' 54.68"	111° 16' 47"	0.69120
17	172° 38' 51"	5° 13' 50"	175° 19' 50"	7° 43' 11"	0° 58' 24"	15' 54.95"	111° 21' 26"	0.68692
18	173° 13' 25"	5° 13' 39"	175° 51' 37"	7° 29' 19"	0° 58' 25"	15' 55.23"	111° 25' 56"	0.68262
19	173° 47' 59"	5° 13' 26"	176° 23' 23"	7° 15' 24"	0° 58' 26"	15' 55.51"	111° 30' 17"	0.67830
20	174° 22' 35"	5° 13' 12"	176° 55' 07"	7° 01' 27"	0° 58' 27"	15' 55.78"	111° 34' 30"	0.67397
21	174° 57' 12"	5° 12' 55"	177° 26' 51"	6° 47' 27"	0° 58' 28"	15' 56.05"	111° 38' 34"	0.66961
22	175° 31' 49"	5° 12' 37"	177° 58' 34"	6° 33' 24"	0° 58' 29"	15' 56.33"	111° 42' 29"	0.66524
23	176° 06' 28"	5° 12' 16"	178° 30' 16"	6° 19' 19"	0° 58' 30"	15' 56.60"	111° 46' 16"	0.66085
24	176° 41' 08"	5° 11' 54"	179° 01' 57"	6° 05' 12"	0° 58' 31"	15' 56.87"	111° 49' 54"	0.65645

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	284° 51' 54"	0.46"	286° 07' 25"	-22° 36' 33"	0.9832738	16' 15.95"	23° 26' 13"	-5 m 17 s
1	284° 54' 27"	0.46"	286° 10' 10"	-22° 36' 17"	0.9832744	16' 15.95"	23° 26' 13"	-5 m 18 s
2	284° 56' 60"	0.45"	286° 12' 55"	-22° 35' 60"	0.9832750	16' 15.95"	23° 26' 13"	-5 m 19 s
3	284° 59' 33"	0.45"	286° 15' 39"	-22° 35' 43"	0.9832757	16' 15.95"	23° 26' 13"	-5 m 20 s
4	285° 02' 05"	0.45"	286° 18' 24"	-22° 35' 26"	0.9832763	16' 15.95"	23° 26' 13"	-5 m 21 s
5	285° 04' 38"	0.45"	286° 21' 08"	-22° 35' 08"	0.9832769	16' 15.95"	23° 26' 13"	-5 m 22 s
6	285° 07' 11"	0.45"	286° 23' 53"	-22° 34' 51"	0.9832776	16' 15.95"	23° 26' 13"	-5 m 23 s
7	285° 09' 44"	0.45"	286° 26' 37"	-22° 34' 34"	0.9832782	16' 15.95"	23° 26' 13"	-5 m 25 s
8	285° 12' 17"	0.45"	286° 29' 22"	-22° 34' 17"	0.9832789	16' 15.95"	23° 26' 13"	-5 m 26 s
9	285° 14' 50"	0.45"	286° 32' 06"	-22° 33' 60"	0.9832796	16' 15.95"	23° 26' 13"	-5 m 27 s
10	285° 17' 23"	0.44"	286° 34' 51"	-22° 33' 42"	0.9832803	16' 15.95"	23° 26' 13"	-5 m 28 s
11	285° 19' 56"	0.44"	286° 37' 35"	-22° 33' 25"	0.9832810	16' 15.95"	23° 26' 13"	-5 m 29 s
12	285° 22' 29"	0.44"	286° 40' 20"	-22° 33' 07"	0.9832817	16' 15.95"	23° 26' 13"	-5 m 30 s
13	285° 25' 01"	0.44"	286° 43' 04"	-22° 32' 50"	0.9832824	16' 15.95"	23° 26' 13"	-5 m 31 s
14	285° 27' 34"	0.44"	286° 45' 49"	-22° 32' 32"	0.9832831	16' 15.94"	23° 26' 13"	-5 m 32 s
15	285° 30' 07"	0.44"	286° 48' 33"	-22° 32' 15"	0.9832839	16' 15.94"	23° 26' 13"	-5 m 33 s
16	285° 32' 40"	0.43"	286° 51' 17"	-22° 31' 57"	0.9832846	16' 15.94"	23° 26' 13"	-5 m 35 s
17	285° 35' 13"	0.43"	286° 54' 02"	-22° 31' 40"	0.9832854	16' 15.94"	23° 26' 13"	-5 m 36 s
18	285° 37' 46"	0.43"	286° 56' 46"	-22° 31' 22"	0.9832861	16' 15.94"	23° 26' 13"	-5 m 37 s
19	285° 40' 19"	0.43"	286° 59' 31"	-22° 31' 04"	0.9832869	16' 15.94"	23° 26' 13"	-5 m 38 s
20	285° 42' 52"	0.43"	287° 02' 15"	-22° 30' 46"	0.9832877	16' 15.94"	23° 26' 13"	-5 m 39 s
21	285° 45' 24"	0.43"	287° 04' 59"	-22° 30' 29"	0.9832885	16' 15.94"	23° 26' 13"	-5 m 40 s
22	285° 47' 57"	0.42"	287° 07' 44"	-22° 30' 11"	0.9832893	16' 15.94"	23° 26' 13"	-5 m 41 s
23	285° 50' 30"	0.42"	287° 10' 28"	-22° 29' 53"	0.9832901	16' 15.94"	23° 26' 13"	-5 m 42 s
24	285° 53' 03"	0.42"	287° 13' 12"	-22° 29' 35"	0.9832909	16' 15.94"	23° 26' 13"	-5 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	176° 41' 08"	5° 11' 54"	179° 01' 57"	6° 05' 12"	0° 58' 31"	15' 56.87"	111° 49' 54"	0.65645
1	177° 15' 49"	5° 11' 30"	179° 33' 37"	5° 51' 02"	0° 58' 32"	15' 57.14"	111° 53' 24"	0.65203
2	177° 50' 31"	5° 11' 04"	180° 05' 17"	5° 36' 50"	0° 58' 33"	15' 57.41"	111° 56' 45"	0.64759
3	178° 25' 13"	5° 10' 36"	180° 36' 57"	5° 22' 36"	0° 58' 34"	15' 57.68"	111° 59' 57"	0.64314
4	178° 59' 57"	5° 10' 06"	181° 08' 35"	5° 08' 20"	0° 58' 35"	15' 57.94"	112° 3' 01"	0.63868
5	179° 34' 42"	5° 09' 35"	181° 40' 14"	4° 54' 02"	0° 58' 36"	15' 58.21"	112° 5' 56"	0.63420
6	180° 09' 28"	5° 09' 01"	182° 11' 52"	4° 39' 42"	0° 58' 37"	15' 58.48"	112° 8' 42"	0.62970
7	180° 44' 15"	5° 08' 25"	182° 43' 30"	4° 25' 20"	0° 58' 38"	15' 58.74"	112° 11' 20"	0.62519
8	181° 19' 03"	5° 07' 48"	183° 15' 07"	4° 10' 56"	0° 58' 39"	15' 59.00"	112° 13' 49"	0.62067
9	181° 53' 52"	5° 07' 08"	183° 46' 44"	3° 56' 31"	0° 58' 40"	15' 59.27"	112° 16' 09"	0.61613
10	182° 28' 42"	5° 06' 27"	184° 18' 21"	3° 42' 04"	0° 58' 41"	15' 59.53"	112° 18' 21"	0.61159
11	183° 03' 33"	5° 05' 44"	184° 49' 58"	3° 27' 35"	0° 58' 42"	15' 59.79"	112° 20' 24"	0.60703
12	183° 38' 25"	5° 04' 59"	185° 21' 36"	3° 13' 05"	0° 58' 43"	16' 00.05"	112° 22' 18"	0.60245
13	184° 13' 18"	5° 04' 12"	185° 53' 13"	2° 58' 33"	0° 58' 44"	16' 00.31"	112° 24' 04"	0.59787
14	184° 48' 12"	5° 03' 23"	186° 24' 50"	2° 44' 00"	0° 58' 45"	16' 00.56"	112° 25' 40"	0.59327
15	185° 23' 07"	5° 02' 32"	186° 56' 27"	2° 29' 26"	0° 58' 46"	16' 00.82"	112° 27' 08"	0.58867
16	185° 58' 02"	5° 01' 39"	187° 28' 05"	2° 14' 51"	0° 58' 47"	16' 01.07"	112° 28' 27"	0.58405
17	186° 32' 59"	5° 00' 45"	187° 59' 43"	2° 00' 14"	0° 58' 48"	16' 01.33"	112° 29' 38"	0.57943
18	187° 07' 57"	4° 59' 48"	188° 31' 21"	1° 45' 37"	0° 58' 49"	16' 01.58"	112° 30' 40"	0.57479
19	187° 42' 56"	4° 58' 50"	189° 03' 00"	1° 30' 58"	0° 58' 50"	16' 01.83"	112° 31' 33"	0.57015
20	188° 17' 55"	4° 57' 50"	189° 34' 40"	1° 16' 19"	0° 58' 51"	16' 02.08"	112° 32' 17"	0.56549
21	188° 52' 56"	4° 56' 48"	190° 06' 20"	1° 01' 38"	0° 58' 52"	16' 02.33"	112° 32' 52"	0.56083
22	189° 27' 57"	4° 55' 44"	190° 38' 00"	0° 46' 57"	0° 58' 52"	16' 02.58"	112° 33' 18"	0.55616
23	190° 02' 60"	4° 54' 38"	191° 09' 42"	0° 32' 16"	0° 58' 53"	16' 02.83"	112° 33' 36"	0.55148
24	190° 38' 03"	4° 53' 30"	191° 41' 24"	0° 17' 33"	0° 58' 54"	16' 03.07"	112° 33' 45"	0.54680

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	285° 53' 03"	0.42"	287° 13' 12"	-22° 29' 35"	0.9832909	16' 15.94"	23° 26' 13"	-5 m 43 s
1	285° 55' 36"	0.42"	287° 15' 57"	-22° 29' 17"	0.9832917	16' 15.94"	23° 26' 13"	-5 m 44 s
2	285° 58' 09"	0.41"	287° 18' 41"	-22° 28' 59"	0.9832926	16' 15.94"	23° 26' 13"	-5 m 46 s
3	286° 00' 42"	0.41"	287° 21' 25"	-22° 28' 41"	0.9832934	16' 15.93"	23° 26' 13"	-5 m 47 s
4	286° 03' 15"	0.41"	287° 24' 10"	-22° 28' 22"	0.9832943	16' 15.93"	23° 26' 13"	-5 m 48 s
5	286° 05' 48"	0.41"	287° 26' 54"	-22° 28' 04"	0.9832952	16' 15.93"	23° 26' 13"	-5 m 49 s
6	286° 08' 20"	0.41"	287° 29' 38"	-22° 27' 46"	0.9832960	16' 15.93"	23° 26' 13"	-5 m 50 s
7	286° 10' 53"	0.40"	287° 32' 22"	-22° 27' 28"	0.9832969	16' 15.93"	23° 26' 13"	-5 m 51 s
8	286° 13' 26"	0.40"	287° 35' 07"	-22° 27' 09"	0.9832978	16' 15.93"	23° 26' 13"	-5 m 52 s
9	286° 15' 59"	0.40"	287° 37' 51"	-22° 26' 51"	0.9832987	16' 15.93"	23° 26' 13"	-5 m 53 s
10	286° 18' 32"	0.39"	287° 40' 35"	-22° 26' 32"	0.9832996	16' 15.93"	23° 26' 13"	-5 m 54 s
11	286° 21' 05"	0.39"	287° 43' 19"	-22° 26' 14"	0.9833005	16' 15.93"	23° 26' 13"	-5 m 55 s
12	286° 23' 38"	0.39"	287° 46' 03"	-22° 25' 55"	0.9833015	16' 15.93"	23° 26' 13"	-5 m 56 s
13	286° 26' 11"	0.39"	287° 48' 48"	-22° 25' 37"	0.9833024	16' 15.93"	23° 26' 13"	-5 m 58 s
14	286° 28' 44"	0.38"	287° 51' 32"	-22° 25' 18"	0.9833033	16' 15.92"	23° 26' 13"	-5 m 59 s
15	286° 31' 17"	0.38"	287° 54' 16"	-22° 24' 60"	0.9833043	16' 15.92"	23° 26' 13"	-5 m 60 s
16	286° 33' 49"	0.38"	287° 57' 00"	-22° 24' 41"	0.9833053	16' 15.92"	23° 26' 13"	-6 m 01 s
17	286° 36' 22"	0.38"	287° 59' 44"	-22° 24' 22"	0.9833062	16' 15.92"	23° 26' 13"	-6 m 02 s
18	286° 38' 55"	0.37"	288° 02' 28"	-22° 24' 03"	0.9833072	16' 15.92"	23° 26' 13"	-6 m 03 s
19	286° 41' 28"	0.37"	288° 05' 12"	-22° 23' 44"	0.9833082	16' 15.92"	23° 26' 13"	-6 m 04 s
20	286° 44' 01"	0.37"	288° 07' 57"	-22° 23' 26"	0.9833092	16' 15.92"	23° 26' 13"	-6 m 05 s
21	286° 46' 34"	0.36"	288° 10' 41"	-22° 23' 07"	0.9833102	16' 15.92"	23° 26' 13"	-6 m 06 s
22	286° 49' 07"	0.36"	288° 13' 25"	-22° 22' 48"	0.9833112	16' 15.92"	23° 26' 13"	-6 m 07 s
23	286° 51' 40"	0.36"	288° 16' 09"	-22° 22' 29"	0.9833122	16' 15.92"	23° 26' 13"	-6 m 08 s
24	286° 54' 13"	0.35"	288° 18' 53"	-22° 22' 10"	0.9833133	16' 15.91"	23° 26' 13"	-6 m 09 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	190° 38' 03"	4° 53' 30"	191° 41' 24"	0° 17' 33"	0° 58' 54"	16' 03.07"	112° 33' 45"	0.54680
1	191° 13' 07"	4° 52' 20"	192° 13' 07"	0° 02' 50"	0° 58' 55"	16' 03.31"	112° 33' 45"	0.54210
2	191° 48' 12"	4° 51' 09"	192° 44' 51"	0° -11' 53"	0° 58' 56"	16' 03.56"	112° 33' 36"	0.53741
3	192° 23' 19"	4° 49' 56"	193° 16' 35"	0° -26' 36"	0° 58' 57"	16' 03.80"	112° 33' 18"	0.53270
4	192° 58' 26"	4° 48' 41"	193° 48' 21"	0° -41' 20"	0° 58' 58"	16' 04.04"	112° 32' 51"	0.52799
5	193° 33' 33"	4° 47' 24"	194° 20' 08"	0° -56' 05"	0° 58' 59"	16' 04.28"	112° 32' 16"	0.52328
6	194° 08' 42"	4° 46' 05"	194° 51' 57"	-1° 10' 49"	0° 58' 60"	16' 04.51"	112° 31' 31"	0.51856
7	194° 43' 52"	4° 44' 44"	195° 23' 46"	-1° 25' 33"	0° 59' 00"	16' 04.75"	112° 30' 37"	0.51384
8	195° 19' 02"	4° 43' 22"	195° 55' 37"	-1° 40' 18"	0° 59' 01"	16' 04.98"	112° 29' 35"	0.50911
9	195° 54' 14"	4° 41' 58"	196° 27' 29"	-1° 55' 02"	0° 59' 02"	16' 05.21"	112° 28' 23"	0.50438
10	196° 29' 26"	4° 40' 32"	196° 59' 23"	-2° 09' 46"	0° 59' 03"	16' 05.44"	112° 27' 03"	0.49965
11	197° 04' 39"	4° 39' 04"	197° 31' 18"	-2° 24' 30"	0° 59' 04"	16' 05.67"	112° 25' 33"	0.49491
12	197° 39' 53"	4° 37' 34"	198° 03' 15"	-2° 39' 13"	0° 59' 05"	16' 05.90"	112° 23' 55"	0.49017
13	198° 15' 08"	4° 36' 03"	198° 35' 14"	-2° 53' 57"	0° 59' 05"	16' 06.13"	112° 22' 07"	0.48543
14	198° 50' 24"	4° 34' 30"	199° 07' 14"	-3° 08' 39"	0° 59' 06"	16' 06.35"	112° 20' 11"	0.48069
15	199° 25' 40"	4° 32' 55"	199° 39' 16"	-3° 23' 21"	0° 59' 07"	16' 06.57"	112° 18' 05"	0.47595
16	200° 00' 58"	4° 31' 18"	200° 11' 20"	-3° 38' 03"	0° 59' 08"	16' 06.80"	112° 15' 50"	0.47121
17	200° 36' 16"	4° 29' 39"	200° 43' 26"	-3° 52' 43"	0° 59' 09"	16' 07.01"	112° 13' 26"	0.46647
18	201° 11' 35"	4° 27' 59"	201° 15' 34"	-4° 07' 23"	0° 59' 09"	16' 07.23"	112° 10' 53"	0.46173
19	201° 46' 55"	4° 26' 17"	201° 47' 44"	-4° 22' 02"	0° 59' 10"	16' 07.45"	112° 8' 11"	0.45699
20	202° 22' 15"	4° 24' 33"	202° 19' 56"	-4° 36' 40"	0° 59' 11"	16' 07.66"	112° 5' 20"	0.45225
21	202° 57' 37"	4° 22' 48"	202° 52' 10"	-4° 51' 17"	0° 59' 12"	16' 07.87"	112° 2' 19"	0.44751
22	203° 32' 59"	4° 21' 01"	203° 24' 27"	-5° 05' 53"	0° 59' 13"	16' 08.08"	111° 59' 09"	0.44278
23	204° 08' 22"	4° 19' 12"	203° 56' 46"	-5° 20' 28"	0° 59' 13"	16' 08.29"	111° 55' 50"	0.43805
24	204° 43' 46"	4° 17' 22"	204° 29' 07"	-5° 35' 01"	0° 59' 14"	16' 08.50"	111° 52' 22"	0.43332

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	286° 54' 13"	0.35"	288° 18' 53"	-22° 22' 10"	0.9833133	16' 15.91"	23° 26' 13"	-6 m 09 s
1	286° 56' 45"	0.35"	288° 21' 37"	-22° 21' 50"	0.9833143	16' 15.91"	23° 26' 13"	-6 m 11 s
2	286° 59' 18"	0.35"	288° 24' 21"	-22° 21' 31"	0.9833154	16' 15.91"	23° 26' 13"	-6 m 12 s
3	287° 01' 51"	0.34"	288° 27' 05"	-22° 21' 12"	0.9833164	16' 15.91"	23° 26' 13"	-6 m 13 s
4	287° 04' 24"	0.34"	288° 29' 49"	-22° 20' 53"	0.9833175	16' 15.91"	23° 26' 13"	-6 m 14 s
5	287° 06' 57"	0.34"	288° 32' 33"	-22° 20' 33"	0.9833185	16' 15.91"	23° 26' 13"	-6 m 15 s
6	287° 09' 30"	0.33"	288° 35' 17"	-22° 20' 14"	0.9833196	16' 15.91"	23° 26' 13"	-6 m 16 s
7	287° 12' 03"	0.33"	288° 38' 01"	-22° 19' 55"	0.9833207	16' 15.91"	23° 26' 13"	-6 m 17 s
8	287° 14' 36"	0.33"	288° 40' 45"	-22° 19' 35"	0.9833218	16' 15.91"	23° 26' 13"	-6 m 18 s
9	287° 17' 09"	0.32"	288° 43' 29"	-22° 19' 16"	0.9833229	16' 15.91"	23° 26' 13"	-6 m 19 s
10	287° 19' 42"	0.32"	288° 46' 13"	-22° 18' 56"	0.9833240	16' 15.90"	23° 26' 13"	-6 m 20 s
11	287° 22' 14"	0.32"	288° 48' 57"	-22° 18' 37"	0.9833252	16' 15.90"	23° 26' 13"	-6 m 21 s
12	287° 24' 47"	0.31"	288° 51' 40"	-22° 18' 17"	0.9833263	16' 15.90"	23° 26' 13"	-6 m 22 s
13	287° 27' 20"	0.31"	288° 54' 24"	-22° 17' 57"	0.9833274	16' 15.90"	23° 26' 13"	-6 m 23 s
14	287° 29' 53"	0.30"	288° 57' 08"	-22° 17' 38"	0.9833286	16' 15.90"	23° 26' 13"	-6 m 24 s
15	287° 32' 26"	0.30"	288° 59' 52"	-22° 17' 18"	0.9833297	16' 15.90"	23° 26' 13"	-6 m 26 s
16	287° 34' 59"	0.30"	289° 02' 36"	-22° 16' 58"	0.9833309	16' 15.90"	23° 26' 13"	-6 m 27 s
17	287° 37' 32"	0.29"	289° 05' 20"	-22° 16' 38"	0.9833321	16' 15.90"	23° 26' 13"	-6 m 28 s
18	287° 40' 05"	0.29"	289° 08' 04"	-22° 16' 18"	0.9833332	16' 15.89"	23° 26' 13"	-6 m 29 s
19	287° 42' 38"	0.28"	289° 10' 47"	-22° 15' 58"	0.9833344	16' 15.89"	23° 26' 13"	-6 m 30 s
20	287° 45' 11"	0.28"	289° 13' 31"	-22° 15' 38"	0.9833356	16' 15.89"	23° 26' 13"	-6 m 31 s
21	287° 47' 44"	0.28"	289° 16' 15"	-22° 15' 18"	0.9833368	16' 15.89"	23° 26' 13"	-6 m 32 s
22	287° 50' 16"	0.27"	289° 18' 59"	-22° 14' 58"	0.9833380	16' 15.89"	23° 26' 13"	-6 m 33 s
23	287° 52' 49"	0.27"	289° 21' 43"	-22° 14' 38"	0.9833393	16' 15.89"	23° 26' 13"	-6 m 34 s
24	287° 55' 22"	0.26"	289° 24' 26"	-22° 14' 18"	0.9833405	16' 15.89"	23° 26' 13"	-6 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	204° 43' 46"	4° 17' 22"	204° 29' 07"	-5° 35' 01"	0° 59' 14"	16' 08.50"	111° 52' 22"	0.43332
1	205° 19' 10"	4° 15' 29"	205° 01' 31"	-5° 49' 33"	0° 59' 15"	16' 08.70"	111° 48' 44"	0.42860
2	205° 54' 36"	4° 13' 36"	205° 33' 57"	-6° 04' 04"	0° 59' 16"	16' 08.90"	111° 44' 57"	0.42388
3	206° 30' 02"	4° 11' 40"	206° 06' 26"	-6° 18' 32"	0° 59' 16"	16' 09.10"	111° 41' 01"	0.41916
4	207° 05' 28"	4° 09' 43"	206° 38' 58"	-6° 32' 60"	0° 59' 17"	16' 09.30"	111° 36' 56"	0.41445
5	207° 40' 56"	4° 07' 44"	207° 11' 32"	-6° 47' 25"	0° 59' 18"	16' 09.50"	111° 32' 41"	0.40975
6	208° 16' 24"	4° 05' 44"	207° 44' 09"	-7° 01' 49"	0° 59' 19"	16' 09.69"	111° 28' 16"	0.40505
7	208° 51' 53"	4° 03' 42"	208° 16' 49"	-7° 16' 11"	0° 59' 19"	16' 09.88"	111° 23' 43"	0.40036
8	209° 27' 23"	4° 01' 38"	208° 49' 32"	-7° 30' 31"	0° 59' 20"	16' 10.07"	111° 18' 60"	0.39567
9	210° 02' 54"	3° 59' 33"	209° 22' 18"	-7° 44' 48"	0° 59' 21"	16' 10.26"	111° 14' 07"	0.39099
10	210° 38' 25"	3° 57' 26"	209° 55' 07"	-7° 59' 04"	0° 59' 21"	16' 10.44"	111° 9' 05"	0.38632
11	211° 13' 57"	3° 55' 18"	210° 27' 59"	-8° 13' 18"	0° 59' 22"	16' 10.62"	111° 3' 54"	0.38166
12	211° 49' 29"	3° 53' 08"	211° 00' 54"	-8° 27' 29"	0° 59' 23"	16' 10.80"	110° 58' 33"	0.37701
13	212° 25' 02"	3° 50' 56"	211° 33' 52"	-8° 41' 37"	0° 59' 23"	16' 10.98"	110° 53' 02"	0.37236
14	213° 00' 36"	3° 48' 43"	212° 06' 54"	-8° 55' 43"	0° 59' 24"	16' 11.16"	110° 47' 22"	0.36773
15	213° 36' 11"	3° 46' 29"	212° 39' 59"	-9° 09' 47"	0° 59' 25"	16' 11.33"	110° 41' 32"	0.36311
16	214° 11' 46"	3° 44' 13"	213° 13' 08"	-9° 23' 48"	0° 59' 25"	16' 11.50"	110° 35' 33"	0.35849
17	214° 47' 22"	3° 41' 55"	213° 46' 19"	-9° 37' 46"	0° 59' 26"	16' 11.67"	110° 29' 24"	0.35389
18	215° 22' 59"	3° 39' 36"	214° 19' 35"	-9° 51' 41"	0° 59' 26"	16' 11.83"	110° 23' 05"	0.34930
19	215° 58' 36"	3° 37' 16"	214° 52' 54"	-10° 05' 34"	0° 59' 27"	16' 11.99"	110° 16' 37"	0.34472
20	216° 34' 14"	3° 34' 54"	215° 26' 16"	-10° 19' 23"	0° 59' 28"	16' 12.15"	110° 9' 59"	0.34015
21	217° 09' 52"	3° 32' 31"	215° 59' 43"	-10° 33' 09"	0° 59' 28"	16' 12.31"	110° 3' 11"	0.33560
22	217° 45' 27"	3° 30' 06"	216° 33' 09"	-10° 46' 51"	0° 59' 29"	16' 12.46"	109° 56' 14"	0.33107
23	218° 21' 07"	3° 27' 40"	217° 06' 43"	-11° 00' 30"	0° 59' 29"	16' 12.61"	109° 49' 07"	0.32654
24	218° 56' 47"	3° 25' 13"	217° 40' 21"	-11° 14' 06"	0° 59' 30"	16' 12.76"	109° 41' 50"	0.32203

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	287° 55' 22"	0.26"	289° 24' 26"	-22° 14' 18"	0.9833405	16' 15.89"	23° 26' 13"	-6 m 35 s
1	287° 57' 55"	0.26"	289° 27' 10"	-22° 13' 58"	0.9833417	16' 15.89"	23° 26' 13"	-6 m 36 s
2	288° 00' 28"	0.26"	289° 29' 54"	-22° 13' 37"	0.9833430	16' 15.89"	23° 26' 13"	-6 m 37 s
3	288° 03' 01"	0.25"	289° 32' 37"	-22° 13' 17"	0.9833442	16' 15.88"	23° 26' 13"	-6 m 38 s
4	288° 05' 34"	0.25"	289° 35' 21"	-22° 12' 57"	0.9833455	16' 15.88"	23° 26' 13"	-6 m 39 s
5	288° 08' 07"	0.24"	289° 38' 05"	-22° 12' 36"	0.9833467	16' 15.88"	23° 26' 13"	-6 m 40 s
6	288° 10' 40"	0.24"	289° 40' 49"	-22° 12' 16"	0.9833480	16' 15.88"	23° 26' 13"	-6 m 41 s
7	288° 13' 13"	0.23"	289° 43' 32"	-22° 11' 55"	0.9833493	16' 15.88"	23° 26' 13"	-6 m 42 s
8	288° 15' 45"	0.23"	289° 46' 16"	-22° 11' 35"	0.9833506	16' 15.88"	23° 26' 13"	-6 m 43 s
9	288° 18' 18"	0.23"	289° 48' 59"	-22° 11' 14"	0.9833519	16' 15.88"	23° 26' 13"	-6 m 45 s
10	288° 20' 51"	0.22"	289° 51' 43"	-22° 10' 53"	0.9833532	16' 15.88"	23° 26' 13"	-6 m 46 s
11	288° 23' 24"	0.22"	289° 54' 27"	-22° 10' 33"	0.9833545	16' 15.87"	23° 26' 13"	-6 m 47 s
12	288° 25' 57"	0.21"	289° 57' 10"	-22° 10' 12"	0.9833558	16' 15.87"	23° 26' 13"	-6 m 48 s
13	288° 28' 30"	0.21"	289° 59' 54"	-22° 09' 51"	0.9833571	16' 15.87"	23° 26' 13"	-6 m 49 s
14	288° 31' 03"	0.20"	290° 02' 37"	-22° 09' 30"	0.9833585	16' 15.87"	23° 26' 13"	-6 m 50 s
15	288° 33' 36"	0.20"	290° 05' 21"	-22° 09' 10"	0.9833598	16' 15.87"	23° 26' 13"	-6 m 51 s
16	288° 36' 09"	0.19"	290° 08' 05"	-22° 08' 49"	0.9833612	16' 15.87"	23° 26' 13"	-6 m 52 s
17	288° 38' 42"	0.19"	290° 10' 48"	-22° 08' 28"	0.9833625	16' 15.87"	23° 26' 13"	-6 m 53 s
18	288° 41' 15"	0.19"	290° 13' 32"	-22° 08' 07"	0.9833639	16' 15.86"	23° 26' 13"	-6 m 54 s
19	288° 43' 47"	0.18"	290° 16' 15"	-22° 07' 46"	0.9833653	16' 15.86"	23° 26' 13"	-6 m 55 s
20	288° 46' 20"	0.18"	290° 18' 59"	-22° 07' 25"	0.9833666	16' 15.86"	23° 26' 13"	-6 m 56 s
21	288° 48' 53"	0.17"	290° 21' 42"	-22° 07' 03"	0.9833680	16' 15.86"	23° 26' 13"	-6 m 57 s
22	288° 51' 26"	0.17"	290° 24' 26"	-22° 06' 42"	0.9833694	16' 15.86"	23° 26' 13"	-6 m 58 s
23	288° 53' 59"	0.16"	290° 27' 09"	-22° 06' 21"	0.9833708	16' 15.86"	23° 26' 13"	-6 m 59 s
24	288° 56' 32"	0.16"	290° 29' 52"	-22° 05' 60"	0.9833722	16' 15.86"	23° 26' 13"	-7 m 00 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	218° 56' 47"	3° 25' 13"	217° 40' 21"	-11° 14' 06"	0° 59' 30"	16' 12.76"	109° 41' 50"	0.32203
1	219° 32' 28"	3° 22' 44"	218° 14' 02"	-11° 27' 39"	0° 59' 30"	16' 12.91"	109° 34' 23"	0.31753
2	220° 08' 09"	3° 20' 14"	218° 47' 48"	-11° 41' 08"	0° 59' 31"	16' 13.05"	109° 26' 46"	0.31305
3	220° 43' 51"	3° 17' 42"	219° 21' 37"	-11° 54' 34"	0° 59' 31"	16' 13.19"	109° 18' 60"	0.30859
4	221° 19' 33"	3° 15' 09"	219° 55' 30"	-12° 07' 55"	0° 59' 32"	16' 13.32"	109° 11' 03"	0.30414
5	221° 55' 16"	3° 12' 35"	220° 29' 28"	-12° 21' 13"	0° 59' 32"	16' 13.46"	109° 2' 57"	0.29970
6	222° 30' 60"	3° 09' 59"	221° 03' 30"	-12° 34' 27"	0° 59' 33"	16' 13.59"	108° 54' 40"	0.29529
7	223° 06' 44"	3° 07' 23"	221° 37' 35"	-12° 47' 37"	0° 59' 33"	16' 13.71"	108° 46' 14"	0.29089
8	223° 42' 28"	3° 04' 45"	222° 11' 45"	-13° 00' 42"	0° 59' 34"	16' 13.84"	108° 37' 38"	0.28651
9	224° 18' 13"	3° 02' 05"	222° 45' 60"	-13° 13' 44"	0° 59' 34"	16' 13.96"	108° 28' 51"	0.28215
10	224° 53' 58"	2° 59' 25"	223° 20' 18"	-13° 26' 41"	0° 59' 35"	16' 14.08"	108° 19' 55"	0.27780
11	225° 29' 44"	2° 56' 43"	223° 54' 41"	-13° 39' 34"	0° 59' 35"	16' 14.19"	108° 10' 48"	0.27348
12	226° 05' 31"	2° 54' 00"	224° 29' 08"	-13° 52' 22"	0° 59' 35"	16' 14.30"	108° 1' 31"	0.26918
13	226° 41' 17"	2° 51' 16"	225° 03' 40"	-14° 05' 05"	0° 59' 36"	16' 14.41"	107° 52' 04"	0.26489
14	227° 17' 05"	2° 48' 31"	225° 38' 16"	-14° 17' 44"	0° 59' 36"	16' 14.51"	107° 42' 27"	0.26063
15	227° 52' 52"	2° 45' 45"	226° 12' 56"	-14° 30' 18"	0° 59' 37"	16' 14.61"	107° 32' 40"	0.25639
16	228° 28' 40"	2° 42' 57"	226° 47' 41"	-14° 42' 47"	0° 59' 37"	16' 14.71"	107° 22' 43"	0.25217
17	229° 04' 29"	2° 40' 09"	227° 22' 31"	-14° 55' 11"	0° 59' 37"	16' 14.80"	107° 12' 35"	0.24797
18	229° 40' 18"	2° 37' 19"	227° 57' 25"	-15° 07' 30"	0° 59' 38"	16' 14.89"	107° 2' 17"	0.24379
19	230° 16' 07"	2° 34' 29"	228° 32' 24"	-15° 19' 44"	0° 59' 38"	16' 14.98"	106° 51' 49"	0.23964
20	230° 51' 57"	2° 31' 37"	229° 07' 27"	-15° 31' 52"	0° 59' 38"	16' 15.06"	106° 41' 10"	0.23551
21	231° 27' 46"	2° 28' 44"	229° 42' 35"	-15° 43' 55"	0° 59' 39"	16' 15.14"	106° 30' 21"	0.23141
22	232° 03' 37"	2° 25' 50"	230° 17' 47"	-15° 55' 53"	0° 59' 39"	16' 15.21"	106° 19' 22"	0.22733
23	232° 39' 27"	2° 22' 56"	230° 53' 04"	-16° 07' 45"	0° 59' 39"	16' 15.28"	106° 8' 12"	0.22327
24	233° 15' 18"	2° 20' 00"	231° 28' 26"	-16° 19' 31"	0° 59' 39"	16' 15.35"	105° 56' 52"	0.21924

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	288° 56' 32"	0.16"	290° 29' 52"	-22° 05' 60"	0.9833722	16' 15.86"	23° 26' 13"	-7 m 00 s
1	288° 59' 05"	0.15"	290° 32' 36"	-22° 05' 38"	0.9833737	16' 15.85"	23° 26' 13"	-7 m 01 s
2	289° 01' 38"	0.15"	290° 35' 19"	-22° 05' 17"	0.9833751	16' 15.85"	23° 26' 13"	-7 m 02 s
3	289° 04' 11"	0.14"	290° 38' 03"	-22° 04' 56"	0.9833765	16' 15.85"	23° 26' 13"	-7 m 03 s
4	289° 06' 44"	0.14"	290° 40' 46"	-22° 04' 34"	0.9833779	16' 15.85"	23° 26' 13"	-7 m 04 s
5	289° 09' 17"	0.13"	290° 43' 29"	-22° 04' 13"	0.9833794	16' 15.85"	23° 26' 13"	-7 m 05 s
6	289° 11' 49"	0.13"	290° 46' 13"	-22° 03' 51"	0.9833808	16' 15.85"	23° 26' 13"	-7 m 06 s
7	289° 14' 22"	0.12"	290° 48' 56"	-22° 03' 30"	0.9833823	16' 15.85"	23° 26' 13"	-7 m 07 s
8	289° 16' 55"	0.12"	290° 51' 39"	-22° 03' 08"	0.9833838	16' 15.84"	23° 26' 13"	-7 m 08 s
9	289° 19' 28"	0.11"	290° 54' 23"	-22° 02' 46"	0.9833852	16' 15.84"	23° 26' 13"	-7 m 09 s
10	289° 22' 01"	0.11"	290° 57' 06"	-22° 02' 25"	0.9833867	16' 15.84"	23° 26' 13"	-7 m 10 s
11	289° 24' 34"	0.10"	290° 59' 49"	-22° 02' 03"	0.9833882	16' 15.84"	23° 26' 13"	-7 m 12 s
12	289° 27' 07"	0.10"	291° 02' 33"	-22° 01' 41"	0.9833897	16' 15.84"	23° 26' 13"	-7 m 13 s
13	289° 29' 40"	0.09"	291° 05' 16"	-22° 01' 19"	0.9833912	16' 15.84"	23° 26' 13"	-7 m 14 s
14	289° 32' 13"	0.09"	291° 07' 59"	-22° 00' 57"	0.9833927	16' 15.84"	23° 26' 13"	-7 m 15 s
15	289° 34' 46"	0.08"	291° 10' 42"	-22° 00' 35"	0.9833942	16' 15.83"	23° 26' 13"	-7 m 16 s
16	289° 37' 19"	0.08"	291° 13' 26"	-22° 00' 13"	0.9833957	16' 15.83"	23° 26' 13"	-7 m 17 s
17	289° 39' 51"	0.07"	291° 16' 09"	-21° 59' 51"	0.9833973	16' 15.83"	23° 26' 13"	-7 m 18 s
18	289° 42' 24"	0.07"	291° 18' 52"	-21° 59' 29"	0.9833988	16' 15.83"	23° 26' 13"	-7 m 19 s
19	289° 44' 57"	0.06"	291° 21' 35"	-21° 59' 07"	0.9834004	16' 15.83"	23° 26' 13"	-7 m 20 s
20	289° 47' 30"	0.06"	291° 24' 18"	-21° 58' 45"	0.9834019	16' 15.83"	23° 26' 13"	-7 m 21 s
21	289° 50' 03"	0.05"	291° 27' 01"	-21° 58' 23"	0.9834035	16' 15.83"	23° 26' 13"	-7 m 22 s
22	289° 52' 36"	0.05"	291° 29' 45"	-21° 58' 00"	0.9834050	16' 15.82"	23° 26' 13"	-7 m 23 s
23	289° 55' 09"	0.04"	291° 32' 28"	-21° 57' 38"	0.9834066	16' 15.82"	23° 26' 13"	-7 m 24 s
24	289° 57' 42"	0.04"	291° 35' 11"	-21° 57' 16"	0.9834082	16' 15.82"	23° 26' 13"	-7 m 25 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	233° 15' 18"	2° 20' 00"	231° 28' 26"	-16° 19' 31"	0° 59' 39"	16' 15.35"	105° 56' 52"	0.21924
1	233° 51' 09"	2° 17' 04"	232° 03' 52"	-16° 31' 12"	0° 59' 40"	16' 15.41"	105° 45' 21"	0.21523
2	234° 27' 01"	2° 14' 06"	232° 39' 23"	-16° 42' 47"	0° 59' 40"	16' 15.47"	105° 33' 40"	0.21125
3	235° 02' 53"	2° 11' 08"	233° 14' 59"	-16° 54' 16"	0° 59' 40"	16' 15.53"	105° 21' 48"	0.20730
4	235° 38' 45"	2° 08' 08"	233° 50' 40"	-17° 05' 38"	0° 59' 40"	16' 15.58"	105° 9' 45"	0.20338
5	236° 14' 37"	2° 05' 08"	234° 26' 25"	-17° 16' 55"	0° 59' 40"	16' 15.63"	104° 57' 32"	0.19948
6	236° 50' 29"	2° 02' 07"	235° 02' 15"	-17° 28' 06"	0° 59' 40"	16' 15.67"	104° 45' 08"	0.19561
7	237° 26' 22"	1° 59' 05"	235° 38' 10"	-17° 39' 10"	0° 59' 41"	16' 15.71"	104° 32' 34"	0.19176
8	238° 02' 15"	1° 56' 03"	236° 14' 09"	-17° 50' 07"	0° 59' 41"	16' 15.74"	104° 19' 49"	0.18795
9	238° 38' 08"	1° 52' 59"	236° 50' 14"	-18° 00' 58"	0° 59' 41"	16' 15.77"	104° 6' 53"	0.18416
10	239° 14' 01"	1° 49' 55"	237° 26' 23"	-18° 11' 43"	0° 59' 41"	16' 15.80"	103° 53' 46"	0.18041
11	239° 49' 54"	1° 46' 50"	238° 02' 36"	-18° 22' 21"	0° 59' 41"	16' 15.82"	103° 40' 28"	0.17668
12	240° 25' 48"	1° 43' 45"	238° 38' 55"	-18° 32' 52"	0° 59' 41"	16' 15.84"	103° 26' 60"	0.17299
13	241° 01' 41"	1° 40' 38"	239° 15' 18"	-18° 43' 16"	0° 59' 41"	16' 15.86"	103° 13' 20"	0.16932
14	241° 37' 35"	1° 37' 32"	239° 51' 45"	-18° 53' 33"	0° 59' 41"	16' 15.86"	102° 59' 29"	0.16569
15	242° 13' 29"	1° 34' 24"	240° 28' 18"	-19° 03' 43"	0° 59' 41"	16' 15.87"	102° 45' 28"	0.16208
16	242° 49' 23"	1° 31' 16"	241° 04' 55"	-19° 13' 46"	0° 59' 41"	16' 15.87"	102° 31' 15"	0.15851
17	243° 25' 17"	1° 28' 07"	241° 41' 36"	-19° 23' 41"	0° 59' 41"	16' 15.87"	102° 16' 51"	0.15497
18	244° 01' 10"	1° 24' 58"	242° 18' 23"	-19° 33' 29"	0° 59' 41"	16' 15.86"	102° 2' 15"	0.15147
19	244° 37' 04"	1° 21' 48"	242° 55' 13"	-19° 43' 10"	0° 59' 41"	16' 15.85"	101° 47' 29"	0.14799
20	245° 12' 58"	1° 18' 37"	243° 32' 09"	-19° 52' 44"	0° 59' 41"	16' 15.83"	101° 32' 30"	0.14455
21	245° 48' 52"	1° 15' 26"	244° 09' 09"	-20° 02' 09"	0° 59' 41"	16' 15.81"	101° 17' 21"	0.14115
22	246° 24' 46"	1° 12' 15"	244° 46' 13"	-20° 11' 27"	0° 59' 41"	16' 15.78"	101° 1' 59"	0.13778
23	247° 00' 40"	1° 09' 03"	245° 23' 22"	-20° 20' 37"	0° 59' 41"	16' 15.75"	100° 46' 27"	0.13444
24	247° 36' 34"	1° 05' 50"	246° 00' 35"	-20° 29' 40"	0° 59' 41"	16' 15.71"	100° 30' 42"	0.13113

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	289° 57' 42"	0.04"	291° 35' 11"	-21° 57' 16"	0.9834082	16' 15.82"	23° 26' 13"	-7 m 25 s
1	290° 00' 15"	0.03"	291° 37' 54"	-21° 56' 53"	0.9834098	16' 15.82"	23° 26' 13"	-7 m 26 s
2	290° 02' 48"	0.03"	291° 40' 37"	-21° 56' 31"	0.9834114	16' 15.82"	23° 26' 13"	-7 m 27 s
3	290° 05' 21"	0.02"	291° 43' 20"	-21° 56' 08"	0.9834130	16' 15.82"	23° 26' 13"	-7 m 28 s
4	290° 07' 53"	0.01"	291° 46' 03"	-21° 55' 46"	0.9834146	16' 15.81"	23° 26' 13"	-7 m 29 s
5	290° 10' 26"	0.01"	291° 48' 46"	-21° 55' 23"	0.9834162	16' 15.81"	23° 26' 13"	-7 m 30 s
6	290° 12' 59"	0.00"	291° 51' 29"	-21° 55' 01"	0.9834178	16' 15.81"	23° 26' 13"	-7 m 31 s
7	290° 15' 32"	-0.00"	291° 54' 12"	-21° 54' 38"	0.9834194	16' 15.81"	23° 26' 13"	-7 m 32 s
8	290° 18' 05"	-0.01"	291° 56' 55"	-21° 54' 15"	0.9834210	16' 15.81"	23° 26' 13"	-7 m 33 s
9	290° 20' 38"	-0.01"	291° 59' 38"	-21° 53' 53"	0.9834227	16' 15.81"	23° 26' 13"	-7 m 34 s
10	290° 23' 11"	-0.02"	292° 02' 21"	-21° 53' 30"	0.9834243	16' 15.80"	23° 26' 13"	-7 m 35 s
11	290° 25' 44"	-0.02"	292° 05' 04"	-21° 53' 07"	0.9834260	16' 15.80"	23° 26' 13"	-7 m 36 s
12	290° 28' 17"	-0.03"	292° 07' 47"	-21° 52' 44"	0.9834276	16' 15.80"	23° 26' 13"	-7 m 37 s
13	290° 30' 50"	-0.03"	292° 10' 30"	-21° 52' 21"	0.9834293	16' 15.80"	23° 26' 13"	-7 m 38 s
14	290° 33' 23"	-0.04"	292° 13' 13"	-21° 51' 58"	0.9834310	16' 15.80"	23° 26' 13"	-7 m 39 s
15	290° 35' 55"	-0.04"	292° 15' 56"	-21° 51' 35"	0.9834327	16' 15.80"	23° 26' 13"	-7 m 40 s
16	290° 38' 28"	-0.05"	292° 18' 38"	-21° 51' 12"	0.9834343	16' 15.79"	23° 26' 13"	-7 m 41 s
17	290° 41' 01"	-0.05"	292° 21' 21"	-21° 50' 49"	0.9834360	16' 15.79"	23° 26' 13"	-7 m 42 s
18	290° 43' 34"	-0.06"	292° 24' 04"	-21° 50' 26"	0.9834377	16' 15.79"	23° 26' 13"	-7 m 43 s
19	290° 46' 07"	-0.07"	292° 26' 47"	-21° 50' 03"	0.9834394	16' 15.79"	23° 26' 13"	-7 m 44 s
20	290° 48' 40"	-0.07"	292° 29' 30"	-21° 49' 39"	0.9834411	16' 15.79"	23° 26' 13"	-7 m 45 s
21	290° 51' 13"	-0.08"	292° 32' 13"	-21° 49' 16"	0.9834429	16' 15.79"	23° 26' 13"	-7 m 46 s
22	290° 53' 46"	-0.08"	292° 34' 55"	-21° 48' 53"	0.9834446	16' 15.78"	23° 26' 13"	-7 m 47 s
23	290° 56' 19"	-0.09"	292° 37' 38"	-21° 48' 29"	0.9834463	16' 15.78"	23° 26' 13"	-7 m 48 s
24	290° 58' 52"	-0.09"	292° 40' 21"	-21° 48' 06"	0.9834480	16' 15.78"	23° 26' 13"	-7 m 49 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	247° 36' 34"	1° 05' 50"	246° 00' 35"	-20° 29' 40"	0° 59' 41"	16' 15.71"	100° 30' 42"	0.13113
1	248° 12' 28"	1° 02' 38"	246° 37' 53"	-20° 38' 34"	0° 59' 40"	16' 15.67"	100° 14' 45"	0.12787
2	248° 48' 22"	0° 59' 24"	247° 15' 14"	-20° 47' 20"	0° 59' 40"	16' 15.63"	99° 58' 37"	0.12463
3	249° 24' 15"	0° 56' 11"	247° 52' 41"	-20° 55' 59"	0° 59' 40"	16' 15.58"	99° 42' 16"	0.12144
4	250° 00' 08"	0° 52' 57"	248° 30' 11"	-21° 04' 29"	0° 59' 40"	16' 15.52"	99° 25' 43"	0.11828
5	250° 36' 02"	0° 49' 43"	249° 07' 45"	-21° 12' 50"	0° 59' 40"	16' 15.46"	99° 8' 58"	0.11515
6	251° 11' 55"	0° 46' 28"	249° 45' 24"	-21° 21' 04"	0° 59' 39"	16' 15.40"	98° 51' 60"	0.11206
7	251° 47' 48"	0° 43' 13"	250° 23' 07"	-21° 29' 09"	0° 59' 39"	16' 15.33"	98° 34' 49"	0.10901
8	252° 23' 41"	0° 39' 58"	251° 00' 54"	-21° 37' 05"	0° 59' 39"	16' 15.26"	98° 17' 26"	0.10600
9	252° 59' 33"	0° 36' 43"	251° 38' 44"	-21° 44' 53"	0° 59' 39"	16' 15.18"	97° 59' 49"	0.10303
10	253° 35' 25"	0° 33' 27"	252° 16' 39"	-21° 52' 32"	0° 59' 38"	16' 15.09"	97° 41' 60"	0.10009
11	254° 11' 17"	0° 30' 12"	252° 54' 37"	-22° 00' 02"	0° 59' 38"	16' 15.00"	97° 23' 57"	0.09719
12	254° 47' 09"	0° 26' 56"	253° 32' 39"	-22° 07' 24"	0° 59' 38"	16' 14.91"	97° 5' 40"	0.09433
13	255° 23' 00"	0° 23' 40"	254° 10' 45"	-22° 14' 36"	0° 59' 37"	16' 14.81"	96° 47' 09"	0.09151
14	255° 58' 52"	0° 20' 24"	254° 48' 54"	-22° 21' 40"	0° 59' 37"	16' 14.71"	96° 28' 24"	0.08873
15	256° 34' 42"	0° 17' 07"	255° 27' 07"	-22° 28' 35"	0° 59' 37"	16' 14.60"	96° 9' 24"	0.08598
16	257° 10' 33"	0° 13' 51"	256° 05' 23"	-22° 35' 20"	0° 59' 36"	16' 14.49"	95° 50' 10"	0.08328
17	257° 46' 23"	0° 10' 35"	256° 43' 43"	-22° 41' 57"	0° 59' 36"	16' 14.37"	95° 30' 41"	0.08062
18	258° 22' 12"	0° 07' 18"	257° 22' 05"	-22° 48' 24"	0° 59' 35"	16' 14.25"	95° 10' 56"	0.07800
19	258° 58' 02"	0° 04' 02"	258° 00' 31"	-22° 54' 42"	0° 59' 35"	16' 14.12"	94° 50' 55"	0.07541
20	259° 33' 51"	0° 00' 46"	258° 39' 00"	-23° 00' 51"	0° 59' 34"	16' 13.98"	94° 30' 37"	0.07287
21	260° 09' 39"	0° -2' 31"	259° 17' 32"	-23° 06' 50"	0° 59' 34"	16' 13.85"	94° 10' 03"	0.07037
22	260° 45' 27"	0° -5' 47"	259° 56' 07"	-23° 12' 39"	0° 59' 33"	16' 13.70"	93° 49' 11"	0.06791
23	261° 21' 14"	0° -9' 03"	260° 34' 45"	-23° 18' 20"	0° 59' 33"	16' 13.55"	93° 28' 02"	0.06550
24	261° 57' 01"	0° -12' 19"	261° 13' 25"	-23° 23' 50"	0° 59' 32"	16' 13.40"	93° 6' 34"	0.06312

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	290° 58' 52"	-0.09"	292° 40' 21"	-21° 48' 06"	0.9834480	16' 15.78"	23° 26' 13"	-7 m 49 s
1	291° 01' 24"	-0.10"	292° 43' 04"	-21° 47' 43"	0.9834498	16' 15.78"	23° 26' 13"	-7 m 50 s
2	291° 03' 57"	-0.10"	292° 45' 46"	-21° 47' 19"	0.9834515	16' 15.78"	23° 26' 13"	-7 m 51 s
3	291° 06' 30"	-0.11"	292° 48' 29"	-21° 46' 55"	0.9834533	16' 15.78"	23° 26' 13"	-7 m 52 s
4	291° 09' 03"	-0.11"	292° 51' 12"	-21° 46' 32"	0.9834551	16' 15.77"	23° 26' 13"	-7 m 53 s
5	291° 11' 36"	-0.12"	292° 53' 54"	-21° 46' 08"	0.9834568	16' 15.77"	23° 26' 13"	-7 m 54 s
6	291° 14' 09"	-0.12"	292° 56' 37"	-21° 45' 45"	0.9834586	16' 15.77"	23° 26' 13"	-7 m 55 s
7	291° 16' 42"	-0.13"	292° 59' 20"	-21° 45' 21"	0.9834604	16' 15.77"	23° 26' 13"	-7 m 56 s
8	291° 19' 15"	-0.13"	293° 02' 02"	-21° 44' 57"	0.9834622	16' 15.77"	23° 26' 13"	-7 m 57 s
9	291° 21' 48"	-0.14"	293° 04' 45"	-21° 44' 33"	0.9834640	16' 15.77"	23° 26' 13"	-7 m 58 s
10	291° 24' 21"	-0.15"	293° 07' 28"	-21° 44' 09"	0.9834658	16' 15.76"	23° 26' 13"	-7 m 59 s
11	291° 26' 54"	-0.15"	293° 10' 10"	-21° 43' 46"	0.9834676	16' 15.76"	23° 26' 13"	-7 m 60 s
12	291° 29' 26"	-0.16"	293° 12' 53"	-21° 43' 22"	0.9834694	16' 15.76"	23° 26' 13"	-8 m 01 s
13	291° 31' 59"	-0.16"	293° 15' 35"	-21° 42' 58"	0.9834712	16' 15.76"	23° 26' 13"	-8 m 02 s
14	291° 34' 32"	-0.17"	293° 18' 18"	-21° 42' 34"	0.9834730	16' 15.76"	23° 26' 13"	-8 m 03 s
15	291° 37' 05"	-0.17"	293° 21' 00"	-21° 42' 09"	0.9834749	16' 15.75"	23° 26' 13"	-8 m 04 s
16	291° 39' 38"	-0.18"	293° 23' 43"	-21° 41' 45"	0.9834767	16' 15.75"	23° 26' 13"	-8 m 04 s
17	291° 42' 11"	-0.18"	293° 26' 25"	-21° 41' 21"	0.9834786	16' 15.75"	23° 26' 13"	-8 m 05 s
18	291° 44' 44"	-0.19"	293° 29' 08"	-21° 40' 57"	0.9834804	16' 15.75"	23° 26' 13"	-8 m 06 s
19	291° 47' 17"	-0.19"	293° 31' 50"	-21° 40' 33"	0.9834823	16' 15.75"	23° 26' 13"	-8 m 07 s
20	291° 49' 50"	-0.20"	293° 34' 33"	-21° 40' 08"	0.9834841	16' 15.75"	23° 26' 13"	-8 m 08 s
21	291° 52' 23"	-0.20"	293° 37' 15"	-21° 39' 44"	0.9834860	16' 15.74"	23° 26' 13"	-8 m 09 s
22	291° 54' 55"	-0.21"	293° 39' 58"	-21° 39' 20"	0.9834879	16' 15.74"	23° 26' 13"	-8 m 10 s
23	291° 57' 28"	-0.21"	293° 42' 40"	-21° 38' 55"	0.9834898	16' 15.74"	23° 26' 13"	-8 m 11 s
24	292° 00' 01"	-0.22"	293° 45' 22"	-21° 38' 31"	0.9834917	16' 15.74"	23° 26' 13"	-8 m 12 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	261° 57' 01"	0°-12' 19"	261° 13' 25"	-23° 23' 50"	0° 59' 32"	16' 13.40"	93° 6' 34"	0.06312
1	262° 32' 47"	0°-15' 35"	261° 52' 08"	-23° 29' 11"	0° 59' 32"	16' 13.24"	92° 44' 46"	0.06079
2	263° 08' 33"	0°-18' 50"	262° 30' 54"	-23° 34' 23"	0° 59' 31"	16' 13.08"	92° 22' 39"	0.05850
3	263° 44' 18"	0°-22' 06"	263° 09' 41"	-23° 39' 24"	0° 59' 30"	16' 12.91"	92° 0' 11"	0.05625
4	264° 20' 03"	0°-25' 21"	263° 48' 32"	-23° 44' 16"	0° 59' 30"	16' 12.73"	91° 37' 22"	0.05404
5	264° 55' 47"	0°-28' 36"	264° 27' 24"	-23° 48' 58"	0° 59' 29"	16' 12.56"	91° 14' 09"	0.05188
6	265° 31' 31"	0°-31' 51"	265° 06' 18"	-23° 53' 30"	0° 59' 28"	16' 12.37"	90° 50' 34"	0.04976
7	266° 07' 13"	0°-35' 05"	265° 45' 14"	-23° 57' 53"	0° 59' 28"	16' 12.18"	90° 26' 33"	0.04768
8	266° 42' 55"	0°-38' 20"	266° 24' 12"	-24° 02' 05"	0° 59' 27"	16' 11.99"	90° 2' 06"	0.04565
9	267° 18' 37"	0°-41' 34"	267° 03' 12"	-24° 06' 07"	0° 59' 26"	16' 11.79"	89° 37' 13"	0.04366
10	267° 54' 17"	0°-44' 47"	267° 42' 13"	-24° 09' 60"	0° 59' 25"	16' 11.58"	89° 11' 50"	0.04171
11	268° 29' 57"	0°-48' 00"	268° 21' 16"	-24° 13' 42"	0° 59' 25"	16' 11.38"	88° 45' 56"	0.03981
12	269° 05' 37"	0°-51' 13"	269° 00' 20"	-24° 17' 15"	0° 59' 24"	16' 11.16"	88° 19' 31"	0.03795
13	269° 41' 15"	0°-54' 25"	269° 39' 25"	-24° 20' 37"	0° 59' 23"	16' 10.94"	87° 52' 30"	0.03614
14	270° 16' 52"	0°-57' 37"	270° 18' 32"	-24° 23' 49"	0° 59' 22"	16' 10.72"	87° 24' 54"	0.03437
15	270° 52' 29"	-1° 00' 48"	270° 57' 39"	-24° 26' 51"	0° 59' 21"	16' 10.49"	86° 56' 38"	0.03264
16	271° 28' 05"	-1° 03' 59"	271° 36' 47"	-24° 29' 43"	0° 59' 21"	16' 10.25"	86° 27' 40"	0.03096
17	272° 03' 40"	-1° 07' 10"	272° 15' 56"	-24° 32' 24"	0° 59' 20"	16' 10.01"	85° 57' 56"	0.02933
18	272° 39' 14"	-1° 10' 20"	272° 55' 05"	-24° 34' 56"	0° 59' 19"	16' 09.77"	85° 27' 25"	0.02773
19	273° 14' 48"	-1° 13' 29"	273° 34' 15"	-24° 37' 17"	0° 59' 18"	16' 09.52"	84° 56' 01"	0.02619
20	273° 50' 20"	-1° 16' 38"	274° 13' 25"	-24° 39' 28"	0° 59' 17"	16' 09.27"	84° 23' 40"	0.02469
21	274° 25' 52"	-1° 19' 46"	274° 52' 36"	-24° 41' 29"	0° 59' 16"	16' 09.01"	83° 50' 18"	0.02323
22	275° 01' 22"	-1° 22' 53"	275° 31' 46"	-24° 43' 20"	0° 59' 15"	16' 08.74"	83° 15' 48"	0.02182
23	275° 36' 51"	-1° 26' 00"	276° 10' 56"	-24° 44' 60"	0° 59' 14"	16' 08.47"	82° 40' 05"	0.02045
24	276° 12' 20"	-1° 29' 06"	276° 50' 07"	-24° 46' 30"	0° 59' 13"	16' 08.20"	82° 3' 02"	0.01913

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	292° 00' 01"	-0.22"	293° 45' 22"	-21° 38' 31"	0.9834917	16' 15.74"	23° 26' 13"	-8 m 12 s
1	292° 02' 34"	-0.22"	293° 48' 05"	-21° 38' 06"	0.9834936	16' 15.74"	23° 26' 13"	-8 m 13 s
2	292° 05' 07"	-0.23"	293° 50' 47"	-21° 37' 42"	0.9834955	16' 15.73"	23° 26' 13"	-8 m 14 s
3	292° 07' 40"	-0.23"	293° 53' 29"	-21° 37' 17"	0.9834974	16' 15.73"	23° 26' 13"	-8 m 15 s
4	292° 10' 13"	-0.24"	293° 56' 12"	-21° 36' 52"	0.9834993	16' 15.73"	23° 26' 13"	-8 m 16 s
5	292° 12' 46"	-0.24"	293° 58' 54"	-21° 36' 28"	0.9835012	16' 15.73"	23° 26' 13"	-8 m 17 s
6	292° 15' 19"	-0.25"	294° 01' 36"	-21° 36' 03"	0.9835031	16' 15.73"	23° 26' 13"	-8 m 18 s
7	292° 17' 51"	-0.25"	294° 04' 19"	-21° 35' 38"	0.9835051	16' 15.72"	23° 26' 13"	-8 m 19 s
8	292° 20' 24"	-0.26"	294° 07' 01"	-21° 35' 13"	0.9835070	16' 15.72"	23° 26' 13"	-8 m 20 s
9	292° 22' 57"	-0.26"	294° 09' 43"	-21° 34' 49"	0.9835090	16' 15.72"	23° 26' 13"	-8 m 21 s
10	292° 25' 30"	-0.27"	294° 12' 25"	-21° 34' 24"	0.9835109	16' 15.72"	23° 26' 13"	-8 m 22 s
11	292° 28' 03"	-0.27"	294° 15' 08"	-21° 33' 59"	0.9835129	16' 15.72"	23° 26' 13"	-8 m 23 s
12	292° 30' 36"	-0.28"	294° 17' 50"	-21° 33' 34"	0.9835148	16' 15.71"	23° 26' 13"	-8 m 24 s
13	292° 33' 09"	-0.28"	294° 20' 32"	-21° 33' 09"	0.9835168	16' 15.71"	23° 26' 13"	-8 m 25 s
14	292° 35' 42"	-0.29"	294° 23' 14"	-21° 32' 44"	0.9835188	16' 15.71"	23° 26' 13"	-8 m 26 s
15	292° 38' 15"	-0.29"	294° 25' 56"	-21° 32' 18"	0.9835208	16' 15.71"	23° 26' 13"	-8 m 27 s
16	292° 40' 48"	-0.30"	294° 28' 38"	-21° 31' 53"	0.9835228	16' 15.71"	23° 26' 13"	-8 m 28 s
17	292° 43' 20"	-0.30"	294° 31' 20"	-21° 31' 28"	0.9835247	16' 15.70"	23° 26' 13"	-8 m 28 s
18	292° 45' 53"	-0.31"	294° 34' 03"	-21° 31' 03"	0.9835268	16' 15.70"	23° 26' 13"	-8 m 29 s
19	292° 48' 26"	-0.31"	294° 36' 45"	-21° 30' 38"	0.9835288	16' 15.70"	23° 26' 13"	-8 m 30 s
20	292° 50' 59"	-0.32"	294° 39' 27"	-21° 30' 12"	0.9835308	16' 15.70"	23° 26' 13"	-8 m 31 s
21	292° 53' 32"	-0.32"	294° 42' 09"	-21° 29' 47"	0.9835328	16' 15.70"	23° 26' 13"	-8 m 32 s
22	292° 56' 05"	-0.33"	294° 44' 51"	-21° 29' 21"	0.9835348	16' 15.69"	23° 26' 13"	-8 m 33 s
23	292° 58' 38"	-0.33"	294° 47' 33"	-21° 28' 56"	0.9835369	16' 15.69"	23° 26' 13"	-8 m 34 s
24	293° 01' 11"	-0.34"	294° 50' 15"	-21° 28' 30"	0.9835389	16' 15.69"	23° 26' 13"	-8 m 35 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	276° 12' 20"	-1° 29' 06"	276° 50' 07"	-24° 46' 30"	0° 59' 13"	16' 08.20"	82° 3' 02"	0.01913
1	276° 47' 47"	-1° 32' 12"	277° 29' 16"	-24° 47' 50"	0° 59' 12"	16' 07.92"	81° 24' 29"	0.01786
2	277° 23' 14"	-1° 35' 17"	278° 08' 26"	-24° 48' 59"	0° 59' 11"	16' 07.64"	80° 44' 19"	0.01663
3	277° 58' 39"	-1° 38' 21"	278° 47' 34"	-24° 49' 59"	0° 59' 10"	16' 07.35"	80° 2' 21"	0.01544
4	278° 34' 03"	-1° 41' 24"	279° 26' 42"	-24° 50' 48"	0° 59' 09"	16' 07.06"	79° 18' 21"	0.01431
5	279° 09' 27"	-1° 44' 27"	280° 05' 49"	-24° 51' 27"	0° 59' 08"	16' 06.76"	78° 32' 07"	0.01321
6	279° 44' 49"	-1° 47' 29"	280° 44' 55"	-24° 51' 55"	0° 59' 07"	16' 06.46"	77° 43' 21"	0.01216
7	280° 20' 09"	-1° 50' 30"	281° 23' 60"	-24° 52' 14"	0° 59' 06"	16' 06.15"	76° 51' 44"	0.01116
8	280° 55' 29"	-1° 53' 30"	282° 03' 04"	-24° 52' 22"	0° 59' 04"	16' 05.84"	75° 56' 53"	0.01021
9	281° 30' 48"	-1° 56' 29"	282° 42' 06"	-24° 52' 20"	0° 59' 03"	16' 05.52"	74° 58' 21"	0.00930
10	282° 06' 05"	-1° 59' 28"	283° 21' 06"	-24° 52' 08"	0° 59' 02"	16' 05.20"	73° 55' 36"	0.00843
11	282° 41' 21"	-2° 02' 25"	284° 00' 05"	-24° 51' 46"	0° 59' 01"	16' 04.88"	72° 47' 60"	0.00761
12	283° 16' 36"	-2° 05' 22"	284° 39' 02"	-24° 51' 14"	0° 58' 60"	16' 04.55"	71° 34' 45"	0.00684
13	283° 51' 49"	-2° 08' 18"	285° 17' 57"	-24° 50' 31"	0° 58' 58"	16' 04.21"	70° 14' 55"	0.00611
14	284° 27' 01"	-2° 11' 13"	285° 56' 50"	-24° 49' 39"	0° 58' 57"	16' 03.87"	68° 47' 21"	0.00543
15	285° 02' 12"	-2° 14' 06"	286° 35' 41"	-24° 48' 36"	0° 58' 56"	16' 03.53"	67° 10' 36"	0.00479
16	285° 37' 22"	-2° 16' 59"	287° 14' 30"	-24° 47' 24"	0° 58' 55"	16' 03.18"	65° 22' 54"	0.00420
17	286° 12' 30"	-2° 19' 51"	287° 53' 16"	-24° 46' 01"	0° 58' 53"	16' 02.83"	63° 21' 59"	0.00366
18	286° 47' 37"	-2° 22' 42"	288° 31' 59"	-24° 44' 29"	0° 58' 52"	16' 02.48"	61° 5' 02"	0.00316
19	287° 22' 43"	-2° 25' 32"	289° 10' 40"	-24° 42' 47"	0° 58' 51"	16' 02.12"	58° 28' 26"	0.00270
20	287° 57' 47"	-2° 28' 21"	289° 49' 18"	-24° 40' 55"	0° 58' 49"	16' 01.75"	55° 27' 33"	0.00229
21	288° 32' 49"	-2° 31' 08"	290° 27' 53"	-24° 38' 53"	0° 58' 48"	16' 01.38"	51° 56' 30"	0.00193
22	289° 07' 51"	-2° 33' 55"	291° 06' 25"	-24° 36' 41"	0° 58' 47"	16' 01.01"	47° 47' 48"	0.00161
23	289° 42' 50"	-2° 36' 41"	291° 44' 54"	-24° 34' 20"	0° 58' 45"	16' 00.63"	42° 52' 19"	0.00133
24	290° 17' 49"	-2° 39' 25"	292° 23' 20"	-24° 31' 49"	0° 58' 44"	16' 00.25"	36° 59' 22"	0.00111

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	293° 01' 11"	-0.34"	294° 50' 15"	-21° 28' 30"	0.9835389	16' 15.69"	23° 26' 13"	-8 m 35 s
1	293° 03' 43"	-0.34"	294° 52' 57"	-21° 28' 05"	0.9835409	16' 15.69"	23° 26' 13"	-8 m 36 s
2	293° 06' 16"	-0.35"	294° 55' 39"	-21° 27' 39"	0.9835430	16' 15.69"	23° 26' 13"	-8 m 37 s
3	293° 08' 49"	-0.35"	294° 58' 21"	-21° 27' 14"	0.9835451	16' 15.68"	23° 26' 13"	-8 m 38 s
4	293° 11' 22"	-0.36"	295° 01' 03"	-21° 26' 48"	0.9835471	16' 15.68"	23° 26' 13"	-8 m 39 s
5	293° 13' 55"	-0.36"	295° 03' 45"	-21° 26' 22"	0.9835492	16' 15.68"	23° 26' 13"	-8 m 40 s
6	293° 16' 28"	-0.37"	295° 06' 26"	-21° 25' 56"	0.9835513	16' 15.68"	23° 26' 13"	-8 m 41 s
7	293° 19' 01"	-0.37"	295° 09' 08"	-21° 25' 31"	0.9835534	16' 15.68"	23° 26' 13"	-8 m 42 s
8	293° 21' 34"	-0.37"	295° 11' 50"	-21° 25' 05"	0.9835554	16' 15.67"	23° 26' 13"	-8 m 43 s
9	293° 24' 07"	-0.38"	295° 14' 32"	-21° 24' 39"	0.9835575	16' 15.67"	23° 26' 13"	-8 m 43 s
10	293° 26' 39"	-0.38"	295° 17' 14"	-21° 24' 13"	0.9835596	16' 15.67"	23° 26' 13"	-8 m 44 s
11	293° 29' 12"	-0.39"	295° 19' 56"	-21° 23' 47"	0.9835617	16' 15.67"	23° 26' 13"	-8 m 45 s
12	293° 31' 45"	-0.39"	295° 22' 37"	-21° 23' 21"	0.9835639	16' 15.67"	23° 26' 13"	-8 m 46 s
13	293° 34' 18"	-0.40"	295° 25' 19"	-21° 22' 55"	0.9835660	16' 15.66"	23° 26' 13"	-8 m 47 s
14	293° 36' 51"	-0.40"	295° 28' 01"	-21° 22' 29"	0.9835681	16' 15.66"	23° 26' 13"	-8 m 48 s
15	293° 39' 24"	-0.40"	295° 30' 43"	-21° 22' 02"	0.9835702	16' 15.66"	23° 26' 13"	-8 m 49 s
16	293° 41' 57"	-0.41"	295° 33' 24"	-21° 21' 36"	0.9835724	16' 15.66"	23° 26' 13"	-8 m 50 s
17	293° 44' 30"	-0.41"	295° 36' 06"	-21° 21' 10"	0.9835745	16' 15.66"	23° 26' 13"	-8 m 51 s
18	293° 47' 02"	-0.42"	295° 38' 48"	-21° 20' 44"	0.9835767	16' 15.65"	23° 26' 13"	-8 m 52 s
19	293° 49' 35"	-0.42"	295° 41' 30"	-21° 20' 17"	0.9835788	16' 15.65"	23° 26' 13"	-8 m 53 s
20	293° 52' 08"	-0.43"	295° 44' 11"	-21° 19' 51"	0.9835810	16' 15.65"	23° 26' 13"	-8 m 54 s
21	293° 54' 41"	-0.43"	295° 46' 53"	-21° 19' 25"	0.9835832	16' 15.65"	23° 26' 13"	-8 m 55 s
22	293° 57' 14"	-0.43"	295° 49' 34"	-21° 18' 58"	0.9835854	16' 15.64"	23° 26' 13"	-8 m 55 s
23	293° 59' 47"	-0.44"	295° 52' 16"	-21° 18' 32"	0.9835875	16' 15.64"	23° 26' 13"	-8 m 56 s
24	294° 02' 20"	-0.44"	295° 54' 58"	-21° 18' 05"	0.9835897	16' 15.64"	23° 26' 13"	-8 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	290° 17' 49"	-2° 39' 25"	292° 23' 20"	-24° 31' 49"	0° 58' 44"	16' 00.25"	36° 59' 22"	0.00111
1	290° 52' 45"	-2° 42' 08"	293° 01' 42"	-24° 29' 08"	0° 58' 42"	15' 59.87"	29° 58' 04"	0.00092
2	291° 27' 41"	-2° 44' 50"	293° 40' 00"	-24° 26' 18"	0° 58' 41"	15' 59.48"	21° 40' 24"	0.00078
3	292° 02' 34"	-2° 47' 31"	294° 18' 15"	-24° 23' 18"	0° 58' 40"	15' 59.09"	12° 7' 06"	0.00069
4	292° 37' 26"	-2° 50' 11"	294° 56' 26"	-24° 20' 09"	0° 58' 38"	15' 58.69"	1° 34' 23"	0.00064
5	293° 12' 17"	-2° 52' 50"	295° 34' 34"	-24° 16' 51"	0° 58' 37"	15' 58.29"	350° 36' 04"	0.00064
6	293° 47' 06"	-2° 55' 27"	296° 12' 37"	-24° 13' 23"	0° 58' 35"	15' 57.89"	339° 55' 15"	0.00067
7	294° 21' 53"	-2° 58' 03"	296° 50' 37"	-24° 09' 46"	0° 58' 34"	15' 57.48"	330° 8' 37"	0.00076
8	294° 56' 39"	-3° 00' 38"	297° 28' 32"	-24° 05' 59"	0° 58' 32"	15' 57.07"	321° 35' 58"	0.00089
9	295° 31' 23"	-3° 03' 12"	298° 06' 23"	-24° 02' 04"	0° 58' 31"	15' 56.66"	314° 20' 33"	0.00106
10	296° 06' 06"	-3° 05' 44"	298° 44' 09"	-23° 57' 59"	0° 58' 29"	15' 56.24"	308° 15' 34"	0.00127
11	296° 40' 47"	-3° 08' 15"	299° 21' 51"	-23° 53' 46"	0° 58' 28"	15' 55.82"	303° 10' 21"	0.00153
12	297° 15' 26"	-3° 10' 45"	299° 59' 29"	-23° 49' 23"	0° 58' 26"	15' 55.40"	298° 54' 04"	0.00184
13	297° 50' 03"	-3° 13' 14"	300° 37' 02"	-23° 44' 52"	0° 58' 24"	15' 54.97"	295° 17' 12"	0.00218
14	298° 24' 38"	-3° 15' 41"	301° 14' 29"	-23° 40' 11"	0° 58' 23"	15' 54.54"	292° 12' 01"	0.00257
15	298° 59' 12"	-3° 18' 06"	301° 51' 53"	-23° 35' 22"	0° 58' 21"	15' 54.10"	289° 32' 13"	0.00301
16	299° 33' 44"	-3° 20' 31"	302° 29' 12"	-23° 30' 25"	0° 58' 20"	15' 53.66"	287° 13' 00"	0.00348
17	300° 08' 14"	-3° 22' 54"	303° 06' 25"	-23° 25' 18"	0° 58' 18"	15' 53.22"	285° 10' 36"	0.00400
18	300° 42' 43"	-3° 25' 16"	303° 43' 34"	-23° 20' 04"	0° 58' 16"	15' 52.78"	283° 22' 02"	0.00456
19	301° 17' 10"	-3° 27' 36"	304° 20' 38"	-23° 14' 40"	0° 58' 15"	15' 52.34"	281° 44' 56"	0.00517
20	301° 51' 35"	-3° 29' 55"	304° 57' 36"	-23° 09' 09"	0° 58' 13"	15' 51.89"	280° 17' 27"	0.00581
21	302° 25' 58"	-3° 32' 13"	305° 34' 29"	-23° 03' 29"	0° 58' 12"	15' 51.43"	278° 58' 04"	0.00650
22	303° 00' 19"	-3° 34' 29"	306° 11' 17"	-22° 57' 41"	0° 58' 10"	15' 50.98"	277° 45' 36"	0.00723
23	303° 34' 39"	-3° 36' 43"	306° 47' 60"	-22° 51' 44"	0° 58' 08"	15' 50.52"	276° 39' 03"	0.00800
24	304° 08' 56"	-3° 38' 57"	307° 24' 37"	-22° 45' 40"	0° 58' 06"	15' 50.06"	275° 37' 37"	0.00881

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	294° 02' 20"	-0.44"	295° 54' 58"	-21° 18' 05"	0.9835897	16' 15.64"	23° 26' 13"	-8 m 57 s
1	294° 04' 53"	-0.45"	295° 57' 39"	-21° 17' 39"	0.9835919	16' 15.64"	23° 26' 13"	-8 m 58 s
2	294° 07' 25"	-0.45"	296° 00' 21"	-21° 17' 12"	0.9835941	16' 15.64"	23° 26' 13"	-8 m 59 s
3	294° 09' 58"	-0.45"	296° 03' 02"	-21° 16' 45"	0.9835963	16' 15.63"	23° 26' 13"	-9 m 00 s
4	294° 12' 31"	-0.46"	296° 05' 44"	-21° 16' 19"	0.9835986	16' 15.63"	23° 26' 13"	-9 m 01 s
5	294° 15' 04"	-0.46"	296° 08' 25"	-21° 15' 52"	0.9836008	16' 15.63"	23° 26' 13"	-9 m 02 s
6	294° 17' 37"	-0.47"	296° 11' 07"	-21° 15' 25"	0.9836030	16' 15.63"	23° 26' 13"	-9 m 03 s
7	294° 20' 10"	-0.47"	296° 13' 48"	-21° 14' 58"	0.9836052	16' 15.63"	23° 26' 13"	-9 m 04 s
8	294° 22' 43"	-0.47"	296° 16' 30"	-21° 14' 31"	0.9836075	16' 15.62"	23° 26' 13"	-9 m 05 s
9	294° 25' 15"	-0.48"	296° 19' 11"	-21° 14' 04"	0.9836097	16' 15.62"	23° 26' 13"	-9 m 05 s
10	294° 27' 48"	-0.48"	296° 21' 53"	-21° 13' 37"	0.9836120	16' 15.62"	23° 26' 13"	-9 m 06 s
11	294° 30' 21"	-0.48"	296° 24' 34"	-21° 13' 10"	0.9836142	16' 15.62"	23° 26' 13"	-9 m 07 s
12	294° 32' 54"	-0.49"	296° 27' 15"	-21° 12' 43"	0.9836165	16' 15.61"	23° 26' 13"	-9 m 08 s
13	294° 35' 27"	-0.49"	296° 29' 57"	-21° 12' 16"	0.9836188	16' 15.61"	23° 26' 13"	-9 m 09 s
14	294° 37' 00"	-0.49"	296° 32' 38"	-21° 11' 49"	0.9836211	16' 15.61"	23° 26' 13"	-9 m 10 s
15	294° 40' 33"	-0.50"	296° 35' 19"	-21° 11' 22"	0.9836234	16' 15.61"	23° 26' 13"	-9 m 11 s
16	294° 43' 05"	-0.50"	296° 38' 01"	-21° 10' 55"	0.9836256	16' 15.60"	23° 26' 13"	-9 m 12 s
17	294° 45' 38"	-0.50"	296° 40' 42"	-21° 10' 27"	0.9836279	16' 15.60"	23° 26' 13"	-9 m 13 s
18	294° 48' 11"	-0.51"	296° 43' 23"	-21° 09' 60"	0.9836302	16' 15.60"	23° 26' 13"	-9 m 14 s
19	294° 50' 44"	-0.51"	296° 46' 05"	-21° 09' 33"	0.9836326	16' 15.60"	23° 26' 13"	-9 m 14 s
20	294° 53' 17"	-0.51"	296° 48' 46"	-21° 09' 05"	0.9836349	16' 15.60"	23° 26' 13"	-9 m 15 s
21	294° 55' 50"	-0.52"	296° 51' 27"	-21° 08' 38"	0.9836372	16' 15.59"	23° 26' 13"	-9 m 16 s
22	294° 58' 23"	-0.52"	296° 54' 08"	-21° 08' 10"	0.9836395	16' 15.59"	23° 26' 13"	-9 m 17 s
23	295° 00' 55"	-0.52"	296° 56' 50"	-21° 07' 43"	0.9836419	16' 15.59"	23° 26' 13"	-9 m 18 s
24	295° 03' 28"	-0.53"	296° 59' 31"	-21° 07' 15"	0.9836442	16' 15.59"	23° 26' 13"	-9 m 19 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	304° 08' 56"	-3° 38' 57"	307° 24' 37"	-22° 45' 40"	0° 58' 06"	15' 50.06"	275° 37' 37"	0.00881
1	304° 43' 12"	-3° 41' 08"	308° 01' 08"	-22° 39' 28"	0° 58' 05"	15' 49.60"	274° 40' 38"	0.00967
2	305° 17' 26"	-3° 43' 19"	308° 37' 35"	-22° 33' 07"	0° 58' 03"	15' 49.14"	273° 47' 31"	0.01056
3	305° 51' 38"	-3° 45' 28"	309° 13' 55"	-22° 26' 39"	0° 58' 01"	15' 48.67"	272° 57' 50"	0.01150
4	306° 25' 48"	-3° 47' 35"	309° 50' 10"	-22° 20' 03"	0° 57' 60"	15' 48.20"	272° 11' 11"	0.01247
5	306° 59' 56"	-3° 49' 41"	310° 26' 19"	-22° 13' 20"	0° 57' 58"	15' 47.73"	271° 27' 12"	0.01349
6	307° 34' 02"	-3° 51' 45"	311° 02' 22"	-22° 06' 29"	0° 57' 56"	15' 47.26"	270° 45' 38"	0.01455
7	308° 08' 06"	-3° 53' 48"	311° 38' 20"	-21° 59' 31"	0° 57' 54"	15' 46.78"	270° 6' 14"	0.01564
8	308° 42' 08"	-3° 55' 50"	312° 14' 12"	-21° 52' 25"	0° 57' 53"	15' 46.30"	269° 28' 46"	0.01678
9	309° 16' 08"	-3° 57' 49"	312° 49' 58"	-21° 45' 12"	0° 57' 51"	15' 45.82"	268° 53' 04"	0.01795
10	309° 50' 06"	-3° 59' 48"	313° 25' 38"	-21° 37' 51"	0° 57' 49"	15' 45.34"	268° 18' 58"	0.01917
11	310° 24' 02"	-4° 01' 45"	314° 01' 12"	-21° 30' 24"	0° 57' 47"	15' 44.86"	267° 46' 20"	0.02042
12	310° 57' 57"	-4° 03' 40"	314° 36' 40"	-21° 22' 49"	0° 57' 46"	15' 44.37"	267° 15' 02"	0.02171
13	311° 31' 49"	-4° 05' 33"	315° 12' 03"	-21° 15' 08"	0° 57' 44"	15' 43.88"	266° 44' 58"	0.02304
14	312° 05' 39"	-4° 07' 26"	315° 47' 19"	-21° 07' 19"	0° 57' 42"	15' 43.39"	266° 16' 02"	0.02441
15	312° 39' 27"	-4° 09' 16"	316° 22' 29"	-20° 59' 24"	0° 57' 40"	15' 42.90"	265° 48' 08"	0.02582
16	313° 13' 13"	-4° 11' 05"	316° 57' 33"	-20° 51' 22"	0° 57' 38"	15' 42.41"	265° 21' 13"	0.02726
17	313° 46' 57"	-4° 12' 52"	317° 32' 31"	-20° 43' 14"	0° 57' 37"	15' 41.92"	264° 55' 12"	0.02874
18	314° 20' 39"	-4° 14' 38"	318° 07' 23"	-20° 34' 59"	0° 57' 35"	15' 41.42"	264° 30' 02"	0.03026
19	314° 54' 19"	-4° 16' 22"	318° 42' 09"	-20° 26' 37"	0° 57' 33"	15' 40.93"	264° 5' 39"	0.03181
20	315° 27' 56"	-4° 18' 05"	319° 16' 49"	-20° 18' 10"	0° 57' 31"	15' 40.43"	263° 42' 01"	0.03341
21	316° 01' 32"	-4° 19' 46"	319° 51' 22"	-20° 09' 36"	0° 57' 29"	15' 39.93"	263° 19' 04"	0.03503
22	316° 35' 05"	-4° 21' 25"	320° 25' 50"	-20° 00' 55"	0° 57' 27"	15' 39.43"	262° 56' 46"	0.03670
23	317° 08' 37"	-4° 23' 03"	321° 00' 11"	-19° 52' 09"	0° 57' 26"	15' 38.93"	262° 35' 06"	0.03840
24	317° 42' 06"	-4° 24' 39"	321° 34' 26"	-19° 43' 17"	0° 57' 24"	15' 38.43"	262° 14' 00"	0.04013

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	295° 03' 28"	-0.53"	296° 59' 31"	-21° 07' 15"	0.9836442	16' 15.59"	23° 26' 13"	-9 m 19 s
1	295° 06' 01"	-0.53"	297° 02' 12"	-21° 06' 48"	0.9836466	16' 15.58"	23° 26' 13"	-9 m 20 s
2	295° 08' 34"	-0.53"	297° 04' 53"	-21° 06' 20"	0.9836489	16' 15.58"	23° 26' 13"	-9 m 21 s
3	295° 11' 07"	-0.54"	297° 07' 34"	-21° 05' 52"	0.9836513	16' 15.58"	23° 26' 13"	-9 m 22 s
4	295° 13' 40"	-0.54"	297° 10' 15"	-21° 05' 25"	0.9836537	16' 15.58"	23° 26' 13"	-9 m 22 s
5	295° 16' 12"	-0.54"	297° 12' 56"	-21° 04' 57"	0.9836560	16' 15.57"	23° 26' 13"	-9 m 23 s
6	295° 18' 45"	-0.54"	297° 15' 37"	-21° 04' 29"	0.9836584	16' 15.57"	23° 26' 13"	-9 m 24 s
7	295° 21' 18"	-0.55"	297° 18' 18"	-21° 04' 01"	0.9836608	16' 15.57"	23° 26' 13"	-9 m 25 s
8	295° 23' 51"	-0.55"	297° 20' 59"	-21° 03' 33"	0.9836632	16' 15.57"	23° 26' 13"	-9 m 26 s
9	295° 26' 24"	-0.55"	297° 23' 40"	-21° 03' 05"	0.9836656	16' 15.57"	23° 26' 13"	-9 m 27 s
10	295° 28' 57"	-0.55"	297° 26' 21"	-21° 02' 37"	0.9836680	16' 15.56"	23° 26' 13"	-9 m 28 s
11	295° 31' 29"	-0.56"	297° 29' 02"	-21° 02' 09"	0.9836704	16' 15.56"	23° 26' 13"	-9 m 29 s
12	295° 34' 02"	-0.56"	297° 31' 43"	-21° 01' 41"	0.9836729	16' 15.56"	23° 26' 13"	-9 m 29 s
13	295° 36' 35"	-0.56"	297° 34' 24"	-21° 01' 13"	0.9836753	16' 15.56"	23° 26' 13"	-9 m 30 s
14	295° 39' 08"	-0.56"	297° 37' 05"	-21° 00' 45"	0.9836777	16' 15.55"	23° 26' 13"	-9 m 31 s
15	295° 41' 41"	-0.57"	297° 39' 46"	-21° 00' 17"	0.9836802	16' 15.55"	23° 26' 13"	-9 m 32 s
16	295° 44' 14"	-0.57"	297° 42' 27"	-20° 59' 48"	0.9836826	16' 15.55"	23° 26' 13"	-9 m 33 s
17	295° 46' 46"	-0.57"	297° 45' 08"	-20° 59' 20"	0.9836851	16' 15.55"	23° 26' 13"	-9 m 34 s
18	295° 49' 19"	-0.57"	297° 47' 49"	-20° 58' 52"	0.9836875	16' 15.54"	23° 26' 13"	-9 m 35 s
19	295° 51' 52"	-0.58"	297° 50' 30"	-20° 58' 23"	0.9836900	16' 15.54"	23° 26' 13"	-9 m 36 s
20	295° 54' 25"	-0.58"	297° 53' 10"	-20° 57' 55"	0.9836925	16' 15.54"	23° 26' 13"	-9 m 36 s
21	295° 56' 58"	-0.58"	297° 55' 51"	-20° 57' 27"	0.9836950	16' 15.54"	23° 26' 13"	-9 m 37 s
22	295° 59' 31"	-0.58"	297° 58' 32"	-20° 56' 58"	0.9836974	16' 15.53"	23° 26' 13"	-9 m 38 s
23	296° 02' 03"	-0.58"	298° 01' 13"	-20° 56' 30"	0.9836999	16' 15.53"	23° 26' 13"	-9 m 39 s
24	296° 04' 36"	-0.59"	298° 03' 53"	-20° 56' 01"	0.9837024	16' 15.53"	23° 26' 13"	-9 m 40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	317° 42' 06"	-4° 24' 39"	321° 34' 26"	-19° 43' 17"	0° 57' 24"	15' 38.43"	262° 14' 00"	0.04013
1	318° 15' 33"	-4° 26' 14"	322° 08' 35"	-19° 34' 19"	0° 57' 22"	15' 37.93"	261° 53' 28"	0.04190
2	318° 48' 58"	-4° 27' 47"	322° 42' 38"	-19° 25' 15"	0° 57' 20"	15' 37.42"	261° 33' 28"	0.04370
3	319° 22' 21"	-4° 29' 18"	323° 16' 35"	-19° 16' 05"	0° 57' 18"	15' 36.92"	261° 13' 57"	0.04554
4	319° 55' 42"	-4° 30' 48"	323° 50' 26"	-19° 06' 50"	0° 57' 16"	15' 36.42"	260° 54' 55"	0.04742
5	320° 29' 00"	-4° 32' 16"	324° 24' 10"	-18° 57' 29"	0° 57' 15"	15' 35.91"	260° 36' 21"	0.04932
6	321° 02' 17"	-4° 33' 42"	324° 57' 49"	-18° 48' 03"	0° 57' 13"	15' 35.40"	260° 18' 12"	0.05126
7	321° 35' 31"	-4° 35' 07"	325° 31' 21"	-18° 38' 31"	0° 57' 11"	15' 34.90"	260° 0' 29"	0.05324
8	322° 08' 43"	-4° 36' 30"	326° 04' 47"	-18° 28' 54"	0° 57' 09"	15' 34.39"	259° 43' 10"	0.05524
9	322° 41' 53"	-4° 37' 51"	326° 38' 07"	-18° 19' 12"	0° 57' 07"	15' 33.89"	259° 26' 14"	0.05728
10	323° 15' 01"	-4° 39' 11"	327° 11' 22"	-18° 09' 25"	0° 57' 05"	15' 33.38"	259° 9' 40"	0.05936
11	323° 48' 07"	-4° 40' 29"	327° 44' 30"	-17° 59' 33"	0° 57' 03"	15' 32.87"	258° 53' 28"	0.06146
12	324° 21' 10"	-4° 41' 46"	328° 17' 32"	-17° 49' 36"	0° 57' 02"	15' 32.36"	258° 37' 37"	0.06360
13	324° 54' 11"	-4° 43' 00"	328° 50' 28"	-17° 39' 34"	0° 56' 60"	15' 31.86"	258° 22' 06"	0.06576
14	325° 27' 10"	-4° 44' 13"	329° 23' 18"	-17° 29' 27"	0° 56' 58"	15' 31.35"	258° 6' 54"	0.06796
15	326° 00' 07"	-4° 45' 25"	329° 56' 02"	-17° 19' 15"	0° 56' 56"	15' 30.84"	257° 52' 01"	0.07019
16	326° 33' 02"	-4° 46' 35"	330° 28' 40"	-17° 08' 59"	0° 56' 54"	15' 30.34"	257° 37' 26"	0.07245
17	327° 05' 55"	-4° 47' 43"	331° 01' 12"	-16° 58' 38"	0° 56' 52"	15' 29.83"	257° 23' 09"	0.07474
18	327° 38' 45"	-4° 48' 49"	331° 33' 39"	-16° 48' 13"	0° 56' 50"	15' 29.32"	257° 9' 09"	0.07707
19	328° 11' 33"	-4° 49' 54"	332° 05' 59"	-16° 37' 44"	0° 56' 49"	15' 28.82"	256° 55' 26"	0.07942
20	328° 44' 19"	-4° 50' 57"	332° 38' 14"	-16° 27' 10"	0° 56' 47"	15' 28.31"	256° 41' 59"	0.08180
21	329° 17' 03"	-4° 51' 59"	333° 10' 23"	-16° 16' 32"	0° 56' 45"	15' 27.81"	256° 28' 48"	0.08421
22	329° 49' 44"	-4° 52' 59"	333° 42' 26"	-16° 05' 50"	0° 56' 43"	15' 27.30"	256° 15' 53"	0.08664
23	330° 22' 24"	-4° 53' 57"	334° 14' 24"	-15° 55' 04"	0° 56' 41"	15' 26.80"	256° 3' 13"	0.08911
24	330° 55' 01"	-4° 54' 53"	334° 46' 16"	-15° 44' 15"	0° 56' 39"	15' 26.30"	255° 50' 48"	0.09161

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	296° 04' 36"	-0.59"	298° 03' 53"	-20° 56' 01"	0.9837024	16' 15.53"	23° 26' 13"	-9 m 40 s
1	296° 07' 09"	-0.59"	298° 06' 34"	-20° 55' 32"	0.9837050	16' 15.53"	23° 26' 13"	-9 m 41 s
2	296° 09' 42"	-0.59"	298° 09' 15"	-20° 55' 04"	0.9837075	16' 15.52"	23° 26' 13"	-9 m 42 s
3	296° 12' 15"	-0.59"	298° 11' 56"	-20° 54' 35"	0.9837100	16' 15.52"	23° 26' 13"	-9 m 42 s
4	296° 14' 48"	-0.59"	298° 14' 36"	-20° 54' 06"	0.9837125	16' 15.52"	23° 26' 13"	-9 m 43 s
5	296° 17' 20"	-0.60"	298° 17' 17"	-20° 53' 38"	0.9837151	16' 15.52"	23° 26' 13"	-9 m 44 s
6	296° 19' 53"	-0.60"	298° 19' 58"	-20° 53' 09"	0.9837176	16' 15.51"	23° 26' 13"	-9 m 45 s
7	296° 22' 26"	-0.60"	298° 22' 38"	-20° 52' 40"	0.9837202	16' 15.51"	23° 26' 13"	-9 m 46 s
8	296° 24' 59"	-0.60"	298° 25' 19"	-20° 52' 11"	0.9837227	16' 15.51"	23° 26' 13"	-9 m 47 s
9	296° 27' 32"	-0.60"	298° 27' 59"	-20° 51' 42"	0.9837253	16' 15.51"	23° 26' 13"	-9 m 47 s
10	296° 30' 04"	-0.60"	298° 30' 40"	-20° 51' 13"	0.9837279	16' 15.50"	23° 26' 13"	-9 m 48 s
11	296° 32' 37"	-0.60"	298° 33' 20"	-20° 50' 44"	0.9837304	16' 15.50"	23° 26' 13"	-9 m 49 s
12	296° 35' 10"	-0.61"	298° 36' 01"	-20° 50' 15"	0.9837330	16' 15.50"	23° 26' 13"	-9 m 50 s
13	296° 37' 43"	-0.61"	298° 38' 41"	-20° 49' 46"	0.9837356	16' 15.50"	23° 26' 13"	-9 m 51 s
14	296° 40' 16"	-0.61"	298° 41' 22"	-20° 49' 17"	0.9837382	16' 15.49"	23° 26' 13"	-9 m 52 s
15	296° 42' 48"	-0.61"	298° 44' 02"	-20° 48' 47"	0.9837408	16' 15.49"	23° 26' 13"	-9 m 53 s
16	296° 45' 21"	-0.61"	298° 46' 43"	-20° 48' 18"	0.9837434	16' 15.49"	23° 26' 13"	-9 m 53 s
17	296° 47' 54"	-0.61"	298° 49' 23"	-20° 47' 49"	0.9837461	16' 15.49"	23° 26' 13"	-9 m 54 s
18	296° 50' 27"	-0.61"	298° 52' 04"	-20° 47' 20"	0.9837487	16' 15.48"	23° 26' 13"	-9 m 55 s
19	296° 52' 60"	-0.61"	298° 54' 44"	-20° 46' 50"	0.9837513	16' 15.48"	23° 26' 13"	-9 m 56 s
20	296° 55' 32"	-0.61"	298° 57' 24"	-20° 46' 21"	0.9837540	16' 15.48"	23° 26' 13"	-9 m 57 s
21	296° 58' 05"	-0.62"	299° 00' 05"	-20° 45' 51"	0.9837566	16' 15.48"	23° 26' 13"	-9 m 58 s
22	297° 00' 38"	-0.62"	299° 02' 45"	-20° 45' 22"	0.9837593	16' 15.47"	23° 26' 13"	-9 m 58 s
23	297° 03' 11"	-0.62"	299° 05' 25"	-20° 44' 52"	0.9837619	16' 15.47"	23° 26' 13"	-9 m 59 s
24	297° 05' 44"	-0.62"	299° 08' 06"	-20° 44' 23"	0.9837646	16' 15.47"	23° 26' 13"	-10 m 00 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	330° 55' 01"	-4° 54' 53"	334° 46' 16"	-15° 44' 15"	0° 56' 39"	15' 26.30"	255° 50' 48"	0.09161
1	331° 27' 36"	-4° 55' 48"	335° 18' 02"	-15° 33' 21"	0° 56' 37"	15' 25.80"	255° 38' 37"	0.09413
2	332° 00' 09"	-4° 56' 41"	335° 49' 43"	-15° 22' 23"	0° 56' 36"	15' 25.29"	255° 26' 40"	0.09668
3	332° 32' 39"	-4° 57' 33"	336° 21' 18"	-15° 11' 22"	0° 56' 34"	15' 24.79"	255° 14' 58"	0.09926
4	333° 05' 08"	-4° 58' 23"	336° 52' 47"	-15° 00' 17"	0° 56' 32"	15' 24.30"	255° 3' 29"	0.10186
5	333° 37' 34"	-4° 59' 11"	337° 24' 12"	-14° 49' 08"	0° 56' 30"	15' 23.80"	254° 52' 13"	0.10449
6	334° 09' 58"	-4° 59' 57"	337° 55' 30"	-14° 37' 56"	0° 56' 28"	15' 23.30"	254° 41' 10"	0.10715
7	334° 42' 20"	-5° 00' 42"	338° 26' 44"	-14° 26' 41"	0° 56' 26"	15' 22.80"	254° 30' 21"	0.10984
8	335° 14' 40"	-5° 01' 26"	338° 57' 52"	-14° 15' 22"	0° 56' 25"	15' 22.31"	254° 19' 44"	0.11255
9	335° 46' 57"	-5° 02' 07"	339° 28' 54"	-14° 04' 00"	0° 56' 23"	15' 21.82"	254° 9' 19"	0.11528
10	336° 19' 13"	-5° 02' 47"	339° 59' 52"	-13° 52' 35"	0° 56' 21"	15' 21.33"	253° 59' 06"	0.11804
11	336° 51' 26"	-5° 03' 25"	340° 30' 44"	-13° 41' 07"	0° 56' 19"	15' 20.84"	253° 49' 06"	0.12083
12	337° 23' 37"	-5° 04' 02"	341° 01' 31"	-13° 29' 36"	0° 56' 17"	15' 20.35"	253° 39' 17"	0.12364
13	337° 55' 46"	-5° 04' 37"	341° 32' 13"	-13° 18' 01"	0° 56' 16"	15' 19.86"	253° 29' 40"	0.12647
14	338° 27' 53"	-5° 05' 10"	342° 02' 50"	-13° 06' 24"	0° 56' 14"	15' 19.38"	253° 20' 15"	0.12933
15	338° 59' 58"	-5° 05' 42"	342° 33' 22"	-12° 54' 44"	0° 56' 12"	15' 18.89"	253° 11' 01"	0.13221
16	339° 32' 00"	-5° 06' 12"	343° 03' 49"	-12° 43' 02"	0° 56' 10"	15' 18.41"	253° 1' 58"	0.13512
17	340° 04' 01"	-5° 06' 41"	343° 34' 12"	-12° 31' 16"	0° 56' 09"	15' 17.93"	252° 53' 06"	0.13804
18	340° 35' 59"	-5° 07' 07"	344° 04' 29"	-12° 19' 28"	0° 56' 07"	15' 17.45"	252° 44' 25"	0.14099
19	341° 07' 55"	-5° 07' 33"	344° 34' 42"	-12° 07' 38"	0° 56' 05"	15' 16.98"	252° 35' 54"	0.14397
20	341° 39' 49"	-5° 07' 56"	345° 04' 49"	-11° 55' 45"	0° 56' 03"	15' 16.50"	252° 27' 34"	0.14696
21	342° 11' 41"	-5° 08' 18"	345° 34' 53"	-11° 43' 49"	0° 56' 02"	15' 16.03"	252° 19' 25"	0.14998
22	342° 43' 31"	-5° 08' 38"	346° 04' 51"	-11° 31' 51"	0° 55' 60"	15' 15.56"	252° 11' 26"	0.15302
23	343° 15' 19"	-5° 08' 57"	346° 34' 45"	-11° 19' 51"	0° 55' 58"	15' 15.09"	252° 3' 37"	0.15608
24	343° 47' 04"	-5° 09' 14"	347° 04' 35"	-11° 07' 49"	0° 55' 56"	15' 14.63"	251° 55' 58"	0.15916

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	297° 05' 44"	-0.62"	299° 08' 06"	-20° 44' 23"	0.9837646	16' 15.47"	23° 26' 13"	-10 m 00 s
1	297° 08' 16"	-0.62"	299° 10' 46"	-20° 43' 53"	0.9837673	16' 15.46"	23° 26' 13"	-10 m 01 s
2	297° 10' 49"	-0.62"	299° 13' 26"	-20° 43' 24"	0.9837700	16' 15.46"	23° 26' 13"	-10 m 02 s
3	297° 13' 22"	-0.62"	299° 16' 06"	-20° 42' 54"	0.9837726	16' 15.46"	23° 26' 13"	-10 m 03 s
4	297° 15' 55"	-0.62"	299° 18' 47"	-20° 42' 24"	0.9837753	16' 15.46"	23° 26' 13"	-10 m 03 s
5	297° 18' 28"	-0.62"	299° 21' 27"	-20° 41' 54"	0.9837780	16' 15.45"	23° 26' 13"	-10 m 04 s
6	297° 21' 00"	-0.62"	299° 24' 07"	-20° 41' 25"	0.9837808	16' 15.45"	23° 26' 13"	-10 m 05 s
7	297° 23' 33"	-0.62"	299° 26' 47"	-20° 40' 55"	0.9837835	16' 15.45"	23° 26' 13"	-10 m 06 s
8	297° 26' 06"	-0.62"	299° 29' 27"	-20° 40' 25"	0.9837862	16' 15.45"	23° 26' 13"	-10 m 07 s
9	297° 28' 39"	-0.62"	299° 32' 08"	-20° 39' 55"	0.9837889	16' 15.44"	23° 26' 13"	-10 m 07 s
10	297° 31' 11"	-0.62"	299° 34' 48"	-20° 39' 25"	0.9837917	16' 15.44"	23° 26' 13"	-10 m 08 s
11	297° 33' 44"	-0.62"	299° 37' 28"	-20° 38' 55"	0.9837944	16' 15.44"	23° 26' 13"	-10 m 09 s
12	297° 36' 17"	-0.62"	299° 40' 08"	-20° 38' 25"	0.9837972	16' 15.43"	23° 26' 13"	-10 m 10 s
13	297° 38' 50"	-0.62"	299° 42' 48"	-20° 37' 55"	0.9837999	16' 15.43"	23° 26' 13"	-10 m 11 s
14	297° 41' 23"	-0.62"	299° 45' 28"	-20° 37' 25"	0.9838027	16' 15.43"	23° 26' 13"	-10 m 12 s
15	297° 43' 55"	-0.62"	299° 48' 08"	-20° 36' 55"	0.9838055	16' 15.43"	23° 26' 13"	-10 m 12 s
16	297° 46' 28"	-0.62"	299° 50' 48"	-20° 36' 24"	0.9838083	16' 15.42"	23° 26' 13"	-10 m 13 s
17	297° 49' 01"	-0.62"	299° 53' 28"	-20° 35' 54"	0.9838111	16' 15.42"	23° 26' 13"	-10 m 14 s
18	297° 51' 34"	-0.62"	299° 56' 08"	-20° 35' 24"	0.9838139	16' 15.42"	23° 26' 13"	-10 m 15 s
19	297° 54' 06"	-0.62"	299° 58' 48"	-20° 34' 53"	0.9838167	16' 15.42"	23° 26' 13"	-10 m 16 s
20	297° 56' 39"	-0.62"	300° 01' 28"	-20° 34' 23"	0.9838195	16' 15.41"	23° 26' 13"	-10 m 16 s
21	297° 59' 12"	-0.62"	300° 04' 08"	-20° 33' 53"	0.9838223	16' 15.41"	23° 26' 13"	-10 m 17 s
22	298° 01' 45"	-0.62"	300° 06' 47"	-20° 33' 22"	0.9838251	16' 15.41"	23° 26' 13"	-10 m 18 s
23	298° 04' 18"	-0.62"	300° 09' 27"	-20° 32' 52"	0.9838280	16' 15.40"	23° 26' 13"	-10 m 19 s
24	298° 06' 50"	-0.62"	300° 12' 07"	-20° 32' 21"	0.9838308	16' 15.40"	23° 26' 13"	-10 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	343° 47' 04"	-5° 09' 14"	347° 04' 35"	-11° 07' 49"	0° 55' 56"	15' 14.63"	251° 55' 58"	0.15916
1	344° 18' 48"	-5° 09' 30"	347° 34' 20"	-10° 55' 45"	0° 55' 55"	15' 14.16"	251° 48' 29"	0.16226
2	344° 50' 29"	-5° 09' 44"	348° 04' 00"	-10° 43' 38"	0° 55' 53"	15' 13.70"	251° 41' 10"	0.16539
3	345° 22' 09"	-5° 09' 56"	348° 33' 37"	-10° 31' 30"	0° 55' 51"	15' 13.25"	251° 34' 01"	0.16853
4	345° 53' 46"	-5° 10' 07"	349° 03' 09"	-10° 19' 19"	0° 55' 50"	15' 12.79"	251° 27' 01"	0.17169
5	346° 25' 22"	-5° 10' 16"	349° 32' 37"	-10° 07' 07"	0° 55' 48"	15' 12.34"	251° 20' 11"	0.17487
6	346° 56' 55"	-5° 10' 23"	350° 02' 01"	-9° 54' 53"	0° 55' 46"	15' 11.89"	251° 13' 31"	0.17807
7	347° 28' 26"	-5° 10' 29"	350° 31' 20"	-9° 42' 37"	0° 55' 45"	15' 11.44"	251° 6' 60"	0.18129
8	347° 59' 56"	-5° 10' 34"	351° 00' 36"	-9° 30' 19"	0° 55' 43"	15' 10.99"	251° 0' 38"	0.18453
9	348° 31' 23"	-5° 10' 36"	351° 29' 48"	-9° 17' 60"	0° 55' 41"	15' 10.55"	250° 54' 25"	0.18779
10	349° 02' 48"	-5° 10' 38"	351° 58' 55"	-9° 05' 39"	0° 55' 40"	15' 10.11"	250° 48' 21"	0.19106
11	349° 34' 12"	-5° 10' 37"	352° 27' 59"	-8° 53' 16"	0° 55' 38"	15' 09.68"	250° 42' 27"	0.19436
12	350° 05' 33"	-5° 10' 36"	352° 56' 59"	-8° 40' 52"	0° 55' 37"	15' 09.24"	250° 36' 41"	0.19767
13	350° 36' 53"	-5° 10' 32"	353° 25' 56"	-8° 28' 27"	0° 55' 35"	15' 08.81"	250° 31' 04"	0.20099
14	351° 08' 10"	-5° 10' 27"	353° 54' 48"	-8° 16' 00"	0° 55' 34"	15' 08.38"	250° 25' 36"	0.20434
15	351° 39' 26"	-5° 10' 21"	354° 23' 38"	-8° 03' 32"	0° 55' 32"	15' 07.96"	250° 20' 17"	0.20770
16	352° 10' 39"	-5° 10' 13"	354° 52' 23"	-7° 51' 03"	0° 55' 30"	15' 07.54"	250° 15' 06"	0.21108
17	352° 41' 51"	-5° 10' 03"	355° 21' 05"	-7° 38' 32"	0° 55' 29"	15' 07.12"	250° 10' 04"	0.21447
18	353° 13' 01"	-5° 09' 52"	355° 49' 44"	-7° 26' 01"	0° 55' 27"	15' 06.70"	250° 5' 10"	0.21788
19	353° 44' 09"	-5° 09' 39"	356° 18' 19"	-7° 13' 28"	0° 55' 26"	15' 06.29"	250° 0' 25"	0.22131
20	354° 15' 15"	-5° 09' 25"	356° 46' 51"	-7° 00' 54"	0° 55' 24"	15' 05.88"	249° 55' 49"	0.22475
21	354° 46' 19"	-5° 09' 10"	357° 15' 20"	-6° 48' 19"	0° 55' 23"	15' 05.48"	249° 51' 20"	0.22820
22	355° 17' 22"	-5° 08' 53"	357° 43' 46"	-6° 35' 44"	0° 55' 21"	15' 05.08"	249° 46' 60"	0.23168
23	355° 48' 22"	-5° 08' 34"	358° 12' 09"	-6° 23' 07"	0° 55' 20"	15' 04.68"	249° 42' 48"	0.23516
24	356° 19' 21"	-5° 08' 14"	358° 40' 28"	-6° 10' 29"	0° 55' 18"	15' 04.28"	249° 38' 44"	0.23866

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	298° 06' 50"	-0.62"	300° 12' 07"	-20° 32' 21"	0.9838308	16' 15.40"	23° 26' 13"	-10 m 20 s
1	298° 09' 23"	-0.62"	300° 14' 47"	-20° 31' 50"	0.9838337	16' 15.40"	23° 26' 13"	-10 m 20 s
2	298° 11' 56"	-0.62"	300° 17' 27"	-20° 31' 20"	0.9838365	16' 15.40"	23° 26' 13"	-10 m 21 s
3	298° 14' 29"	-0.62"	300° 20' 07"	-20° 30' 49"	0.9838394	16' 15.39"	23° 26' 13"	-10 m 22 s
4	298° 17' 01"	-0.62"	300° 22' 46"	-20° 30' 18"	0.9838423	16' 15.39"	23° 26' 13"	-10 m 23 s
5	298° 19' 34"	-0.62"	300° 25' 26"	-20° 29' 48"	0.9838452	16' 15.39"	23° 26' 13"	-10 m 24 s
6	298° 22' 07"	-0.61"	300° 28' 06"	-20° 29' 17"	0.9838480	16' 15.38"	23° 26' 13"	-10 m 24 s
7	298° 24' 40"	-0.61"	300° 30' 45"	-20° 28' 46"	0.9838509	16' 15.38"	23° 26' 13"	-10 m 25 s
8	298° 27' 12"	-0.61"	300° 33' 25"	-20° 28' 15"	0.9838538	16' 15.38"	23° 26' 13"	-10 m 26 s
9	298° 29' 45"	-0.61"	300° 36' 05"	-20° 27' 44"	0.9838568	16' 15.38"	23° 26' 13"	-10 m 27 s
10	298° 32' 18"	-0.61"	300° 38' 44"	-20° 27' 13"	0.9838597	16' 15.37"	23° 26' 13"	-10 m 28 s
11	298° 34' 51"	-0.61"	300° 41' 24"	-20° 26' 42"	0.9838626	16' 15.37"	23° 26' 13"	-10 m 28 s
12	298° 37' 23"	-0.61"	300° 44' 04"	-20° 26' 11"	0.9838655	16' 15.37"	23° 26' 13"	-10 m 29 s
13	298° 39' 56"	-0.61"	300° 46' 43"	-20° 25' 40"	0.9838685	16' 15.36"	23° 26' 13"	-10 m 30 s
14	298° 42' 29"	-0.61"	300° 49' 23"	-20° 25' 09"	0.9838714	16' 15.36"	23° 26' 13"	-10 m 31 s
15	298° 45' 02"	-0.60"	300° 52' 02"	-20° 24' 38"	0.9838744	16' 15.36"	23° 26' 13"	-10 m 31 s
16	298° 47' 34"	-0.60"	300° 54' 42"	-20° 24' 07"	0.9838774	16' 15.36"	23° 26' 13"	-10 m 32 s
17	298° 50' 07"	-0.60"	300° 57' 21"	-20° 23' 36"	0.9838803	16' 15.35"	23° 26' 13"	-10 m 33 s
18	298° 52' 40"	-0.60"	301° 00' 01"	-20° 23' 04"	0.9838833	16' 15.35"	23° 26' 13"	-10 m 34 s
19	298° 55' 13"	-0.60"	301° 02' 40"	-20° 22' 33"	0.9838863	16' 15.35"	23° 26' 13"	-10 m 35 s
20	298° 57' 45"	-0.60"	301° 05' 20"	-20° 22' 02"	0.9838893	16' 15.34"	23° 26' 13"	-10 m 35 s
21	299° 00' 18"	-0.60"	301° 07' 59"	-20° 21' 30"	0.9838923	16' 15.34"	23° 26' 13"	-10 m 36 s
22	299° 02' 51"	-0.59"	301° 10' 39"	-20° 20' 59"	0.9838953	16' 15.34"	23° 26' 13"	-10 m 37 s
23	299° 05' 23"	-0.59"	301° 13' 18"	-20° 20' 27"	0.9838983	16' 15.33"	23° 26' 13"	-10 m 38 s
24	299° 07' 56"	-0.59"	301° 15' 57"	-20° 19' 56"	0.9839014	16' 15.33"	23° 26' 13"	-10 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	356° 19' 21"	-5° 08' 14"	358° 40' 28"	-6° 10' 29"	0° 55' 18"	15' 04.28"	249° 38' 44"	0.23866
1	356° 50' 18"	-5° 07' 52"	359° 08' 45"	-5° 57' 51"	0° 55' 17"	15' 03.89"	249° 34' 48"	0.24217
2	357° 21' 13"	-5° 07' 29"	359° 36' 58"	-5° 45' 12"	0° 55' 16"	15' 03.50"	249° 31' 01"	0.24570
3	357° 52' 07"	-5° 07' 05"	0° 05' 09"	-5° 32' 33"	0° 55' 14"	15' 03.12"	249° 27' 21"	0.24924
4	358° 22' 58"	-5° 06' 39"	0° 33' 17"	-5° 19' 52"	0° 55' 13"	15' 02.74"	249° 23' 49"	0.25280
5	358° 53' 48"	-5° 06' 11"	1° 01' 23"	-5° 07' 11"	0° 55' 11"	15' 02.36"	249° 20' 25"	0.25636
6	359° 24' 36"	-5° 05' 43"	1° 29' 25"	-4° 54' 30"	0° 55' 10"	15' 01.99"	249° 17' 09"	0.25994
7	359° 55' 23"	-5° 05' 12"	1° 57' 26"	-4° 41' 48"	0° 55' 09"	15' 01.62"	249° 14' 01"	0.26354
8	0° 26' 08"	-5° 04' 40"	2° 25' 23"	-4° 29' 06"	0° 55' 07"	15' 01.25"	249° 11' 00"	0.26714
9	0° 56' 51"	-5° 04' 07"	2° 53' 18"	-4° 16' 23"	0° 55' 06"	15' 00.89"	249° 8' 07"	0.27076
10	1° 27' 32"	-5° 03' 33"	3° 21' 11"	-4° 03' 40"	0° 55' 05"	15' 00.53"	249° 5' 22"	0.27439
11	1° 58' 12"	-5° 02' 57"	3° 49' 02"	-3° 50' 57"	0° 55' 03"	15' 00.18"	249° 2' 45"	0.27803
12	2° 28' 50"	-5° 02' 19"	4° 16' 50"	-3° 38' 13"	0° 55' 02"	14' 59.83"	249° 0' 15"	0.28168
13	2° 59' 27"	-5° 01' 40"	4° 44' 36"	-3° 25' 29"	0° 55' 01"	14' 59.48"	248° 57' 52"	0.28534
14	3° 30' 02"	-5° 00' 60"	5° 12' 20"	-3° 12' 45"	0° 54' 60"	14' 59.14"	248° 55' 37"	0.28901
15	4° 00' 35"	-5° 00' 18"	5° 40' 01"	-3° 00' 01"	0° 54' 58"	14' 58.80"	248° 53' 30"	0.29270
16	4° 31' 07"	-4° 59' 35"	6° 07' 41"	-2° 47' 17"	0° 54' 57"	14' 58.47"	248° 51' 29"	0.29639
17	5° 01' 37"	-4° 58' 51"	6° 35' 19"	-2° 34' 32"	0° 54' 56"	14' 58.14"	248° 49' 37"	0.30009
18	5° 32' 06"	-4° 58' 05"	7° 02' 55"	-2° 21' 48"	0° 54' 55"	14' 57.81"	248° 47' 51"	0.30381
19	6° 02' 33"	-4° 57' 18"	7° 30' 29"	-2° 09' 04"	0° 54' 54"	14' 57.49"	248° 46' 13"	0.30753
20	6° 32' 59"	-4° 56' 29"	7° 58' 01"	-1° 56' 20"	0° 54' 52"	14' 57.17"	248° 44' 42"	0.31126
21	7° 03' 23"	-4° 55' 39"	8° 25' 32"	-1° 43' 36"	0° 54' 51"	14' 56.86"	248° 43' 19"	0.31500
22	7° 33' 46"	-4° 54' 48"	8° 53' 01"	-1° 30' 52"	0° 54' 50"	14' 56.55"	248° 42' 02"	0.31875
23	8° 04' 07"	-4° 53' 55"	9° 20' 29"	-1° 18' 08"	0° 54' 49"	14' 56.25"	248° 40' 53"	0.32251
24	8° 34' 27"	-4° 53' 01"	9° 47' 55"	-1° 05' 25"	0° 54' 48"	14' 55.95"	248° 39' 51"	0.32628

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	299° 07' 56"	-0.59"	301° 15' 57"	-20° 19' 56"	0.9839014	16' 15.33"	23° 26' 13"	-10 m 38 s
1	299° 10' 29"	-0.59"	301° 18' 37"	-20° 19' 24"	0.9839044	16' 15.33"	23° 26' 13"	-10 m 39 s
2	299° 13' 02"	-0.59"	301° 21' 16"	-20° 18' 53"	0.9839074	16' 15.33"	23° 26' 13"	-10 m 40 s
3	299° 15' 34"	-0.58"	301° 23' 56"	-20° 18' 21"	0.9839105	16' 15.32"	23° 26' 13"	-10 m 41 s
4	299° 18' 07"	-0.58"	301° 26' 35"	-20° 17' 50"	0.9839135	16' 15.32"	23° 26' 13"	-10 m 42 s
5	299° 20' 40"	-0.58"	301° 29' 14"	-20° 17' 18"	0.9839166	16' 15.32"	23° 26' 13"	-10 m 42 s
6	299° 23' 13"	-0.58"	301° 31' 53"	-20° 16' 46"	0.9839197	16' 15.31"	23° 26' 13"	-10 m 43 s
7	299° 25' 45"	-0.58"	301° 34' 33"	-20° 16' 14"	0.9839228	16' 15.31"	23° 26' 13"	-10 m 44 s
8	299° 28' 18"	-0.57"	301° 37' 12"	-20° 15' 42"	0.9839259	16' 15.31"	23° 26' 13"	-10 m 45 s
9	299° 30' 51"	-0.57"	301° 39' 51"	-20° 15' 11"	0.9839289	16' 15.30"	23° 26' 13"	-10 m 45 s
10	299° 33' 23"	-0.57"	301° 42' 30"	-20° 14' 39"	0.9839321	16' 15.30"	23° 26' 13"	-10 m 46 s
11	299° 35' 56"	-0.57"	301° 45' 09"	-20° 14' 07"	0.9839352	16' 15.30"	23° 26' 13"	-10 m 47 s
12	299° 38' 29"	-0.56"	301° 47' 48"	-20° 13' 35"	0.9839383	16' 15.29"	23° 26' 13"	-10 m 48 s
13	299° 41' 02"	-0.56"	301° 50' 28"	-20° 13' 03"	0.9839414	16' 15.29"	23° 26' 13"	-10 m 48 s
14	299° 43' 34"	-0.56"	301° 53' 07"	-20° 12' 31"	0.9839446	16' 15.29"	23° 26' 13"	-10 m 49 s
15	299° 46' 07"	-0.56"	301° 55' 46"	-20° 11' 59"	0.9839477	16' 15.29"	23° 26' 13"	-10 m 50 s
16	299° 48' 40"	-0.55"	301° 58' 25"	-20° 11' 26"	0.9839509	16' 15.28"	23° 26' 13"	-10 m 51 s
17	299° 51' 12"	-0.55"	302° 01' 04"	-20° 10' 54"	0.9839540	16' 15.28"	23° 26' 13"	-10 m 51 s
18	299° 53' 45"	-0.55"	302° 03' 43"	-20° 10' 22"	0.9839572	16' 15.28"	23° 26' 13"	-10 m 52 s
19	299° 56' 18"	-0.55"	302° 06' 22"	-20° 09' 50"	0.9839604	16' 15.27"	23° 26' 13"	-10 m 53 s
20	299° 58' 50"	-0.54"	302° 09' 01"	-20° 09' 17"	0.9839636	16' 15.27"	23° 26' 13"	-10 m 54 s
21	300° 01' 23"	-0.54"	302° 11' 40"	-20° 08' 45"	0.9839667	16' 15.27"	23° 26' 13"	-10 m 54 s
22	300° 03' 56"	-0.54"	302° 14' 19"	-20° 08' 13"	0.9839699	16' 15.26"	23° 26' 13"	-10 m 55 s
23	300° 06' 29"	-0.53"	302° 16' 58"	-20° 07' 40"	0.9839732	16' 15.26"	23° 26' 13"	-10 m 56 s
24	300° 09' 01"	-0.53"	302° 19' 37"	-20° 07' 08"	0.9839764	16' 15.26"	23° 26' 13"	-10 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	8° 34' 27"	-4° 53' 01"	9° 47' 55"	-1° 05' 25"	0° 54' 48"	14' 55.95"	248° 39' 51"	0.32628
1	9° 04' 46"	-4° 52' 06"	10° 15' 19"	0°-52' 42"	0° 54' 47"	14' 55.65"	248° 38' 56"	0.33006
2	9° 35' 03"	-4° 51' 10"	10° 42' 43"	0°-39' 59"	0° 54' 46"	14' 55.36"	248° 38' 08"	0.33384
3	10° 05' 19"	-4° 50' 12"	11° 10' 05"	0°-27' 17"	0° 54' 45"	14' 55.08"	248° 37' 28"	0.33763
4	10° 35' 33"	-4° 49' 12"	11° 37' 25"	0°-14' 35"	0° 54' 44"	14' 54.79"	248° 36' 54"	0.34143
5	11° 05' 46"	-4° 48' 12"	12° 04' 45"	0° -1' 53"	0° 54' 43"	14' 54.52"	248° 36' 27"	0.34524
6	11° 35' 58"	-4° 47' 10"	12° 32' 03"	0° 10' 48"	0° 54' 42"	14' 54.24"	248° 36' 08"	0.34905
7	12° 06' 08"	-4° 46' 07"	12° 59' 21"	0° 23' 28"	0° 54' 41"	14' 53.97"	248° 35' 55"	0.35287
8	12° 36' 18"	-4° 45' 03"	13° 26' 37"	0° 36' 08"	0° 54' 40"	14' 53.71"	248° 35' 49"	0.35670
9	13° 06' 26"	-4° 43' 57"	13° 53' 53"	0° 48' 47"	0° 54' 39"	14' 53.45"	248° 35' 50"	0.36053
10	13° 36' 33"	-4° 42' 50"	14° 21' 07"	1° 01' 26"	0° 54' 38"	14' 53.20"	248° 35' 58"	0.36437
11	14° 06' 38"	-4° 41' 42"	14° 48' 21"	1° 14' 04"	0° 54' 37"	14' 52.94"	248° 36' 13"	0.36822
12	14° 36' 43"	-4° 40' 33"	15° 15' 34"	1° 26' 41"	0° 54' 36"	14' 52.70"	248° 36' 35"	0.37207
13	15° 06' 46"	-4° 39' 22"	15° 42' 47"	1° 39' 18"	0° 54' 35"	14' 52.46"	248° 37' 04"	0.37592
14	15° 36' 48"	-4° 38' 10"	16° 09' 59"	1° 51' 53"	0° 54' 34"	14' 52.22"	248° 37' 39"	0.37979
15	16° 06' 49"	-4° 36' 57"	16° 37' 10"	2° 04' 28"	0° 54' 33"	14' 51.99"	248° 38' 22"	0.38365
16	16° 36' 49"	-4° 35' 42"	17° 04' 21"	2° 17' 02"	0° 54' 33"	14' 51.76"	248° 39' 11"	0.38753
17	17° 06' 47"	-4° 34' 27"	17° 31' 31"	2° 29' 35"	0° 54' 32"	14' 51.54"	248° 40' 07"	0.39140
18	17° 36' 45"	-4° 33' 10"	17° 58' 41"	2° 42' 07"	0° 54' 31"	14' 51.32"	248° 41' 09"	0.39529
19	18° 06' 42"	-4° 31' 52"	18° 25' 51"	2° 54' 38"	0° 54' 30"	14' 51.11"	248° 42' 19"	0.39917
20	18° 36' 37"	-4° 30' 33"	18° 53' 01"	3° 07' 08"	0° 54' 29"	14' 50.90"	248° 43' 35"	0.40306
21	19° 06' 32"	-4° 29' 13"	19° 20' 10"	3° 19' 37"	0° 54' 29"	14' 50.70"	248° 44' 58"	0.40695
22	19° 36' 26"	-4° 27' 51"	19° 47' 19"	3° 32' 04"	0° 54' 28"	14' 50.50"	248° 46' 27"	0.41085
23	20° 06' 18"	-4° 26' 28"	20° 14' 29"	3° 44' 31"	0° 54' 27"	14' 50.31"	248° 48' 03"	0.41475
24	20° 36' 10"	-4° 25' 04"	20° 41' 38"	3° 56' 57"	0° 54' 26"	14' 50.12"	248° 49' 46"	0.41866

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	300° 09' 01"	-0.53"	302° 19' 37"	-20° 07' 08"	0.9839764	16' 15.26"	23° 26' 13"	-10 m 57 s
1	300° 11' 34"	-0.53"	302° 22' 15"	-20° 06' 35"	0.9839796	16' 15.25"	23° 26' 13"	-10 m 57 s
2	300° 14' 07"	-0.53"	302° 24' 54"	-20° 06' 03"	0.9839828	16' 15.25"	23° 26' 13"	-10 m 58 s
3	300° 16' 39"	-0.52"	302° 27' 33"	-20° 05' 30"	0.9839861	16' 15.25"	23° 26' 13"	-10 m 59 s
4	300° 19' 12"	-0.52"	302° 30' 12"	-20° 04' 58"	0.9839893	16' 15.24"	23° 26' 13"	-10 m 59 s
5	300° 21' 45"	-0.52"	302° 32' 51"	-20° 04' 25"	0.9839926	16' 15.24"	23° 26' 13"	-11 m 00 s
6	300° 24' 17"	-0.51"	302° 35' 30"	-20° 03' 52"	0.9839959	16' 15.24"	23° 26' 13"	-11 m 01 s
7	300° 26' 50"	-0.51"	302° 38' 08"	-20° 03' 20"	0.9839991	16' 15.23"	23° 26' 13"	-11 m 02 s
8	300° 29' 23"	-0.51"	302° 40' 47"	-20° 02' 47"	0.9840024	16' 15.23"	23° 26' 13"	-11 m 02 s
9	300° 31' 55"	-0.50"	302° 43' 26"	-20° 02' 14"	0.9840057	16' 15.23"	23° 26' 13"	-11 m 03 s
10	300° 34' 28"	-0.50"	302° 46' 04"	-20° 01' 41"	0.9840090	16' 15.22"	23° 26' 13"	-11 m 04 s
11	300° 37' 01"	-0.50"	302° 48' 43"	-20° 01' 08"	0.9840123	16' 15.22"	23° 26' 13"	-11 m 05 s
12	300° 39' 33"	-0.49"	302° 51' 22"	-20° 00' 35"	0.9840156	16' 15.22"	23° 26' 13"	-11 m 05 s
13	300° 42' 06"	-0.49"	302° 54' 00"	-20° 00' 02"	0.9840190	16' 15.21"	23° 26' 13"	-11 m 06 s
14	300° 44' 39"	-0.48"	302° 56' 39"	-19° 59' 29"	0.9840223	16' 15.21"	23° 26' 13"	-11 m 07 s
15	300° 47' 11"	-0.48"	302° 59' 18"	-19° 58' 56"	0.9840256	16' 15.21"	23° 26' 13"	-11 m 07 s
16	300° 49' 44"	-0.48"	303° 01' 56"	-19° 58' 23"	0.9840290	16' 15.21"	23° 26' 13"	-11 m 08 s
17	300° 52' 17"	-0.47"	303° 04' 35"	-19° 57' 50"	0.9840324	16' 15.20"	23° 26' 13"	-11 m 09 s
18	300° 54' 49"	-0.47"	303° 07' 13"	-19° 57' 17"	0.9840357	16' 15.20"	23° 26' 13"	-11 m 10 s
19	300° 57' 22"	-0.47"	303° 09' 52"	-19° 56' 44"	0.9840391	16' 15.19"	23° 26' 13"	-11 m 10 s
20	300° 59' 55"	-0.46"	303° 12' 30"	-19° 56' 10"	0.9840425	16' 15.19"	23° 26' 13"	-11 m 11 s
21	301° 02' 27"	-0.46"	303° 15' 09"	-19° 55' 37"	0.9840459	16' 15.19"	23° 26' 13"	-11 m 12 s
22	301° 05' 00"	-0.45"	303° 17' 47"	-19° 55' 04"	0.9840493	16' 15.18"	23° 26' 13"	-11 m 12 s
23	301° 07' 33"	-0.45"	303° 20' 26"	-19° 54' 30"	0.9840527	16' 15.18"	23° 26' 13"	-11 m 13 s
24	301° 10' 05"	-0.45"	303° 23' 04"	-19° 53' 57"	0.9840561	16' 15.18"	23° 26' 13"	-11 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	20° 36' 10"	-4° 25' 04"	20° 41' 38"	3° 56' 57"	0° 54' 26"	14' 50.12"	248° 49' 46"	0.41866
1	21° 06' 01"	-4° 23' 39"	21° 08' 47"	4° 09' 21"	0° 54' 26"	14' 49.94"	248° 51' 36"	0.42256
2	21° 35' 51"	-4° 22' 13"	21° 35' 57"	4° 21' 44"	0° 54' 25"	14' 49.76"	248° 53' 32"	0.42648
3	22° 05' 40"	-4° 20' 46"	22° 03' 06"	4° 34' 06"	0° 54' 25"	14' 49.58"	248° 55' 35"	0.43039
4	22° 35' 28"	-4° 19' 17"	22° 30' 16"	4° 46' 26"	0° 54' 24"	14' 49.42"	248° 57' 45"	0.43430
5	23° 05' 16"	-4° 17' 48"	22° 57' 27"	4° 58' 45"	0° 54' 23"	14' 49.25"	249° 0' 01"	0.43822
6	23° 35' 02"	-4° 16' 17"	23° 24' 37"	5° 11' 03"	0° 54' 23"	14' 49.09"	249° 2' 24"	0.44214
7	24° 04' 48"	-4° 14' 45"	23° 51' 48"	5° 23' 19"	0° 54' 22"	14' 48.94"	249° 4' 53"	0.44606
8	24° 34' 33"	-4° 13' 12"	24° 18' 60"	5° 35' 34"	0° 54' 22"	14' 48.79"	249° 7' 29"	0.44999
9	25° 04' 17"	-4° 11' 38"	24° 46' 12"	5° 47' 47"	0° 54' 21"	14' 48.64"	249° 10' 12"	0.45391
10	25° 34' 01"	-4° 10' 03"	25° 13' 25"	5° 59' 59"	0° 54' 21"	14' 48.51"	249° 13' 01"	0.45784
11	26° 03' 44"	-4° 08' 26"	25° 40' 38"	6° 12' 09"	0° 54' 20"	14' 48.37"	249° 15' 57"	0.46177
12	26° 33' 26"	-4° 06' 49"	26° 07' 53"	6° 24' 17"	0° 54' 20"	14' 48.24"	249° 18' 59"	0.46569
13	27° 03' 08"	-4° 05' 11"	26° 35' 08"	6° 36' 24"	0° 54' 19"	14' 48.12"	249° 22' 08"	0.46962
14	27° 32' 48"	-4° 03' 31"	27° 02' 24"	6° 48' 29"	0° 54' 19"	14' 48.00"	249° 25' 24"	0.47355
15	28° 02' 29"	-4° 01' 51"	27° 29' 40"	7° 00' 33"	0° 54' 18"	14' 47.88"	249° 28' 46"	0.47748
16	28° 32' 09"	-4° 00' 09"	27° 56' 58"	7° 12' 34"	0° 54' 18"	14' 47.77"	249° 32' 15"	0.48141
17	29° 01' 48"	-3° 58' 26"	28° 24' 17"	7° 24' 34"	0° 54' 18"	14' 47.67"	249° 35' 50"	0.48534
18	29° 31' 26"	-3° 56' 43"	28° 51' 37"	7° 36' 32"	0° 54' 17"	14' 47.57"	249° 39' 32"	0.48927
19	30° 01' 04"	-3° 54' 58"	29° 18' 58"	7° 48' 28"	0° 54' 17"	14' 47.48"	249° 43' 20"	0.49320
20	30° 30' 42"	-3° 53' 12"	29° 46' 21"	8° 00' 23"	0° 54' 16"	14' 47.39"	249° 47' 15"	0.49713
21	31° 00' 19"	-3° 51' 26"	30° 13' 44"	8° 12' 15"	0° 54' 16"	14' 47.30"	249° 51' 17"	0.50106
22	31° 29' 56"	-3° 49' 38"	30° 41' 09"	8° 24' 05"	0° 54' 16"	14' 47.23"	249° 55' 25"	0.50499
23	31° 59' 32"	-3° 47' 49"	31° 08' 35"	8° 35' 54"	0° 54' 16"	14' 47.15"	249° 59' 40"	0.50891
24	32° 29' 08"	-3° 45' 59"	31° 36' 03"	8° 47' 40"	0° 54' 15"	14' 47.08"	250° 4' 01"	0.51284

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	301° 10' 05"	-0.45"	303° 23' 04"	-19° 53' 57"	0.9840561	16' 15.18"	23° 26' 13"	-11 m 14 s
1	301° 12' 38"	-0.44"	303° 25' 43"	-19° 53' 24"	0.9840595	16' 15.17"	23° 26' 13"	-11 m 15 s
2	301° 15' 11"	-0.44"	303° 28' 21"	-19° 52' 50"	0.9840630	16' 15.17"	23° 26' 13"	-11 m 15 s
3	301° 17' 43"	-0.43"	303° 30' 59"	-19° 52' 17"	0.9840664	16' 15.17"	23° 26' 13"	-11 m 16 s
4	301° 20' 16"	-0.43"	303° 33' 38"	-19° 51' 43"	0.9840699	16' 15.16"	23° 26' 13"	-11 m 17 s
5	301° 22' 49"	-0.43"	303° 36' 16"	-19° 51' 10"	0.9840733	16' 15.16"	23° 26' 13"	-11 m 17 s
6	301° 25' 21"	-0.42"	303° 38' 54"	-19° 50' 36"	0.9840768	16' 15.16"	23° 26' 13"	-11 m 18 s
7	301° 27' 54"	-0.42"	303° 41' 33"	-19° 50' 02"	0.9840803	16' 15.15"	23° 26' 13"	-11 m 19 s
8	301° 30' 27"	-0.41"	303° 44' 11"	-19° 49' 29"	0.9840838	16' 15.15"	23° 26' 13"	-11 m 20 s
9	301° 32' 59"	-0.41"	303° 46' 49"	-19° 48' 55"	0.9840873	16' 15.15"	23° 26' 13"	-11 m 20 s
10	301° 35' 32"	-0.40"	303° 49' 27"	-19° 48' 21"	0.9840908	16' 15.14"	23° 26' 13"	-11 m 21 s
11	301° 38' 04"	-0.40"	303° 52' 05"	-19° 47' 47"	0.9840943	16' 15.14"	23° 26' 13"	-11 m 22 s
12	301° 40' 37"	-0.40"	303° 54' 44"	-19° 47' 13"	0.9840978	16' 15.14"	23° 26' 13"	-11 m 22 s
13	301° 43' 10"	-0.39"	303° 57' 22"	-19° 46' 39"	0.9841013	16' 15.13"	23° 26' 13"	-11 m 23 s
14	301° 45' 42"	-0.39"	303° 59' 60"	-19° 46' 06"	0.9841049	16' 15.13"	23° 26' 13"	-11 m 24 s
15	301° 48' 15"	-0.38"	304° 02' 38"	-19° 45' 32"	0.9841084	16' 15.13"	23° 26' 13"	-11 m 24 s
16	301° 50' 48"	-0.38"	304° 05' 16"	-19° 44' 58"	0.9841120	16' 15.12"	23° 26' 13"	-11 m 25 s
17	301° 53' 20"	-0.37"	304° 07' 54"	-19° 44' 23"	0.9841155	16' 15.12"	23° 26' 13"	-11 m 26 s
18	301° 55' 53"	-0.37"	304° 10' 32"	-19° 43' 49"	0.9841191	16' 15.12"	23° 26' 13"	-11 m 26 s
19	301° 58' 26"	-0.36"	304° 13' 10"	-19° 43' 15"	0.9841227	16' 15.11"	23° 26' 13"	-11 m 27 s
20	302° 00' 58"	-0.36"	304° 15' 48"	-19° 42' 41"	0.9841263	16' 15.11"	23° 26' 13"	-11 m 28 s
21	302° 03' 31"	-0.35"	304° 18' 26"	-19° 42' 07"	0.9841299	16' 15.11"	23° 26' 13"	-11 m 28 s
22	302° 06' 03"	-0.35"	304° 21' 04"	-19° 41' 33"	0.9841335	16' 15.10"	23° 26' 13"	-11 m 29 s
23	302° 08' 36"	-0.34"	304° 23' 42"	-19° 40' 58"	0.9841371	16' 15.10"	23° 26' 13"	-11 m 30 s
24	302° 11' 09"	-0.34"	304° 26' 20"	-19° 40' 24"	0.9841407	16' 15.09"	23° 26' 13"	-11 m 31 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	32° 29' 08"	-3° 45' 59"	31° 36' 03"	8° 47' 40"	0° 54' 15"	14' 47.08"	250° 4' 01"	0.51284
1	32° 58' 43"	-3° 44' 09"	32° 03' 33"	8° 59' 24"	0° 54' 15"	14' 47.02"	250° 8' 29"	0.51676
2	33° 28' 18"	-3° 42' 17"	32° 31' 03"	9° 11' 06"	0° 54' 15"	14' 46.96"	250° 13' 03"	0.52068
3	33° 57' 53"	-3° 40' 24"	32° 58' 36"	9° 22' 46"	0° 54' 15"	14' 46.91"	250° 17' 44"	0.52460
4	34° 27' 28"	-3° 38' 31"	33° 26' 10"	9° 34' 24"	0° 54' 15"	14' 46.86"	250° 22' 32"	0.52852
5	34° 57' 02"	-3° 36' 36"	33° 53' 46"	9° 45' 59"	0° 54' 14"	14' 46.81"	250° 27' 26"	0.53244
6	35° 26' 36"	-3° 34' 40"	34° 21' 24"	9° 57' 32"	0° 54' 14"	14' 46.77"	250° 32' 27"	0.53635
7	35° 56' 09"	-3° 32' 44"	34° 49' 03"	10° 09' 03"	0° 54' 14"	14' 46.74"	250° 37' 34"	0.54026
8	36° 25' 43"	-3° 30' 46"	35° 16' 44"	10° 20' 31"	0° 54' 14"	14' 46.71"	250° 42' 48"	0.54417
9	36° 55' 16"	-3° 28' 48"	35° 44' 28"	10° 31' 57"	0° 54' 14"	14' 46.69"	250° 48' 08"	0.54807
10	37° 24' 49"	-3° 26' 49"	36° 12' 13"	10° 43' 21"	0° 54' 14"	14' 46.67"	250° 53' 35"	0.55197
11	37° 54' 22"	-3° 24' 49"	36° 40' 01"	10° 54' 42"	0° 54' 14"	14' 46.66"	250° 59' 09"	0.55587
12	38° 23' 55"	-3° 22' 48"	37° 07' 50"	11° 06' 01"	0° 54' 14"	14' 46.65"	251° 4' 49"	0.55976
13	38° 53' 27"	-3° 20' 46"	37° 35' 42"	11° 17' 17"	0° 54' 14"	14' 46.64"	251° 10' 36"	0.56365
14	39° 22' 60"	-3° 18' 43"	38° 03' 36"	11° 28' 30"	0° 54' 14"	14' 46.65"	251° 16' 30"	0.56754
15	39° 52' 32"	-3° 16' 39"	38° 31' 32"	11° 39' 41"	0° 54' 14"	14' 46.65"	251° 22' 30"	0.57142
16	40° 22' 05"	-3° 14' 34"	38° 59' 31"	11° 50' 49"	0° 54' 14"	14' 46.66"	251° 28' 37"	0.57530
17	40° 51' 37"	-3° 12' 29"	39° 27' 31"	12° 01' 55"	0° 54' 14"	14' 46.68"	251° 34' 50"	0.57917
18	41° 21' 10"	-3° 10' 23"	39° 55' 35"	12° 12' 58"	0° 54' 14"	14' 46.70"	251° 41' 10"	0.58304
19	41° 50' 42"	-3° 08' 15"	40° 23' 41"	12° 23' 58"	0° 54' 14"	14' 46.73"	251° 47' 37"	0.58691
20	42° 20' 15"	-3° 06' 07"	40° 51' 49"	12° 34' 55"	0° 54' 14"	14' 46.76"	251° 54' 11"	0.59077
21	42° 49' 47"	-3° 03' 59"	41° 19' 60"	12° 45' 49"	0° 54' 14"	14' 46.80"	252° 0' 51"	0.59462
22	43° 19' 20"	-3° 01' 49"	41° 48' 13"	12° 56' 40"	0° 54' 14"	14' 46.84"	252° 7' 38"	0.59847
23	43° 48' 53"	-2° 59' 38"	42° 16' 30"	13° 07' 29"	0° 54' 15"	14' 46.88"	252° 14' 31"	0.60231
24	44° 18' 26"	-2° 57' 27"	42° 44' 49"	13° 18' 14"	0° 54' 15"	14' 46.94"	252° 21' 31"	0.60615

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	302° 11' 09"	-0.34"	304° 26' 20"	-19° 40' 24"	0.9841407	16' 15.09"	23° 26' 13"	-11 m 31 s
1	302° 13' 41"	-0.33"	304° 28' 58"	-19° 39' 50"	0.9841444	16' 15.09"	23° 26' 13"	-11 m 31 s
2	302° 16' 14"	-0.33"	304° 31' 36"	-19° 39' 15"	0.9841480	16' 15.09"	23° 26' 13"	-11 m 32 s
3	302° 18' 46"	-0.32"	304° 34' 14"	-19° 38' 41"	0.9841517	16' 15.08"	23° 26' 13"	-11 m 33 s
4	302° 21' 19"	-0.32"	304° 36' 52"	-19° 38' 06"	0.9841553	16' 15.08"	23° 26' 13"	-11 m 33 s
5	302° 23' 52"	-0.31"	304° 39' 30"	-19° 37' 32"	0.9841590	16' 15.08"	23° 26' 13"	-11 m 34 s
6	302° 26' 24"	-0.31"	304° 42' 07"	-19° 36' 57"	0.9841627	16' 15.07"	23° 26' 13"	-11 m 35 s
7	302° 28' 57"	-0.30"	304° 44' 45"	-19° 36' 23"	0.9841664	16' 15.07"	23° 26' 13"	-11 m 35 s
8	302° 31' 30"	-0.30"	304° 47' 23"	-19° 35' 48"	0.9841701	16' 15.07"	23° 26' 13"	-11 m 36 s
9	302° 34' 02"	-0.29"	304° 50' 01"	-19° 35' 14"	0.9841738	16' 15.06"	23° 26' 13"	-11 m 37 s
10	302° 36' 35"	-0.29"	304° 52' 38"	-19° 34' 39"	0.9841775	16' 15.06"	23° 26' 13"	-11 m 37 s
11	302° 39' 07"	-0.28"	304° 55' 16"	-19° 34' 04"	0.9841812	16' 15.05"	23° 26' 13"	-11 m 38 s
12	302° 41' 40"	-0.28"	304° 57' 54"	-19° 33' 29"	0.9841849	16' 15.05"	23° 26' 13"	-11 m 39 s
13	302° 44' 12"	-0.27"	305° 00' 31"	-19° 32' 55"	0.9841887	16' 15.05"	23° 26' 13"	-11 m 39 s
14	302° 46' 45"	-0.27"	305° 03' 09"	-19° 32' 20"	0.9841924	16' 15.04"	23° 26' 13"	-11 m 40 s
15	302° 49' 18"	-0.26"	305° 05' 47"	-19° 31' 45"	0.9841962	16' 15.04"	23° 26' 13"	-11 m 41 s
16	302° 51' 50"	-0.26"	305° 08' 24"	-19° 31' 10"	0.9842000	16' 15.04"	23° 26' 13"	-11 m 41 s
17	302° 54' 23"	-0.25"	305° 11' 02"	-19° 30' 35"	0.9842037	16' 15.03"	23° 26' 13"	-11 m 42 s
18	302° 56' 55"	-0.25"	305° 13' 39"	-19° 29' 60"	0.9842075	16' 15.03"	23° 26' 13"	-11 m 42 s
19	302° 59' 28"	-0.24"	305° 16' 17"	-19° 29' 25"	0.9842113	16' 15.02"	23° 26' 13"	-11 m 43 s
20	303° 02' 01"	-0.24"	305° 18' 55"	-19° 28' 50"	0.9842151	16' 15.02"	23° 26' 13"	-11 m 44 s
21	303° 04' 33"	-0.23"	305° 21' 32"	-19° 28' 15"	0.9842189	16' 15.02"	23° 26' 13"	-11 m 44 s
22	303° 07' 06"	-0.23"	305° 24' 10"	-19° 27' 40"	0.9842228	16' 15.01"	23° 26' 13"	-11 m 45 s
23	303° 09' 38"	-0.22"	305° 26' 47"	-19° 27' 04"	0.9842266	16' 15.01"	23° 26' 13"	-11 m 46 s
24	303° 12' 11"	-0.22"	305° 29' 24"	-19° 26' 29"	0.9842304	16' 15.01"	23° 26' 13"	-11 m 46 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	44° 18' 26"	-2° 57' 27"	42° 44' 49"	13° 18' 14"	0° 54' 15"	14' 46.94"	252° 21' 31"	0.60615
1	44° 47' 59"	-2° 55' 15"	43° 13' 10"	13° 28' 56"	0° 54' 15"	14' 46.99"	252° 28' 38"	0.60998
2	45° 17' 32"	-2° 53' 02"	43° 41' 35"	13° 39' 35"	0° 54' 15"	14' 47.05"	252° 35' 52"	0.61380
3	45° 47' 06"	-2° 50' 48"	44° 10' 03"	13° 50' 12"	0° 54' 15"	14' 47.12"	252° 43' 12"	0.61762
4	46° 16' 40"	-2° 48' 34"	44° 38' 33"	14° 00' 44"	0° 54' 16"	14' 47.19"	252° 50' 39"	0.62143
5	46° 46' 14"	-2° 46' 19"	45° 07' 06"	14° 11' 14"	0° 54' 16"	14' 47.26"	252° 58' 13"	0.62524
6	47° 15' 48"	-2° 44' 03"	45° 35' 43"	14° 21' 41"	0° 54' 16"	14' 47.35"	253° 5' 54"	0.62904
7	47° 45' 23"	-2° 41' 46"	46° 04' 22"	14° 32' 04"	0° 54' 17"	14' 47.43"	253° 13' 41"	0.63283
8	48° 14' 58"	-2° 39' 28"	46° 33' 05"	14° 42' 24"	0° 54' 17"	14' 47.52"	253° 21' 36"	0.63661
9	48° 44' 33"	-2° 37' 10"	47° 01' 51"	14° 52' 40"	0° 54' 17"	14' 47.62"	253° 29' 37"	0.64039
10	49° 14' 08"	-2° 34' 51"	47° 30' 40"	15° 02' 53"	0° 54' 18"	14' 47.72"	253° 37' 44"	0.64416
11	49° 43' 45"	-2° 32' 31"	47° 59' 32"	15° 13' 03"	0° 54' 18"	14' 47.82"	253° 45' 59"	0.64792
12	50° 13' 21"	-2° 30' 11"	48° 28' 27"	15° 23' 09"	0° 54' 18"	14' 47.93"	253° 54' 21"	0.65167
13	50° 42' 58"	-2° 27' 50"	48° 57' 26"	15° 33' 11"	0° 54' 19"	14' 48.04"	254° 2' 49"	0.65541
14	51° 12' 35"	-2° 25' 28"	49° 26' 28"	15° 43' 10"	0° 54' 19"	14' 48.16"	254° 11' 24"	0.65915
15	51° 42' 13"	-2° 23' 06"	49° 55' 34"	15° 53' 05"	0° 54' 20"	14' 48.29"	254° 20' 06"	0.66288
16	52° 11' 51"	-2° 20' 42"	50° 24' 43"	16° 02' 57"	0° 54' 20"	14' 48.41"	254° 28' 55"	0.66659
17	52° 41' 30"	-2° 18' 19"	50° 53' 55"	16° 12' 44"	0° 54' 21"	14' 48.55"	254° 37' 51"	0.67030
18	53° 11' 10"	-2° 15' 54"	51° 23' 12"	16° 22' 28"	0° 54' 21"	14' 48.68"	254° 46' 54"	0.67400
19	53° 40' 50"	-2° 13' 29"	51° 52' 31"	16° 32' 09"	0° 54' 22"	14' 48.83"	254° 56' 04"	0.67769
20	54° 10' 30"	-2° 11' 03"	52° 21' 55"	16° 41' 45"	0° 54' 22"	14' 48.97"	255° 5' 20"	0.68137
21	54° 40' 11"	-2° 08' 37"	52° 51' 22"	16° 51' 17"	0° 54' 23"	14' 49.13"	255° 14' 44"	0.68505
22	55° 09' 53"	-2° 06' 10"	53° 20' 52"	17° 00' 45"	0° 54' 23"	14' 49.28"	255° 24' 14"	0.68871
23	55° 39' 36"	-2° 03' 42"	53° 50' 27"	17° 10' 10"	0° 54' 24"	14' 49.44"	255° 33' 52"	0.69236
24	56° 09' 19"	-2° 01' 14"	54° 20' 05"	17° 19' 30"	0° 54' 25"	14' 49.61"	255° 43' 36"	0.69600

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	303° 12' 11"	-0.22"	305° 29' 24"	-19° 26' 29"	0.9842304	16' 15.01"	23° 26' 13"	-11 m 46 s
1	303° 14' 44"	-0.21"	305° 32' 02"	-19° 25' 54"	0.9842343	16' 15.00"	23° 26' 13"	-11 m 47 s
2	303° 17' 16"	-0.20"	305° 34' 39"	-19° 25' 19"	0.9842381	16' 15.00"	23° 26' 13"	-11 m 48 s
3	303° 19' 49"	-0.20"	305° 37' 17"	-19° 24' 43"	0.9842420	16' 14.99"	23° 26' 13"	-11 m 48 s
4	303° 22' 21"	-0.19"	305° 39' 54"	-19° 24' 08"	0.9842459	16' 14.99"	23° 26' 13"	-11 m 49 s
5	303° 24' 54"	-0.19"	305° 42' 31"	-19° 23' 33"	0.9842498	16' 14.99"	23° 26' 13"	-11 m 50 s
6	303° 27' 26"	-0.18"	305° 45' 09"	-19° 22' 57"	0.9842537	16' 14.98"	23° 26' 13"	-11 m 50 s
7	303° 29' 59"	-0.18"	305° 47' 46"	-19° 22' 22"	0.9842576	16' 14.98"	23° 26' 13"	-11 m 51 s
8	303° 32' 31"	-0.17"	305° 50' 23"	-19° 21' 46"	0.9842615	16' 14.97"	23° 26' 13"	-11 m 51 s
9	303° 35' 04"	-0.17"	305° 53' 00"	-19° 21' 11"	0.9842654	16' 14.97"	23° 26' 13"	-11 m 52 s
10	303° 37' 37"	-0.16"	305° 55' 38"	-19° 20' 35"	0.9842694	16' 14.97"	23° 26' 13"	-11 m 53 s
11	303° 40' 09"	-0.16"	305° 58' 15"	-19° 19' 59"	0.9842733	16' 14.96"	23° 26' 13"	-11 m 53 s
12	303° 42' 42"	-0.15"	306° 00' 52"	-19° 19' 24"	0.9842773	16' 14.96"	23° 26' 13"	-11 m 54 s
13	303° 45' 14"	-0.14"	306° 03' 29"	-19° 18' 48"	0.9842812	16' 14.96"	23° 26' 13"	-11 m 55 s
14	303° 47' 47"	-0.14"	306° 06' 06"	-19° 18' 12"	0.9842852	16' 14.95"	23° 26' 13"	-11 m 55 s
15	303° 50' 19"	-0.13"	306° 08' 44"	-19° 17' 36"	0.9842892	16' 14.95"	23° 26' 13"	-11 m 56 s
16	303° 52' 52"	-0.13"	306° 11' 21"	-19° 17' 01"	0.9842932	16' 14.94"	23° 26' 13"	-11 m 56 s
17	303° 55' 24"	-0.12"	306° 13' 58"	-19° 16' 25"	0.9842972	16' 14.94"	23° 26' 13"	-11 m 57 s
18	303° 57' 57"	-0.12"	306° 16' 35"	-19° 15' 49"	0.9843012	16' 14.94"	23° 26' 13"	-11 m 58 s
19	304° 00' 30"	-0.11"	306° 19' 12"	-19° 15' 13"	0.9843052	16' 14.93"	23° 26' 13"	-11 m 58 s
20	304° 03' 02"	-0.10"	306° 21' 49"	-19° 14' 37"	0.9843092	16' 14.93"	23° 26' 13"	-11 m 59 s
21	304° 05' 35"	-0.10"	306° 24' 26"	-19° 14' 01"	0.9843132	16' 14.92"	23° 26' 13"	-11 m 60 s
22	304° 08' 07"	-0.09"	306° 27' 03"	-19° 13' 25"	0.9843173	16' 14.92"	23° 26' 13"	-12 m 00 s
23	304° 10' 40"	-0.09"	306° 29' 40"	-19° 12' 49"	0.9843213	16' 14.92"	23° 26' 13"	-12 m 01 s
24	304° 13' 12"	-0.08"	306° 32' 17"	-19° 12' 13"	0.9843254	16' 14.91"	23° 26' 13"	-12 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	56° 09' 19"	-2° 01' 14"	54° 20' 05"	17° 19' 30"	0° 54' 25"	14' 49.61"	255° 43' 36"	0.69600
1	56° 39' 03"	-1° 58' 45"	54° 49' 47"	17° 28' 46"	0° 54' 25"	14' 49.78"	255° 53' 28"	0.69963
2	57° 08' 47"	-1° 56' 15"	55° 19' 32"	17° 37' 58"	0° 54' 26"	14' 49.95"	256° 3' 27"	0.70325
3	57° 38' 33"	-1° 53' 45"	55° 49' 22"	17° 47' 05"	0° 54' 27"	14' 50.13"	256° 13' 32"	0.70685
4	58° 08' 19"	-1° 51' 15"	56° 19' 15"	17° 56' 09"	0° 54' 27"	14' 50.31"	256° 23' 45"	0.71045
5	58° 38' 06"	-1° 48' 43"	56° 49' 13"	18° 05' 08"	0° 54' 28"	14' 50.50"	256° 34' 05"	0.71404
6	59° 07' 53"	-1° 46' 12"	57° 19' 14"	18° 14' 03"	0° 54' 29"	14' 50.69"	256° 44' 31"	0.71761
7	59° 37' 42"	-1° 43' 39"	57° 49' 20"	18° 22' 53"	0° 54' 29"	14' 50.89"	256° 55' 05"	0.72117
8	60° 07' 31"	-1° 41' 06"	58° 19' 29"	18° 31' 39"	0° 54' 30"	14' 51.09"	257° 5' 46"	0.72472
9	60° 37' 21"	-1° 38' 33"	58° 49' 43"	18° 40' 20"	0° 54' 31"	14' 51.29"	257° 16' 35"	0.72826
10	61° 07' 13"	-1° 35' 59"	59° 20' 00"	18° 48' 57"	0° 54' 32"	14' 51.50"	257° 27' 30"	0.73178
11	61° 37' 05"	-1° 33' 25"	59° 50' 22"	18° 57' 29"	0° 54' 32"	14' 51.71"	257° 38' 32"	0.73530
12	62° 06' 58"	-1° 30' 50"	60° 20' 47"	19° 05' 56"	0° 54' 33"	14' 51.93"	257° 49' 42"	0.73880
13	62° 36' 51"	-1° 28' 14"	60° 51' 17"	19° 14' 19"	0° 54' 34"	14' 52.15"	258° 0' 59"	0.74228
14	63° 06' 46"	-1° 25' 39"	61° 21' 51"	19° 22' 37"	0° 54' 35"	14' 52.38"	258° 12' 23"	0.74576
15	63° 36' 42"	-1° 23' 02"	61° 52' 29"	19° 30' 50"	0° 54' 36"	14' 52.61"	258° 23' 54"	0.74921
16	64° 06' 39"	-1° 20' 25"	62° 23' 12"	19° 38' 58"	0° 54' 36"	14' 52.84"	258° 35' 33"	0.75266
17	64° 36' 37"	-1° 17' 48"	62° 53' 59"	19° 47' 01"	0° 54' 37"	14' 53.08"	258° 47' 19"	0.75609
18	65° 06' 36"	-1° 15' 10"	63° 24' 49"	19° 54' 59"	0° 54' 38"	14' 53.32"	258° 59' 12"	0.75951
19	65° 36' 36"	-1° 12' 32"	63° 55' 45"	20° 02' 52"	0° 54' 39"	14' 53.57"	259° 11' 13"	0.76291
20	66° 06' 37"	-1° 09' 54"	64° 26' 44"	20° 10' 41"	0° 54' 40"	14' 53.82"	259° 23' 20"	0.76630
21	66° 36' 39"	-1° 07' 15"	64° 57' 48"	20° 18' 24"	0° 54' 41"	14' 54.07"	259° 35' 36"	0.76968
22	67° 06' 43"	-1° 04' 35"	65° 28' 56"	20° 26' 01"	0° 54' 42"	14' 54.33"	259° 47' 58"	0.77304
23	67° 36' 47"	-1° 01' 56"	66° 00' 08"	20° 33' 34"	0° 54' 43"	14' 54.59"	260° 0' 28"	0.77638
24	68° 06' 53"	0°-59' 16"	66° 31' 25"	20° 41' 01"	0° 54' 44"	14' 54.86"	260° 13' 05"	0.77971

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	304° 13' 12"	-0.08"	306° 32' 17"	-19° 12' 13"	0.9843254	16' 14.91"	23° 26' 13"	-12 m 01 s
1	304° 15' 45"	-0.08"	306° 34' 54"	-19° 11' 37"	0.9843295	16' 14.91"	23° 26' 13"	-12 m 02 s
2	304° 18' 17"	-0.07"	306° 37' 31"	-19° 11' 00"	0.9843336	16' 14.90"	23° 26' 13"	-12 m 03 s
3	304° 20' 50"	-0.06"	306° 40' 07"	-19° 10' 24"	0.9843377	16' 14.90"	23° 26' 13"	-12 m 03 s
4	304° 23' 22"	-0.06"	306° 42' 44"	-19° 09' 48"	0.9843418	16' 14.90"	23° 26' 13"	-12 m 04 s
5	304° 25' 55"	-0.05"	306° 45' 21"	-19° 09' 12"	0.9843459	16' 14.89"	23° 26' 13"	-12 m 04 s
6	304° 28' 27"	-0.05"	306° 47' 58"	-19° 08' 35"	0.9843500	16' 14.89"	23° 26' 13"	-12 m 05 s
7	304° 30' 60"	-0.04"	306° 50' 35"	-19° 07' 59"	0.9843541	16' 14.88"	23° 26' 13"	-12 m 06 s
8	304° 33' 32"	-0.04"	306° 53' 11"	-19° 07' 23"	0.9843583	16' 14.88"	23° 26' 13"	-12 m 06 s
9	304° 36' 05"	-0.03"	306° 55' 48"	-19° 06' 46"	0.9843624	16' 14.87"	23° 26' 13"	-12 m 07 s
10	304° 38' 38"	-0.02"	306° 58' 25"	-19° 06' 10"	0.9843666	16' 14.87"	23° 26' 13"	-12 m 07 s
11	304° 41' 10"	-0.02"	307° 01' 02"	-19° 05' 33"	0.9843708	16' 14.87"	23° 26' 13"	-12 m 08 s
12	304° 43' 43"	-0.01"	307° 03' 38"	-19° 04' 57"	0.9843749	16' 14.86"	23° 26' 13"	-12 m 09 s
13	304° 46' 15"	-0.01"	307° 06' 15"	-19° 04' 20"	0.9843791	16' 14.86"	23° 26' 13"	-12 m 09 s
14	304° 48' 48"	-0.00"	307° 08' 52"	-19° 03' 43"	0.9843833	16' 14.85"	23° 26' 13"	-12 m 10 s
15	304° 51' 20"	0.00"	307° 11' 28"	-19° 03' 07"	0.9843875	16' 14.85"	23° 26' 13"	-12 m 10 s
16	304° 53' 53"	0.01"	307° 14' 05"	-19° 02' 30"	0.9843917	16' 14.85"	23° 26' 13"	-12 m 11 s
17	304° 56' 25"	0.02"	307° 16' 42"	-19° 01' 53"	0.9843960	16' 14.84"	23° 26' 13"	-12 m 12 s
18	304° 58' 58"	0.02"	307° 19' 18"	-19° 01' 17"	0.9844002	16' 14.84"	23° 26' 13"	-12 m 12 s
19	305° 01' 30"	0.03"	307° 21' 55"	-19° 00' 40"	0.9844045	16' 14.83"	23° 26' 13"	-12 m 13 s
20	305° 04' 03"	0.03"	307° 24' 31"	-19° 00' 03"	0.9844087	16' 14.83"	23° 26' 13"	-12 m 13 s
21	305° 06' 35"	0.04"	307° 27' 08"	-18° 59' 26"	0.9844130	16' 14.82"	23° 26' 13"	-12 m 14 s
22	305° 09' 08"	0.04"	307° 29' 44"	-18° 58' 49"	0.9844173	16' 14.82"	23° 26' 13"	-12 m 15 s
23	305° 11' 40"	0.05"	307° 32' 21"	-18° 58' 12"	0.9844215	16' 14.82"	23° 26' 13"	-12 m 15 s
24	305° 14' 13"	0.06"	307° 34' 57"	-18° 57' 35"	0.9844258	16' 14.81"	23° 26' 13"	-12 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	68° 06' 53"	0°-59' 16"	66° 31' 25"	20° 41' 01"	0° 54' 44"	14' 54.86"	260° 13' 05"	0.77971
1	68° 36' 60"	0°-56' 35"	67° 02' 46"	20° 48' 23"	0° 54' 45"	14' 55.13"	260° 25' 50"	0.78302
2	69° 07' 08"	0°-53' 54"	67° 34' 11"	20° 55' 39"	0° 54' 46"	14' 55.40"	260° 38' 43"	0.78632
3	69° 37' 17"	0°-51' 13"	68° 05' 41"	21° 02' 50"	0° 54' 47"	14' 55.68"	260° 51' 42"	0.78960
4	70° 07' 28"	0°-48' 31"	68° 37' 15"	21° 09' 55"	0° 54' 48"	14' 55.96"	261° 4' 50"	0.79286
5	70° 37' 39"	0°-45' 50"	69° 08' 54"	21° 16' 55"	0° 54' 49"	14' 56.24"	261° 18' 05"	0.79611
6	71° 07' 53"	0°-43' 07"	69° 40' 37"	21° 23' 49"	0° 54' 50"	14' 56.53"	261° 31' 27"	0.79934
7	71° 38' 07"	0°-40' 25"	70° 12' 24"	21° 30' 38"	0° 54' 51"	14' 56.82"	261° 44' 57"	0.80256
8	72° 08' 23"	0°-37' 42"	70° 44' 16"	21° 37' 21"	0° 54' 52"	14' 57.12"	261° 58' 35"	0.80575
9	72° 38' 40"	0°-34' 59"	71° 16' 12"	21° 43' 58"	0° 54' 53"	14' 57.42"	262° 12' 20"	0.80893
10	73° 08' 58"	0°-32' 16"	71° 48' 12"	21° 50' 29"	0° 54' 54"	14' 57.72"	262° 26' 13"	0.81209
11	73° 39' 18"	0°-29' 32"	72° 20' 17"	21° 56' 54"	0° 54' 56"	14' 58.03"	262° 40' 14"	0.81524
12	74° 09' 39"	0°-26' 48"	72° 52' 26"	22° 03' 13"	0° 54' 57"	14' 58.34"	262° 54' 22"	0.81836
13	74° 40' 01"	0°-24' 06"	73° 24' 40"	22° 09' 24"	0° 54' 58"	14' 58.65"	263° 8' 37"	0.82147
14	75° 10' 25"	0°-21' 22"	73° 56' 58"	22° 15' 31"	0° 54' 59"	14' 58.96"	263° 23' 01"	0.82456
15	75° 40' 51"	0°-18' 37"	74° 29' 20"	22° 21' 32"	0° 55' 00"	14' 59.28"	263° 37' 33"	0.82763
16	76° 11' 18"	0°-15' 53"	75° 01' 46"	22° 27' 27"	0° 55' 01"	14' 59.61"	263° 52' 13"	0.83068
17	76° 41' 46"	0°-13' 08"	75° 34' 17"	22° 33' 16"	0° 55' 03"	14' 59.93"	264° 7' 01"	0.83371
18	77° 12' 16"	0°-10' 23"	76° 06' 52"	22° 38' 58"	0° 55' 04"	15' 00.26"	264° 21' 57"	0.83672
19	77° 42' 47"	0° -7' 37"	76° 39' 32"	22° 44' 34"	0° 55' 05"	15' 00.59"	264° 37' 01"	0.83972
20	78° 13' 20"	0° -4' 52"	77° 12' 16"	22° 50' 04"	0° 55' 06"	15' 00.93"	264° 52' 13"	0.84269
21	78° 43' 54"	0° -2' 06"	77° 45' 04"	22° 55' 27"	0° 55' 07"	15' 01.26"	265° 7' 33"	0.84564
22	79° 14' 30"	0° 00' 40"	78° 17' 56"	23° 00' 44"	0° 55' 09"	15' 01.61"	265° 23' 02"	0.84857
23	79° 45' 07"	0° 03' 25"	78° 50' 52"	23° 05' 54"	0° 55' 10"	15' 01.95"	265° 38' 39"	0.85148
24	80° 15' 46"	0° 06' 11"	79° 23' 53"	23° 10' 57"	0° 55' 11"	15' 02.30"	265° 54' 24"	0.85437

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	305° 14' 13"	0.06"	307° 34' 57"	-18° 57' 35"	0.9844258	16' 14.81"	23° 26' 13"	-12 m 16 s
1	305° 16' 45"	0.06"	307° 37' 33"	-18° 56' 58"	0.9844301	16' 14.81"	23° 26' 13"	-12 m 16 s
2	305° 19' 18"	0.07"	307° 40' 10"	-18° 56' 21"	0.9844345	16' 14.80"	23° 26' 13"	-12 m 17 s
3	305° 21' 50"	0.07"	307° 42' 46"	-18° 55' 44"	0.9844388	16' 14.80"	23° 26' 13"	-12 m 17 s
4	305° 24' 23"	0.08"	307° 45' 23"	-18° 55' 07"	0.9844431	16' 14.79"	23° 26' 13"	-12 m 18 s
5	305° 26' 55"	0.08"	307° 47' 59"	-18° 54' 30"	0.9844475	16' 14.79"	23° 26' 13"	-12 m 19 s
6	305° 29' 28"	0.09"	307° 50' 35"	-18° 53' 53"	0.9844518	16' 14.79"	23° 26' 13"	-12 m 19 s
7	305° 32' 00"	0.10"	307° 53' 11"	-18° 53' 15"	0.9844562	16' 14.78"	23° 26' 13"	-12 m 20 s
8	305° 34' 32"	0.10"	307° 55' 48"	-18° 52' 38"	0.9844606	16' 14.78"	23° 26' 13"	-12 m 20 s
9	305° 37' 05"	0.11"	307° 58' 24"	-18° 52' 01"	0.9844649	16' 14.77"	23° 26' 13"	-12 m 21 s
10	305° 39' 37"	0.11"	308° 01' 00"	-18° 51' 23"	0.9844693	16' 14.77"	23° 26' 13"	-12 m 21 s
11	305° 42' 10"	0.12"	308° 03' 36"	-18° 50' 46"	0.9844737	16' 14.76"	23° 26' 13"	-12 m 22 s
12	305° 44' 42"	0.12"	308° 06' 13"	-18° 50' 09"	0.9844781	16' 14.76"	23° 26' 13"	-12 m 23 s
13	305° 47' 15"	0.13"	308° 08' 49"	-18° 49' 31"	0.9844826	16' 14.76"	23° 26' 13"	-12 m 23 s
14	305° 49' 47"	0.14"	308° 11' 25"	-18° 48' 54"	0.9844870	16' 14.75"	23° 26' 13"	-12 m 24 s
15	305° 52' 20"	0.14"	308° 14' 01"	-18° 48' 16"	0.9844914	16' 14.75"	23° 26' 13"	-12 m 24 s
16	305° 54' 52"	0.15"	308° 16' 37"	-18° 47' 39"	0.9844959	16' 14.74"	23° 26' 13"	-12 m 25 s
17	305° 57' 25"	0.15"	308° 19' 13"	-18° 47' 01"	0.9845004	16' 14.74"	23° 26' 13"	-12 m 25 s
18	305° 59' 57"	0.16"	308° 21' 49"	-18° 46' 23"	0.9845048	16' 14.73"	23° 26' 13"	-12 m 26 s
19	306° 02' 30"	0.16"	308° 24' 25"	-18° 45' 46"	0.9845093	16' 14.73"	23° 26' 13"	-12 m 26 s
20	306° 05' 02"	0.17"	308° 27' 01"	-18° 45' 08"	0.9845138	16' 14.72"	23° 26' 13"	-12 m 27 s
21	306° 07' 35"	0.17"	308° 29' 37"	-18° 44' 30"	0.9845183	16' 14.72"	23° 26' 13"	-12 m 28 s
22	306° 10' 07"	0.18"	308° 32' 13"	-18° 43' 53"	0.9845228	16' 14.72"	23° 26' 13"	-12 m 28 s
23	306° 12' 39"	0.19"	308° 34' 49"	-18° 43' 15"	0.9845273	16' 14.71"	23° 26' 13"	-12 m 29 s
24	306° 15' 12"	0.19"	308° 37' 25"	-18° 42' 37"	0.9845319	16' 14.71"	23° 26' 13"	-12 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	80° 15' 46"	0° 06' 11"	79° 23' 53"	23° 10' 57"	0° 55' 11"	15' 02.30"	265° 54' 24"	0.85437
1	80° 46' 27"	0° 08' 58"	79° 56' 58"	23° 15' 54"	0° 55' 12"	15' 02.65"	266° 10' 18"	0.85724
2	81° 17' 09"	0° 11' 44"	80° 30' 07"	23° 20' 44"	0° 55' 14"	15' 03.00"	266° 26' 20"	0.86009
3	81° 47' 53"	0° 14' 30"	81° 03' 20"	23° 25' 28"	0° 55' 15"	15' 03.35"	266° 42' 31"	0.86292
4	82° 18' 38"	0° 17' 16"	81° 36' 38"	23° 30' 05"	0° 55' 16"	15' 03.71"	266° 58' 51"	0.86572
5	82° 49' 26"	0° 20' 03"	82° 09' 59"	23° 34' 34"	0° 55' 18"	15' 04.07"	267° 15' 19"	0.86850
6	83° 20' 14"	0° 22' 49"	82° 43' 24"	23° 38' 57"	0° 55' 19"	15' 04.44"	267° 31' 57"	0.87126
7	83° 51' 05"	0° 25' 35"	83° 16' 54"	23° 43' 13"	0° 55' 20"	15' 04.80"	267° 48' 43"	0.87400
8	84° 21' 57"	0° 28' 22"	83° 50' 27"	23° 47' 22"	0° 55' 22"	15' 05.17"	268° 5' 39"	0.87671
9	84° 52' 51"	0° 31' 08"	84° 24' 05"	23° 51' 24"	0° 55' 23"	15' 05.54"	268° 22' 43"	0.87940
10	85° 23' 46"	0° 33' 55"	84° 57' 46"	23° 55' 18"	0° 55' 24"	15' 05.92"	268° 39' 57"	0.88207
11	85° 54' 44"	0° 36' 41"	85° 31' 31"	23° 59' 06"	0° 55' 26"	15' 06.29"	268° 57' 21"	0.88471
12	86° 25' 43"	0° 39' 27"	86° 05' 20"	24° 02' 46"	0° 55' 27"	15' 06.67"	269° 14' 54"	0.88733
13	86° 56' 43"	0° 42' 14"	86° 39' 13"	24° 06' 19"	0° 55' 29"	15' 07.05"	269° 32' 37"	0.88993
14	87° 27' 46"	0° 44' 60"	87° 13' 09"	24° 09' 45"	0° 55' 30"	15' 07.43"	269° 50' 30"	0.89250
15	87° 58' 50"	0° 47' 46"	87° 47' 09"	24° 13' 04"	0° 55' 31"	15' 07.82"	270° 8' 33"	0.89505
16	88° 29' 56"	0° 50' 32"	88° 21' 13"	24° 16' 15"	0° 55' 33"	15' 08.21"	270° 26' 46"	0.89757
17	89° 01' 04"	0° 53' 18"	88° 55' 20"	24° 19' 18"	0° 55' 34"	15' 08.60"	270° 45' 10"	0.90007
18	89° 32' 14"	0° 56' 04"	89° 29' 31"	24° 22' 14"	0° 55' 36"	15' 08.99"	271° 3' 45"	0.90254
19	90° 03' 26"	0° 58' 50"	90° 03' 46"	24° 25' 03"	0° 55' 37"	15' 09.38"	271° 22' 30"	0.90498
20	90° 34' 39"	1° 01' 35"	90° 38' 04"	24° 27' 44"	0° 55' 39"	15' 09.78"	271° 41' 27"	0.90741
21	91° 05' 54"	1° 04' 20"	91° 12' 25"	24° 30' 17"	0° 55' 40"	15' 10.17"	272° 0' 35"	0.90980
22	91° 37' 11"	1° 07' 06"	91° 46' 50"	24° 32' 43"	0° 55' 42"	15' 10.57"	272° 19' 55"	0.91217
23	92° 08' 30"	1° 09' 51"	92° 21' 18"	24° 35' 01"	0° 55' 43"	15' 10.97"	272° 39' 27"	0.91451
24	92° 39' 51"	1° 12' 35"	92° 55' 49"	24° 37' 11"	0° 55' 45"	15' 11.38"	272° 59' 11"	0.91682

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblivity	Equation Of Time
0	306° 15' 12"	0.19"	308° 37' 25"	-18° 42' 37"	0.9845319	16' 14.71"	23° 26' 13"	-12 m 29 s
1	306° 17' 44"	0.20"	308° 40' 01"	-18° 41' 59"	0.9845364	16' 14.70"	23° 26' 13"	-12 m 30 s
2	306° 20' 17"	0.20"	308° 42' 37"	-18° 41' 21"	0.9845410	16' 14.70"	23° 26' 13"	-12 m 30 s
3	306° 22' 49"	0.21"	308° 45' 13"	-18° 40' 43"	0.9845455	16' 14.69"	23° 26' 13"	-12 m 31 s
4	306° 25' 22"	0.21"	308° 47' 49"	-18° 40' 05"	0.9845501	16' 14.69"	23° 26' 13"	-12 m 31 s
5	306° 27' 54"	0.22"	308° 50' 25"	-18° 39' 27"	0.9845547	16' 14.68"	23° 26' 13"	-12 m 32 s
6	306° 30' 27"	0.22"	308° 53' 00"	-18° 38' 49"	0.9845593	16' 14.68"	23° 26' 13"	-12 m 32 s
7	306° 32' 59"	0.23"	308° 55' 36"	-18° 38' 11"	0.9845639	16' 14.68"	23° 26' 13"	-12 m 33 s
8	306° 35' 32"	0.23"	308° 58' 12"	-18° 37' 33"	0.9845685	16' 14.67"	23° 26' 13"	-12 m 33 s
9	306° 38' 04"	0.24"	309° 00' 48"	-18° 36' 55"	0.9845731	16' 14.67"	23° 26' 13"	-12 m 34 s
10	306° 40' 36"	0.24"	309° 03' 23"	-18° 36' 17"	0.9845778	16' 14.66"	23° 26' 13"	-12 m 35 s
11	306° 43' 09"	0.25"	309° 05' 59"	-18° 35' 38"	0.9845824	16' 14.66"	23° 26' 13"	-12 m 35 s
12	306° 45' 41"	0.25"	309° 08' 35"	-18° 35' 00"	0.9845871	16' 14.65"	23° 26' 13"	-12 m 36 s
13	306° 48' 14"	0.26"	309° 11' 10"	-18° 34' 22"	0.9845917	16' 14.65"	23° 26' 13"	-12 m 36 s
14	306° 50' 46"	0.26"	309° 13' 46"	-18° 33' 44"	0.9845964	16' 14.64"	23° 26' 13"	-12 m 37 s
15	306° 53' 19"	0.27"	309° 16' 22"	-18° 33' 05"	0.9846011	16' 14.64"	23° 26' 13"	-12 m 37 s
16	306° 55' 51"	0.27"	309° 18' 57"	-18° 32' 27"	0.9846058	16' 14.63"	23° 26' 13"	-12 m 38 s
17	306° 58' 23"	0.28"	309° 21' 33"	-18° 31' 48"	0.9846105	16' 14.63"	23° 26' 13"	-12 m 38 s
18	307° 00' 56"	0.28"	309° 24' 08"	-18° 31' 10"	0.9846152	16' 14.62"	23° 26' 13"	-12 m 39 s
19	307° 03' 28"	0.29"	309° 26' 44"	-18° 30' 31"	0.9846199	16' 14.62"	23° 26' 13"	-12 m 39 s
20	307° 06' 01"	0.29"	309° 29' 19"	-18° 29' 53"	0.9846246	16' 14.62"	23° 26' 13"	-12 m 40 s
21	307° 08' 33"	0.30"	309° 31' 55"	-18° 29' 14"	0.9846294	16' 14.61"	23° 26' 13"	-12 m 40 s
22	307° 11' 05"	0.30"	309° 34' 30"	-18° 28' 36"	0.9846341	16' 14.61"	23° 26' 13"	-12 m 41 s
23	307° 13' 38"	0.31"	309° 37' 06"	-18° 27' 57"	0.9846389	16' 14.60"	23° 26' 13"	-12 m 41 s
24	307° 16' 10"	0.31"	309° 39' 41"	-18° 27' 18"	0.9846437	16' 14.60"	23° 26' 13"	-12 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	92° 39' 51"	1° 12' 35"	92° 55' 49"	24° 37' 11"	0° 55' 45"	15' 11.38"	272° 59' 11"	0.91682
1	93° 11' 14"	1° 15' 20"	93° 30' 23"	24° 39' 14"	0° 55' 46"	15' 11.78"	273° 19' 08"	0.91911
2	93° 42' 38"	1° 18' 04"	94° 05' 00"	24° 41' 08"	0° 55' 47"	15' 12.19"	273° 39' 18"	0.92137
3	94° 14' 05"	1° 20' 48"	94° 39' 41"	24° 42' 55"	0° 55' 49"	15' 12.59"	273° 59' 42"	0.92361
4	94° 45' 33"	1° 23' 32"	95° 14' 24"	24° 44' 34"	0° 55' 50"	15' 13.00"	274° 20' 20"	0.92581
5	95° 17' 04"	1° 26' 16"	95° 49' 11"	24° 46' 05"	0° 55' 52"	15' 13.41"	274° 41' 11"	0.92799
6	95° 48' 36"	1° 28' 59"	96° 23' 60"	24° 47' 28"	0° 55' 53"	15' 13.83"	275° 2' 18"	0.93014
7	96° 20' 10"	1° 31' 42"	96° 58' 52"	24° 48' 43"	0° 55' 55"	15' 14.24"	275° 23' 40"	0.93226
8	96° 51' 46"	1° 34' 24"	97° 33' 47"	24° 49' 50"	0° 55' 57"	15' 14.65"	275° 45' 18"	0.93435
9	97° 23' 24"	1° 37' 07"	98° 08' 44"	24° 50' 49"	0° 55' 58"	15' 15.07"	276° 7' 13"	0.93641
10	97° 55' 04"	1° 39' 49"	98° 43' 44"	24° 51' 39"	0° 55' 60"	15' 15.49"	276° 29' 25"	0.93845
11	98° 26' 46"	1° 42' 30"	99° 18' 46"	24° 52' 22"	0° 56' 01"	15' 15.91"	276° 51' 54"	0.94045
12	98° 58' 30"	1° 45' 11"	99° 53' 51"	24° 52' 56"	0° 56' 03"	15' 16.33"	277° 14' 43"	0.94243
13	99° 30' 16"	1° 47' 52"	100° 28' 59"	24° 53' 23"	0° 56' 04"	15' 16.75"	277° 37' 51"	0.94437
14	100° 02' 04"	1° 50' 32"	101° 04' 08"	24° 53' 41"	0° 56' 06"	15' 17.17"	278° 1' 20"	0.94629
15	100° 33' 54"	1° 53' 12"	101° 39' 20"	24° 53' 50"	0° 56' 07"	15' 17.59"	278° 25' 10"	0.94817
16	101° 05' 46"	1° 55' 52"	102° 14' 34"	24° 53' 52"	0° 56' 09"	15' 18.02"	278° 49' 22"	0.95003
17	101° 37' 40"	1° 58' 31"	102° 49' 50"	24° 53' 45"	0° 56' 10"	15' 18.44"	279° 13' 58"	0.95185
18	102° 09' 36"	2° 01' 09"	103° 25' 08"	24° 53' 30"	0° 56' 12"	15' 18.87"	279° 38' 59"	0.95364
19	102° 41' 34"	2° 03' 47"	104° 00' 28"	24° 53' 06"	0° 56' 14"	15' 19.29"	280° 4' 26"	0.95540
20	103° 13' 34"	2° 06' 25"	104° 35' 50"	24° 52' 35"	0° 56' 15"	15' 19.72"	280° 30' 21"	0.95713
21	103° 45' 36"	2° 09' 02"	105° 11' 13"	24° 51' 54"	0° 56' 17"	15' 20.15"	280° 56' 46"	0.95883
22	104° 17' 40"	2° 11' 38"	105° 46' 39"	24° 51' 06"	0° 56' 18"	15' 20.58"	281° 23' 41"	0.96049
23	104° 49' 46"	2° 14' 14"	106° 22' 05"	24° 50' 09"	0° 56' 20"	15' 21.00"	281° 51' 09"	0.96212
24	105° 21' 54"	2° 16' 50"	106° 57' 34"	24° 49' 03"	0° 56' 21"	15' 21.43"	282° 19' 13"	0.96372

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	307° 16' 10"	0.31"	309° 39' 41"	-18° 27' 18"	0.9846437	16' 14.60"	23° 26' 13"	-12 m 42 s
1	307° 18' 43"	0.32"	309° 42' 17"	-18° 26' 40"	0.9846485	16' 14.59"	23° 26' 13"	-12 m 42 s
2	307° 21' 15"	0.32"	309° 44' 52"	-18° 26' 01"	0.9846533	16' 14.59"	23° 26' 13"	-12 m 43 s
3	307° 23' 48"	0.33"	309° 47' 27"	-18° 25' 22"	0.9846581	16' 14.58"	23° 26' 13"	-12 m 43 s
4	307° 26' 20"	0.33"	309° 50' 03"	-18° 24' 43"	0.9846629	16' 14.58"	23° 26' 13"	-12 m 44 s
5	307° 28' 52"	0.34"	309° 52' 38"	-18° 24' 04"	0.9846677	16' 14.57"	23° 26' 13"	-12 m 44 s
6	307° 31' 25"	0.34"	309° 55' 13"	-18° 23' 26"	0.9846726	16' 14.57"	23° 26' 13"	-12 m 45 s
7	307° 33' 57"	0.35"	309° 57' 49"	-18° 22' 47"	0.9846774	16' 14.56"	23° 26' 13"	-12 m 45 s
8	307° 36' 30"	0.35"	310° 00' 24"	-18° 22' 08"	0.9846823	16' 14.56"	23° 26' 13"	-12 m 46 s
9	307° 39' 02"	0.36"	310° 02' 59"	-18° 21' 29"	0.9846871	16' 14.55"	23° 26' 13"	-12 m 46 s
10	307° 41' 34"	0.36"	310° 05' 34"	-18° 20' 50"	0.9846920	16' 14.55"	23° 26' 13"	-12 m 47 s
11	307° 44' 07"	0.37"	310° 08' 10"	-18° 20' 11"	0.9846969	16' 14.54"	23° 26' 13"	-12 m 47 s
12	307° 46' 39"	0.37"	310° 10' 45"	-18° 19' 32"	0.9847018	16' 14.54"	23° 26' 13"	-12 m 48 s
13	307° 49' 11"	0.38"	310° 13' 20"	-18° 18' 52"	0.9847067	16' 14.53"	23° 26' 13"	-12 m 48 s
14	307° 51' 44"	0.38"	310° 15' 55"	-18° 18' 13"	0.9847116	16' 14.53"	23° 26' 13"	-12 m 49 s
15	307° 54' 16"	0.38"	310° 18' 30"	-18° 17' 34"	0.9847166	16' 14.52"	23° 26' 13"	-12 m 49 s
16	307° 56' 49"	0.39"	310° 21' 05"	-18° 16' 55"	0.9847215	16' 14.52"	23° 26' 13"	-12 m 50 s
17	307° 59' 21"	0.39"	310° 23' 40"	-18° 16' 16"	0.9847264	16' 14.51"	23° 26' 13"	-12 m 50 s
18	308° 01' 53"	0.40"	310° 26' 15"	-18° 15' 36"	0.9847314	16' 14.51"	23° 26' 13"	-12 m 51 s
19	308° 04' 26"	0.40"	310° 28' 50"	-18° 14' 57"	0.9847364	16' 14.50"	23° 26' 13"	-12 m 51 s
20	308° 06' 58"	0.41"	310° 31' 25"	-18° 14' 18"	0.9847414	16' 14.50"	23° 26' 13"	-12 m 52 s
21	308° 09' 31"	0.41"	310° 34' 00"	-18° 13' 38"	0.9847464	16' 14.49"	23° 26' 13"	-12 m 52 s
22	308° 12' 03"	0.41"	310° 36' 35"	-18° 12' 59"	0.9847514	16' 14.49"	23° 26' 13"	-12 m 53 s
23	308° 14' 35"	0.42"	310° 39' 10"	-18° 12' 19"	0.9847564	16' 14.48"	23° 26' 13"	-12 m 53 s
24	308° 17' 08"	0.42"	310° 41' 45"	-18° 11' 40"	0.9847614	16' 14.48"	23° 26' 13"	-12 m 54 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	105° 21' 54"	2° 16' 50"	106° 57' 34"	24° 49' 03"	0° 56' 21"	15' 21.43"	282° 19' 13"	0.96372
1	105° 54' 04"	2° 19' 24"	107° 33' 04"	24° 47' 49"	0° 56' 23"	15' 21.86"	282° 47' 54"	0.96529
2	106° 26' 16"	2° 21' 59"	108° 08' 35"	24° 46' 27"	0° 56' 25"	15' 22.29"	283° 17' 14"	0.96683
3	106° 58' 30"	2° 24' 32"	108° 44' 07"	24° 44' 56"	0° 56' 26"	15' 22.72"	283° 47' 18"	0.96833
4	107° 30' 46"	2° 27' 05"	109° 19' 41"	24° 43' 16"	0° 56' 28"	15' 23.16"	284° 18' 07"	0.96979
5	108° 03' 04"	2° 29' 37"	109° 55' 16"	24° 41' 28"	0° 56' 29"	15' 23.59"	284° 49' 45"	0.97123
6	108° 35' 24"	2° 32' 09"	110° 30' 51"	24° 39' 32"	0° 56' 31"	15' 24.02"	285° 22' 16"	0.97263
7	109° 07' 47"	2° 34' 40"	111° 06' 28"	24° 37' 27"	0° 56' 32"	15' 24.45"	285° 55' 43"	0.97400
8	109° 40' 11"	2° 37' 10"	111° 42' 06"	24° 35' 13"	0° 56' 34"	15' 24.88"	286° 30' 12"	0.97533
9	110° 12' 37"	2° 39' 40"	112° 17' 44"	24° 32' 51"	0° 56' 36"	15' 25.31"	287° 5' 48"	0.97663
10	110° 45' 06"	2° 42' 08"	112° 53' 23"	24° 30' 20"	0° 56' 37"	15' 25.74"	287° 42' 36"	0.97789
11	111° 17' 36"	2° 44' 37"	113° 29' 03"	24° 27' 41"	0° 56' 39"	15' 26.17"	288° 20' 42"	0.97912
12	111° 50' 08"	2° 47' 04"	114° 04' 43"	24° 24' 53"	0° 56' 40"	15' 26.60"	289° 0' 13"	0.98031
13	112° 22' 43"	2° 49' 30"	114° 40' 24"	24° 21' 57"	0° 56' 42"	15' 27.03"	289° 41' 18"	0.98147
14	112° 55' 20"	2° 51' 56"	115° 16' 05"	24° 18' 52"	0° 56' 44"	15' 27.47"	290° 24' 05"	0.98259
15	113° 27' 58"	2° 54' 21"	115° 51' 47"	24° 15' 39"	0° 56' 45"	15' 27.90"	291° 8' 45"	0.98367
16	114° 00' 39"	2° 56' 45"	116° 27' 28"	24° 12' 17"	0° 56' 47"	15' 28.33"	291° 55' 28"	0.98472
17	114° 33' 21"	2° 59' 08"	117° 03' 10"	24° 08' 46"	0° 56' 48"	15' 28.75"	292° 44' 29"	0.98574
18	115° 06' 06"	3° 01' 31"	117° 38' 52"	24° 05' 07"	0° 56' 50"	15' 29.18"	293° 36' 01"	0.98672
19	115° 38' 53"	3° 03' 52"	118° 14' 34"	24° 01' 20"	0° 56' 51"	15' 29.61"	294° 30' 21"	0.98766
20	116° 11' 41"	3° 06' 13"	118° 50' 15"	23° 57' 24"	0° 56' 53"	15' 30.04"	295° 27' 50"	0.98856
21	116° 44' 32"	3° 08' 33"	119° 25' 57"	23° 53' 19"	0° 56' 55"	15' 30.47"	296° 28' 49"	0.98943
22	117° 17' 25"	3° 10' 51"	120° 01' 38"	23° 49' 06"	0° 56' 56"	15' 30.89"	297° 33' 45"	0.99026
23	117° 50' 20"	3° 13' 09"	120° 37' 19"	23° 44' 44"	0° 56' 58"	15' 31.32"	298° 43' 07"	0.99105
24	118° 23' 17"	3° 15' 26"	121° 12' 60"	23° 40' 14"	0° 56' 59"	15' 31.74"	299° 57' 32"	0.99181

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	308° 17' 08"	0.42"	310° 41' 45"	-18° 11' 40"	0.9847614	16' 14.48"	23° 26' 13"	-12 m 54 s
1	308° 19' 40"	0.43"	310° 44' 20"	-18° 11' 00"	0.9847664	16' 14.47"	23° 26' 13"	-12 m 54 s
2	308° 22' 12"	0.43"	310° 46' 55"	-18° 10' 21"	0.9847715	16' 14.47"	23° 26' 13"	-12 m 55 s
3	308° 24' 45"	0.43"	310° 49' 30"	-18° 09' 41"	0.9847765	16' 14.46"	23° 26' 13"	-12 m 55 s
4	308° 27' 17"	0.44"	310° 52' 05"	-18° 09' 01"	0.9847816	16' 14.46"	23° 26' 13"	-12 m 56 s
5	308° 29' 50"	0.44"	310° 54' 39"	-18° 08' 22"	0.9847867	16' 14.45"	23° 26' 13"	-12 m 56 s
6	308° 32' 22"	0.45"	310° 57' 14"	-18° 07' 42"	0.9847918	16' 14.45"	23° 26' 13"	-12 m 57 s
7	308° 34' 54"	0.45"	310° 59' 49"	-18° 07' 02"	0.9847968	16' 14.44"	23° 26' 13"	-12 m 57 s
8	308° 37' 27"	0.45"	311° 02' 24"	-18° 06' 23"	0.9848020	16' 14.44"	23° 26' 13"	-12 m 57 s
9	308° 39' 59"	0.46"	311° 04' 58"	-18° 05' 43"	0.9848071	16' 14.43"	23° 26' 13"	-12 m 58 s
10	308° 42' 31"	0.46"	311° 07' 33"	-18° 05' 03"	0.9848122	16' 14.43"	23° 26' 13"	-12 m 58 s
11	308° 45' 04"	0.46"	311° 10' 08"	-18° 04' 23"	0.9848173	16' 14.42"	23° 26' 13"	-12 m 59 s
12	308° 47' 36"	0.47"	311° 12' 42"	-18° 03' 43"	0.9848225	16' 14.42"	23° 26' 13"	-12 m 59 s
13	308° 50' 08"	0.47"	311° 15' 17"	-18° 03' 03"	0.9848276	16' 14.41"	23° 26' 13"	-12 m 60 s
14	308° 52' 41"	0.47"	311° 17' 52"	-18° 02' 23"	0.9848328	16' 14.41"	23° 26' 13"	-13 m 00 s
15	308° 55' 13"	0.48"	311° 20' 26"	-18° 01' 43"	0.9848380	16' 14.40"	23° 26' 13"	-13 m 01 s
16	308° 57' 45"	0.48"	311° 23' 01"	-18° 01' 03"	0.9848432	16' 14.40"	23° 26' 13"	-13 m 01 s
17	309° 00' 18"	0.48"	311° 25' 35"	-18° 00' 23"	0.9848484	16' 14.39"	23° 26' 13"	-13 m 02 s
18	309° 02' 50"	0.49"	311° 28' 10"	-17° 59' 43"	0.9848536	16' 14.39"	23° 26' 13"	-13 m 02 s
19	309° 05' 22"	0.49"	311° 30' 44"	-17° 59' 03"	0.9848588	16' 14.38"	23° 26' 13"	-13 m 03 s
20	309° 07' 55"	0.49"	311° 33' 19"	-17° 58' 23"	0.9848640	16' 14.38"	23° 26' 13"	-13 m 03 s
21	309° 10' 27"	0.50"	311° 35' 53"	-17° 57' 42"	0.9848693	16' 14.37"	23° 26' 13"	-13 m 03 s
22	309° 12' 59"	0.50"	311° 38' 28"	-17° 57' 02"	0.9848745	16' 14.37"	23° 26' 13"	-13 m 04 s
23	309° 15' 32"	0.50"	311° 41' 02"	-17° 56' 22"	0.9848798	16' 14.36"	23° 26' 13"	-13 m 04 s
24	309° 18' 04"	0.51"	311° 43' 37"	-17° 55' 42"	0.9848851	16' 14.36"	23° 26' 13"	-13 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	118° 23' 17"	3° 15' 26"	121° 12' 60"	23° 40' 14"	0° 56' 59"	15' 31.74"	299° 57' 32"	0.99181
1	118° 56' 15"	3° 17' 42"	121° 48' 40"	23° 35' 36"	0° 57' 01"	15' 32.17"	301° 17' 39"	0.99253
2	119° 29' 16"	3° 19' 57"	122° 24' 19"	23° 30' 49"	0° 57' 02"	15' 32.59"	302° 44' 19"	0.99321
3	120° 02' 19"	3° 22' 11"	122° 59' 58"	23° 25' 54"	0° 57' 04"	15' 33.01"	304° 18' 28"	0.99385
4	120° 35' 24"	3° 24' 24"	123° 35' 36"	23° 20' 50"	0° 57' 05"	15' 33.44"	306° 1' 14"	0.99445
5	121° 08' 31"	3° 26' 36"	124° 11' 14"	23° 15' 38"	0° 57' 07"	15' 33.86"	307° 53' 57"	0.99502
6	121° 41' 39"	3° 28' 47"	124° 46' 50"	23° 10' 18"	0° 57' 09"	15' 34.28"	309° 58' 14"	0.99555
7	122° 14' 50"	3° 30' 57"	125° 22' 26"	23° 04' 49"	0° 57' 10"	15' 34.69"	312° 15' 57"	0.99604
8	122° 48' 03"	3° 33' 05"	125° 58' 00"	22° 59' 12"	0° 57' 12"	15' 35.11"	314° 49' 22"	0.99649
9	123° 21' 18"	3° 35' 13"	126° 33' 34"	22° 53' 27"	0° 57' 13"	15' 35.53"	317° 41' 07"	0.99690
10	123° 54' 34"	3° 37' 19"	127° 09' 06"	22° 47' 34"	0° 57' 15"	15' 35.94"	320° 54' 15"	0.99727
11	124° 27' 53"	3° 39' 25"	127° 44' 37"	22° 41' 32"	0° 57' 16"	15' 36.35"	324° 32' 15"	0.99760
12	125° 01' 13"	3° 41' 29"	128° 20' 07"	22° 35' 22"	0° 57' 18"	15' 36.77"	328° 38' 53"	0.99789
13	125° 34' 36"	3° 43' 32"	128° 55' 36"	22° 29' 04"	0° 57' 19"	15' 37.18"	333° 17' 60"	0.99815
14	126° 08' 00"	3° 45' 34"	129° 31' 03"	22° 22' 38"	0° 57' 21"	15' 37.58"	338° 32' 59"	0.99836
15	126° 41' 26"	3° 47' 35"	130° 06' 29"	22° 16' 03"	0° 57' 22"	15' 37.99"	344° 26' 02"	0.99854
16	127° 14' 55"	3° 49' 34"	130° 41' 53"	22° 09' 21"	0° 57' 24"	15' 38.40"	350° 56' 53"	0.99867
17	127° 48' 25"	3° 51' 32"	131° 17' 16"	22° 02' 31"	0° 57' 25"	15' 38.80"	358° 1' 40"	0.99876
18	128° 21' 57"	3° 53' 30"	131° 52' 37"	21° 55' 33"	0° 57' 27"	15' 39.20"	5° 32' 01"	0.99882
19	128° 55' 31"	3° 55' 25"	132° 27' 56"	21° 48' 26"	0° 57' 28"	15' 39.60"	13° 15' 19"	0.99883
20	129° 29' 06"	3° 57' 20"	133° 03' 14"	21° 41' 12"	0° 57' 30"	15' 40.00"	20° 56' 31"	0.99881
21	130° 02' 44"	3° 59' 13"	133° 38' 30"	21° 33' 50"	0° 57' 31"	15' 40.40"	28° 20' 59"	0.99874
22	130° 36' 24"	4° 01' 05"	134° 13' 44"	21° 26' 21"	0° 57' 32"	15' 40.80"	35° 17' 04"	0.99863
23	131° 10' 05"	4° 02' 56"	134° 48' 56"	21° 18' 43"	0° 57' 34"	15' 41.19"	41° 37' 38"	0.99848
24	131° 43' 48"	4° 04' 45"	135° 24' 06"	21° 10' 58"	0° 57' 35"	15' 41.58"	47° 19' 52"	0.99829

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	309° 18' 04"	0.51"	311° 43' 37"	-17° 55' 42"	0.9848851	16' 14.36"	23° 26' 13"	-13 m 05 s
1	309° 20' 36"	0.51"	311° 46' 11"	-17° 55' 01"	0.9848904	16' 14.35"	23° 26' 13"	-13 m 05 s
2	309° 23' 09"	0.51"	311° 48' 45"	-17° 54' 21"	0.9848957	16' 14.35"	23° 26' 13"	-13 m 06 s
3	309° 25' 41"	0.52"	311° 51' 20"	-17° 53' 40"	0.9849010	16' 14.34"	23° 26' 13"	-13 m 06 s
4	309° 28' 13"	0.52"	311° 53' 54"	-17° 52' 60"	0.9849063	16' 14.34"	23° 26' 13"	-13 m 07 s
5	309° 30' 46"	0.52"	311° 56' 28"	-17° 52' 20"	0.9849116	16' 14.33"	23° 26' 13"	-13 m 07 s
6	309° 33' 18"	0.52"	311° 59' 03"	-17° 51' 39"	0.9849169	16' 14.33"	23° 26' 14"	-13 m 07 s
7	309° 35' 50"	0.53"	312° 01' 37"	-17° 50' 58"	0.9849223	16' 14.32"	23° 26' 14"	-13 m 08 s
8	309° 38' 23"	0.53"	312° 04' 11"	-17° 50' 18"	0.9849276	16' 14.32"	23° 26' 14"	-13 m 08 s
9	309° 40' 55"	0.53"	312° 06' 45"	-17° 49' 37"	0.9849330	16' 14.31"	23° 26' 14"	-13 m 09 s
10	309° 43' 27"	0.54"	312° 09' 20"	-17° 48' 57"	0.9849384	16' 14.30"	23° 26' 14"	-13 m 09 s
11	309° 45' 60"	0.54"	312° 11' 54"	-17° 48' 16"	0.9849438	16' 14.30"	23° 26' 14"	-13 m 10 s
12	309° 48' 32"	0.54"	312° 14' 28"	-17° 47' 35"	0.9849492	16' 14.29"	23° 26' 14"	-13 m 10 s
13	309° 51' 04"	0.54"	312° 17' 02"	-17° 46' 54"	0.9849546	16' 14.29"	23° 26' 14"	-13 m 10 s
14	309° 53' 37"	0.54"	312° 19' 36"	-17° 46' 14"	0.9849600	16' 14.28"	23° 26' 14"	-13 m 11 s
15	309° 56' 09"	0.55"	312° 22' 10"	-17° 45' 33"	0.9849654	16' 14.28"	23° 26' 14"	-13 m 11 s
16	309° 58' 41"	0.55"	312° 24' 44"	-17° 44' 52"	0.9849709	16' 14.27"	23° 26' 14"	-13 m 12 s
17	310° 01' 13"	0.55"	312° 27' 18"	-17° 44' 11"	0.9849763	16' 14.27"	23° 26' 14"	-13 m 12 s
18	310° 03' 46"	0.55"	312° 29' 52"	-17° 43' 30"	0.9849818	16' 14.26"	23° 26' 14"	-13 m 13 s
19	310° 06' 18"	0.56"	312° 32' 26"	-17° 42' 49"	0.9849872	16' 14.26"	23° 26' 14"	-13 m 13 s
20	310° 08' 50"	0.56"	312° 35' 00"	-17° 42' 08"	0.9849927	16' 14.25"	23° 26' 14"	-13 m 13 s
21	310° 11' 23"	0.56"	312° 37' 34"	-17° 41' 27"	0.9849982	16' 14.25"	23° 26' 14"	-13 m 14 s
22	310° 13' 55"	0.56"	312° 40' 08"	-17° 40' 46"	0.9850037	16' 14.24"	23° 26' 14"	-13 m 14 s
23	310° 16' 27"	0.56"	312° 42' 42"	-17° 40' 05"	0.9850092	16' 14.23"	23° 26' 14"	-13 m 15 s
24	310° 18' 60"	0.57"	312° 45' 16"	-17° 39' 24"	0.9850148	16' 14.23"	23° 26' 14"	-13 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	131° 43' 48"	4° 04' 45"	135° 24' 06"	21° 10' 58"	0° 57' 35"	15' 41.58"	47° 19' 52"	0.99829
1	132° 17' 33"	4° 06' 33"	135° 59' 14"	21° 03' 05"	0° 57' 37"	15' 41.97"	52° 24' 17"	0.99806
2	132° 51' 20"	4° 08' 19"	136° 34' 20"	20° 55' 04"	0° 57' 38"	15' 42.36"	56° 53' 28"	0.99779
3	133° 25' 08"	4° 10' 05"	137° 09' 24"	20° 46' 56"	0° 57' 40"	15' 42.75"	60° 50' 60"	0.99748
4	133° 58' 59"	4° 11' 48"	137° 44' 26"	20° 38' 41"	0° 57' 41"	15' 43.13"	64° 20' 45"	0.99712
5	134° 32' 51"	4° 13' 31"	138° 19' 26"	20° 30' 18"	0° 57' 42"	15' 43.51"	67° 26' 25"	0.99673
6	135° 06' 45"	4° 15' 12"	138° 54' 24"	20° 21' 47"	0° 57' 44"	15' 43.89"	70° 11' 23"	0.99629
7	135° 40' 40"	4° 16' 51"	139° 29' 19"	20° 13' 09"	0° 57' 45"	15' 44.27"	72° 38' 36"	0.99582
8	136° 14' 38"	4° 18' 30"	140° 04' 12"	20° 04' 24"	0° 57' 47"	15' 44.64"	74° 50' 36"	0.99530
9	136° 48' 37"	4° 20' 06"	140° 39' 03"	19° 55' 31"	0° 57' 48"	15' 45.02"	76° 49' 31"	0.99474
10	137° 22' 37"	4° 21' 42"	141° 13' 51"	19° 46' 32"	0° 57' 49"	15' 45.39"	78° 37' 10"	0.99414
11	137° 56' 40"	4° 23' 15"	141° 48' 37"	19° 37' 25"	0° 57' 51"	15' 45.75"	80° 15' 05"	0.99349
12	138° 30' 44"	4° 24' 47"	142° 23' 21"	19° 28' 11"	0° 57' 52"	15' 46.12"	81° 44' 32"	0.99281
13	139° 04' 50"	4° 26' 18"	142° 58' 02"	19° 18' 50"	0° 57' 53"	15' 46.48"	83° 6' 37"	0.99208
14	139° 38' 57"	4° 27' 47"	143° 32' 41"	19° 09' 22"	0° 57' 55"	15' 46.84"	84° 22' 14"	0.99131
15	140° 13' 06"	4° 29' 15"	144° 07' 17"	18° 59' 47"	0° 57' 56"	15' 47.20"	85° 32' 11"	0.99050
16	140° 47' 17"	4° 30' 41"	144° 41' 51"	18° 50' 05"	0° 57' 57"	15' 47.56"	86° 37' 06"	0.98965
17	141° 21' 30"	4° 32' 06"	145° 16' 22"	18° 40' 16"	0° 57' 59"	15' 47.91"	87° 37' 33"	0.98876
18	141° 55' 44"	4° 33' 29"	145° 50' 51"	18° 30' 21"	0° 57' 60"	15' 48.26"	88° 34' 03"	0.98782
19	142° 29' 59"	4° 34' 50"	146° 25' 17"	18° 20' 19"	0° 58' 01"	15' 48.61"	89° 26' 59"	0.98684
20	143° 04' 16"	4° 36' 10"	146° 59' 40"	18° 10' 10"	0° 58' 02"	15' 48.96"	90° 16' 43"	0.98582
21	143° 38' 35"	4° 37' 28"	147° 34' 01"	17° 59' 55"	0° 58' 04"	15' 49.30"	91° 3' 35"	0.98476
22	144° 12' 55"	4° 38' 45"	148° 08' 20"	17° 49' 33"	0° 58' 05"	15' 49.64"	91° 47' 50"	0.98366
23	144° 47' 17"	4° 39' 60"	148° 42' 35"	17° 39' 05"	0° 58' 06"	15' 49.98"	92° 29' 43"	0.98252
24	145° 21' 40"	4° 41' 13"	149° 16' 48"	17° 28' 30"	0° 58' 07"	15' 50.31"	93° 9' 27"	0.98133

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	310° 18' 60"	0.57"	312° 45' 16"	-17° 39' 24"	0.9850148	16' 14.23"	23° 26' 14"	-13 m 15 s
1	310° 21' 32"	0.57"	312° 47' 50"	-17° 38' 43"	0.9850203	16' 14.22"	23° 26' 14"	-13 m 15 s
2	310° 24' 04"	0.57"	312° 50' 24"	-17° 38' 02"	0.9850258	16' 14.22"	23° 26' 14"	-13 m 16 s
3	310° 26' 36"	0.57"	312° 52' 58"	-17° 37' 21"	0.9850314	16' 14.21"	23° 26' 14"	-13 m 16 s
4	310° 29' 09"	0.57"	312° 55' 31"	-17° 36' 39"	0.9850369	16' 14.21"	23° 26' 14"	-13 m 17 s
5	310° 31' 41"	0.57"	312° 58' 05"	-17° 35' 58"	0.9850425	16' 14.20"	23° 26' 14"	-13 m 17 s
6	310° 34' 13"	0.58"	313° 00' 39"	-17° 35' 17"	0.9850481	16' 14.20"	23° 26' 14"	-13 m 17 s
7	310° 36' 46"	0.58"	313° 03' 13"	-17° 34' 36"	0.9850537	16' 14.19"	23° 26' 14"	-13 m 18 s
8	310° 39' 18"	0.58"	313° 05' 46"	-17° 33' 54"	0.9850593	16' 14.19"	23° 26' 14"	-13 m 18 s
9	310° 41' 50"	0.58"	313° 08' 20"	-17° 33' 13"	0.9850649	16' 14.18"	23° 26' 14"	-13 m 19 s
10	310° 44' 22"	0.58"	313° 10' 54"	-17° 32' 31"	0.9850705	16' 14.17"	23° 26' 14"	-13 m 19 s
11	310° 46' 55"	0.58"	313° 13' 27"	-17° 31' 50"	0.9850762	16' 14.17"	23° 26' 14"	-13 m 19 s
12	310° 49' 27"	0.58"	313° 16' 01"	-17° 31' 08"	0.9850818	16' 14.16"	23° 26' 14"	-13 m 20 s
13	310° 51' 59"	0.59"	313° 18' 35"	-17° 30' 27"	0.9850875	16' 14.16"	23° 26' 14"	-13 m 20 s
14	310° 54' 32"	0.59"	313° 21' 08"	-17° 29' 45"	0.9850931	16' 14.15"	23° 26' 14"	-13 m 21 s
15	310° 57' 04"	0.59"	313° 23' 42"	-17° 29' 04"	0.9850988	16' 14.15"	23° 26' 14"	-13 m 21 s
16	310° 59' 36"	0.59"	313° 26' 15"	-17° 28' 22"	0.9851045	16' 14.14"	23° 26' 14"	-13 m 21 s
17	311° 02' 08"	0.59"	313° 28' 49"	-17° 27' 40"	0.9851102	16' 14.13"	23° 26' 14"	-13 m 22 s
18	311° 04' 41"	0.59"	313° 31' 23"	-17° 26' 59"	0.9851159	16' 14.13"	23° 26' 14"	-13 m 22 s
19	311° 07' 13"	0.59"	313° 33' 56"	-17° 26' 17"	0.9851216	16' 14.12"	23° 26' 14"	-13 m 23 s
20	311° 09' 45"	0.59"	313° 36' 30"	-17° 25' 35"	0.9851274	16' 14.12"	23° 26' 14"	-13 m 23 s
21	311° 12' 17"	0.59"	313° 39' 03"	-17° 24' 53"	0.9851331	16' 14.11"	23° 26' 14"	-13 m 23 s
22	311° 14' 50"	0.59"	313° 41' 36"	-17° 24' 12"	0.9851389	16' 14.11"	23° 26' 14"	-13 m 24 s
23	311° 17' 22"	0.60"	313° 44' 10"	-17° 23' 30"	0.9851446	16' 14.10"	23° 26' 14"	-13 m 24 s
24	311° 19' 54"	0.60"	313° 46' 43"	-17° 22' 48"	0.9851504	16' 14.09"	23° 26' 14"	-13 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 21' 40"	4° 41' 13"	149° 16' 48"	17° 28' 30"	0° 58' 07"	15' 50.31"	93° 9' 27"	0.98133
1	145° 56' 04"	4° 42' 25"	149° 50' 59"	17° 17' 50"	0° 58' 09"	15' 50.65"	93° 47' 13"	0.98010
2	146° 30' 31"	4° 43' 35"	150° 25' 07"	17° 07' 03"	0° 58' 10"	15' 50.98"	94° 23' 10"	0.97883
3	147° 04' 58"	4° 44' 43"	150° 59' 12"	16° 56' 09"	0° 58' 11"	15' 51.30"	94° 57' 28"	0.97752
4	147° 39' 27"	4° 45' 49"	151° 33' 14"	16° 45' 10"	0° 58' 12"	15' 51.63"	95° 30' 13"	0.97617
5	148° 13' 58"	4° 46' 54"	152° 07' 14"	16° 34' 05"	0° 58' 13"	15' 51.95"	96° 1' 34"	0.97477
6	148° 48' 30"	4° 47' 58"	152° 41' 11"	16° 22' 54"	0° 58' 15"	15' 52.27"	96° 31' 36"	0.97334
7	149° 23' 03"	4° 48' 59"	153° 15' 06"	16° 11' 37"	0° 58' 16"	15' 52.58"	97° 0' 24"	0.97186
8	149° 57' 37"	4° 49' 59"	153° 48' 57"	16° 00' 14"	0° 58' 17"	15' 52.89"	97° 28' 05"	0.97034
9	150° 32' 13"	4° 50' 57"	154° 22' 47"	15° 48' 45"	0° 58' 18"	15' 53.20"	97° 54' 41"	0.96878
10	151° 06' 51"	4° 51' 53"	154° 56' 33"	15° 37' 11"	0° 58' 19"	15' 53.51"	98° 20' 18"	0.96718
11	151° 41' 29"	4° 52' 48"	155° 30' 17"	15° 25' 31"	0° 58' 20"	15' 53.81"	98° 44' 58"	0.96553
12	152° 16' 09"	4° 53' 40"	156° 03' 58"	15° 13' 46"	0° 58' 21"	15' 54.11"	99° 8' 46"	0.96385
13	152° 50' 50"	4° 54' 31"	156° 37' 37"	15° 01' 55"	0° 58' 22"	15' 54.41"	99° 31' 44"	0.96212
14	153° 25' 33"	4° 55' 20"	157° 11' 13"	14° 49' 59"	0° 58' 24"	15' 54.71"	99° 53' 56"	0.96036
15	154° 00' 16"	4° 56' 08"	157° 44' 46"	14° 37' 57"	0° 58' 25"	15' 55.00"	100° 15' 23"	0.95855
16	154° 35' 01"	4° 56' 53"	158° 18' 17"	14° 25' 51"	0° 58' 26"	15' 55.29"	100° 36' 08"	0.95670
17	155° 09' 47"	4° 57' 37"	158° 51' 45"	14° 13' 39"	0° 58' 27"	15' 55.57"	100° 56' 13"	0.95481
18	155° 44' 35"	4° 58' 19"	159° 25' 11"	14° 01' 22"	0° 58' 28"	15' 55.85"	101° 15' 40"	0.95288
19	156° 19' 23"	4° 58' 59"	159° 58' 34"	13° 49' 00"	0° 58' 29"	15' 56.13"	101° 34' 31"	0.95091
20	156° 54' 13"	4° 59' 37"	160° 31' 54"	13° 36' 33"	0° 58' 30"	15' 56.41"	101° 52' 47"	0.94890
21	157° 29' 04"	5° 00' 14"	161° 05' 12"	13° 24' 02"	0° 58' 31"	15' 56.68"	102° 10' 31"	0.94685
22	158° 03' 55"	5° 00' 49"	161° 38' 28"	13° 11' 25"	0° 58' 32"	15' 56.95"	102° 27' 43"	0.94476
23	158° 38' 48"	5° 01' 21"	162° 11' 41"	12° 58' 44"	0° 58' 33"	15' 57.22"	102° 44' 24"	0.94263
24	159° 13' 43"	5° 01' 52"	162° 44' 52"	12° 45' 59"	0° 58' 34"	15' 57.48"	103° 0' 37"	0.94046

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	311° 19' 54"	0.60"	313° 46' 43"	-17° 22' 48"	0.9851504	16' 14.09"	23° 26' 14"	-13 m 24 s
1	311° 22' 26"	0.60"	313° 49' 17"	-17° 22' 06"	0.9851562	16' 14.09"	23° 26' 14"	-13 m 25 s
2	311° 24' 59"	0.60"	313° 51' 50"	-17° 21' 24"	0.9851619	16' 14.08"	23° 26' 14"	-13 m 25 s
3	311° 27' 31"	0.60"	313° 54' 23"	-17° 20' 42"	0.9851677	16' 14.08"	23° 26' 14"	-13 m 26 s
4	311° 30' 03"	0.60"	313° 56' 57"	-17° 20' 00"	0.9851736	16' 14.07"	23° 26' 14"	-13 m 26 s
5	311° 32' 35"	0.60"	313° 59' 30"	-17° 19' 18"	0.9851794	16' 14.07"	23° 26' 14"	-13 m 26 s
6	311° 35' 08"	0.60"	314° 02' 03"	-17° 18' 36"	0.9851852	16' 14.06"	23° 26' 14"	-13 m 27 s
7	311° 37' 40"	0.60"	314° 04' 36"	-17° 17' 54"	0.9851910	16' 14.05"	23° 26' 14"	-13 m 27 s
8	311° 40' 12"	0.60"	314° 07' 10"	-17° 17' 12"	0.9851969	16' 14.05"	23° 26' 14"	-13 m 27 s
9	311° 42' 44"	0.60"	314° 09' 43"	-17° 16' 30"	0.9852028	16' 14.04"	23° 26' 14"	-13 m 28 s
10	311° 45' 17"	0.60"	314° 12' 16"	-17° 15' 47"	0.9852086	16' 14.04"	23° 26' 14"	-13 m 28 s
11	311° 47' 49"	0.60"	314° 14' 49"	-17° 15' 05"	0.9852145	16' 14.03"	23° 26' 14"	-13 m 28 s
12	311° 50' 21"	0.60"	314° 17' 22"	-17° 14' 23"	0.9852204	16' 14.03"	23° 26' 14"	-13 m 29 s
13	311° 52' 53"	0.60"	314° 19' 55"	-17° 13' 41"	0.9852263	16' 14.02"	23° 26' 14"	-13 m 29 s
14	311° 55' 26"	0.60"	314° 22' 28"	-17° 12' 58"	0.9852322	16' 14.01"	23° 26' 14"	-13 m 30 s
15	311° 57' 58"	0.60"	314° 25' 02"	-17° 12' 16"	0.9852381	16' 14.01"	23° 26' 14"	-13 m 30 s
16	312° 00' 30"	0.60"	314° 27' 35"	-17° 11' 33"	0.9852440	16' 14.00"	23° 26' 14"	-13 m 30 s
17	312° 03' 02"	0.60"	314° 30' 08"	-17° 10' 51"	0.9852500	16' 14.00"	23° 26' 14"	-13 m 31 s
18	312° 05' 35"	0.60"	314° 32' 41"	-17° 10' 09"	0.9852559	16' 13.99"	23° 26' 14"	-13 m 31 s
19	312° 08' 07"	0.60"	314° 35' 14"	-17° 09' 26"	0.9852619	16' 13.98"	23° 26' 14"	-13 m 31 s
20	312° 10' 39"	0.60"	314° 37' 47"	-17° 08' 44"	0.9852679	16' 13.98"	23° 26' 14"	-13 m 32 s
21	312° 13' 11"	0.60"	314° 40' 20"	-17° 08' 01"	0.9852738	16' 13.97"	23° 26' 14"	-13 m 32 s
22	312° 15' 43"	0.60"	314° 42' 52"	-17° 07' 18"	0.9852798	16' 13.97"	23° 26' 14"	-13 m 32 s
23	312° 18' 16"	0.60"	314° 45' 25"	-17° 06' 36"	0.9852858	16' 13.96"	23° 26' 14"	-13 m 33 s
24	312° 20' 48"	0.60"	314° 47' 58"	-17° 05' 53"	0.9852918	16' 13.96"	23° 26' 14"	-13 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	159° 13' 43"	5° 01' 52"	162° 44' 52"	12° 45' 59"	0° 58' 34"	15' 57.48"	103° 0' 37"	0.94046
1	159° 48' 38"	5° 02' 21"	163° 17' 60"	12° 33' 09"	0° 58' 35"	15' 57.74"	103° 16' 21"	0.93824
2	160° 23' 34"	5° 02' 48"	163° 51' 06"	12° 20' 14"	0° 58' 36"	15' 58.00"	103° 31' 39"	0.93599
3	160° 58' 31"	5° 03' 14"	164° 24' 09"	12° 07' 15"	0° 58' 37"	15' 58.25"	103° 46' 30"	0.93370
4	161° 33' 29"	5° 03' 37"	164° 57' 11"	11° 54' 12"	0° 58' 37"	15' 58.50"	104° 0' 57"	0.93138
5	162° 08' 28"	5° 03' 59"	165° 30' 10"	11° 41' 04"	0° 58' 38"	15' 58.75"	104° 14' 59"	0.92901
6	162° 43' 29"	5° 04' 18"	166° 03' 06"	11° 27' 53"	0° 58' 39"	15' 58.99"	104° 28' 38"	0.92660
7	163° 18' 30"	5° 04' 36"	166° 36' 01"	11° 14' 37"	0° 58' 40"	15' 59.23"	104° 41' 54"	0.92416
8	163° 53' 32"	5° 04' 52"	167° 08' 53"	11° 01' 17"	0° 58' 41"	15' 59.47"	104° 54' 48"	0.92167
9	164° 28' 35"	5° 05' 06"	167° 41' 43"	10° 47' 54"	0° 58' 42"	15' 59.71"	105° 7' 21"	0.91915
10	165° 03' 38"	5° 05' 18"	168° 14' 31"	10° 34' 26"	0° 58' 43"	15' 59.94"	105° 19' 32"	0.91659
11	165° 38' 43"	5° 05' 28"	168° 47' 17"	10° 20' 55"	0° 58' 44"	16' 00.17"	105° 31' 24"	0.91399
12	166° 13' 49"	5° 05' 36"	169° 20' 01"	10° 07' 21"	0° 58' 44"	16' 00.39"	105° 42' 56"	0.91135
13	166° 48' 55"	5° 05' 42"	169° 52' 42"	9° 53' 42"	0° 58' 45"	16' 00.61"	105° 54' 09"	0.90868
14	167° 24' 02"	5° 05' 47"	170° 25' 22"	9° 40' 01"	0° 58' 46"	16' 00.83"	106° 5' 03"	0.90597
15	167° 59' 10"	5° 05' 49"	170° 58' 00"	9° 26' 15"	0° 58' 47"	16' 01.05"	106° 15' 38"	0.90322
16	168° 34' 19"	5° 05' 50"	171° 30' 36"	9° 12' 27"	0° 58' 48"	16' 01.26"	106° 25' 56"	0.90044
17	169° 09' 29"	5° 05' 48"	172° 03' 10"	8° 58' 35"	0° 58' 48"	16' 01.47"	106° 35' 56"	0.89761
18	169° 44' 39"	5° 05' 45"	172° 35' 43"	8° 44' 40"	0° 58' 49"	16' 01.67"	106° 45' 40"	0.89475
19	170° 19' 50"	5° 05' 40"	173° 08' 13"	8° 30' 42"	0° 58' 50"	16' 01.88"	106° 55' 06"	0.89186
20	170° 55' 02"	5° 05' 32"	173° 40' 42"	8° 16' 41"	0° 58' 51"	16' 02.08"	107° 4' 16"	0.88893
21	171° 30' 14"	5° 05' 23"	174° 13' 09"	8° 02' 37"	0° 58' 51"	16' 02.27"	107° 13' 10"	0.88596
22	172° 05' 27"	5° 05' 12"	174° 45' 35"	7° 48' 31"	0° 58' 52"	16' 02.47"	107° 21' 48"	0.88296
23	172° 40' 41"	5° 04' 59"	175° 17' 59"	7° 34' 21"	0° 58' 53"	16' 02.65"	107° 30' 10"	0.87992
24	173° 15' 56"	5° 04' 44"	175° 50' 21"	7° 20' 09"	0° 58' 53"	16' 02.84"	107° 38' 17"	0.87685

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	312° 20' 48"	0.60"	314° 47' 58"	-17° 05' 53"	0.9852918	16' 13.96"	23° 26' 14"	-13 m 33 s
1	312° 23' 20"	0.59"	314° 50' 31"	-17° 05' 11"	0.9852979	16' 13.95"	23° 26' 14"	-13 m 33 s
2	312° 25' 52"	0.59"	314° 53' 04"	-17° 04' 28"	0.9853039	16' 13.94"	23° 26' 14"	-13 m 34 s
3	312° 28' 25"	0.59"	314° 55' 37"	-17° 03' 45"	0.9853099	16' 13.94"	23° 26' 14"	-13 m 34 s
4	312° 30' 57"	0.59"	314° 58' 10"	-17° 03' 02"	0.9853160	16' 13.93"	23° 26' 14"	-13 m 34 s
5	312° 33' 29"	0.59"	315° 00' 42"	-17° 02' 20"	0.9853220	16' 13.93"	23° 26' 14"	-13 m 35 s
6	312° 36' 01"	0.59"	315° 03' 15"	-17° 01' 37"	0.9853281	16' 13.92"	23° 26' 14"	-13 m 35 s
7	312° 38' 33"	0.59"	315° 05' 48"	-17° 00' 54"	0.9853342	16' 13.91"	23° 26' 14"	-13 m 35 s
8	312° 41' 06"	0.59"	315° 08' 21"	-17° 00' 11"	0.9853402	16' 13.91"	23° 26' 14"	-13 m 36 s
9	312° 43' 38"	0.59"	315° 10' 53"	-16° 59' 28"	0.9853463	16' 13.90"	23° 26' 14"	-13 m 36 s
10	312° 46' 10"	0.59"	315° 13' 26"	-16° 58' 45"	0.9853524	16' 13.90"	23° 26' 14"	-13 m 36 s
11	312° 48' 42"	0.58"	315° 15' 59"	-16° 58' 02"	0.9853586	16' 13.89"	23° 26' 14"	-13 m 37 s
12	312° 51' 14"	0.58"	315° 18' 31"	-16° 57' 19"	0.9853647	16' 13.88"	23° 26' 14"	-13 m 37 s
13	312° 53' 47"	0.58"	315° 21' 04"	-16° 56' 36"	0.9853708	16' 13.88"	23° 26' 14"	-13 m 37 s
14	312° 56' 19"	0.58"	315° 23' 36"	-16° 55' 53"	0.9853770	16' 13.87"	23° 26' 14"	-13 m 38 s
15	312° 58' 51"	0.58"	315° 26' 09"	-16° 55' 10"	0.9853831	16' 13.86"	23° 26' 14"	-13 m 38 s
16	313° 01' 23"	0.58"	315° 28' 42"	-16° 54' 27"	0.9853893	16' 13.86"	23° 26' 14"	-13 m 38 s
17	313° 03' 55"	0.58"	315° 31' 14"	-16° 53' 44"	0.9853954	16' 13.85"	23° 26' 14"	-13 m 39 s
18	313° 06' 28"	0.57"	315° 33' 47"	-16° 53' 00"	0.9854016	16' 13.85"	23° 26' 14"	-13 m 39 s
19	313° 08' 60"	0.57"	315° 36' 19"	-16° 52' 17"	0.9854078	16' 13.84"	23° 26' 14"	-13 m 39 s
20	313° 11' 32"	0.57"	315° 38' 52"	-16° 51' 34"	0.9854140	16' 13.83"	23° 26' 14"	-13 m 40 s
21	313° 14' 04"	0.57"	315° 41' 24"	-16° 50' 51"	0.9854202	16' 13.83"	23° 26' 14"	-13 m 40 s
22	313° 16' 36"	0.57"	315° 43' 56"	-16° 50' 07"	0.9854264	16' 13.82"	23° 26' 14"	-13 m 40 s
23	313° 19' 09"	0.57"	315° 46' 29"	-16° 49' 24"	0.9854327	16' 13.82"	23° 26' 14"	-13 m 40 s
24	313° 21' 41"	0.56"	315° 49' 01"	-16° 48' 40"	0.9854389	16' 13.81"	23° 26' 14"	-13 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	173° 15' 56"	5° 04' 44"	175° 50' 21"	7° 20' 09"	0° 58' 53"	16' 02.84"	107° 38' 17"	0.87685
1	173° 51' 11"	5° 04' 27"	176° 22' 42"	7° 05' 54"	0° 58' 54"	16' 03.02"	107° 46' 09"	0.87374
2	174° 26' 26"	5° 04' 09"	176° 55' 02"	6° 51' 37"	0° 58' 55"	16' 03.20"	107° 53' 47"	0.87060
3	175° 01' 42"	5° 03' 48"	177° 27' 20"	6° 37' 17"	0° 58' 55"	16' 03.38"	108° 1' 09"	0.86743
4	175° 36' 59"	5° 03' 25"	177° 59' 37"	6° 22' 55"	0° 58' 56"	16' 03.56"	108° 8' 18"	0.86422
5	176° 12' 17"	5° 03' 01"	178° 31' 52"	6° 08' 31"	0° 58' 57"	16' 03.73"	108° 15' 12"	0.86097
6	176° 47' 34"	5° 02' 34"	179° 04' 07"	5° 54' 04"	0° 58' 57"	16' 03.89"	108° 21' 52"	0.85770
7	177° 22' 53"	5° 02' 06"	179° 36' 20"	5° 39' 36"	0° 58' 58"	16' 04.06"	108° 28' 19"	0.85439
8	177° 58' 12"	5° 01' 35"	180° 08' 32"	5° 25' 05"	0° 58' 58"	16' 04.22"	108° 34' 31"	0.85105
9	178° 33' 31"	5° 01' 03"	180° 40' 43"	5° 10' 32"	0° 58' 59"	16' 04.38"	108° 40' 31"	0.84767
10	179° 08' 51"	5° 00' 29"	181° 12' 53"	4° 55' 58"	0° 58' 60"	16' 04.53"	108° 46' 17"	0.84426
11	179° 44' 11"	4° 59' 52"	181° 45' 02"	4° 41' 22"	0° 59' 00"	16' 04.68"	108° 51' 50"	0.84082
12	180° 19' 32"	4° 59' 14"	182° 17' 10"	4° 26' 44"	0° 59' 01"	16' 04.83"	108° 57' 10"	0.83735
13	180° 54' 53"	4° 58' 34"	182° 49' 17"	4° 12' 05"	0° 59' 01"	16' 04.98"	109° 2' 17"	0.83385
14	181° 30' 14"	4° 57' 52"	183° 21' 24"	3° 57' 24"	0° 59' 02"	16' 05.12"	109° 7' 12"	0.83032
15	182° 05' 36"	4° 57' 09"	183° 53' 29"	3° 42' 41"	0° 59' 02"	16' 05.26"	109° 11' 54"	0.82676
16	182° 40' 58"	4° 56' 23"	184° 25' 35"	3° 27' 57"	0° 59' 03"	16' 05.40"	109° 16' 23"	0.82316
17	183° 16' 21"	4° 55' 35"	184° 57' 39"	3° 13' 12"	0° 59' 03"	16' 05.53"	109° 20' 40"	0.81954
18	183° 51' 44"	4° 54' 46"	185° 29' 43"	2° 58' 26"	0° 59' 04"	16' 05.66"	109° 24' 45"	0.81589
19	184° 27' 07"	4° 53' 54"	186° 01' 46"	2° 43' 38"	0° 59' 04"	16' 05.79"	109° 28' 38"	0.81220
20	185° 02' 31"	4° 53' 01"	186° 33' 49"	2° 28' 50"	0° 59' 05"	16' 05.91"	109° 32' 19"	0.80849
21	185° 37' 54"	4° 52' 06"	187° 05' 52"	2° 14' 01"	0° 59' 05"	16' 06.03"	109° 35' 48"	0.80475
22	186° 13' 18"	4° 51' 09"	187° 37' 54"	1° 59' 10"	0° 59' 06"	16' 06.15"	109° 39' 05"	0.80098
23	186° 48' 43"	4° 50' 10"	188° 09' 56"	1° 44' 19"	0° 59' 06"	16' 06.27"	109° 42' 10"	0.79719
24	187° 24' 07"	4° 49' 09"	188° 41' 58"	1° 29' 28"	0° 59' 06"	16' 06.38"	109° 45' 04"	0.79336

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	313° 21' 41"	0.56"	315° 49' 01"	-16° 48' 40"	0.9854389	16' 13.81"	23° 26' 14"	-13 m 41 s
1	313° 24' 13"	0.56"	315° 51' 34"	-16° 47' 57"	0.9854452	16' 13.80"	23° 26' 14"	-13 m 41 s
2	313° 26' 45"	0.56"	315° 54' 06"	-16° 47' 14"	0.9854514	16' 13.80"	23° 26' 14"	-13 m 41 s
3	313° 29' 17"	0.56"	315° 56' 38"	-16° 46' 30"	0.9854577	16' 13.79"	23° 26' 14"	-13 m 42 s
4	313° 31' 49"	0.56"	315° 59' 11"	-16° 45' 47"	0.9854639	16' 13.78"	23° 26' 14"	-13 m 42 s
5	313° 34' 22"	0.55"	316° 01' 43"	-16° 45' 03"	0.9854702	16' 13.78"	23° 26' 14"	-13 m 42 s
6	313° 36' 54"	0.55"	316° 04' 15"	-16° 44' 19"	0.9854765	16' 13.77"	23° 26' 14"	-13 m 43 s
7	313° 39' 26"	0.55"	316° 06' 47"	-16° 43' 36"	0.9854828	16' 13.77"	23° 26' 14"	-13 m 43 s
8	313° 41' 58"	0.55"	316° 09' 20"	-16° 42' 52"	0.9854891	16' 13.76"	23° 26' 14"	-13 m 43 s
9	313° 44' 30"	0.55"	316° 11' 52"	-16° 42' 09"	0.9854954	16' 13.75"	23° 26' 14"	-13 m 43 s
10	313° 47' 03"	0.54"	316° 14' 24"	-16° 41' 25"	0.9855018	16' 13.75"	23° 26' 14"	-13 m 44 s
11	313° 49' 35"	0.54"	316° 16' 56"	-16° 40' 41"	0.9855081	16' 13.74"	23° 26' 14"	-13 m 44 s
12	313° 52' 07"	0.54"	316° 19' 28"	-16° 39' 57"	0.9855145	16' 13.74"	23° 26' 14"	-13 m 44 s
13	313° 54' 39"	0.54"	316° 22' 00"	-16° 39' 14"	0.9855208	16' 13.73"	23° 26' 14"	-13 m 45 s
14	313° 57' 11"	0.53"	316° 24' 32"	-16° 38' 30"	0.9855272	16' 13.72"	23° 26' 14"	-13 m 45 s
15	313° 59' 43"	0.53"	316° 27' 04"	-16° 37' 46"	0.9855336	16' 13.72"	23° 26' 14"	-13 m 45 s
16	314° 02' 16"	0.53"	316° 29' 37"	-16° 37' 02"	0.9855399	16' 13.71"	23° 26' 14"	-13 m 45 s
17	314° 04' 48"	0.53"	316° 32' 09"	-16° 36' 18"	0.9855463	16' 13.70"	23° 26' 14"	-13 m 46 s
18	314° 07' 20"	0.52"	316° 34' 41"	-16° 35' 34"	0.9855527	16' 13.70"	23° 26' 14"	-13 m 46 s
19	314° 09' 52"	0.52"	316° 37' 13"	-16° 34' 50"	0.9855591	16' 13.69"	23° 26' 14"	-13 m 46 s
20	314° 12' 24"	0.52"	316° 39' 45"	-16° 34' 06"	0.9855656	16' 13.68"	23° 26' 14"	-13 m 47 s
21	314° 14' 56"	0.51"	316° 42' 16"	-16° 33' 22"	0.9855720	16' 13.68"	23° 26' 14"	-13 m 47 s
22	314° 17' 29"	0.51"	316° 44' 48"	-16° 32' 38"	0.9855784	16' 13.67"	23° 26' 14"	-13 m 47 s
23	314° 20' 01"	0.51"	316° 47' 20"	-16° 31' 54"	0.9855849	16' 13.67"	23° 26' 14"	-13 m 47 s
24	314° 22' 33"	0.51"	316° 49' 52"	-16° 31' 10"	0.9855913	16' 13.66"	23° 26' 14"	-13 m 48 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	187° 24' 07"	4° 49' 09"	188° 41' 58"	1° 29' 28"	0° 59' 06"	16' 06.38"	109° 45' 04"	0.79336
1	187° 59' 32"	4° 48' 07"	189° 13' 59"	1° 14' 35"	0° 59' 07"	16' 06.49"	109° 47' 46"	0.78951
2	188° 34' 57"	4° 47' 02"	189° 46' 01"	0° 59' 42"	0° 59' 07"	16' 06.60"	109° 50' 17"	0.78563
3	189° 10' 22"	4° 45' 56"	190° 18' 03"	0° 44' 49"	0° 59' 08"	16' 06.70"	109° 52' 36"	0.78173
4	189° 45' 48"	4° 44' 48"	190° 50' 04"	0° 29' 55"	0° 59' 08"	16' 06.80"	109° 54' 44"	0.77780
5	190° 21' 13"	4° 43' 38"	191° 22' 06"	0° 15' 01"	0° 59' 08"	16' 06.90"	109° 56' 41"	0.77384
6	190° 56' 39"	4° 42' 26"	191° 54' 08"	0° 00' 07"	0° 59' 09"	16' 07.00"	109° 58' 26"	0.76986
7	191° 32' 05"	4° 41' 12"	192° 26' 10"	0° -14' 47"	0° 59' 09"	16' 07.09"	110° 0' 01"	0.76585
8	192° 07' 31"	4° 39' 57"	192° 58' 12"	0° -29' 41"	0° 59' 09"	16' 07.18"	110° 1' 24"	0.76182
9	192° 42' 57"	4° 38' 40"	193° 30' 15"	0° -44' 36"	0° 59' 10"	16' 07.27"	110° 2' 36"	0.75776
10	193° 18' 23"	4° 37' 21"	194° 02' 18"	0° -59' 30"	0° 59' 10"	16' 07.35"	110° 3' 37"	0.75368
11	193° 53' 49"	4° 35' 60"	194° 34' 22"	-1° 14' 24"	0° 59' 10"	16' 07.43"	110° 4' 28"	0.74958
12	194° 29' 16"	4° 34' 37"	195° 06' 26"	-1° 29' 18"	0° 59' 11"	16' 07.51"	110° 5' 07"	0.74545
13	195° 04' 42"	4° 33' 13"	195° 38' 31"	-1° 44' 11"	0° 59' 11"	16' 07.59"	110° 5' 36"	0.74130
14	195° 40' 08"	4° 31' 47"	196° 10' 36"	-1° 59' 04"	0° 59' 11"	16' 07.66"	110° 5' 54"	0.73713
15	196° 15' 35"	4° 30' 19"	196° 42' 43"	-2° 13' 56"	0° 59' 11"	16' 07.73"	110° 6' 01"	0.73293
16	196° 51' 01"	4° 28' 49"	197° 14' 50"	-2° 28' 48"	0° 59' 12"	16' 07.80"	110° 5' 58"	0.72872
17	197° 26' 28"	4° 27' 18"	197° 46' 58"	-2° 43' 39"	0° 59' 12"	16' 07.86"	110° 5' 44"	0.72448
18	198° 01' 54"	4° 25' 45"	198° 19' 06"	-2° 58' 29"	0° 59' 12"	16' 07.93"	110° 5' 19"	0.72022
19	198° 37' 21"	4° 24' 10"	198° 51' 16"	-3° 13' 18"	0° 59' 12"	16' 07.99"	110° 4' 44"	0.71594
20	199° 12' 47"	4° 22' 34"	199° 23' 27"	-3° 28' 07"	0° 59' 12"	16' 08.04"	110° 3' 59"	0.71165
21	199° 48' 14"	4° 20' 56"	199° 55' 39"	-3° 42' 54"	0° 59' 13"	16' 08.10"	110° 3' 03"	0.70733
22	200° 23' 40"	4° 19' 16"	200° 27' 52"	-3° 57' 41"	0° 59' 13"	16' 08.15"	110° 1' 56"	0.70299
23	200° 59' 07"	4° 17' 35"	201° 00' 06"	-4° 12' 26"	0° 59' 13"	16' 08.20"	110° 0' 39"	0.69864
24	201° 34' 33"	4° 15' 52"	201° 32' 22"	-4° 27' 09"	0° 59' 13"	16' 08.25"	109° 59' 12"	0.69426

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	314° 22' 33"	0.51"	316° 49' 52"	-16° 31' 10"	0.9855913	16' 13.66"	23° 26' 14"	-13 m 48 s
1	314° 25' 05"	0.50"	316° 52' 24"	-16° 30' 26"	0.9855978	16' 13.65"	23° 26' 14"	-13 m 48 s
2	314° 27' 37"	0.50"	316° 54' 56"	-16° 29' 42"	0.9856042	16' 13.65"	23° 26' 14"	-13 m 48 s
3	314° 30' 09"	0.50"	316° 57' 28"	-16° 28' 57"	0.9856107	16' 13.64"	23° 26' 14"	-13 m 49 s
4	314° 32' 41"	0.49"	316° 59' 60"	-16° 28' 13"	0.9856172	16' 13.63"	23° 26' 14"	-13 m 49 s
5	314° 35' 14"	0.49"	317° 02' 31"	-16° 27' 29"	0.9856237	16' 13.63"	23° 26' 14"	-13 m 49 s
6	314° 37' 46"	0.49"	317° 05' 03"	-16° 26' 45"	0.9856302	16' 13.62"	23° 26' 14"	-13 m 49 s
7	314° 40' 18"	0.48"	317° 07' 35"	-16° 26' 00"	0.9856367	16' 13.61"	23° 26' 14"	-13 m 50 s
8	314° 42' 50"	0.48"	317° 10' 07"	-16° 25' 16"	0.9856432	16' 13.61"	23° 26' 14"	-13 m 50 s
9	314° 45' 22"	0.48"	317° 12' 38"	-16° 24' 32"	0.9856498	16' 13.60"	23° 26' 14"	-13 m 50 s
10	314° 47' 54"	0.47"	317° 15' 10"	-16° 23' 47"	0.9856563	16' 13.59"	23° 26' 14"	-13 m 50 s
11	314° 50' 26"	0.47"	317° 17' 42"	-16° 23' 03"	0.9856629	16' 13.59"	23° 26' 14"	-13 m 51 s
12	314° 52' 59"	0.47"	317° 20' 13"	-16° 22' 18"	0.9856694	16' 13.58"	23° 26' 14"	-13 m 51 s
13	314° 55' 31"	0.46"	317° 22' 45"	-16° 21' 34"	0.9856760	16' 13.58"	23° 26' 14"	-13 m 51 s
14	314° 58' 03"	0.46"	317° 25' 16"	-16° 20' 49"	0.9856825	16' 13.57"	23° 26' 14"	-13 m 51 s
15	315° 00' 35"	0.46"	317° 27' 48"	-16° 20' 05"	0.9856891	16' 13.56"	23° 26' 14"	-13 m 52 s
16	315° 03' 07"	0.45"	317° 30' 20"	-16° 19' 20"	0.9856957	16' 13.56"	23° 26' 14"	-13 m 52 s
17	315° 05' 39"	0.45"	317° 32' 51"	-16° 18' 35"	0.9857023	16' 13.55"	23° 26' 14"	-13 m 52 s
18	315° 08' 11"	0.44"	317° 35' 23"	-16° 17' 51"	0.9857089	16' 13.54"	23° 26' 14"	-13 m 52 s
19	315° 10' 43"	0.44"	317° 37' 54"	-16° 17' 06"	0.9857155	16' 13.54"	23° 26' 14"	-13 m 53 s
20	315° 13' 16"	0.44"	317° 40' 26"	-16° 16' 21"	0.9857221	16' 13.53"	23° 26' 14"	-13 m 53 s
21	315° 15' 48"	0.43"	317° 42' 57"	-16° 15' 37"	0.9857288	16' 13.52"	23° 26' 14"	-13 m 53 s
22	315° 18' 20"	0.43"	317° 45' 29"	-16° 14' 52"	0.9857354	16' 13.52"	23° 26' 14"	-13 m 53 s
23	315° 20' 52"	0.42"	317° 47' 60"	-16° 14' 07"	0.9857420	16' 13.51"	23° 26' 14"	-13 m 54 s
24	315° 23' 24"	0.42"	317° 50' 31"	-16° 13' 22"	0.9857487	16' 13.50"	23° 26' 14"	-13 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	201° 34' 33"	4° 15' 52"	201° 32' 22"	-4° 27' 09"	0° 59' 13"	16' 08.25"	109° 59' 12"	0.69426
1	202° 09' 59"	4° 14' 07"	202° 04' 39"	-4° 41' 52"	0° 59' 13"	16' 08.29"	109° 57' 35"	0.68987
2	202° 45' 25"	4° 12' 21"	202° 36' 58"	-4° 56' 33"	0° 59' 14"	16' 08.33"	109° 55' 47"	0.68546
3	203° 20' 51"	4° 10' 33"	203° 09' 17"	-5° 11' 12"	0° 59' 14"	16' 08.37"	109° 53' 49"	0.68103
4	203° 56' 17"	4° 08' 43"	203° 41' 39"	-5° 25' 50"	0° 59' 14"	16' 08.41"	109° 51' 40"	0.67659
5	204° 31' 43"	4° 06' 52"	204° 14' 02"	-5° 40' 26"	0° 59' 14"	16' 08.44"	109° 49' 22"	0.67213
6	205° 07' 08"	4° 04' 59"	204° 46' 27"	-5° 55' 01"	0° 59' 14"	16' 08.47"	109° 46' 53"	0.66766
7	205° 42' 34"	4° 03' 05"	205° 18' 53"	-6° 09' 33"	0° 59' 14"	16' 08.50"	109° 44' 14"	0.66317
8	206° 17' 59"	4° 01' 09"	205° 51' 22"	-6° 24' 04"	0° 59' 14"	16' 08.53"	109° 41' 25"	0.65866
9	206° 53' 25"	3° 59' 12"	206° 23' 52"	-6° 38' 32"	0° 59' 14"	16' 08.56"	109° 38' 26"	0.65414
10	207° 28' 50"	3° 57' 13"	206° 56' 24"	-6° 52' 59"	0° 59' 14"	16' 08.58"	109° 35' 17"	0.64960
11	208° 04' 15"	3° 55' 12"	207° 28' 58"	-7° 07' 23"	0° 59' 15"	16' 08.60"	109° 31' 58"	0.64506
12	208° 39' 39"	3° 53' 10"	208° 01' 34"	-7° 21' 45"	0° 59' 15"	16' 08.62"	109° 28' 29"	0.64050
13	209° 15' 04"	3° 51' 07"	208° 34' 12"	-7° 36' 04"	0° 59' 15"	16' 08.63"	109° 24' 49"	0.63592
14	209° 50' 28"	3° 49' 02"	209° 06' 52"	-7° 50' 21"	0° 59' 15"	16' 08.64"	109° 21' 00"	0.63133
15	210° 25' 52"	3° 46' 56"	209° 39' 35"	-8° 04' 36"	0° 59' 15"	16' 08.65"	109° 17' 01"	0.62674
16	211° 01' 16"	3° 44' 48"	210° 12' 20"	-8° 18' 48"	0° 59' 15"	16' 08.66"	109° 12' 52"	0.62213
17	211° 36' 40"	3° 42' 39"	210° 45' 07"	-8° 32' 57"	0° 59' 15"	16' 08.67"	109° 8' 33"	0.61750
18	212° 12' 03"	3° 40' 28"	211° 17' 56"	-8° 47' 04"	0° 59' 15"	16' 08.67"	109° 4' 04"	0.61287
19	212° 47' 27"	3° 38' 16"	211° 50' 48"	-9° 01' 08"	0° 59' 15"	16' 08.67"	108° 59' 25"	0.60823
20	213° 22' 50"	3° 36' 03"	212° 23' 43"	-9° 15' 08"	0° 59' 15"	16' 08.67"	108° 54' 36"	0.60358
21	213° 58' 12"	3° 33' 48"	212° 56' 40"	-9° 29' 06"	0° 59' 15"	16' 08.67"	108° 49' 37"	0.59892
22	214° 33' 35"	3° 31' 32"	213° 29' 39"	-9° 43' 01"	0° 59' 15"	16' 08.66"	108° 44' 29"	0.59425
23	215° 08' 57"	3° 29' 14"	214° 02' 42"	-9° 56' 52"	0° 59' 15"	16' 08.66"	108° 39' 10"	0.58957
24	215° 44' 19"	3° 26' 55"	214° 35' 46"	-10° 10' 40"	0° 59' 15"	16' 08.65"	108° 33' 42"	0.58488

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	315° 23' 24"	0.42"	317° 50' 31"	-16° 13' 22"	0.9857487	16' 13.50"	23° 26' 14"	-13 m 54 s
1	315° 25' 56"	0.42"	317° 53' 03"	-16° 12' 37"	0.9857554	16' 13.50"	23° 26' 14"	-13 m 54 s
2	315° 28' 28"	0.41"	317° 55' 34"	-16° 11' 52"	0.9857620	16' 13.49"	23° 26' 14"	-13 m 54 s
3	315° 31' 00"	0.41"	317° 58' 05"	-16° 11' 07"	0.9857687	16' 13.48"	23° 26' 14"	-13 m 55 s
4	315° 33' 33"	0.40"	318° 00' 37"	-16° 10' 22"	0.9857754	16' 13.48"	23° 26' 14"	-13 m 55 s
5	315° 36' 05"	0.40"	318° 03' 08"	-16° 09' 38"	0.9857821	16' 13.47"	23° 26' 14"	-13 m 55 s
6	315° 38' 37"	0.40"	318° 05' 39"	-16° 08' 52"	0.9857888	16' 13.46"	23° 26' 14"	-13 m 55 s
7	315° 41' 09"	0.39"	318° 08' 11"	-16° 08' 07"	0.9857955	16' 13.46"	23° 26' 14"	-13 m 55 s
8	315° 43' 41"	0.39"	318° 10' 42"	-16° 07' 22"	0.9858022	16' 13.45"	23° 26' 14"	-13 m 56 s
9	315° 46' 13"	0.38"	318° 13' 13"	-16° 06' 37"	0.9858089	16' 13.44"	23° 26' 14"	-13 m 56 s
10	315° 48' 45"	0.38"	318° 15' 44"	-16° 05' 52"	0.9858157	16' 13.44"	23° 26' 14"	-13 m 56 s
11	315° 51' 17"	0.38"	318° 18' 15"	-16° 05' 07"	0.9858224	16' 13.43"	23° 26' 14"	-13 m 56 s
12	315° 53' 49"	0.37"	318° 20' 46"	-16° 04' 22"	0.9858291	16' 13.42"	23° 26' 14"	-13 m 57 s
13	315° 56' 22"	0.37"	318° 23' 18"	-16° 03' 37"	0.9858359	16' 13.42"	23° 26' 14"	-13 m 57 s
14	315° 58' 54"	0.36"	318° 25' 49"	-16° 02' 51"	0.9858427	16' 13.41"	23° 26' 14"	-13 m 57 s
15	316° 01' 26"	0.36"	318° 28' 20"	-16° 02' 06"	0.9858494	16' 13.40"	23° 26' 14"	-13 m 57 s
16	316° 03' 58"	0.35"	318° 30' 51"	-16° 01' 21"	0.9858562	16' 13.40"	23° 26' 14"	-13 m 57 s
17	316° 06' 30"	0.35"	318° 33' 22"	-16° 00' 35"	0.9858630	16' 13.39"	23° 26' 14"	-13 m 58 s
18	316° 09' 02"	0.34"	318° 35' 53"	-15° 59' 50"	0.9858698	16' 13.38"	23° 26' 14"	-13 m 58 s
19	316° 11' 34"	0.34"	318° 38' 24"	-15° 59' 05"	0.9858766	16' 13.38"	23° 26' 14"	-13 m 58 s
20	316° 14' 06"	0.34"	318° 40' 55"	-15° 58' 19"	0.9858834	16' 13.37"	23° 26' 14"	-13 m 58 s
21	316° 16' 38"	0.33"	318° 43' 26"	-15° 57' 34"	0.9858902	16' 13.36"	23° 26' 14"	-13 m 59 s
22	316° 19' 10"	0.33"	318° 45' 57"	-15° 56' 48"	0.9858970	16' 13.36"	23° 26' 14"	-13 m 59 s
23	316° 21' 42"	0.32"	318° 48' 28"	-15° 56' 03"	0.9859038	16' 13.35"	23° 26' 14"	-13 m 59 s
24	316° 24' 15"	0.32"	318° 50' 59"	-15° 55' 17"	0.9859107	16' 13.34"	23° 26' 14"	-13 m 59 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	215° 44' 19"	3° 26' 55"	214° 35' 46"	-10° 10' 40"	0° 59' 15"	16' 08.65"	108° 33' 42"	0.58488
1	216° 19' 41"	3° 24' 35"	215° 08' 54"	-10° 24' 25"	0° 59' 15"	16' 08.63"	108° 28' 04"	0.58019
2	216° 55' 02"	3° 22' 14"	215° 42' 05"	-10° 38' 06"	0° 59' 15"	16' 08.62"	108° 22' 16"	0.57548
3	217° 30' 23"	3° 19' 51"	216° 15' 18"	-10° 51' 44"	0° 59' 15"	16' 08.60"	108° 16' 19"	0.57078
4	218° 05' 44"	3° 17' 27"	216° 48' 34"	-11° 05' 18"	0° 59' 14"	16' 08.58"	108° 10' 12"	0.56606
5	218° 41' 05"	3° 15' 02"	217° 21' 54"	-11° 18' 49"	0° 59' 14"	16' 08.56"	108° 3' 55"	0.56134
6	219° 16' 25"	3° 12' 36"	217° 55' 16"	-11° 32' 15"	0° 59' 14"	16' 08.54"	107° 57' 28"	0.55662
7	219° 51' 45"	3° 10' 08"	218° 28' 41"	-11° 45' 38"	0° 59' 14"	16' 08.52"	107° 50' 52"	0.55189
8	220° 27' 04"	3° 07' 39"	219° 02' 10"	-11° 58' 57"	0° 59' 14"	16' 08.49"	107° 44' 06"	0.54715
9	221° 02' 23"	3° 05' 09"	219° 35' 41"	-12° 12' 12"	0° 59' 14"	16' 08.46"	107° 37' 10"	0.54241
10	221° 37' 42"	3° 02' 38"	220° 09' 16"	-12° 25' 23"	0° 59' 14"	16' 08.43"	107° 30' 04"	0.53767
11	222° 12' 57"	3° 00' 06"	220° 42' 50"	-12° 38' 28"	0° 59' 14"	16' 08.40"	107° 22' 50"	0.53293
12	222° 48' 15"	2° 57' 33"	221° 16' 32"	-12° 51' 30"	0° 59' 14"	16' 08.36"	107° 15' 26"	0.52819
13	223° 23' 33"	2° 54' 58"	221° 50' 16"	-13° 04' 28"	0° 59' 13"	16' 08.32"	107° 7' 51"	0.52343
14	223° 58' 51"	2° 52' 23"	222° 24' 04"	-13° 17' 21"	0° 59' 13"	16' 08.28"	107° 0' 08"	0.51868
15	224° 34' 08"	2° 49' 46"	222° 57' 55"	-13° 30' 10"	0° 59' 13"	16' 08.24"	106° 52' 14"	0.51393
16	225° 09' 25"	2° 47' 08"	223° 31' 50"	-13° 42' 54"	0° 59' 13"	16' 08.20"	106° 44' 11"	0.50917
17	225° 44' 42"	2° 44' 29"	224° 05' 49"	-13° 55' 34"	0° 59' 13"	16' 08.15"	106° 35' 59"	0.50442
18	226° 19' 58"	2° 41' 49"	224° 39' 50"	-14° 08' 09"	0° 59' 13"	16' 08.10"	106° 27' 37"	0.49966
19	226° 55' 13"	2° 39' 09"	225° 13' 56"	-14° 20' 39"	0° 59' 13"	16' 08.05"	106° 19' 05"	0.49491
20	227° 30' 29"	2° 36' 27"	225° 48' 05"	-14° 33' 03"	0° 59' 12"	16' 08.00"	106° 10' 24"	0.49016
21	228° 05' 44"	2° 33' 44"	226° 22' 17"	-14° 45' 23"	0° 59' 12"	16' 07.95"	106° 1' 34"	0.48540
22	228° 40' 59"	2° 31' 00"	226° 56' 33"	-14° 57' 38"	0° 59' 12"	16' 07.89"	105° 52' 34"	0.48065
23	229° 16' 13"	2° 28' 16"	227° 30' 53"	-15° 09' 48"	0° 59' 12"	16' 07.83"	105° 43' 25"	0.47591
24	229° 51' 27"	2° 25' 30"	228° 05' 17"	-15° 21' 52"	0° 59' 11"	16' 07.77"	105° 34' 06"	0.47116

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	316° 24' 15"	0.32"	318° 50' 59"	-15° 55' 17"	0.9859107	16' 13.34"	23° 26' 14"	-13 m 59 s
1	316° 26' 47"	0.31"	318° 53' 30"	-15° 54' 32"	0.9859175	16' 13.34"	23° 26' 14"	-13 m 59 s
2	316° 29' 19"	0.31"	318° 56' 00"	-15° 53' 46"	0.9859244	16' 13.33"	23° 26' 14"	-13 m 60 s
3	316° 31' 51"	0.30"	318° 58' 31"	-15° 53' 01"	0.9859312	16' 13.32"	23° 26' 14"	-13 m 60 s
4	316° 34' 23"	0.30"	319° 01' 02"	-15° 52' 15"	0.9859381	16' 13.32"	23° 26' 14"	-13 m 60 s
5	316° 36' 55"	0.29"	319° 03' 33"	-15° 51' 29"	0.9859450	16' 13.31"	23° 26' 14"	-14 m 00 s
6	316° 39' 27"	0.29"	319° 06' 04"	-15° 50' 44"	0.9859518	16' 13.30"	23° 26' 14"	-14 m 00 s
7	316° 41' 59"	0.28"	319° 08' 34"	-15° 49' 58"	0.9859587	16' 13.30"	23° 26' 14"	-14 m 01 s
8	316° 44' 31"	0.28"	319° 11' 05"	-15° 49' 12"	0.9859656	16' 13.29"	23° 26' 14"	-14 m 01 s
9	316° 47' 03"	0.27"	319° 13' 36"	-15° 48' 26"	0.9859725	16' 13.28"	23° 26' 14"	-14 m 01 s
10	316° 49' 35"	0.27"	319° 16' 07"	-15° 47' 40"	0.9859794	16' 13.28"	23° 26' 14"	-14 m 01 s
11	316° 52' 07"	0.26"	319° 18' 37"	-15° 46' 55"	0.9859863	16' 13.27"	23° 26' 14"	-14 m 01 s
12	316° 54' 39"	0.26"	319° 21' 08"	-15° 46' 09"	0.9859933	16' 13.26"	23° 26' 14"	-14 m 01 s
13	316° 57' 12"	0.25"	319° 23' 39"	-15° 45' 23"	0.9860002	16' 13.26"	23° 26' 14"	-14 m 02 s
14	316° 59' 44"	0.25"	319° 26' 09"	-15° 44' 37"	0.9860071	16' 13.25"	23° 26' 14"	-14 m 02 s
15	317° 02' 16"	0.24"	319° 28' 40"	-15° 43' 51"	0.9860141	16' 13.24"	23° 26' 14"	-14 m 02 s
16	317° 04' 48"	0.24"	319° 31' 10"	-15° 43' 05"	0.9860210	16' 13.23"	23° 26' 14"	-14 m 02 s
17	317° 07' 20"	0.23"	319° 33' 41"	-15° 42' 19"	0.9860280	16' 13.23"	23° 26' 14"	-14 m 02 s
18	317° 09' 52"	0.23"	319° 36' 11"	-15° 41' 33"	0.9860349	16' 13.22"	23° 26' 14"	-14 m 03 s
19	317° 12' 24"	0.22"	319° 38' 42"	-15° 40' 47"	0.9860419	16' 13.21"	23° 26' 14"	-14 m 03 s
20	317° 14' 56"	0.22"	319° 41' 13"	-15° 40' 01"	0.9860489	16' 13.21"	23° 26' 14"	-14 m 03 s
21	317° 17' 28"	0.21"	319° 43' 43"	-15° 39' 15"	0.9860558	16' 13.20"	23° 26' 14"	-14 m 03 s
22	317° 20' 00"	0.21"	319° 46' 13"	-15° 38' 28"	0.9860628	16' 13.19"	23° 26' 14"	-14 m 03 s
23	317° 22' 32"	0.20"	319° 48' 44"	-15° 37' 42"	0.9860698	16' 13.19"	23° 26' 14"	-14 m 03 s
24	317° 25' 04"	0.20"	319° 51' 14"	-15° 36' 56"	0.9860768	16' 13.18"	23° 26' 14"	-14 m 04 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	229° 51' 27"	2° 25' 30"	228° 05' 17"	-15° 21' 52"	0° 59' 11"	16' 07.77"	105° 34' 06"	0.47116
1	230° 26' 40"	2° 22' 44"	228° 39' 44"	-15° 33' 51"	0° 59' 11"	16' 07.71"	105° 24' 38"	0.46642
2	231° 01' 53"	2° 19' 56"	229° 14' 15"	-15° 45' 44"	0° 59' 11"	16' 07.65"	105° 15' 00"	0.46168
3	231° 37' 06"	2° 17' 08"	229° 48' 50"	-15° 57' 32"	0° 59' 11"	16' 07.58"	105° 5' 14"	0.45694
4	232° 12' 18"	2° 14' 19"	230° 23' 29"	-16° 09' 15"	0° 59' 11"	16' 07.51"	104° 55' 18"	0.45221
5	232° 47' 30"	2° 11' 29"	230° 58' 11"	-16° 20' 51"	0° 59' 10"	16' 07.44"	104° 45' 12"	0.44749
6	233° 22' 42"	2° 08' 39"	231° 32' 57"	-16° 32' 22"	0° 59' 10"	16' 07.37"	104° 34' 57"	0.44277
7	233° 57' 53"	2° 05' 47"	232° 07' 48"	-16° 43' 47"	0° 59' 10"	16' 07.30"	104° 24' 34"	0.43805
8	234° 33' 04"	2° 02' 55"	232° 42' 42"	-16° 55' 06"	0° 59' 09"	16' 07.22"	104° 14' 00"	0.43335
9	235° 08' 14"	2° 00' 02"	233° 17' 40"	-17° 06' 19"	0° 59' 09"	16' 07.14"	104° 3' 18"	0.42864
10	235° 43' 24"	1° 57' 08"	233° 52' 41"	-17° 17' 26"	0° 59' 09"	16' 07.06"	103° 52' 27"	0.42395
11	236° 18' 33"	1° 54' 14"	234° 27' 47"	-17° 28' 27"	0° 59' 09"	16' 06.98"	103° 41' 26"	0.41926
12	236° 53' 42"	1° 51' 19"	235° 02' 57"	-17° 39' 21"	0° 59' 08"	16' 06.90"	103° 30' 16"	0.41458
13	237° 28' 51"	1° 48' 23"	235° 38' 10"	-17° 50' 09"	0° 59' 08"	16' 06.81"	103° 18' 57"	0.40991
14	238° 03' 59"	1° 45' 27"	236° 13' 28"	-18° 00' 51"	0° 59' 08"	16' 06.72"	103° 7' 30"	0.40525
15	238° 39' 06"	1° 42' 30"	236° 48' 49"	-18° 11' 26"	0° 59' 07"	16' 06.63"	102° 55' 53"	0.40060
16	239° 14' 14"	1° 39' 32"	237° 24' 15"	-18° 21' 55"	0° 59' 07"	16' 06.54"	102° 44' 07"	0.39596
17	239° 49' 20"	1° 36' 34"	237° 59' 44"	-18° 32' 17"	0° 59' 07"	16' 06.45"	102° 32' 12"	0.39132
18	240° 24' 27"	1° 33' 35"	238° 35' 18"	-18° 42' 32"	0° 59' 06"	16' 06.35"	102° 20' 08"	0.38670
19	240° 59' 33"	1° 30' 36"	239° 10' 55"	-18° 52' 40"	0° 59' 06"	16' 06.25"	102° 7' 55"	0.38209
20	241° 34' 38"	1° 27' 36"	239° 46' 36"	-19° 02' 42"	0° 59' 06"	16' 06.15"	101° 55' 34"	0.37749
21	242° 09' 43"	1° 24' 36"	240° 22' 21"	-19° 12' 36"	0° 59' 05"	16' 06.05"	101° 43' 04"	0.37290
22	242° 44' 48"	1° 21' 35"	240° 58' 10"	-19° 22' 23"	0° 59' 05"	16' 05.95"	101° 30' 24"	0.36833
23	243° 19' 52"	1° 18' 33"	241° 34' 03"	-19° 32' 04"	0° 59' 04"	16' 05.84"	101° 17' 37"	0.36377
24	243° 54' 55"	1° 15' 32"	242° 09' 60"	-19° 41' 37"	0° 59' 04"	16' 05.74"	101° 4' 40"	0.35922

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	317° 25' 04"	0.20"	319° 51' 14"	-15° 36' 56"	0.9860768	16' 13.18"	23° 26' 14"	-14 m 04 s
1	317° 27' 36"	0.19"	319° 53' 45"	-15° 36' 10"	0.9860838	16' 13.17"	23° 26' 14"	-14 m 04 s
2	317° 30' 08"	0.19"	319° 56' 15"	-15° 35' 24"	0.9860909	16' 13.17"	23° 26' 14"	-14 m 04 s
3	317° 32' 40"	0.18"	319° 58' 45"	-15° 34' 37"	0.9860979	16' 13.16"	23° 26' 14"	-14 m 04 s
4	317° 35' 12"	0.18"	320° 01' 16"	-15° 33' 51"	0.9861049	16' 13.15"	23° 26' 14"	-14 m 04 s
5	317° 37' 44"	0.17"	320° 03' 46"	-15° 33' 05"	0.9861119	16' 13.15"	23° 26' 14"	-14 m 04 s
6	317° 40' 16"	0.17"	320° 06' 16"	-15° 32' 18"	0.9861190	16' 13.14"	23° 26' 14"	-14 m 05 s
7	317° 42' 49"	0.16"	320° 08' 47"	-15° 31' 32"	0.9861260	16' 13.13"	23° 26' 14"	-14 m 05 s
8	317° 45' 21"	0.16"	320° 11' 17"	-15° 30' 45"	0.9861331	16' 13.12"	23° 26' 14"	-14 m 05 s
9	317° 47' 53"	0.15"	320° 13' 47"	-15° 29' 59"	0.9861401	16' 13.12"	23° 26' 14"	-14 m 05 s
10	317° 50' 25"	0.15"	320° 16' 17"	-15° 29' 12"	0.9861472	16' 13.11"	23° 26' 14"	-14 m 05 s
11	317° 52' 57"	0.14"	320° 18' 48"	-15° 28' 26"	0.9861543	16' 13.10"	23° 26' 14"	-14 m 05 s
12	317° 55' 29"	0.14"	320° 21' 18"	-15° 27' 39"	0.9861614	16' 13.10"	23° 26' 14"	-14 m 06 s
13	317° 58' 01"	0.13"	320° 23' 48"	-15° 26' 53"	0.9861684	16' 13.09"	23° 26' 14"	-14 m 06 s
14	318° 00' 33"	0.12"	320° 26' 18"	-15° 26' 06"	0.9861755	16' 13.08"	23° 26' 14"	-14 m 06 s
15	318° 03' 05"	0.12"	320° 28' 48"	-15° 25' 20"	0.9861826	16' 13.08"	23° 26' 14"	-14 m 06 s
16	318° 05' 37"	0.11"	320° 31' 18"	-15° 24' 33"	0.9861897	16' 13.07"	23° 26' 14"	-14 m 06 s
17	318° 08' 09"	0.11"	320° 33' 48"	-15° 23' 46"	0.9861968	16' 13.06"	23° 26' 14"	-14 m 06 s
18	318° 10' 41"	0.10"	320° 36' 18"	-15° 22' 60"	0.9862039	16' 13.05"	23° 26' 14"	-14 m 06 s
19	318° 13' 13"	0.10"	320° 38' 48"	-15° 22' 13"	0.9862111	16' 13.05"	23° 26' 14"	-14 m 07 s
20	318° 15' 45"	0.09"	320° 41' 18"	-15° 21' 26"	0.9862182	16' 13.04"	23° 26' 14"	-14 m 07 s
21	318° 18' 17"	0.09"	320° 43' 48"	-15° 20' 39"	0.9862253	16' 13.03"	23° 26' 14"	-14 m 07 s
22	318° 20' 49"	0.08"	320° 46' 18"	-15° 19' 52"	0.9862325	16' 13.03"	23° 26' 14"	-14 m 07 s
23	318° 23' 21"	0.08"	320° 48' 48"	-15° 19' 06"	0.9862396	16' 13.02"	23° 26' 14"	-14 m 07 s
24	318° 25' 53"	0.07"	320° 51' 18"	-15° 18' 19"	0.9862468	16' 13.01"	23° 26' 14"	-14 m 07 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	243° 54' 55"	1° 15' 32"	242° 09' 60"	-19° 41' 37"	0° 59' 04"	16' 05.74"	101° 4' 40"	0.35922
1	244° 29' 58"	1° 12' 29"	242° 46' 00"	-19° 51' 02"	0° 59' 04"	16' 05.63"	100° 51' 35"	0.35468
2	245° 05' 01"	1° 09' 27"	243° 22' 05"	-20° 00' 21"	0° 59' 03"	16' 05.51"	100° 38' 21"	0.35016
3	245° 40' 03"	1° 06' 24"	243° 58' 13"	-20° 09' 32"	0° 59' 03"	16' 05.40"	100° 24' 58"	0.34565
4	246° 15' 05"	1° 03' 20"	244° 34' 26"	-20° 18' 35"	0° 59' 02"	16' 05.28"	100° 11' 27"	0.34116
5	246° 50' 06"	1° 00' 17"	245° 10' 41"	-20° 27' 31"	0° 59' 02"	16' 05.17"	99° 57' 48"	0.33668
6	247° 25' 07"	0° 57' 13"	245° 47' 01"	-20° 36' 20"	0° 59' 01"	16' 05.05"	99° 43' 60"	0.33222
7	248° 00' 07"	0° 54' 08"	246° 23' 25"	-20° 45' 00"	0° 59' 01"	16' 04.92"	99° 30' 03"	0.32777
8	248° 35' 07"	0° 51' 04"	246° 59' 52"	-20° 53' 33"	0° 59' 01"	16' 04.80"	99° 15' 58"	0.32334
9	249° 10' 06"	0° 47' 59"	247° 36' 23"	-21° 01' 58"	0° 59' 00"	16' 04.67"	99° 1' 45"	0.31893
10	249° 45' 05"	0° 44' 53"	248° 12' 57"	-21° 10' 15"	0° 58' 60"	16' 04.55"	98° 47' 24"	0.31453
11	250° 20' 04"	0° 41' 48"	248° 49' 35"	-21° 18' 24"	0° 58' 59"	16' 04.42"	98° 32' 54"	0.31015
12	250° 55' 01"	0° 38' 42"	249° 26' 17"	-21° 26' 25"	0° 58' 59"	16' 04.28"	98° 18' 16"	0.30579
13	251° 29' 59"	0° 35' 37"	250° 03' 02"	-21° 34' 18"	0° 58' 58"	16' 04.15"	98° 3' 30"	0.30145
14	252° 04' 56"	0° 32' 31"	250° 39' 51"	-21° 42' 02"	0° 58' 58"	16' 04.01"	97° 48' 36"	0.29713
15	252° 39' 52"	0° 29' 25"	251° 16' 43"	-21° 49' 39"	0° 58' 57"	16' 03.87"	97° 33' 34"	0.29282
16	253° 14' 48"	0° 26' 18"	251° 53' 38"	-21° 57' 07"	0° 58' 57"	16' 03.73"	97° 18' 24"	0.28854
17	253° 49' 43"	0° 23' 12"	252° 30' 37"	-22° 04' 27"	0° 58' 56"	16' 03.59"	97° 3' 05"	0.28427
18	254° 24' 38"	0° 20' 05"	253° 07' 39"	-22° 11' 38"	0° 58' 56"	16' 03.45"	96° 47' 39"	0.28003
19	254° 59' 32"	0° 16' 59"	253° 44' 44"	-22° 18' 41"	0° 58' 55"	16' 03.30"	96° 32' 05"	0.27580
20	255° 34' 26"	0° 13' 52"	254° 21' 53"	-22° 25' 35"	0° 58' 55"	16' 03.15"	96° 16' 24"	0.27160
21	256° 09' 19"	0° 10' 46"	254° 59' 04"	-22° 32' 21"	0° 58' 54"	16' 03.00"	96° 0' 34"	0.26742
22	256° 44' 11"	0° 07' 39"	255° 36' 19"	-22° 38' 57"	0° 58' 53"	16' 02.85"	95° 44' 37"	0.26326
23	257° 19' 03"	0° 04' 33"	256° 13' 36"	-22° 45' 26"	0° 58' 53"	16' 02.69"	95° 28' 32"	0.25912
24	257° 53' 55"	0° 01' 26"	256° 50' 57"	-22° 51' 45"	0° 58' 52"	16' 02.53"	95° 12' 20"	0.25501

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblivity	Equation Of Time
0	318° 25' 53"	0.07"	320° 51' 18"	-15° 18' 19"	0.9862468	16' 13.01"	23° 26' 14"	-14 m 07 s
1	318° 28' 25"	0.07"	320° 53' 48"	-15° 17' 32"	0.9862539	16' 13.01"	23° 26' 14"	-14 m 07 s
2	318° 30' 57"	0.06"	320° 56' 18"	-15° 16' 45"	0.9862611	16' 13.00"	23° 26' 14"	-14 m 08 s
3	318° 33' 29"	0.06"	320° 58' 48"	-15° 15' 58"	0.9862682	16' 12.99"	23° 26' 14"	-14 m 08 s
4	318° 36' 01"	0.05"	321° 01' 18"	-15° 15' 11"	0.9862754	16' 12.98"	23° 26' 14"	-14 m 08 s
5	318° 38' 33"	0.05"	321° 03' 48"	-15° 14' 24"	0.9862826	16' 12.98"	23° 26' 14"	-14 m 08 s
6	318° 41' 05"	0.04"	321° 06' 17"	-15° 13' 37"	0.9862898	16' 12.97"	23° 26' 14"	-14 m 08 s
7	318° 43' 37"	0.03"	321° 08' 47"	-15° 12' 50"	0.9862970	16' 12.96"	23° 26' 14"	-14 m 08 s
8	318° 46' 09"	0.03"	321° 11' 17"	-15° 12' 03"	0.9863042	16' 12.96"	23° 26' 14"	-14 m 08 s
9	318° 48' 41"	0.02"	321° 13' 47"	-15° 11' 16"	0.9863114	16' 12.95"	23° 26' 14"	-14 m 08 s
10	318° 51' 13"	0.02"	321° 16' 16"	-15° 10' 28"	0.9863186	16' 12.94"	23° 26' 14"	-14 m 09 s
11	318° 53' 45"	0.01"	321° 18' 46"	-15° 09' 41"	0.9863258	16' 12.93"	23° 26' 14"	-14 m 09 s
12	318° 56' 17"	0.01"	321° 21' 16"	-15° 08' 54"	0.9863330	16' 12.93"	23° 26' 14"	-14 m 09 s
13	318° 58' 49"	0.00"	321° 23' 46"	-15° 08' 07"	0.9863402	16' 12.92"	23° 26' 14"	-14 m 09 s
14	319° 01' 21"	-0.00"	321° 26' 15"	-15° 07' 20"	0.9863475	16' 12.91"	23° 26' 14"	-14 m 09 s
15	319° 03' 53"	-0.01"	321° 28' 45"	-15° 06' 32"	0.9863547	16' 12.91"	23° 26' 14"	-14 m 09 s
16	319° 06' 25"	-0.01"	321° 31' 14"	-15° 05' 45"	0.9863620	16' 12.90"	23° 26' 14"	-14 m 09 s
17	319° 08' 57"	-0.02"	321° 33' 44"	-15° 04' 58"	0.9863692	16' 12.89"	23° 26' 14"	-14 m 09 s
18	319° 11' 29"	-0.02"	321° 36' 14"	-15° 04' 10"	0.9863765	16' 12.88"	23° 26' 14"	-14 m 10 s
19	319° 14' 01"	-0.03"	321° 38' 43"	-15° 03' 23"	0.9863837	16' 12.88"	23° 26' 14"	-14 m 10 s
20	319° 16' 33"	-0.03"	321° 41' 13"	-15° 02' 36"	0.9863910	16' 12.87"	23° 26' 14"	-14 m 10 s
21	319° 19' 05"	-0.04"	321° 43' 42"	-15° 01' 48"	0.9863982	16' 12.86"	23° 26' 14"	-14 m 10 s
22	319° 21' 37"	-0.04"	321° 46' 12"	-15° 01' 01"	0.9864055	16' 12.86"	23° 26' 14"	-14 m 10 s
23	319° 24' 09"	-0.05"	321° 48' 41"	-15° 00' 13"	0.9864128	16' 12.85"	23° 26' 14"	-14 m 10 s
24	319° 26' 41"	-0.06"	321° 51' 11"	-14° 59' 26"	0.9864201	16' 12.84"	23° 26' 14"	-14 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	257° 53' 55"	0° 01' 26"	256° 50' 57"	-22° 51' 45"	0° 58' 52"	16' 02.53"	95° 12' 20"	0.25501
1	258° 28' 46"	0° -1' 40"	257° 28' 20"	-22° 57' 56"	0° 58' 52"	16' 02.38"	94° 55' 60"	0.25092
2	259° 03' 36"	0° -4' 47"	258° 05' 46"	-23° 03' 57"	0° 58' 51"	16' 02.21"	94° 39' 32"	0.24685
3	259° 38' 26"	0° -7' 53"	258° 43' 15"	-23° 09' 50"	0° 58' 50"	16' 02.05"	94° 22' 57"	0.24281
4	260° 13' 16"	0° -10' 59"	259° 20' 47"	-23° 15' 34"	0° 58' 50"	16' 01.88"	94° 6' 15"	0.23879
5	260° 48' 04"	0° -14' 06"	259° 58' 21"	-23° 21' 09"	0° 58' 49"	16' 01.72"	93° 49' 25"	0.23479
6	261° 22' 53"	0° -17' 12"	260° 35' 57"	-23° 26' 34"	0° 58' 49"	16' 01.55"	93° 32' 28"	0.23082
7	261° 57' 40"	0° -20' 17"	261° 13' 36"	-23° 31' 51"	0° 58' 48"	16' 01.37"	93° 15' 23"	0.22687
8	262° 32' 27"	0° -23' 23"	261° 51' 18"	-23° 36' 58"	0° 58' 47"	16' 01.20"	92° 58' 12"	0.22295
9	263° 07' 14"	0° -26' 28"	262° 29' 01"	-23° 41' 56"	0° 58' 47"	16' 01.02"	92° 40' 53"	0.21906
10	263° 41' 60"	0° -29' 33"	263° 06' 47"	-23° 46' 45"	0° 58' 46"	16' 00.84"	92° 23' 27"	0.21519
11	264° 16' 45"	0° -32' 38"	263° 44' 35"	-23° 51' 25"	0° 58' 45"	16' 00.66"	92° 5' 54"	0.21135
12	264° 51' 30"	0° -35' 43"	264° 22' 24"	-23° 55' 55"	0° 58' 45"	16' 00.48"	91° 48' 14"	0.20753
13	265° 26' 14"	0° -38' 47"	265° 00' 16"	-24° 00' 16"	0° 58' 44"	16' 00.29"	91° 30' 27"	0.20374
14	266° 00' 57"	0° -41' 51"	265° 38' 09"	-24° 04' 28"	0° 58' 43"	16' 00.11"	91° 12' 32"	0.19998
15	266° 35' 40"	0° -44' 55"	266° 16' 04"	-24° 08' 30"	0° 58' 43"	15' 59.92"	90° 54' 31"	0.19625
16	267° 10' 22"	0° -47' 58"	266° 54' 01"	-24° 12' 22"	0° 58' 42"	15' 59.72"	90° 36' 23"	0.19255
17	267° 45' 04"	0° -51' 01"	267° 31' 60"	-24° 16' 05"	0° 58' 41"	15' 59.53"	90° 18' 08"	0.18887
18	268° 19' 45"	0° -54' 04"	268° 09' 59"	-24° 19' 39"	0° 58' 41"	15' 59.33"	89° 59' 46"	0.18522
19	268° 54' 25"	0° -57' 06"	268° 48' 00"	-24° 23' 03"	0° 58' 40"	15' 59.13"	89° 41' 17"	0.18160
20	269° 29' 05"	-1° 00' 08"	269° 26' 03"	-24° 26' 18"	0° 58' 39"	15' 58.93"	89° 22' 41"	0.17801
21	270° 03' 44"	-1° 03' 09"	270° 04' 06"	-24° 29' 23"	0° 58' 38"	15' 58.73"	89° 3' 58"	0.17445
22	270° 38' 22"	-1° 06' 10"	270° 42' 10"	-24° 32' 18"	0° 58' 38"	15' 58.52"	88° 45' 09"	0.17093
23	271° 12' 60"	-1° 09' 10"	271° 20' 16"	-24° 35' 03"	0° 58' 37"	15' 58.32"	88° 26' 12"	0.16743
24	271° 47' 37"	-1° 12' 10"	271° 58' 22"	-24° 37' 39"	0° 58' 36"	15' 58.11"	88° 7' 09"	0.16396

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	319° 26' 41"	-0.06"	321° 51' 11"	-14° 59' 26"	0.9864201	16' 12.84"	23° 26' 14"	-14 m 10 s
1	319° 29' 13"	-0.06"	321° 53' 40"	-14° 58' 38"	0.9864274	16' 12.83"	23° 26' 14"	-14 m 10 s
2	319° 31' 45"	-0.07"	321° 56' 09"	-14° 57' 51"	0.9864347	16' 12.83"	23° 26' 14"	-14 m 10 s
3	319° 34' 17"	-0.07"	321° 58' 39"	-14° 57' 03"	0.9864420	16' 12.82"	23° 26' 14"	-14 m 10 s
4	319° 36' 49"	-0.08"	322° 01' 08"	-14° 56' 15"	0.9864493	16' 12.81"	23° 26' 14"	-14 m 11 s
5	319° 39' 21"	-0.08"	322° 03' 37"	-14° 55' 28"	0.9864566	16' 12.81"	23° 26' 14"	-14 m 11 s
6	319° 41' 53"	-0.09"	322° 06' 07"	-14° 54' 40"	0.9864639	16' 12.80"	23° 26' 14"	-14 m 11 s
7	319° 44' 24"	-0.09"	322° 08' 36"	-14° 53' 52"	0.9864712	16' 12.79"	23° 26' 14"	-14 m 11 s
8	319° 46' 56"	-0.10"	322° 11' 05"	-14° 53' 05"	0.9864786	16' 12.78"	23° 26' 14"	-14 m 11 s
9	319° 49' 28"	-0.10"	322° 13' 35"	-14° 52' 17"	0.9864859	16' 12.78"	23° 26' 14"	-14 m 11 s
10	319° 52' 00"	-0.11"	322° 16' 04"	-14° 51' 29"	0.9864932	16' 12.77"	23° 26' 14"	-14 m 11 s
11	319° 54' 32"	-0.11"	322° 18' 33"	-14° 50' 41"	0.9865006	16' 12.76"	23° 26' 14"	-14 m 11 s
12	319° 57' 04"	-0.12"	322° 21' 02"	-14° 49' 53"	0.9865079	16' 12.75"	23° 26' 14"	-14 m 11 s
13	319° 59' 36"	-0.12"	322° 23' 32"	-14° 49' 05"	0.9865153	16' 12.75"	23° 26' 14"	-14 m 11 s
14	320° 02' 08"	-0.13"	322° 26' 01"	-14° 48' 18"	0.9865226	16' 12.74"	23° 26' 14"	-14 m 11 s
15	320° 04' 40"	-0.13"	322° 28' 30"	-14° 47' 30"	0.9865300	16' 12.73"	23° 26' 14"	-14 m 12 s
16	320° 07' 12"	-0.14"	322° 30' 59"	-14° 46' 42"	0.9865374	16' 12.73"	23° 26' 14"	-14 m 12 s
17	320° 09' 44"	-0.14"	322° 33' 28"	-14° 45' 54"	0.9865447	16' 12.72"	23° 26' 14"	-14 m 12 s
18	320° 12' 16"	-0.15"	322° 35' 57"	-14° 45' 06"	0.9865521	16' 12.71"	23° 26' 14"	-14 m 12 s
19	320° 14' 48"	-0.15"	322° 38' 26"	-14° 44' 18"	0.9865595	16' 12.70"	23° 26' 14"	-14 m 12 s
20	320° 17' 20"	-0.16"	322° 40' 55"	-14° 43' 30"	0.9865669	16' 12.70"	23° 26' 14"	-14 m 12 s
21	320° 19' 52"	-0.16"	322° 43' 24"	-14° 42' 42"	0.9865743	16' 12.69"	23° 26' 14"	-14 m 12 s
22	320° 22' 24"	-0.17"	322° 45' 53"	-14° 41' 54"	0.9865817	16' 12.68"	23° 26' 14"	-14 m 12 s
23	320° 24' 56"	-0.17"	322° 48' 22"	-14° 41' 05"	0.9865891	16' 12.67"	23° 26' 14"	-14 m 12 s
24	320° 27' 28"	-0.18"	322° 50' 51"	-14° 40' 17"	0.9865965	16' 12.67"	23° 26' 14"	-14 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	271° 47' 37"	-1° 12' 10"	271° 58' 22"	-24° 37' 39"	0° 58' 36"	15' 58.11"	88° 7' 09"	0.16396
1	272° 22' 13"	-1° 15' 09"	272° 36' 29"	-24° 40' 06"	0° 58' 35"	15' 57.89"	87° 47' 59"	0.16052
2	272° 56' 49"	-1° 18' 08"	273° 14' 36"	-24° 42' 22"	0° 58' 34"	15' 57.68"	87° 28' 42"	0.15711
3	273° 31' 24"	-1° 21' 06"	273° 52' 44"	-24° 44' 29"	0° 58' 34"	15' 57.46"	87° 9' 17"	0.15374
4	274° 05' 58"	-1° 24' 04"	274° 30' 52"	-24° 46' 26"	0° 58' 33"	15' 57.24"	86° 49' 46"	0.15039
5	274° 40' 32"	-1° 27' 01"	275° 09' 01"	-24° 48' 14"	0° 58' 32"	15' 57.02"	86° 30' 08"	0.14708
6	275° 15' 05"	-1° 29' 57"	275° 47' 10"	-24° 49' 52"	0° 58' 31"	15' 56.80"	86° 10' 23"	0.14380
7	275° 49' 37"	-1° 32' 53"	276° 25' 19"	-24° 51' 20"	0° 58' 30"	15' 56.57"	85° 50' 31"	0.14056
8	276° 24' 09"	-1° 35' 48"	277° 03' 28"	-24° 52' 38"	0° 58' 30"	15' 56.34"	85° 30' 31"	0.13734
9	276° 58' 39"	-1° 38' 43"	277° 41' 36"	-24° 53' 46"	0° 58' 29"	15' 56.11"	85° 10' 24"	0.13416
10	277° 33' 09"	-1° 41' 37"	278° 19' 45"	-24° 54' 45"	0° 58' 28"	15' 55.88"	84° 50' 10"	0.13102
11	278° 07' 39"	-1° 44' 30"	278° 57' 53"	-24° 55' 34"	0° 58' 27"	15' 55.64"	84° 29' 48"	0.12790
12	278° 42' 07"	-1° 47' 22"	279° 36' 00"	-24° 56' 14"	0° 58' 26"	15' 55.41"	84° 9' 19"	0.12482
13	279° 16' 35"	-1° 50' 14"	280° 14' 07"	-24° 56' 43"	0° 58' 25"	15' 55.17"	83° 48' 42"	0.12178
14	279° 51' 02"	-1° 53' 05"	280° 52' 13"	-24° 57' 03"	0° 58' 24"	15' 54.92"	83° 27' 57"	0.11876
15	280° 25' 28"	-1° 55' 55"	281° 30' 18"	-24° 57' 13"	0° 58' 23"	15' 54.68"	83° 7' 05"	0.11579
16	280° 59' 53"	-1° 58' 44"	282° 08' 23"	-24° 57' 14"	0° 58' 23"	15' 54.43"	82° 46' 04"	0.11284
17	281° 34' 18"	-2° 01' 33"	282° 46' 26"	-24° 57' 04"	0° 58' 22"	15' 54.18"	82° 24' 54"	0.10994
18	282° 08' 42"	-2° 04' 20"	283° 24' 28"	-24° 56' 45"	0° 58' 21"	15' 53.93"	82° 3' 37"	0.10706
19	282° 43' 05"	-2° 07' 07"	284° 02' 29"	-24° 56' 17"	0° 58' 20"	15' 53.68"	81° 42' 10"	0.10423
20	283° 17' 27"	-2° 09' 53"	284° 40' 29"	-24° 55' 39"	0° 58' 19"	15' 53.42"	81° 20' 34"	0.10143
21	283° 51' 48"	-2° 12' 38"	285° 18' 27"	-24° 54' 51"	0° 58' 18"	15' 53.16"	80° 58' 49"	0.09866
22	284° 26' 09"	-2° 15' 22"	285° 56' 23"	-24° 53' 53"	0° 58' 17"	15' 52.90"	80° 36' 55"	0.09593
23	285° 00' 29"	-2° 18' 06"	286° 34' 18"	-24° 52' 46"	0° 58' 16"	15' 52.64"	80° 14' 50"	0.09324
24	285° 34' 47"	-2° 20' 48"	287° 12' 11"	-24° 51' 30"	0° 58' 15"	15' 52.37"	79° 52' 35"	0.09058

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	320° 27' 28"	-0.18"	322° 50' 51"	-14° 40' 17"	0.9865965	16' 12.67"	23° 26' 14"	-14 m 12 s
1	320° 29' 59"	-0.18"	322° 53' 20"	-14° 39' 29"	0.9866039	16' 12.66"	23° 26' 14"	-14 m 12 s
2	320° 32' 31"	-0.19"	322° 55' 49"	-14° 38' 41"	0.9866113	16' 12.65"	23° 26' 14"	-14 m 12 s
3	320° 35' 03"	-0.19"	322° 58' 18"	-14° 37' 53"	0.9866188	16' 12.65"	23° 26' 14"	-14 m 12 s
4	320° 37' 35"	-0.20"	323° 00' 47"	-14° 37' 04"	0.9866262	16' 12.64"	23° 26' 14"	-14 m 13 s
5	320° 40' 07"	-0.20"	323° 03' 16"	-14° 36' 16"	0.9866336	16' 12.63"	23° 26' 14"	-14 m 13 s
6	320° 42' 39"	-0.20"	323° 05' 45"	-14° 35' 28"	0.9866411	16' 12.62"	23° 26' 14"	-14 m 13 s
7	320° 45' 11"	-0.21"	323° 08' 13"	-14° 34' 40"	0.9866485	16' 12.62"	23° 26' 14"	-14 m 13 s
8	320° 47' 43"	-0.21"	323° 10' 42"	-14° 33' 51"	0.9866559	16' 12.61"	23° 26' 14"	-14 m 13 s
9	320° 50' 15"	-0.22"	323° 13' 11"	-14° 33' 03"	0.9866634	16' 12.60"	23° 26' 14"	-14 m 13 s
10	320° 52' 47"	-0.22"	323° 15' 40"	-14° 32' 14"	0.9866708	16' 12.59"	23° 26' 14"	-14 m 13 s
11	320° 55' 19"	-0.23"	323° 18' 08"	-14° 31' 26"	0.9866783	16' 12.59"	23° 26' 14"	-14 m 13 s
12	320° 57' 50"	-0.23"	323° 20' 37"	-14° 30' 38"	0.9866858	16' 12.58"	23° 26' 14"	-14 m 13 s
13	321° 00' 22"	-0.24"	323° 23' 06"	-14° 29' 49"	0.9866932	16' 12.57"	23° 26' 14"	-14 m 13 s
14	321° 02' 54"	-0.24"	323° 25' 35"	-14° 29' 01"	0.9867007	16' 12.56"	23° 26' 14"	-14 m 13 s
15	321° 05' 26"	-0.25"	323° 28' 03"	-14° 28' 12"	0.9867082	16' 12.56"	23° 26' 14"	-14 m 13 s
16	321° 07' 58"	-0.25"	323° 30' 32"	-14° 27' 24"	0.9867157	16' 12.55"	23° 26' 14"	-14 m 13 s
17	321° 10' 30"	-0.25"	323° 33' 01"	-14° 26' 35"	0.9867232	16' 12.54"	23° 26' 14"	-14 m 13 s
18	321° 13' 02"	-0.26"	323° 35' 29"	-14° 25' 46"	0.9867307	16' 12.53"	23° 26' 14"	-14 m 13 s
19	321° 15' 34"	-0.26"	323° 37' 58"	-14° 24' 58"	0.9867382	16' 12.53"	23° 26' 14"	-14 m 13 s
20	321° 18' 06"	-0.27"	323° 40' 26"	-14° 24' 09"	0.9867457	16' 12.52"	23° 26' 14"	-14 m 13 s
21	321° 20' 38"	-0.27"	323° 42' 55"	-14° 23' 20"	0.9867532	16' 12.51"	23° 26' 14"	-14 m 13 s
22	321° 23' 09"	-0.28"	323° 45' 23"	-14° 22' 32"	0.9867607	16' 12.51"	23° 26' 14"	-14 m 13 s
23	321° 25' 41"	-0.28"	323° 47' 52"	-14° 21' 43"	0.9867682	16' 12.50"	23° 26' 14"	-14 m 14 s
24	321° 28' 13"	-0.28"	323° 50' 20"	-14° 20' 54"	0.9867757	16' 12.49"	23° 26' 14"	-14 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	285° 34' 47"	-2° 20' 48"	287° 12' 11"	-24° 51' 30"	0° 58' 15"	15' 52.37"	79° 52' 35"	0.09058
1	286° 09' 05"	-2° 23' 30"	287° 50' 02"	-24° 50' 04"	0° 58' 14"	15' 52.11"	79° 30' 10"	0.08796
2	286° 43' 22"	-2° 26' 10"	288° 27' 50"	-24° 48' 28"	0° 58' 13"	15' 51.84"	79° 7' 33"	0.08538
3	287° 17' 39"	-2° 28' 50"	289° 05' 37"	-24° 46' 43"	0° 58' 12"	15' 51.56"	78° 44' 45"	0.08283
4	287° 51' 54"	-2° 31' 28"	289° 43' 22"	-24° 44' 48"	0° 58' 11"	15' 51.29"	78° 21' 46"	0.08032
5	288° 26' 08"	-2° 34' 06"	290° 21' 04"	-24° 42' 45"	0° 58' 10"	15' 51.01"	77° 58' 33"	0.07785
6	289° 00' 22"	-2° 36' 42"	290° 58' 43"	-24° 40' 31"	0° 58' 09"	15' 50.73"	77° 35' 08"	0.07542
7	289° 34' 34"	-2° 39' 18"	291° 36' 21"	-24° 38' 09"	0° 58' 08"	15' 50.45"	77° 11' 28"	0.07302
8	290° 08' 46"	-2° 41' 52"	292° 13' 55"	-24° 35' 37"	0° 58' 07"	15' 50.17"	76° 47' 35"	0.07066
9	290° 42' 57"	-2° 44' 25"	292° 51' 27"	-24° 32' 56"	0° 58' 06"	15' 49.88"	76° 23' 26"	0.06834
10	291° 17' 07"	-2° 46' 58"	293° 28' 56"	-24° 30' 05"	0° 58' 05"	15' 49.60"	75° 59' 02"	0.06606
11	291° 51' 15"	-2° 49' 29"	294° 06' 22"	-24° 27' 06"	0° 58' 04"	15' 49.31"	75° 34' 21"	0.06381
12	292° 25' 23"	-2° 51' 59"	294° 43' 44"	-24° 23' 57"	0° 58' 03"	15' 49.01"	75° 9' 23"	0.06161
13	292° 59' 30"	-2° 54' 28"	295° 21' 04"	-24° 20' 39"	0° 58' 02"	15' 48.72"	74° 44' 06"	0.05944
14	293° 33' 36"	-2° 56' 56"	295° 58' 21"	-24° 17' 13"	0° 58' 00"	15' 48.42"	74° 18' 29"	0.05731
15	294° 07' 41"	-2° 59' 22"	296° 35' 34"	-24° 13' 37"	0° 57' 59"	15' 48.12"	73° 52' 32"	0.05522
16	294° 41' 45"	-3° 01' 48"	297° 12' 43"	-24° 09' 52"	0° 57' 58"	15' 47.82"	73° 26' 12"	0.05317
17	295° 15' 47"	-3° 04' 12"	297° 49' 50"	-24° 05' 59"	0° 57' 57"	15' 47.52"	72° 59' 30"	0.05116
18	295° 49' 49"	-3° 06' 36"	298° 26' 52"	-24° 01' 56"	0° 57' 56"	15' 47.21"	72° 32' 22"	0.04919
19	296° 23' 50"	-3° 08' 57"	299° 03' 51"	-23° 57' 45"	0° 57' 55"	15' 46.91"	72° 4' 48"	0.04725
20	296° 57' 50"	-3° 11' 18"	299° 40' 46"	-23° 53' 25"	0° 57' 54"	15' 46.60"	71° 36' 46"	0.04536
21	297° 31' 48"	-3° 13' 38"	300° 17' 38"	-23° 48' 57"	0° 57' 53"	15' 46.28"	71° 8' 14"	0.04350
22	298° 05' 46"	-3° 15' 56"	300° 54' 25"	-23° 44' 20"	0° 57' 51"	15' 45.97"	70° 39' 10"	0.04169
23	298° 39' 42"	-3° 18' 13"	301° 31' 09"	-23° 39' 34"	0° 57' 50"	15' 45.65"	70° 9' 31"	0.03991
24	299° 13' 38"	-3° 20' 29"	302° 07' 48"	-23° 34' 40"	0° 57' 49"	15' 45.34"	69° 39' 16"	0.03818

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	321° 28' 13"	-0.28"	323° 50' 20"	-14° 20' 54"	0.9867757	16' 12.49"	23° 26' 14"	-14 m 14 s
1	321° 30' 45"	-0.29"	323° 52' 49"	-14° 20' 05"	0.9867833	16' 12.48"	23° 26' 14"	-14 m 14 s
2	321° 33' 17"	-0.29"	323° 55' 17"	-14° 19' 17"	0.9867908	16' 12.48"	23° 26' 14"	-14 m 14 s
3	321° 35' 49"	-0.30"	323° 57' 46"	-14° 18' 28"	0.9867983	16' 12.47"	23° 26' 14"	-14 m 14 s
4	321° 38' 21"	-0.30"	324° 00' 14"	-14° 17' 39"	0.9868059	16' 12.46"	23° 26' 14"	-14 m 14 s
5	321° 40' 53"	-0.30"	324° 02' 42"	-14° 16' 50"	0.9868134	16' 12.45"	23° 26' 14"	-14 m 14 s
6	321° 43' 24"	-0.31"	324° 05' 11"	-14° 16' 01"	0.9868210	16' 12.45"	23° 26' 14"	-14 m 14 s
7	321° 45' 56"	-0.31"	324° 07' 39"	-14° 15' 12"	0.9868285	16' 12.44"	23° 26' 14"	-14 m 14 s
8	321° 48' 28"	-0.32"	324° 10' 07"	-14° 14' 23"	0.9868361	16' 12.43"	23° 26' 14"	-14 m 14 s
9	321° 50' 60"	-0.32"	324° 12' 36"	-14° 13' 34"	0.9868436	16' 12.42"	23° 26' 14"	-14 m 14 s
10	321° 53' 32"	-0.32"	324° 15' 04"	-14° 12' 45"	0.9868512	16' 12.42"	23° 26' 14"	-14 m 14 s
11	321° 56' 04"	-0.33"	324° 17' 32"	-14° 11' 56"	0.9868588	16' 12.41"	23° 26' 14"	-14 m 14 s
12	321° 58' 36"	-0.33"	324° 20' 00"	-14° 11' 07"	0.9868664	16' 12.40"	23° 26' 14"	-14 m 14 s
13	322° 01' 07"	-0.34"	324° 22' 29"	-14° 10' 18"	0.9868739	16' 12.39"	23° 26' 14"	-14 m 14 s
14	322° 03' 39"	-0.34"	324° 24' 57"	-14° 09' 29"	0.9868815	16' 12.39"	23° 26' 14"	-14 m 14 s
15	322° 06' 11"	-0.34"	324° 27' 25"	-14° 08' 40"	0.9868891	16' 12.38"	23° 26' 14"	-14 m 14 s
16	322° 08' 43"	-0.35"	324° 29' 53"	-14° 07' 51"	0.9868967	16' 12.37"	23° 26' 14"	-14 m 14 s
17	322° 11' 15"	-0.35"	324° 32' 21"	-14° 07' 02"	0.9869043	16' 12.36"	23° 26' 14"	-14 m 14 s
18	322° 13' 47"	-0.35"	324° 34' 49"	-14° 06' 12"	0.9869119	16' 12.36"	23° 26' 14"	-14 m 14 s
19	322° 16' 18"	-0.36"	324° 37' 18"	-14° 05' 23"	0.9869195	16' 12.35"	23° 26' 14"	-14 m 14 s
20	322° 18' 50"	-0.36"	324° 39' 46"	-14° 04' 34"	0.9869271	16' 12.34"	23° 26' 14"	-14 m 14 s
21	322° 21' 22"	-0.36"	324° 42' 14"	-14° 03' 45"	0.9869348	16' 12.33"	23° 26' 14"	-14 m 14 s
22	322° 23' 54"	-0.37"	324° 44' 42"	-14° 02' 55"	0.9869424	16' 12.33"	23° 26' 14"	-14 m 14 s
23	322° 26' 26"	-0.37"	324° 47' 10"	-14° 02' 06"	0.9869500	16' 12.32"	23° 26' 14"	-14 m 14 s
24	322° 28' 58"	-0.37"	324° 49' 38"	-14° 01' 17"	0.9869576	16' 12.31"	23° 26' 14"	-14 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	299° 13' 38"	-3° 20' 29"	302° 07' 48"	-23° 34' 40"	0° 57' 49"	15' 45.34"	69° 39' 16"	0.03818
1	299° 47' 32"	-3° 22' 43"	302° 44' 23"	-23° 29' 37"	0° 57' 48"	15' 45.02"	69° 8' 21"	0.03648
2	300° 21' 25"	-3° 24' 57"	303° 20' 55"	-23° 24' 26"	0° 57' 47"	15' 44.69"	68° 36' 44"	0.03483
3	300° 55' 18"	-3° 27' 08"	303° 57' 21"	-23° 19' 07"	0° 57' 46"	15' 44.37"	68° 4' 22"	0.03321
4	301° 29' 08"	-3° 29' 19"	304° 33' 44"	-23° 13' 39"	0° 57' 44"	15' 44.04"	67° 31' 10"	0.03164
5	302° 02' 58"	-3° 31' 28"	305° 10' 02"	-23° 08' 04"	0° 57' 43"	15' 43.72"	66° 57' 05"	0.03010
6	302° 36' 47"	-3° 33' 36"	305° 46' 15"	-23° 02' 20"	0° 57' 42"	15' 43.39"	66° 22' 02"	0.02861
7	303° 10' 34"	-3° 35' 43"	306° 22' 24"	-22° 56' 28"	0° 57' 41"	15' 43.05"	65° 45' 58"	0.02715
8	303° 44' 21"	-3° 37' 48"	306° 58' 29"	-22° 50' 29"	0° 57' 40"	15' 42.72"	65° 8' 46"	0.02574
9	304° 18' 06"	-3° 39' 52"	307° 34' 29"	-22° 44' 21"	0° 57' 38"	15' 42.38"	64° 30' 21"	0.02436
10	304° 51' 50"	-3° 41' 54"	308° 10' 24"	-22° 38' 06"	0° 57' 37"	15' 42.05"	63° 50' 37"	0.02303
11	305° 25' 33"	-3° 43' 56"	308° 46' 14"	-22° 31' 42"	0° 57' 36"	15' 41.71"	63° 9' 26"	0.02173
12	305° 59' 14"	-3° 45' 55"	309° 21' 60"	-22° 25' 12"	0° 57' 35"	15' 41.36"	62° 26' 40"	0.02048
13	306° 32' 54"	-3° 47' 54"	309° 57' 40"	-22° 18' 33"	0° 57' 33"	15' 41.02"	61° 42' 11"	0.01927
14	307° 06' 33"	-3° 49' 51"	310° 33' 16"	-22° 11' 47"	0° 57' 32"	15' 40.68"	60° 55' 48"	0.01809
15	307° 40' 11"	-3° 51' 46"	311° 08' 47"	-22° 04' 54"	0° 57' 31"	15' 40.33"	60° 7' 20"	0.01696
16	308° 13' 48"	-3° 53' 40"	311° 44' 13"	-21° 57' 53"	0° 57' 29"	15' 39.98"	59° 16' 35"	0.01587
17	308° 47' 23"	-3° 55' 33"	312° 19' 33"	-21° 50' 45"	0° 57' 28"	15' 39.63"	58° 23' 18"	0.01482
18	309° 20' 57"	-3° 57' 24"	312° 54' 49"	-21° 43' 29"	0° 57' 27"	15' 39.28"	57° 27' 12"	0.01381
19	309° 54' 30"	-3° 59' 14"	313° 29' 60"	-21° 36' 07"	0° 57' 26"	15' 38.93"	56° 28' 01"	0.01284
20	310° 28' 01"	-4° 01' 02"	314° 05' 05"	-21° 28' 37"	0° 57' 24"	15' 38.57"	55° 25' 22"	0.01191
21	311° 01' 31"	-4° 02' 49"	314° 40' 06"	-21° 21' 01"	0° 57' 23"	15' 38.21"	54° 18' 52"	0.01102
22	311° 34' 60"	-4° 04' 34"	315° 15' 01"	-21° 13' 17"	0° 57' 22"	15' 37.85"	53° 8' 04"	0.01017
23	312° 08' 27"	-4° 06' 18"	315° 49' 51"	-21° 05' 27"	0° 57' 20"	15' 37.49"	51° 52' 25"	0.00936
24	312° 41' 53"	-4° 07' 60"	316° 24' 35"	-20° 57' 29"	0° 57' 19"	15' 37.13"	50° 31' 21"	0.00859

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	322° 28' 58"	-0.37"	324° 49' 38"	-14° 01' 17"	0.9869576	16' 12.31"	23° 26' 14"	-14 m 14 s
1	322° 31' 29"	-0.38"	324° 52' 06"	-14° 00' 27"	0.9869653	16' 12.30"	23° 26' 14"	-14 m 14 s
2	322° 34' 01"	-0.38"	324° 54' 34"	-13° 59' 38"	0.9869729	16' 12.30"	23° 26' 14"	-14 m 14 s
3	322° 36' 33"	-0.38"	324° 57' 02"	-13° 58' 48"	0.9869806	16' 12.29"	23° 26' 14"	-14 m 14 s
4	322° 39' 05"	-0.39"	324° 59' 30"	-13° 57' 59"	0.9869882	16' 12.28"	23° 26' 14"	-14 m 14 s
5	322° 41' 37"	-0.39"	325° 01' 57"	-13° 57' 10"	0.9869959	16' 12.27"	23° 26' 14"	-14 m 14 s
6	322° 44' 09"	-0.39"	325° 04' 25"	-13° 56' 20"	0.9870035	16' 12.27"	23° 26' 14"	-14 m 14 s
7	322° 46' 40"	-0.40"	325° 06' 53"	-13° 55' 31"	0.9870112	16' 12.26"	23° 26' 14"	-14 m 14 s
8	322° 49' 12"	-0.40"	325° 09' 21"	-13° 54' 41"	0.9870188	16' 12.25"	23° 26' 14"	-14 m 14 s
9	322° 51' 44"	-0.40"	325° 11' 49"	-13° 53' 51"	0.9870265	16' 12.24"	23° 26' 14"	-14 m 14 s
10	322° 54' 16"	-0.40"	325° 14' 17"	-13° 53' 02"	0.9870342	16' 12.24"	23° 26' 14"	-14 m 14 s
11	322° 56' 48"	-0.41"	325° 16' 44"	-13° 52' 12"	0.9870419	16' 12.23"	23° 26' 14"	-14 m 14 s
12	322° 59' 19"	-0.41"	325° 19' 12"	-13° 51' 23"	0.9870495	16' 12.22"	23° 26' 14"	-14 m 14 s
13	323° 01' 51"	-0.41"	325° 21' 40"	-13° 50' 33"	0.9870572	16' 12.21"	23° 26' 14"	-14 m 14 s
14	323° 04' 23"	-0.42"	325° 24' 08"	-13° 49' 43"	0.9870649	16' 12.21"	23° 26' 14"	-14 m 14 s
15	323° 06' 55"	-0.42"	325° 26' 35"	-13° 48' 54"	0.9870726	16' 12.20"	23° 26' 14"	-14 m 14 s
16	323° 09' 27"	-0.42"	325° 29' 03"	-13° 48' 04"	0.9870803	16' 12.19"	23° 26' 14"	-14 m 14 s
17	323° 11' 58"	-0.42"	325° 31' 31"	-13° 47' 14"	0.9870880	16' 12.18"	23° 26' 14"	-14 m 14 s
18	323° 14' 30"	-0.43"	325° 33' 58"	-13° 46' 24"	0.9870957	16' 12.18"	23° 26' 14"	-14 m 14 s
19	323° 17' 02"	-0.43"	325° 36' 26"	-13° 45' 35"	0.9871034	16' 12.17"	23° 26' 14"	-14 m 14 s
20	323° 19' 34"	-0.43"	325° 38' 54"	-13° 44' 45"	0.9871112	16' 12.16"	23° 26' 14"	-14 m 14 s
21	323° 22' 05"	-0.43"	325° 41' 21"	-13° 43' 55"	0.9871189	16' 12.15"	23° 26' 14"	-14 m 14 s
22	323° 24' 37"	-0.43"	325° 43' 49"	-13° 43' 05"	0.9871266	16' 12.14"	23° 26' 14"	-14 m 14 s
23	323° 27' 09"	-0.44"	325° 46' 16"	-13° 42' 15"	0.9871343	16' 12.14"	23° 26' 14"	-14 m 14 s
24	323° 29' 41"	-0.44"	325° 48' 44"	-13° 41' 25"	0.9871421	16' 12.13"	23° 26' 14"	-14 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	312° 41' 53"	-4° 07' 60"	316° 24' 35"	-20° 57' 29"	0° 57' 19"	15' 37.13"	50° 31' 21"	0.00859
1	313° 15' 18"	-4° 09' 41"	316° 59' 15"	-20° 49' 26"	0° 57' 18"	15' 36.77"	49° 4' 09"	0.00787
2	313° 48' 41"	-4° 11' 20"	317° 33' 49"	-20° 41' 15"	0° 57' 16"	15' 36.41"	47° 30' 02"	0.00718
3	314° 22' 03"	-4° 12' 58"	318° 08' 17"	-20° 32' 58"	0° 57' 15"	15' 36.04"	45° 48' 04"	0.00653
4	314° 55' 24"	-4° 14' 34"	318° 42' 41"	-20° 24' 35"	0° 57' 14"	15' 35.67"	43° 57' 11"	0.00593
5	315° 28' 43"	-4° 16' 09"	319° 16' 59"	-20° 16' 05"	0° 57' 12"	15' 35.30"	41° 56' 09"	0.00536
6	316° 02' 01"	-4° 17' 42"	319° 51' 12"	-20° 07' 29"	0° 57' 11"	15' 34.93"	39° 43' 33"	0.00483
7	316° 35' 17"	-4° 19' 14"	320° 25' 19"	-19° 58' 47"	0° 57' 10"	15' 34.56"	37° 17' 46"	0.00435
8	317° 08' 32"	-4° 20' 44"	320° 59' 21"	-19° 49' 58"	0° 57' 08"	15' 34.19"	34° 36' 59"	0.00390
9	317° 41' 46"	-4° 22' 12"	321° 33' 17"	-19° 41' 04"	0° 57' 07"	15' 33.81"	31° 39' 10"	0.00349
10	318° 14' 58"	-4° 23' 39"	322° 07' 08"	-19° 32' 04"	0° 57' 05"	15' 33.44"	28° 22' 08"	0.00313
11	318° 48' 09"	-4° 25' 05"	322° 40' 54"	-19° 22' 57"	0° 57' 04"	15' 33.06"	24° 43' 36"	0.00280
12	319° 21' 18"	-4° 26' 28"	323° 14' 35"	-19° 13' 45"	0° 57' 03"	15' 32.69"	20° 41' 22"	0.00251
13	319° 54' 26"	-4° 27' 51"	323° 48' 09"	-19° 04' 27"	0° 57' 01"	15' 32.31"	16° 13' 37"	0.00227
14	320° 27' 32"	-4° 29' 11"	324° 21' 39"	-18° 55' 04"	0° 56' 60"	15' 31.93"	11° 19' 11"	0.00206
15	321° 00' 37"	-4° 30' 30"	324° 55' 03"	-18° 45' 35"	0° 56' 59"	15' 31.55"	5° 58' 10"	0.00189
16	321° 33' 40"	-4° 31' 48"	325° 28' 22"	-18° 36' 01"	0° 56' 57"	15' 31.16"	0° 12' 22"	0.00176
17	322° 06' 42"	-4° 33' 04"	326° 01' 35"	-18° 26' 21"	0° 56' 56"	15' 30.78"	354° 5' 46"	0.00167
18	322° 39' 42"	-4° 34' 18"	326° 34' 43"	-18° 16' 36"	0° 56' 54"	15' 30.40"	347° 44' 36"	0.00162
19	323° 12' 41"	-4° 35' 31"	327° 07' 45"	-18° 06' 45"	0° 56' 53"	15' 30.01"	341° 16' 56"	0.00161
20	323° 45' 38"	-4° 36' 42"	327° 40' 43"	-17° 56' 50"	0° 56' 51"	15' 29.63"	334° 51' 43"	0.00164
21	324° 18' 34"	-4° 37' 52"	328° 13' 34"	-17° 46' 49"	0° 56' 50"	15' 29.24"	328° 37' 37"	0.00171
22	324° 51' 28"	-4° 38' 60"	328° 46' 21"	-17° 36' 43"	0° 56' 49"	15' 28.85"	322° 41' 50"	0.00182
23	325° 24' 20"	-4° 40' 06"	329° 19' 02"	-17° 26' 33"	0° 56' 47"	15' 28.47"	317° 9' 26"	0.00196
24	325° 57' 11"	-4° 41' 11"	329° 51' 38"	-17° 16' 17"	0° 56' 46"	15' 28.08"	312° 3' 14"	0.00214

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	323° 29' 41"	-0.44"	325° 48' 44"	-13° 41' 25"	0.9871421	16' 12.13"	23° 26' 14"	-14 m 14 s
1	323° 32' 13"	-0.44"	325° 51' 11"	-13° 40' 35"	0.9871498	16' 12.12"	23° 26' 14"	-14 m 14 s
2	323° 34' 44"	-0.44"	325° 53' 39"	-13° 39' 45"	0.9871576	16' 12.11"	23° 26' 14"	-14 m 14 s
3	323° 37' 16"	-0.45"	325° 56' 06"	-13° 38' 55"	0.9871653	16' 12.11"	23° 26' 14"	-14 m 14 s
4	323° 39' 48"	-0.45"	325° 58' 34"	-13° 38' 05"	0.9871731	16' 12.10"	23° 26' 14"	-14 m 14 s
5	323° 42' 20"	-0.45"	326° 01' 01"	-13° 37' 15"	0.9871808	16' 12.09"	23° 26' 14"	-14 m 14 s
6	323° 44' 51"	-0.45"	326° 03' 28"	-13° 36' 25"	0.9871886	16' 12.08"	23° 26' 14"	-14 m 14 s
7	323° 47' 23"	-0.45"	326° 05' 56"	-13° 35' 35"	0.9871964	16' 12.08"	23° 26' 14"	-14 m 14 s
8	323° 49' 55"	-0.45"	326° 08' 23"	-13° 34' 45"	0.9872041	16' 12.07"	23° 26' 14"	-14 m 14 s
9	323° 52' 27"	-0.46"	326° 10' 51"	-13° 33' 55"	0.9872119	16' 12.06"	23° 26' 14"	-14 m 13 s
10	323° 54' 58"	-0.46"	326° 13' 18"	-13° 33' 05"	0.9872197	16' 12.05"	23° 26' 14"	-14 m 13 s
11	323° 57' 30"	-0.46"	326° 15' 45"	-13° 32' 15"	0.9872275	16' 12.05"	23° 26' 14"	-14 m 13 s
12	324° 00' 02"	-0.46"	326° 18' 12"	-13° 31' 24"	0.9872353	16' 12.04"	23° 26' 14"	-14 m 13 s
13	324° 02' 34"	-0.46"	326° 20' 40"	-13° 30' 34"	0.9872431	16' 12.03"	23° 26' 14"	-14 m 13 s
14	324° 05' 05"	-0.46"	326° 23' 07"	-13° 29' 44"	0.9872508	16' 12.02"	23° 26' 14"	-14 m 13 s
15	324° 07' 37"	-0.47"	326° 25' 34"	-13° 28' 54"	0.9872586	16' 12.01"	23° 26' 14"	-14 m 13 s
16	324° 10' 09"	-0.47"	326° 28' 01"	-13° 28' 03"	0.9872665	16' 12.01"	23° 26' 14"	-14 m 13 s
17	324° 12' 40"	-0.47"	326° 30' 29"	-13° 27' 13"	0.9872743	16' 12.00"	23° 26' 14"	-14 m 13 s
18	324° 15' 12"	-0.47"	326° 32' 56"	-13° 26' 23"	0.9872821	16' 11.99"	23° 26' 14"	-14 m 13 s
19	324° 17' 44"	-0.47"	326° 35' 23"	-13° 25' 33"	0.9872899	16' 11.98"	23° 26' 14"	-14 m 13 s
20	324° 20' 16"	-0.47"	326° 37' 50"	-13° 24' 42"	0.9872977	16' 11.98"	23° 26' 14"	-14 m 13 s
21	324° 22' 47"	-0.47"	326° 40' 17"	-13° 23' 52"	0.9873056	16' 11.97"	23° 26' 14"	-14 m 13 s
22	324° 25' 19"	-0.47"	326° 42' 44"	-13° 23' 01"	0.9873134	16' 11.96"	23° 26' 14"	-14 m 13 s
23	324° 27' 51"	-0.48"	326° 45' 11"	-13° 22' 11"	0.9873212	16' 11.95"	23° 26' 14"	-14 m 13 s
24	324° 30' 22"	-0.48"	326° 47' 38"	-13° 21' 20"	0.9873291	16' 11.95"	23° 26' 14"	-14 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	325° 57' 11"	-4° 41' 11"	329° 51' 38"	-17° 16' 17"	0° 56' 46"	15' 28.08"	312° 3' 14"	0.00214
1	326° 30' 01"	-4° 42' 14"	330° 24' 08"	-17° 05' 57"	0° 56' 44"	15' 27.69"	307° 24' 04"	0.00237
2	327° 02' 48"	-4° 43' 15"	330° 56' 33"	-16° 55' 33"	0° 56' 43"	15' 27.30"	303° 11' 23"	0.00263
3	327° 35' 35"	-4° 44' 15"	331° 28' 53"	-16° 45' 03"	0° 56' 41"	15' 26.91"	299° 23' 32"	0.00292
4	328° 08' 19"	-4° 45' 13"	332° 01' 08"	-16° 34' 30"	0° 56' 40"	15' 26.52"	295° 58' 29"	0.00326
5	328° 41' 03"	-4° 46' 10"	332° 33' 17"	-16° 23' 51"	0° 56' 39"	15' 26.12"	292° 53' 60"	0.00363
6	329° 13' 44"	-4° 47' 05"	333° 05' 22"	-16° 13' 09"	0° 56' 37"	15' 25.73"	290° 7' 48"	0.00405
7	329° 46' 24"	-4° 47' 58"	333° 37' 21"	-16° 02' 22"	0° 56' 36"	15' 25.34"	287° 37' 48"	0.00450
8	330° 19' 02"	-4° 48' 50"	334° 09' 15"	-15° 51' 31"	0° 56' 34"	15' 24.95"	285° 22' 03"	0.00498
9	330° 51' 39"	-4° 49' 40"	334° 41' 04"	-15° 40' 35"	0° 56' 33"	15' 24.55"	283° 18' 52"	0.00551
10	331° 24' 14"	-4° 50' 29"	335° 12' 48"	-15° 29' 36"	0° 56' 31"	15' 24.16"	281° 26' 42"	0.00607
11	331° 56' 48"	-4° 51' 16"	335° 44' 26"	-15° 18' 33"	0° 56' 30"	15' 23.77"	279° 44' 16"	0.00667
12	332° 29' 19"	-4° 52' 01"	336° 16' 00"	-15° 07' 26"	0° 56' 29"	15' 23.37"	278° 10' 24"	0.00731
13	333° 01' 50"	-4° 52' 45"	336° 47' 29"	-14° 56' 15"	0° 56' 27"	15' 22.98"	276° 44' 06"	0.00798
14	333° 34' 18"	-4° 53' 27"	337° 18' 53"	-14° 45' 01"	0° 56' 26"	15' 22.58"	275° 24' 32"	0.00869
15	334° 06' 45"	-4° 54' 07"	337° 50' 12"	-14° 33' 42"	0° 56' 24"	15' 22.19"	274° 10' 57"	0.00943
16	334° 39' 10"	-4° 54' 46"	338° 21' 26"	-14° 22' 20"	0° 56' 23"	15' 21.80"	273° 2' 42"	0.01022
17	335° 11' 34"	-4° 55' 23"	338° 52' 35"	-14° 10' 55"	0° 56' 21"	15' 21.40"	271° 59' 13"	0.01103
18	335° 43' 56"	-4° 55' 58"	339° 23' 39"	-13° 59' 26"	0° 56' 20"	15' 21.01"	271° 0' 02"	0.01189
19	336° 16' 16"	-4° 56' 32"	339° 54' 39"	-13° 47' 54"	0° 56' 18"	15' 20.61"	270° 4' 42"	0.01278
20	336° 48' 34"	-4° 57' 05"	340° 25' 34"	-13° 36' 19"	0° 56' 17"	15' 20.22"	269° 12' 52"	0.01370
21	337° 20' 51"	-4° 57' 35"	340° 56' 24"	-13° 24' 40"	0° 56' 16"	15' 19.82"	268° 24' 11"	0.01466
22	337° 53' 06"	-4° 58' 04"	341° 27' 09"	-13° 12' 58"	0° 56' 14"	15' 19.43"	267° 38' 23"	0.01566
23	338° 25' 20"	-4° 58' 32"	341° 57' 50"	-13° 01' 14"	0° 56' 13"	15' 19.04"	266° 55' 12"	0.01669
24	338° 57' 32"	-4° 58' 58"	342° 28' 27"	-12° 49' 26"	0° 56' 11"	15' 18.64"	266° 14' 25"	0.01776

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	324° 30' 22"	-0.48"	326° 47' 38"	-13° 21' 20"	0.9873291	16' 11.95"	23° 26' 14"	-14 m 13 s
1	324° 32' 54"	-0.48"	326° 50' 05"	-13° 20' 30"	0.9873369	16' 11.94"	23° 26' 14"	-14 m 13 s
2	324° 35' 26"	-0.48"	326° 52' 32"	-13° 19' 39"	0.9873448	16' 11.93"	23° 26' 14"	-14 m 13 s
3	324° 37' 58"	-0.48"	326° 54' 59"	-13° 18' 49"	0.9873526	16' 11.92"	23° 26' 14"	-14 m 13 s
4	324° 40' 29"	-0.48"	326° 57' 26"	-13° 17' 58"	0.9873605	16' 11.91"	23° 26' 14"	-14 m 12 s
5	324° 43' 01"	-0.48"	326° 59' 53"	-13° 17' 07"	0.9873683	16' 11.91"	23° 26' 14"	-14 m 12 s
6	324° 45' 33"	-0.48"	327° 02' 20"	-13° 16' 17"	0.9873762	16' 11.90"	23° 26' 14"	-14 m 12 s
7	324° 48' 04"	-0.48"	327° 04' 47"	-13° 15' 26"	0.9873841	16' 11.89"	23° 26' 14"	-14 m 12 s
8	324° 50' 36"	-0.48"	327° 07' 14"	-13° 14' 36"	0.9873920	16' 11.88"	23° 26' 14"	-14 m 12 s
9	324° 53' 08"	-0.48"	327° 09' 41"	-13° 13' 45"	0.9873998	16' 11.88"	23° 26' 14"	-14 m 12 s
10	324° 55' 39"	-0.48"	327° 12' 08"	-13° 12' 54"	0.9874077	16' 11.87"	23° 26' 14"	-14 m 12 s
11	324° 58' 11"	-0.48"	327° 14' 35"	-13° 12' 03"	0.9874156	16' 11.86"	23° 26' 14"	-14 m 12 s
12	325° 00' 43"	-0.48"	327° 17' 01"	-13° 11' 13"	0.9874235	16' 11.85"	23° 26' 14"	-14 m 12 s
13	325° 03' 14"	-0.48"	327° 19' 28"	-13° 10' 22"	0.9874314	16' 11.84"	23° 26' 14"	-14 m 12 s
14	325° 05' 46"	-0.49"	327° 21' 55"	-13° 09' 31"	0.9874393	16' 11.84"	23° 26' 14"	-14 m 12 s
15	325° 08' 18"	-0.49"	327° 24' 22"	-13° 08' 40"	0.9874472	16' 11.83"	23° 26' 14"	-14 m 12 s
16	325° 10' 50"	-0.49"	327° 26' 48"	-13° 07' 49"	0.9874551	16' 11.82"	23° 26' 14"	-14 m 12 s
17	325° 13' 21"	-0.49"	327° 29' 15"	-13° 06' 59"	0.9874630	16' 11.81"	23° 26' 14"	-14 m 12 s
18	325° 15' 53"	-0.49"	327° 31' 42"	-13° 06' 08"	0.9874710	16' 11.81"	23° 26' 14"	-14 m 11 s
19	325° 18' 25"	-0.49"	327° 34' 08"	-13° 05' 17"	0.9874789	16' 11.80"	23° 26' 14"	-14 m 11 s
20	325° 20' 56"	-0.49"	327° 36' 35"	-13° 04' 26"	0.9874868	16' 11.79"	23° 26' 14"	-14 m 11 s
21	325° 23' 28"	-0.49"	327° 39' 02"	-13° 03' 35"	0.9874948	16' 11.78"	23° 26' 14"	-14 m 11 s
22	325° 25' 59"	-0.49"	327° 41' 28"	-13° 02' 44"	0.9875027	16' 11.77"	23° 26' 14"	-14 m 11 s
23	325° 28' 31"	-0.48"	327° 43' 55"	-13° 01' 53"	0.9875106	16' 11.77"	23° 26' 14"	-14 m 11 s
24	325° 31' 03"	-0.48"	327° 46' 22"	-13° 01' 02"	0.9875186	16' 11.76"	23° 26' 14"	-14 m 11 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	338° 57' 32"	-4° 58' 58"	342° 28' 27"	-12° 49' 26"	0° 56' 11"	15' 18.64"	266° 14' 25"	0.01776
1	339° 29' 42"	-4° 59' 22"	342° 58' 58"	-12° 37' 35"	0° 56' 10"	15' 18.25"	265° 35' 49"	0.01886
2	340° 01' 50"	-4° 59' 44"	343° 29' 26"	-12° 25' 42"	0° 56' 08"	15' 17.86"	264° 59' 15"	0.01999
3	340° 33' 57"	-5° 00' 05"	343° 59' 49"	-12° 13' 45"	0° 56' 07"	15' 17.47"	264° 24' 32"	0.02116
4	341° 06' 02"	-5° 00' 25"	344° 30' 07"	-12° 01' 46"	0° 56' 05"	15' 17.08"	263° 51' 32"	0.02237
5	341° 38' 05"	-5° 00' 42"	345° 00' 21"	-11° 49' 45"	0° 56' 04"	15' 16.69"	263° 20' 07"	0.02361
6	342° 10' 07"	-5° 00' 59"	345° 30' 31"	-11° 37' 40"	0° 56' 03"	15' 16.30"	262° 50' 11"	0.02488
7	342° 42' 07"	-5° 01' 13"	346° 00' 37"	-11° 25' 34"	0° 56' 01"	15' 15.91"	262° 21' 38"	0.02618
8	343° 14' 05"	-5° 01' 26"	346° 30' 38"	-11° 13' 24"	0° 55' 60"	15' 15.52"	261° 54' 21"	0.02752
9	343° 46' 02"	-5° 01' 38"	347° 00' 35"	-11° 01' 13"	0° 55' 58"	15' 15.13"	261° 28' 16"	0.02889
10	344° 17' 56"	-5° 01' 47"	347° 30' 28"	-10° 48' 59"	0° 55' 57"	15' 14.74"	261° 3' 18"	0.03030
11	344° 49' 49"	-5° 01' 56"	348° 00' 17"	-10° 36' 43"	0° 55' 55"	15' 14.35"	260° 39' 23"	0.03173
12	345° 21' 41"	-5° 02' 02"	348° 30' 02"	-10° 24' 25"	0° 55' 54"	15' 13.97"	260° 16' 26"	0.03320
13	345° 53' 30"	-5° 02' 07"	348° 59' 44"	-10° 12' 05"	0° 55' 53"	15' 13.58"	259° 54' 26"	0.03471
14	346° 25' 18"	-5° 02' 11"	349° 29' 21"	-9° 59' 42"	0° 55' 51"	15' 13.20"	259° 33' 18"	0.03624
15	346° 57' 05"	-5° 02' 13"	349° 58' 54"	-9° 47' 18"	0° 55' 50"	15' 12.82"	259° 12' 59"	0.03781
16	347° 28' 49"	-5° 02' 13"	350° 28' 23"	-9° 34' 52"	0° 55' 48"	15' 12.43"	258° 53' 27"	0.03940
17	348° 00' 32"	-5° 02' 12"	350° 57' 49"	-9° 22' 24"	0° 55' 47"	15' 12.05"	258° 34' 40"	0.04103
18	348° 32' 13"	-5° 02' 09"	351° 27' 11"	-9° 09' 54"	0° 55' 46"	15' 11.67"	258° 16' 34"	0.04269
19	349° 03' 53"	-5° 02' 05"	351° 56' 30"	-8° 57' 22"	0° 55' 44"	15' 11.30"	257° 59' 09"	0.04439
20	349° 35' 30"	-5° 01' 59"	352° 25' 44"	-8° 44' 49"	0° 55' 43"	15' 10.92"	257° 42' 21"	0.04611
21	350° 07' 06"	-5° 01' 51"	352° 54' 56"	-8° 32' 14"	0° 55' 41"	15' 10.54"	257° 26' 10"	0.04786
22	350° 38' 41"	-5° 01' 42"	353° 24' 03"	-8° 19' 38"	0° 55' 40"	15' 10.17"	257° 10' 34"	0.04965
23	351° 10' 13"	-5° 01' 32"	353° 53' 08"	-8° 07' 00"	0° 55' 39"	15' 09.79"	256° 55' 30"	0.05146
24	351° 41' 44"	-5° 01' 20"	354° 22' 09"	-7° 54' 21"	0° 55' 37"	15' 09.42"	256° 40' 58"	0.05330

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	325° 31' 03"	-0.48"	327° 46' 22"	-13° 01' 02"	0.9875186	16' 11.76"	23° 26' 14"	-14 m 11 s
1	325° 33' 34"	-0.48"	327° 48' 48"	-13° 00' 11"	0.9875265	16' 11.75"	23° 26' 14"	-14 m 11 s
2	325° 36' 06"	-0.48"	327° 51' 15"	-12° 59' 20"	0.9875345	16' 11.74"	23° 26' 14"	-14 m 11 s
3	325° 38' 38"	-0.48"	327° 53' 41"	-12° 58' 29"	0.9875425	16' 11.74"	23° 26' 14"	-14 m 11 s
4	325° 41' 09"	-0.48"	327° 56' 08"	-12° 57' 38"	0.9875504	16' 11.73"	23° 26' 14"	-14 m 11 s
5	325° 43' 41"	-0.48"	327° 58' 34"	-12° 56' 47"	0.9875584	16' 11.72"	23° 26' 14"	-14 m 10 s
6	325° 46' 13"	-0.48"	328° 01' 01"	-12° 55' 56"	0.9875664	16' 11.71"	23° 26' 14"	-14 m 10 s
7	325° 48' 44"	-0.48"	328° 03' 27"	-12° 55' 04"	0.9875744	16' 11.70"	23° 26' 14"	-14 m 10 s
8	325° 51' 16"	-0.48"	328° 05' 53"	-12° 54' 13"	0.9875823	16' 11.70"	23° 26' 14"	-14 m 10 s
9	325° 53' 47"	-0.48"	328° 08' 20"	-12° 53' 22"	0.9875903	16' 11.69"	23° 26' 14"	-14 m 10 s
10	325° 56' 19"	-0.48"	328° 10' 46"	-12° 52' 31"	0.9875983	16' 11.68"	23° 26' 14"	-14 m 10 s
11	325° 58' 51"	-0.48"	328° 13' 13"	-12° 51' 39"	0.9876063	16' 11.67"	23° 26' 14"	-14 m 10 s
12	326° 01' 22"	-0.48"	328° 15' 39"	-12° 50' 48"	0.9876143	16' 11.66"	23° 26' 14"	-14 m 10 s
13	326° 03' 54"	-0.48"	328° 18' 05"	-12° 49' 57"	0.9876223	16' 11.66"	23° 26' 14"	-14 m 10 s
14	326° 06' 26"	-0.48"	328° 20' 32"	-12° 49' 06"	0.9876304	16' 11.65"	23° 26' 14"	-14 m 10 s
15	326° 08' 57"	-0.47"	328° 22' 58"	-12° 48' 14"	0.9876384	16' 11.64"	23° 26' 14"	-14 m 09 s
16	326° 11' 29"	-0.47"	328° 25' 24"	-12° 47' 23"	0.9876464	16' 11.63"	23° 26' 14"	-14 m 09 s
17	326° 14' 00"	-0.47"	328° 27' 50"	-12° 46' 32"	0.9876544	16' 11.63"	23° 26' 14"	-14 m 09 s
18	326° 16' 32"	-0.47"	328° 30' 17"	-12° 45' 40"	0.9876625	16' 11.62"	23° 26' 14"	-14 m 09 s
19	326° 19' 04"	-0.47"	328° 32' 43"	-12° 44' 49"	0.9876705	16' 11.61"	23° 26' 14"	-14 m 09 s
20	326° 21' 35"	-0.47"	328° 35' 09"	-12° 43' 57"	0.9876785	16' 11.60"	23° 26' 14"	-14 m 09 s
21	326° 24' 07"	-0.47"	328° 37' 35"	-12° 43' 06"	0.9876866	16' 11.59"	23° 26' 14"	-14 m 09 s
22	326° 26' 38"	-0.47"	328° 40' 01"	-12° 42' 14"	0.9876946	16' 11.59"	23° 26' 14"	-14 m 09 s
23	326° 29' 10"	-0.46"	328° 42' 27"	-12° 41' 23"	0.9877027	16' 11.58"	23° 26' 14"	-14 m 09 s
24	326° 31' 41"	-0.46"	328° 44' 54"	-12° 40' 31"	0.9877107	16' 11.57"	23° 26' 14"	-14 m 08 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	351° 41' 44"	-5° 01' 20"	354° 22' 09"	-7° 54' 21"	0° 55' 37"	15' 09.42"	256° 40' 58"	0.05330
1	352° 13' 13"	-5° 01' 06"	354° 51' 06"	-7° 41' 41"	0° 55' 36"	15' 09.05"	256° 26' 57"	0.05518
2	352° 44' 41"	-5° 00' 51"	355° 20' 01"	-7° 28' 59"	0° 55' 35"	15' 08.68"	256° 13' 24"	0.05708
3	353° 16' 07"	-5° 00' 35"	355° 48' 52"	-7° 16' 16"	0° 55' 33"	15' 08.32"	256° 0' 19"	0.05901
4	353° 47' 31"	-5° 00' 17"	356° 17' 40"	-7° 03' 31"	0° 55' 32"	15' 07.95"	255° 47' 41"	0.06098
5	354° 18' 53"	-4° 59' 57"	356° 46' 24"	-6° 50' 46"	0° 55' 31"	15' 07.59"	255° 35' 29"	0.06297
6	354° 50' 14"	-4° 59' 36"	357° 15' 06"	-6° 37' 60"	0° 55' 29"	15' 07.22"	255° 23' 42"	0.06499
7	355° 21' 33"	-4° 59' 14"	357° 43' 45"	-6° 25' 12"	0° 55' 28"	15' 06.86"	255° 12' 19"	0.06703
8	355° 52' 51"	-4° 58' 49"	358° 12' 21"	-6° 12' 24"	0° 55' 27"	15' 06.50"	255° 1' 18"	0.06911
9	356° 24' 07"	-4° 58' 24"	358° 40' 54"	-5° 59' 35"	0° 55' 25"	15' 06.15"	254° 50' 40"	0.07121
10	356° 55' 21"	-4° 57' 57"	359° 09' 24"	-5° 46' 45"	0° 55' 24"	15' 05.79"	254° 40' 24"	0.07335
11	357° 26' 33"	-4° 57' 28"	359° 37' 51"	-5° 33' 54"	0° 55' 23"	15' 05.44"	254° 30' 29"	0.07551
12	357° 57' 44"	-4° 56' 59"	0° 06' 16"	-5° 21' 02"	0° 55' 21"	15' 05.09"	254° 20' 54"	0.07769
13	358° 28' 53"	-4° 56' 27"	0° 34' 38"	-5° 08' 10"	0° 55' 20"	15' 04.74"	254° 11' 38"	0.07991
14	359° 00' 01"	-4° 55' 54"	1° 02' 57"	-4° 55' 17"	0° 55' 19"	15' 04.39"	254° 2' 42"	0.08215
15	359° 31' 07"	-4° 55' 20"	1° 31' 14"	-4° 42' 24"	0° 55' 18"	15' 04.05"	253° 54' 04"	0.08441
16	0° 02' 11"	-4° 54' 44"	1° 59' 28"	-4° 29' 30"	0° 55' 16"	15' 03.70"	253° 45' 44"	0.08671
17	0° 33' 14"	-4° 54' 07"	2° 27' 40"	-4° 16' 36"	0° 55' 15"	15' 03.36"	253° 37' 41"	0.08903
18	1° 04' 15"	-4° 53' 29"	2° 55' 50"	-4° 03' 41"	0° 55' 14"	15' 03.02"	253° 29' 56"	0.09137
19	1° 35' 14"	-4° 52' 49"	3° 23' 57"	-3° 50' 46"	0° 55' 13"	15' 02.69"	253° 22' 27"	0.09375
20	2° 06' 12"	-4° 52' 07"	3° 52' 02"	-3° 37' 50"	0° 55' 11"	15' 02.35"	253° 15' 14"	0.09614
21	2° 37' 08"	-4° 51' 25"	4° 20' 05"	-3° 24' 55"	0° 55' 10"	15' 02.02"	253° 8' 17"	0.09857
22	3° 08' 03"	-4° 50' 40"	4° 48' 06"	-3° 11' 59"	0° 55' 09"	15' 01.69"	253° 1' 36"	0.10101
23	3° 38' 56"	-4° 49' 55"	5° 16' 04"	-2° 59' 03"	0° 55' 08"	15' 01.37"	252° 55' 09"	0.10349
24	4° 09' 48"	-4° 49' 08"	5° 44' 01"	-2° 46' 07"	0° 55' 07"	15' 01.04"	252° 48' 57"	0.10598

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	326° 31' 41"	-0.46"	328° 44' 54"	-12° 40' 31"	0.9877107	16' 11.57"	23° 26' 14"	-14 m 08 s
1	326° 34' 13"	-0.46"	328° 47' 20"	-12° 39' 40"	0.9877188	16' 11.56"	23° 26' 14"	-14 m 08 s
2	326° 36' 45"	-0.46"	328° 49' 46"	-12° 38' 48"	0.9877269	16' 11.55"	23° 26' 14"	-14 m 08 s
3	326° 39' 16"	-0.46"	328° 52' 12"	-12° 37' 57"	0.9877349	16' 11.55"	23° 26' 14"	-14 m 08 s
4	326° 41' 48"	-0.46"	328° 54' 38"	-12° 37' 05"	0.9877430	16' 11.54"	23° 26' 14"	-14 m 08 s
5	326° 44' 19"	-0.45"	328° 57' 04"	-12° 36' 13"	0.9877511	16' 11.53"	23° 26' 14"	-14 m 08 s
6	326° 46' 51"	-0.45"	328° 59' 30"	-12° 35' 22"	0.9877592	16' 11.52"	23° 26' 14"	-14 m 08 s
7	326° 49' 22"	-0.45"	329° 01' 56"	-12° 34' 30"	0.9877673	16' 11.51"	23° 26' 14"	-14 m 08 s
8	326° 51' 54"	-0.45"	329° 04' 22"	-12° 33' 38"	0.9877754	16' 11.51"	23° 26' 14"	-14 m 07 s
9	326° 54' 26"	-0.45"	329° 06' 48"	-12° 32' 47"	0.9877835	16' 11.50"	23° 26' 14"	-14 m 07 s
10	326° 56' 57"	-0.44"	329° 09' 14"	-12° 31' 55"	0.9877916	16' 11.49"	23° 26' 14"	-14 m 07 s
11	326° 59' 29"	-0.44"	329° 11' 40"	-12° 31' 03"	0.9877997	16' 11.48"	23° 26' 14"	-14 m 07 s
12	327° 02' 00"	-0.44"	329° 14' 05"	-12° 30' 11"	0.9878078	16' 11.47"	23° 26' 14"	-14 m 07 s
13	327° 04' 32"	-0.44"	329° 16' 31"	-12° 29' 19"	0.9878160	16' 11.47"	23° 26' 14"	-14 m 07 s
14	327° 07' 03"	-0.44"	329° 18' 57"	-12° 28' 28"	0.9878241	16' 11.46"	23° 26' 14"	-14 m 07 s
15	327° 09' 35"	-0.43"	329° 21' 23"	-12° 27' 36"	0.9878322	16' 11.45"	23° 26' 14"	-14 m 06 s
16	327° 12' 06"	-0.43"	329° 23' 49"	-12° 26' 44"	0.9878403	16' 11.44"	23° 26' 14"	-14 m 06 s
17	327° 14' 38"	-0.43"	329° 26' 15"	-12° 25' 52"	0.9878485	16' 11.43"	23° 26' 14"	-14 m 06 s
18	327° 17' 09"	-0.43"	329° 28' 40"	-12° 25' 00"	0.9878566	16' 11.43"	23° 26' 14"	-14 m 06 s
19	327° 19' 41"	-0.42"	329° 31' 06"	-12° 24' 08"	0.9878648	16' 11.42"	23° 26' 14"	-14 m 06 s
20	327° 22' 13"	-0.42"	329° 33' 32"	-12° 23' 16"	0.9878729	16' 11.41"	23° 26' 14"	-14 m 06 s
21	327° 24' 44"	-0.42"	329° 35' 58"	-12° 22' 24"	0.9878811	16' 11.40"	23° 26' 14"	-14 m 06 s
22	327° 27' 16"	-0.42"	329° 38' 23"	-12° 21' 32"	0.9878893	16' 11.39"	23° 26' 14"	-14 m 05 s
23	327° 29' 47"	-0.41"	329° 40' 49"	-12° 20' 40"	0.9878974	16' 11.39"	23° 26' 14"	-14 m 05 s
24	327° 32' 19"	-0.41"	329° 43' 15"	-12° 19' 48"	0.9879056	16' 11.38"	23° 26' 14"	-14 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	4° 09' 48"	-4° 49' 08"	5° 44' 01"	-2° 46' 07"	0° 55' 07"	15' 01.04"	252° 48' 57"	0.10598
1	4° 40' 37"	-4° 48' 20"	6° 11' 55"	-2° 33' 11"	0° 55' 05"	15' 00.72"	252° 42' 60"	0.10851
2	5° 11' 26"	-4° 47' 30"	6° 39' 48"	-2° 20' 14"	0° 55' 04"	15' 00.40"	252° 37' 17"	0.11105
3	5° 42' 13"	-4° 46' 39"	7° 07' 39"	-2° 07' 18"	0° 55' 03"	15' 00.09"	252° 31' 47"	0.11362
4	6° 12' 58"	-4° 45' 46"	7° 35' 28"	-1° 54' 22"	0° 55' 02"	14' 59.77"	252° 26' 31"	0.11622
5	6° 43' 42"	-4° 44' 53"	8° 03' 15"	-1° 41' 26"	0° 55' 01"	14' 59.46"	252° 21' 28"	0.11883
6	7° 14' 24"	-4° 43' 58"	8° 31' 01"	-1° 28' 31"	0° 54' 60"	14' 59.15"	252° 16' 38"	0.12147
7	7° 45' 05"	-4° 43' 01"	8° 58' 45"	-1° 15' 35"	0° 54' 59"	14' 58.85"	252° 12' 01"	0.12414
8	8° 15' 44"	-4° 42' 04"	9° 26' 27"	-1° 02' 40"	0° 54' 57"	14' 58.54"	252° 7' 37"	0.12682
9	8° 46' 22"	-4° 41' 04"	9° 54' 08"	0° 49' 45"	0° 54' 56"	14' 58.24"	252° 3' 24"	0.12953
10	9° 16' 59"	-4° 40' 04"	10° 21' 48"	0° 36' 51"	0° 54' 55"	14' 57.95"	251° 59' 24"	0.13226
11	9° 47' 33"	-4° 39' 02"	10° 49' 26"	0° 23' 57"	0° 54' 54"	14' 57.65"	251° 55' 35"	0.13502
12	10° 18' 07"	-4° 37' 60"	11° 17' 03"	0° 11' 03"	0° 54' 53"	14' 57.36"	251° 51' 59"	0.13779
13	10° 48' 39"	-4° 36' 55"	11° 44' 38"	0° 01' 50"	0° 54' 52"	14' 57.07"	251° 48' 33"	0.14059
14	11° 19' 09"	-4° 35' 50"	12° 12' 13"	0° 12' 43"	0° 54' 51"	14' 56.79"	251° 45' 19"	0.14341
15	11° 49' 39"	-4° 34' 43"	12° 39' 46"	0° 27' 35"	0° 54' 50"	14' 56.51"	251° 42' 16"	0.14625
16	12° 20' 06"	-4° 33' 35"	13° 07' 18"	0° 40' 26"	0° 54' 49"	14' 56.23"	251° 39' 25"	0.14911
17	12° 50' 33"	-4° 32' 26"	13° 34' 49"	0° 53' 17"	0° 54' 48"	14' 55.95"	251° 36' 43"	0.15199
18	13° 20' 58"	-4° 31' 15"	14° 02' 19"	1° 06' 07"	0° 54' 47"	14' 55.68"	251° 34' 13"	0.15489
19	13° 51' 21"	-4° 30' 03"	14° 29' 48"	1° 18' 56"	0° 54' 46"	14' 55.41"	251° 31' 53"	0.15781
20	14° 21' 43"	-4° 28' 50"	14° 57' 16"	1° 31' 44"	0° 54' 45"	14' 55.15"	251° 29' 43"	0.16076
21	14° 52' 04"	-4° 27' 36"	15° 24' 44"	1° 44' 31"	0° 54' 44"	14' 54.88"	251° 27' 44"	0.16372
22	15° 22' 24"	-4° 26' 21"	15° 52' 11"	1° 57' 18"	0° 54' 43"	14' 54.62"	251° 25' 55"	0.16670
23	15° 52' 42"	-4° 25' 04"	16° 19' 37"	2° 10' 04"	0° 54' 42"	14' 54.37"	251° 24' 15"	0.16970
24	16° 22' 59"	-4° 23' 46"	16° 47' 02"	2° 22' 48"	0° 54' 41"	14' 54.12"	251° 22' 46"	0.17272

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	327° 32' 19"	-0.41"	329° 43' 15"	-12° 19' 48"	0.9879056	16' 11.38"	23° 26' 14"	-14 m 05 s
1	327° 34' 50"	-0.41"	329° 45' 40"	-12° 18' 56"	0.9879138	16' 11.37"	23° 26' 14"	-14 m 05 s
2	327° 37' 22"	-0.40"	329° 48' 06"	-12° 18' 04"	0.9879220	16' 11.36"	23° 26' 14"	-14 m 05 s
3	327° 39' 53"	-0.40"	329° 50' 31"	-12° 17' 12"	0.9879302	16' 11.35"	23° 26' 14"	-14 m 05 s
4	327° 42' 25"	-0.40"	329° 52' 57"	-12° 16' 20"	0.9879384	16' 11.35"	23° 26' 14"	-14 m 05 s
5	327° 44' 56"	-0.40"	329° 55' 23"	-12° 15' 28"	0.9879466	16' 11.34"	23° 26' 14"	-14 m 04 s
6	327° 47' 28"	-0.39"	329° 57' 48"	-12° 14' 36"	0.9879548	16' 11.33"	23° 26' 14"	-14 m 04 s
7	327° 49' 59"	-0.39"	330° 00' 14"	-12° 13' 43"	0.9879630	16' 11.32"	23° 26' 14"	-14 m 04 s
8	327° 52' 31"	-0.39"	330° 02' 39"	-12° 12' 51"	0.9879712	16' 11.31"	23° 26' 14"	-14 m 04 s
9	327° 55' 02"	-0.38"	330° 05' 05"	-12° 11' 59"	0.9879794	16' 11.31"	23° 26' 14"	-14 m 04 s
10	327° 57' 34"	-0.38"	330° 07' 30"	-12° 11' 07"	0.9879876	16' 11.30"	23° 26' 14"	-14 m 04 s
11	328° 00' 05"	-0.38"	330° 09' 56"	-12° 10' 15"	0.9879959	16' 11.29"	23° 26' 14"	-14 m 03 s
12	328° 02' 37"	-0.37"	330° 12' 21"	-12° 09' 22"	0.9880041	16' 11.28"	23° 26' 14"	-14 m 03 s
13	328° 05' 08"	-0.37"	330° 14' 46"	-12° 08' 30"	0.9880123	16' 11.27"	23° 26' 14"	-14 m 03 s
14	328° 07' 39"	-0.37"	330° 17' 12"	-12° 07' 38"	0.9880206	16' 11.27"	23° 26' 14"	-14 m 03 s
15	328° 10' 11"	-0.36"	330° 19' 37"	-12° 06' 45"	0.9880288	16' 11.26"	23° 26' 14"	-14 m 03 s
16	328° 12' 42"	-0.36"	330° 22' 03"	-12° 05' 53"	0.9880371	16' 11.25"	23° 26' 14"	-14 m 03 s
17	328° 15' 14"	-0.36"	330° 24' 28"	-12° 05' 01"	0.9880454	16' 11.24"	23° 26' 14"	-14 m 02 s
18	328° 17' 45"	-0.35"	330° 26' 53"	-12° 04' 08"	0.9880536	16' 11.23"	23° 26' 14"	-14 m 02 s
19	328° 20' 17"	-0.35"	330° 29' 19"	-12° 03' 16"	0.9880619	16' 11.22"	23° 26' 14"	-14 m 02 s
20	328° 22' 48"	-0.35"	330° 31' 44"	-12° 02' 23"	0.9880702	16' 11.22"	23° 26' 14"	-14 m 02 s
21	328° 25' 20"	-0.34"	330° 34' 09"	-12° 01' 31"	0.9880784	16' 11.21"	23° 26' 14"	-14 m 02 s
22	328° 27' 51"	-0.34"	330° 36' 34"	-12° 00' 38"	0.9880867	16' 11.20"	23° 26' 14"	-14 m 01 s
23	328° 30' 23"	-0.33"	330° 38' 60"	-11° 59' 46"	0.9880950	16' 11.19"	23° 26' 14"	-14 m 01 s
24	328° 32' 54"	-0.33"	330° 41' 25"	-11° 58' 53"	0.9881033	16' 11.18"	23° 26' 14"	-14 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	16° 22' 59"	-4° 23' 46"	16° 47' 02"	2° 22' 48"	0° 54' 41"	14' 54.12"	251° 22' 46"	0.17272
1	16° 53' 15"	-4° 22' 27"	17° 14' 27"	2° 35' 32"	0° 54' 40"	14' 53.87"	251° 21' 26"	0.17577
2	17° 23' 29"	-4° 21' 07"	17° 41' 52"	2° 48' 14"	0° 54' 39"	14' 53.62"	251° 20' 16"	0.17882
3	17° 53' 42"	-4° 19' 46"	18° 09' 15"	3° 00' 56"	0° 54' 38"	14' 53.38"	251° 19' 16"	0.18190
4	18° 23' 54"	-4° 18' 23"	18° 36' 39"	3° 13' 36"	0° 54' 38"	14' 53.14"	251° 18' 25"	0.18500
5	18° 54' 05"	-4° 16' 59"	19° 04' 02"	3° 26' 15"	0° 54' 37"	14' 52.91"	251° 17' 43"	0.18811
6	19° 24' 14"	-4° 15' 35"	19° 31' 25"	3° 38' 53"	0° 54' 36"	14' 52.68"	251° 17' 10"	0.19125
7	19° 54' 23"	-4° 14' 09"	19° 58' 48"	3° 51' 30"	0° 54' 35"	14' 52.45"	251° 16' 47"	0.19440
8	20° 24' 30"	-4° 12' 42"	20° 26' 10"	4° 04' 05"	0° 54' 34"	14' 52.23"	251° 16' 32"	0.19756
9	20° 54' 36"	-4° 11' 13"	20° 53' 33"	4° 16' 39"	0° 54' 33"	14' 52.01"	251° 16' 27"	0.20075
10	21° 24' 40"	-4° 09' 44"	21° 20' 55"	4° 29' 12"	0° 54' 33"	14' 51.79"	251° 16' 30"	0.20395
11	21° 54' 44"	-4° 08' 13"	21° 48' 17"	4° 41' 43"	0° 54' 32"	14' 51.58"	251° 16' 42"	0.20717
12	22° 24' 46"	-4° 06' 42"	22° 15' 40"	4° 54' 12"	0° 54' 31"	14' 51.37"	251° 17' 03"	0.21041
13	22° 54' 48"	-4° 05' 09"	22° 43' 02"	5° 06' 40"	0° 54' 30"	14' 51.17"	251° 17' 33"	0.21366
14	23° 24' 48"	-4° 03' 35"	23° 10' 25"	5° 19' 07"	0° 54' 30"	14' 50.97"	251° 18' 11"	0.21693
15	23° 54' 47"	-4° 02' 01"	23° 37' 48"	5° 31' 32"	0° 54' 29"	14' 50.77"	251° 18' 58"	0.22021
16	24° 24' 45"	-4° 00' 25"	24° 05' 11"	5° 43' 55"	0° 54' 28"	14' 50.58"	251° 19' 53"	0.22351
17	24° 54' 43"	-3° 58' 48"	24° 32' 34"	5° 56' 17"	0° 54' 27"	14' 50.39"	251° 20' 56"	0.22683
18	25° 24' 39"	-3° 57' 10"	24° 59' 58"	6° 08' 37"	0° 54' 27"	14' 50.20"	251° 22' 08"	0.23016
19	25° 54' 34"	-3° 55' 31"	25° 27' 23"	6° 20' 55"	0° 54' 26"	14' 50.02"	251° 23' 28"	0.23351
20	26° 24' 28"	-3° 53' 51"	25° 54' 47"	6° 33' 12"	0° 54' 25"	14' 49.85"	251° 24' 57"	0.23687
21	26° 54' 21"	-3° 52' 10"	26° 22' 13"	6° 45' 27"	0° 54' 25"	14' 49.68"	251° 26' 33"	0.24025
22	27° 24' 13"	-3° 50' 28"	26° 49' 39"	6° 57' 39"	0° 54' 24"	14' 49.51"	251° 28' 17"	0.24364
23	27° 54' 04"	-3° 48' 44"	27° 17' 06"	7° 09' 50"	0° 54' 24"	14' 49.34"	251° 30' 10"	0.24704
24	28° 23' 55"	-3° 47' 00"	27° 44' 33"	7° 21' 59"	0° 54' 23"	14' 49.18"	251° 32' 11"	0.25047

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	328° 32' 54"	-0.33"	330° 41' 25"	-11° 58' 53"	0.9881033	16' 11.18"	23° 26' 14"	-14 m 01 s
1	328° 35' 25"	-0.33"	330° 43' 50"	-11° 58' 01"	0.9881116	16' 11.18"	23° 26' 14"	-14 m 01 s
2	328° 37' 57"	-0.32"	330° 46' 15"	-11° 57' 08"	0.9881199	16' 11.17"	23° 26' 14"	-14 m 01 s
3	328° 40' 28"	-0.32"	330° 48' 40"	-11° 56' 16"	0.9881282	16' 11.16"	23° 26' 14"	-14 m 01 s
4	328° 42' 60"	-0.31"	330° 51' 05"	-11° 55' 23"	0.9881365	16' 11.15"	23° 26' 14"	-14 m 00 s
5	328° 45' 31"	-0.31"	330° 53' 30"	-11° 54' 30"	0.9881449	16' 11.14"	23° 26' 14"	-14 m 00 s
6	328° 48' 03"	-0.31"	330° 55' 56"	-11° 53' 38"	0.9881532	16' 11.13"	23° 26' 14"	-14 m 00 s
7	328° 50' 34"	-0.30"	330° 58' 21"	-11° 52' 45"	0.9881615	16' 11.13"	23° 26' 14"	-13 m 60 s
8	328° 53' 05"	-0.30"	331° 00' 46"	-11° 51' 53"	0.9881699	16' 11.12"	23° 26' 14"	-13 m 60 s
9	328° 55' 37"	-0.29"	331° 03' 11"	-11° 50' 60"	0.9881782	16' 11.11"	23° 26' 14"	-13 m 59 s
10	328° 58' 08"	-0.29"	331° 05' 36"	-11° 50' 07"	0.9881866	16' 11.10"	23° 26' 14"	-13 m 59 s
11	329° 00' 40"	-0.29"	331° 08' 01"	-11° 49' 14"	0.9881949	16' 11.09"	23° 26' 14"	-13 m 59 s
12	329° 03' 11"	-0.28"	331° 10' 26"	-11° 48' 22"	0.9882033	16' 11.09"	23° 26' 14"	-13 m 59 s
13	329° 05' 42"	-0.28"	331° 12' 51"	-11° 47' 29"	0.9882116	16' 11.08"	23° 26' 14"	-13 m 59 s
14	329° 08' 14"	-0.27"	331° 15' 16"	-11° 46' 36"	0.9882200	16' 11.07"	23° 26' 14"	-13 m 58 s
15	329° 10' 45"	-0.27"	331° 17' 41"	-11° 45' 43"	0.9882284	16' 11.06"	23° 26' 14"	-13 m 58 s
16	329° 13' 17"	-0.26"	331° 20' 06"	-11° 44' 50"	0.9882368	16' 11.05"	23° 26' 14"	-13 m 58 s
17	329° 15' 48"	-0.26"	331° 22' 30"	-11° 43' 58"	0.9882451	16' 11.04"	23° 26' 14"	-13 m 58 s
18	329° 18' 19"	-0.26"	331° 24' 55"	-11° 43' 05"	0.9882535	16' 11.04"	23° 26' 14"	-13 m 58 s
19	329° 20' 51"	-0.25"	331° 27' 20"	-11° 42' 12"	0.9882619	16' 11.03"	23° 26' 14"	-13 m 57 s
20	329° 23' 22"	-0.25"	331° 29' 45"	-11° 41' 19"	0.9882703	16' 11.02"	23° 26' 14"	-13 m 57 s
21	329° 25' 54"	-0.24"	331° 32' 10"	-11° 40' 26"	0.9882787	16' 11.01"	23° 26' 14"	-13 m 57 s
22	329° 28' 25"	-0.24"	331° 34' 35"	-11° 39' 33"	0.9882871	16' 11.00"	23° 26' 14"	-13 m 57 s
23	329° 30' 56"	-0.23"	331° 36' 59"	-11° 38' 40"	0.9882956	16' 10.99"	23° 26' 14"	-13 m 57 s
24	329° 33' 28"	-0.23"	331° 39' 24"	-11° 37' 47"	0.9883040	16' 10.99"	23° 26' 14"	-13 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	28° 23' 55"	-3° 47' 00"	27° 44' 33"	7° 21' 59"	0° 54' 23"	14' 49.18"	251° 32' 11"	0.25047
1	28° 53' 44"	-3° 45' 15"	28° 12' 01"	7° 34' 06"	0° 54' 22"	14' 49.03"	251° 34' 19"	0.25390
2	29° 23' 33"	-3° 43' 29"	28° 39' 30"	7° 46' 11"	0° 54' 22"	14' 48.88"	251° 36' 35"	0.25735
3	29° 53' 20"	-3° 41' 42"	29° 07' 00"	7° 58' 14"	0° 54' 21"	14' 48.73"	251° 38' 60"	0.26081
4	30° 23' 07"	-3° 39' 54"	29° 34' 31"	8° 10' 15"	0° 54' 21"	14' 48.59"	251° 41' 31"	0.26429
5	30° 52' 53"	-3° 38' 05"	30° 02' 03"	8° 22' 13"	0° 54' 20"	14' 48.45"	251° 44' 11"	0.26777
6	31° 22' 38"	-3° 36' 15"	30° 29' 36"	8° 34' 10"	0° 54' 20"	14' 48.31"	251° 46' 59"	0.27128
7	31° 52' 23"	-3° 34' 24"	30° 57' 10"	8° 46' 04"	0° 54' 19"	14' 48.18"	251° 49' 54"	0.27479
8	32° 22' 06"	-3° 32' 32"	31° 24' 45"	8° 57' 56"	0° 54' 19"	14' 48.06"	251° 52' 57"	0.27832
9	32° 51' 49"	-3° 30' 40"	31° 52' 22"	9° 09' 46"	0° 54' 18"	14' 47.94"	251° 56' 07"	0.28186
10	33° 21' 32"	-3° 28' 46"	32° 19' 59"	9° 21' 33"	0° 54' 18"	14' 47.82"	251° 59' 25"	0.28541
11	33° 51' 13"	-3° 26' 51"	32° 47' 38"	9° 33' 19"	0° 54' 18"	14' 47.71"	252° 2' 50"	0.28897
12	34° 20' 54"	-3° 24' 56"	33° 15' 19"	9° 45' 01"	0° 54' 17"	14' 47.60"	252° 6' 23"	0.29255
13	34° 50' 34"	-3° 22' 60"	33° 43' 01"	9° 56' 41"	0° 54' 17"	14' 47.50"	252° 10' 04"	0.29614
14	35° 20' 13"	-3° 21' 02"	34° 10' 44"	10° 08' 19"	0° 54' 17"	14' 47.40"	252° 13' 52"	0.29974
15	35° 49' 52"	-3° 19' 04"	34° 38' 29"	10° 19' 54"	0° 54' 16"	14' 47.31"	252° 17' 47"	0.30335
16	36° 19' 31"	-3° 17' 05"	35° 06' 15"	10° 31' 27"	0° 54' 16"	14' 47.22"	252° 21' 50"	0.30697
17	36° 49' 08"	-3° 15' 06"	35° 34' 03"	10° 42' 57"	0° 54' 16"	14' 47.13"	252° 25' 60"	0.31060
18	37° 18' 45"	-3° 13' 05"	36° 01' 53"	10° 54' 25"	0° 54' 15"	14' 47.05"	252° 30' 17"	0.31424
19	37° 48' 22"	-3° 11' 03"	36° 29' 45"	11° 05' 50"	0° 54' 15"	14' 46.98"	252° 34' 42"	0.31790
20	38° 17' 58"	-3° 09' 01"	36° 57' 38"	11° 17' 12"	0° 54' 15"	14' 46.91"	252° 39' 14"	0.32156
21	38° 47' 33"	-3° 06' 58"	37° 25' 33"	11° 28' 31"	0° 54' 14"	14' 46.84"	252° 43' 53"	0.32524
22	39° 17' 08"	-3° 04' 54"	37° 53' 30"	11° 39' 48"	0° 54' 14"	14' 46.78"	252° 48' 39"	0.32892
23	39° 46' 43"	-3° 02' 49"	38° 21' 29"	11° 51' 01"	0° 54' 14"	14' 46.72"	252° 53' 33"	0.33261
24	40° 16' 17"	-3° 00' 44"	38° 49' 30"	12° 02' 12"	0° 54' 14"	14' 46.67"	252° 58' 33"	0.33632

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	329° 33' 28"	-0.23"	331° 39' 24"	-11° 37' 47"	0.9883040	16' 10.99"	23° 26' 14"	-13 m 56 s
1	329° 35' 59"	-0.22"	331° 41' 49"	-11° 36' 54"	0.9883124	16' 10.98"	23° 26' 14"	-13 m 56 s
2	329° 38' 30"	-0.22"	331° 44' 14"	-11° 36' 01"	0.9883208	16' 10.97"	23° 26' 14"	-13 m 56 s
3	329° 41' 02"	-0.21"	331° 46' 38"	-11° 35' 08"	0.9883293	16' 10.96"	23° 26' 14"	-13 m 56 s
4	329° 43' 33"	-0.21"	331° 49' 03"	-11° 34' 15"	0.9883377	16' 10.95"	23° 26' 14"	-13 m 56 s
5	329° 46' 04"	-0.20"	331° 51' 28"	-11° 33' 22"	0.9883462	16' 10.95"	23° 26' 14"	-13 m 55 s
6	329° 48' 36"	-0.20"	331° 53' 52"	-11° 32' 29"	0.9883546	16' 10.94"	23° 26' 14"	-13 m 55 s
7	329° 51' 07"	-0.19"	331° 56' 17"	-11° 31' 36"	0.9883631	16' 10.93"	23° 26' 14"	-13 m 55 s
8	329° 53' 39"	-0.19"	331° 58' 42"	-11° 30' 43"	0.9883716	16' 10.92"	23° 26' 14"	-13 m 55 s
9	329° 56' 10"	-0.18"	332° 01' 06"	-11° 29' 49"	0.9883800	16' 10.91"	23° 26' 14"	-13 m 54 s
10	329° 58' 41"	-0.18"	332° 03' 31"	-11° 28' 56"	0.9883885	16' 10.90"	23° 26' 14"	-13 m 54 s
11	330° 01' 13"	-0.17"	332° 05' 55"	-11° 28' 03"	0.9883970	16' 10.90"	23° 26' 14"	-13 m 54 s
12	330° 03' 44"	-0.17"	332° 08' 20"	-11° 27' 10"	0.9884055	16' 10.89"	23° 26' 14"	-13 m 54 s
13	330° 06' 15"	-0.16"	332° 10' 44"	-11° 26' 17"	0.9884140	16' 10.88"	23° 26' 14"	-13 m 54 s
14	330° 08' 47"	-0.16"	332° 13' 09"	-11° 25' 23"	0.9884225	16' 10.87"	23° 26' 14"	-13 m 53 s
15	330° 11' 18"	-0.15"	332° 15' 33"	-11° 24' 30"	0.9884310	16' 10.86"	23° 26' 14"	-13 m 53 s
16	330° 13' 49"	-0.15"	332° 17' 58"	-11° 23' 37"	0.9884395	16' 10.85"	23° 26' 14"	-13 m 53 s
17	330° 16' 20"	-0.14"	332° 20' 22"	-11° 22' 44"	0.9884480	16' 10.85"	23° 26' 14"	-13 m 53 s
18	330° 18' 52"	-0.14"	332° 22' 47"	-11° 21' 50"	0.9884565	16' 10.84"	23° 26' 14"	-13 m 52 s
19	330° 21' 23"	-0.13"	332° 25' 11"	-11° 20' 57"	0.9884650	16' 10.83"	23° 26' 14"	-13 m 52 s
20	330° 23' 54"	-0.13"	332° 27' 36"	-11° 20' 04"	0.9884736	16' 10.82"	23° 26' 14"	-13 m 52 s
21	330° 26' 26"	-0.12"	332° 30' 00"	-11° 19' 10"	0.9884821	16' 10.81"	23° 26' 14"	-13 m 52 s
22	330° 28' 57"	-0.12"	332° 32' 24"	-11° 18' 17"	0.9884907	16' 10.80"	23° 26' 14"	-13 m 52 s
23	330° 31' 28"	-0.11"	332° 34' 49"	-11° 17' 23"	0.9884992	16' 10.79"	23° 26' 14"	-13 m 51 s
24	330° 33' 60"	-0.11"	332° 37' 13"	-11° 16' 30"	0.9885078	16' 10.79"	23° 26' 14"	-13 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	40° 16' 17"	-3° 00' 44"	38° 49' 30"	12° 02' 12"	0° 54' 14"	14' 46.67"	252° 58' 33"	0.33632
1	40° 45' 51"	-2° 58' 37"	39° 17' 33"	12° 13' 20"	0° 54' 14"	14' 46.62"	253° 3' 41"	0.34003
2	41° 15' 24"	-2° 56' 30"	39° 45' 38"	12° 24' 25"	0° 54' 13"	14' 46.58"	253° 8' 56"	0.34375
3	41° 44' 57"	-2° 54' 22"	40° 13' 45"	12° 35' 27"	0° 54' 13"	14' 46.54"	253° 14' 18"	0.34748
4	42° 14' 30"	-2° 52' 14"	40° 41' 54"	12° 46' 26"	0° 54' 13"	14' 46.51"	253° 19' 48"	0.35122
5	42° 44' 02"	-2° 50' 04"	41° 10' 06"	12° 57' 22"	0° 54' 13"	14' 46.48"	253° 25' 24"	0.35497
6	43° 13' 34"	-2° 47' 54"	41° 38' 20"	13° 08' 15"	0° 54' 13"	14' 46.46"	253° 31' 07"	0.35873
7	43° 43' 06"	-2° 45' 43"	42° 06' 36"	13° 19' 05"	0° 54' 13"	14' 46.44"	253° 36' 58"	0.36249
8	44° 12' 37"	-2° 43' 31"	42° 34' 55"	13° 29' 52"	0° 54' 13"	14' 46.42"	253° 42' 55"	0.36627
9	44° 42' 09"	-2° 41' 19"	43° 03' 16"	13° 40' 35"	0° 54' 13"	14' 46.41"	253° 48' 59"	0.37005
10	45° 11' 40"	-2° 39' 06"	43° 31' 39"	13° 51' 15"	0° 54' 13"	14' 46.41"	253° 55' 11"	0.37384
11	45° 41' 10"	-2° 36' 52"	44° 00' 05"	14° 01' 52"	0° 54' 13"	14' 46.41"	254° 1' 29"	0.37763
12	46° 10' 41"	-2° 34' 38"	44° 28' 34"	14° 12' 25"	0° 54' 13"	14' 46.42"	254° 7' 54"	0.38144
13	46° 40' 11"	-2° 32' 22"	44° 57' 05"	14° 22' 55"	0° 54' 13"	14' 46.43"	254° 14' 27"	0.38525
14	47° 09' 42"	-2° 30' 07"	45° 25' 39"	14° 33' 22"	0° 54' 13"	14' 46.44"	254° 21' 06"	0.38907
15	47° 39' 12"	-2° 27' 50"	45° 54' 15"	14° 43' 45"	0° 54' 13"	14' 46.46"	254° 27' 52"	0.39289
16	48° 08' 42"	-2° 25' 33"	46° 22' 55"	14° 54' 05"	0° 54' 13"	14' 46.49"	254° 34' 45"	0.39672
17	48° 38' 12"	-2° 23' 15"	46° 51' 37"	15° 04' 21"	0° 54' 13"	14' 46.52"	254° 41' 44"	0.40056
18	49° 07' 42"	-2° 20' 57"	47° 20' 22"	15° 14' 33"	0° 54' 13"	14' 46.55"	254° 48' 51"	0.40440
19	49° 37' 12"	-2° 18' 38"	47° 49' 09"	15° 24' 42"	0° 54' 14"	14' 46.59"	254° 56' 05"	0.40825
20	50° 06' 43"	-2° 16' 18"	48° 18' 00"	15° 34' 47"	0° 54' 14"	14' 46.64"	255° 3' 25"	0.41211
21	50° 36' 13"	-2° 13' 58"	48° 46' 54"	15° 44' 49"	0° 54' 14"	14' 46.69"	255° 10' 52"	0.41597
22	51° 05' 43"	-2° 11' 37"	49° 15' 50"	15° 54' 47"	0° 54' 14"	14' 46.74"	255° 18' 26"	0.41984
23	51° 35' 13"	-2° 09' 15"	49° 44' 50"	16° 04' 41"	0° 54' 14"	14' 46.80"	255° 26' 07"	0.42371
24	52° 04' 43"	-2° 06' 53"	50° 13' 53"	16° 14' 31"	0° 54' 15"	14' 46.87"	255° 33' 54"	0.42759

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	330° 33' 60"	-0.11"	332° 37' 13"	-11° 16' 30"	0.9885078	16' 10.79"	23° 26' 14"	-13 m 51 s
1	330° 36' 31"	-0.10"	332° 39' 37"	-11° 15' 36"	0.9885163	16' 10.78"	23° 26' 14"	-13 m 51 s
2	330° 39' 02"	-0.10"	332° 42' 02"	-11° 14' 43"	0.9885249	16' 10.77"	23° 26' 14"	-13 m 51 s
3	330° 41' 33"	-0.09"	332° 44' 26"	-11° 13' 49"	0.9885335	16' 10.76"	23° 26' 14"	-13 m 50 s
4	330° 44' 05"	-0.09"	332° 46' 50"	-11° 12' 56"	0.9885420	16' 10.75"	23° 26' 14"	-13 m 50 s
5	330° 46' 36"	-0.08"	332° 49' 15"	-11° 12' 02"	0.9885506	16' 10.74"	23° 26' 14"	-13 m 50 s
6	330° 49' 07"	-0.08"	332° 51' 39"	-11° 11' 09"	0.9885592	16' 10.74"	23° 26' 14"	-13 m 50 s
7	330° 51' 39"	-0.07"	332° 54' 03"	-11° 10' 15"	0.9885678	16' 10.73"	23° 26' 14"	-13 m 49 s
8	330° 54' 10"	-0.06"	332° 56' 27"	-11° 09' 22"	0.9885764	16' 10.72"	23° 26' 14"	-13 m 49 s
9	330° 56' 41"	-0.06"	332° 58' 51"	-11° 08' 28"	0.9885850	16' 10.71"	23° 26' 14"	-13 m 49 s
10	330° 59' 12"	-0.05"	333° 01' 15"	-11° 07' 35"	0.9885936	16' 10.70"	23° 26' 14"	-13 m 49 s
11	331° 01' 44"	-0.05"	333° 03' 40"	-11° 06' 41"	0.9886022	16' 10.69"	23° 26' 14"	-13 m 48 s
12	331° 04' 15"	-0.04"	333° 06' 04"	-11° 05' 47"	0.9886109	16' 10.69"	23° 26' 14"	-13 m 48 s
13	331° 06' 46"	-0.04"	333° 08' 28"	-11° 04' 54"	0.9886195	16' 10.68"	23° 26' 14"	-13 m 48 s
14	331° 09' 17"	-0.03"	333° 10' 52"	-11° 03' 60"	0.9886281	16' 10.67"	23° 26' 14"	-13 m 48 s
15	331° 11' 49"	-0.03"	333° 13' 16"	-11° 03' 06"	0.9886368	16' 10.66"	23° 26' 14"	-13 m 47 s
16	331° 14' 20"	-0.02"	333° 15' 40"	-11° 02' 13"	0.9886454	16' 10.65"	23° 26' 14"	-13 m 47 s
17	331° 16' 51"	-0.01"	333° 18' 04"	-11° 01' 19"	0.9886541	16' 10.64"	23° 26' 14"	-13 m 47 s
18	331° 19' 22"	-0.01"	333° 20' 28"	-11° 00' 25"	0.9886627	16' 10.63"	23° 26' 14"	-13 m 47 s
19	331° 21' 54"	-0.00"	333° 22' 52"	-10° 59' 31"	0.9886714	16' 10.63"	23° 26' 14"	-13 m 46 s
20	331° 24' 25"	0.00"	333° 25' 16"	-10° 58' 37"	0.9886801	16' 10.62"	23° 26' 14"	-13 m 46 s
21	331° 26' 56"	0.01"	333° 27' 40"	-10° 57' 44"	0.9886887	16' 10.61"	23° 26' 14"	-13 m 46 s
22	331° 29' 27"	0.01"	333° 30' 04"	-10° 56' 50"	0.9886974	16' 10.60"	23° 26' 14"	-13 m 46 s
23	331° 31' 58"	0.02"	333° 32' 28"	-10° 55' 56"	0.9887061	16' 10.59"	23° 26' 14"	-13 m 45 s
24	331° 34' 30"	0.02"	333° 34' 52"	-10° 55' 02"	0.9887148	16' 10.58"	23° 26' 14"	-13 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	52° 04' 43"	-2° 06' 53"	50° 13' 53"	16° 14' 31"	0° 54' 15"	14' 46.87"	255° 33' 54"	0.42759
1	52° 34' 14"	-2° 04' 30"	50° 42' 59"	16° 24' 17"	0° 54' 15"	14' 46.94"	255° 41' 48"	0.43147
2	53° 03' 45"	-2° 02' 07"	51° 12' 07"	16° 33' 59"	0° 54' 15"	14' 47.01"	255° 49' 49"	0.43536
3	53° 33' 15"	-1° 59' 43"	51° 41' 20"	16° 43' 38"	0° 54' 15"	14' 47.09"	255° 57' 57"	0.43925
4	54° 02' 46"	-1° 57' 19"	52° 10' 35"	16° 53' 12"	0° 54' 16"	14' 47.17"	256° 6' 12"	0.44314
5	54° 32' 18"	-1° 54' 54"	52° 39' 54"	17° 02' 42"	0° 54' 16"	14' 47.26"	256° 14' 33"	0.44704
6	55° 01' 49"	-1° 52' 28"	53° 09' 16"	17° 12' 08"	0° 54' 16"	14' 47.36"	256° 23' 01"	0.45095
7	55° 31' 21"	-1° 50' 02"	53° 38' 41"	17° 21' 31"	0° 54' 17"	14' 47.46"	256° 31' 35"	0.45486
8	56° 00' 53"	-1° 47' 36"	54° 08' 10"	17° 30' 48"	0° 54' 17"	14' 47.56"	256° 40' 17"	0.45877
9	56° 30' 25"	-1° 45' 09"	54° 37' 42"	17° 40' 02"	0° 54' 18"	14' 47.67"	256° 49' 05"	0.46268
10	56° 59' 58"	-1° 42' 41"	55° 07' 17"	17° 49' 11"	0° 54' 18"	14' 47.79"	256° 57' 59"	0.46660
11	57° 29' 31"	-1° 40' 13"	55° 36' 56"	17° 58' 16"	0° 54' 18"	14' 47.91"	257° 7' 00"	0.47052
12	57° 59' 05"	-1° 37' 44"	56° 06' 39"	18° 07' 17"	0° 54' 19"	14' 48.03"	257° 16' 08"	0.47445
13	58° 28' 39"	-1° 35' 15"	56° 36' 25"	18° 16' 13"	0° 54' 19"	14' 48.16"	257° 25' 23"	0.47837
14	58° 58' 13"	-1° 32' 46"	57° 06' 15"	18° 25' 05"	0° 54' 20"	14' 48.30"	257° 34' 44"	0.48230
15	59° 27' 48"	-1° 30' 16"	57° 36' 08"	18° 33' 52"	0° 54' 20"	14' 48.43"	257° 44' 11"	0.48623
16	59° 57' 23"	-1° 27' 46"	58° 06' 05"	18° 42' 35"	0° 54' 21"	14' 48.58"	257° 53' 45"	0.49017
17	60° 26' 59"	-1° 25' 15"	58° 36' 05"	18° 51' 13"	0° 54' 21"	14' 48.73"	258° 3' 26"	0.49410
18	60° 56' 35"	-1° 22' 44"	59° 06' 10"	18° 59' 46"	0° 54' 22"	14' 48.88"	258° 13' 13"	0.49804
19	61° 26' 12"	-1° 20' 12"	59° 36' 18"	19° 08' 15"	0° 54' 23"	14' 49.04"	258° 23' 07"	0.50198
20	61° 55' 50"	-1° 17' 40"	60° 06' 29"	19° 16' 39"	0° 54' 23"	14' 49.21"	258° 33' 08"	0.50592
21	62° 25' 28"	-1° 15' 07"	60° 36' 45"	19° 24' 59"	0° 54' 24"	14' 49.38"	258° 43' 14"	0.50986
22	62° 55' 07"	-1° 12' 34"	61° 07' 04"	19° 33' 13"	0° 54' 24"	14' 49.55"	258° 53' 28"	0.51381
23	63° 24' 46"	-1° 10' 01"	61° 37' 27"	19° 41' 23"	0° 54' 25"	14' 49.73"	259° 3' 47"	0.51775
24	63° 54' 26"	-1° 07' 28"	62° 07' 54"	19° 49' 27"	0° 54' 26"	14' 49.91"	259° 14' 14"	0.52169

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	331° 34' 30"	0.02"	333° 34' 52"	-10° 55' 02"	0.9887148	16' 10.58"	23° 26' 14"	-13 m 45 s
1	331° 37' 01"	0.03"	333° 37' 16"	-10° 54' 08"	0.9887235	16' 10.57"	23° 26' 14"	-13 m 45 s
2	331° 39' 32"	0.04"	333° 39' 40"	-10° 53' 14"	0.9887322	16' 10.57"	23° 26' 14"	-13 m 44 s
3	331° 42' 03"	0.04"	333° 42' 03"	-10° 52' 20"	0.9887409	16' 10.56"	23° 26' 14"	-13 m 44 s
4	331° 44' 35"	0.05"	333° 44' 27"	-10° 51' 27"	0.9887496	16' 10.55"	23° 26' 14"	-13 m 44 s
5	331° 47' 06"	0.05"	333° 46' 51"	-10° 50' 33"	0.9887583	16' 10.54"	23° 26' 14"	-13 m 44 s
6	331° 49' 37"	0.06"	333° 49' 15"	-10° 49' 39"	0.9887671	16' 10.53"	23° 26' 14"	-13 m 43 s
7	331° 52' 08"	0.06"	333° 51' 39"	-10° 48' 45"	0.9887758	16' 10.52"	23° 26' 14"	-13 m 43 s
8	331° 54' 39"	0.07"	333° 54' 02"	-10° 47' 51"	0.9887846	16' 10.51"	23° 26' 14"	-13 m 43 s
9	331° 57' 11"	0.08"	333° 56' 26"	-10° 46' 57"	0.9887933	16' 10.51"	23° 26' 14"	-13 m 43 s
10	331° 59' 42"	0.08"	333° 58' 50"	-10° 46' 03"	0.9888021	16' 10.50"	23° 26' 14"	-13 m 42 s
11	332° 02' 13"	0.09"	334° 01' 14"	-10° 45' 09"	0.9888108	16' 10.49"	23° 26' 14"	-13 m 42 s
12	332° 04' 44"	0.09"	334° 03' 37"	-10° 44' 14"	0.9888196	16' 10.48"	23° 26' 14"	-13 m 42 s
13	332° 07' 15"	0.10"	334° 06' 01"	-10° 43' 20"	0.9888283	16' 10.47"	23° 26' 14"	-13 m 41 s
14	332° 09' 46"	0.10"	334° 08' 25"	-10° 42' 26"	0.9888371	16' 10.46"	23° 26' 14"	-13 m 41 s
15	332° 12' 18"	0.11"	334° 10' 48"	-10° 41' 32"	0.9888459	16' 10.45"	23° 26' 14"	-13 m 41 s
16	332° 14' 49"	0.12"	334° 13' 12"	-10° 40' 38"	0.9888547	16' 10.45"	23° 26' 14"	-13 m 41 s
17	332° 17' 20"	0.12"	334° 15' 36"	-10° 39' 44"	0.9888635	16' 10.44"	23° 26' 14"	-13 m 40 s
18	332° 19' 51"	0.13"	334° 17' 59"	-10° 38' 50"	0.9888723	16' 10.43"	23° 26' 14"	-13 m 40 s
19	332° 22' 22"	0.13"	334° 20' 23"	-10° 37' 55"	0.9888811	16' 10.42"	23° 26' 14"	-13 m 40 s
20	332° 24' 53"	0.14"	334° 22' 46"	-10° 37' 01"	0.9888899	16' 10.41"	23° 26' 14"	-13 m 39 s
21	332° 27' 25"	0.14"	334° 25' 10"	-10° 36' 07"	0.9888987	16' 10.40"	23° 26' 14"	-13 m 39 s
22	332° 29' 56"	0.15"	334° 27' 33"	-10° 35' 13"	0.9889076	16' 10.39"	23° 26' 14"	-13 m 39 s
23	332° 32' 27"	0.16"	334° 29' 57"	-10° 34' 19"	0.9889164	16' 10.39"	23° 26' 14"	-13 m 39 s
24	332° 34' 58"	0.16"	334° 32' 20"	-10° 33' 24"	0.9889252	16' 10.38"	23° 26' 14"	-13 m 38 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	63° 54' 26"	-1° 07' 28"	62° 07' 54"	19° 49' 27"	0° 54' 26"	14' 49.91"	259° 14' 14"	0.52169
1	64° 24' 07"	-1° 04' 54"	62° 38' 25"	19° 57' 27"	0° 54' 26"	14' 50.10"	259° 24' 46"	0.52564
2	64° 53' 49"	-1° 02' 19"	63° 08' 60"	20° 05' 22"	0° 54' 27"	14' 50.30"	259° 35' 25"	0.52958
3	65° 23' 31"	0°-59' 44"	63° 39' 38"	20° 13' 11"	0° 54' 28"	14' 50.50"	259° 46' 11"	0.53353
4	65° 53' 14"	0°-57' 09"	64° 10' 21"	20° 20' 56"	0° 54' 29"	14' 50.70"	259° 57' 03"	0.53747
5	66° 22' 58"	0°-54' 34"	64° 41' 07"	20° 28' 35"	0° 54' 29"	14' 50.91"	260° 8' 01"	0.54141
6	66° 52' 43"	0°-51' 58"	65° 11' 57"	20° 36' 09"	0° 54' 30"	14' 51.12"	260° 19' 05"	0.54536
7	67° 22' 29"	0°-49' 22"	65° 42' 52"	20° 43' 38"	0° 54' 31"	14' 51.34"	260° 30' 16"	0.54930
8	67° 52' 15"	0°-46' 46"	66° 13' 50"	20° 51' 02"	0° 54' 32"	14' 51.57"	260° 41' 33"	0.55324
9	68° 22' 02"	0°-44' 09"	66° 44' 53"	20° 58' 20"	0° 54' 33"	14' 51.80"	260° 52' 57"	0.55718
10	68° 51' 51"	0°-41' 33"	67° 15' 59"	21° 05' 33"	0° 54' 33"	14' 52.03"	261° 4' 27"	0.56112
11	69° 21' 40"	0°-38' 55"	67° 47' 10"	21° 12' 40"	0° 54' 34"	14' 52.27"	261° 16' 03"	0.56506
12	69° 51' 30"	0°-36' 18"	68° 18' 24"	21° 19' 42"	0° 54' 35"	14' 52.51"	261° 27' 45"	0.56899
13	70° 21' 21"	0°-33' 40"	68° 49' 43"	21° 26' 38"	0° 54' 36"	14' 52.76"	261° 39' 33"	0.57293
14	70° 51' 14"	0°-31' 02"	69° 21' 05"	21° 33' 29"	0° 54' 37"	14' 53.01"	261° 51' 28"	0.57686
15	71° 21' 07"	0°-28' 24"	69° 52' 32"	21° 40' 14"	0° 54' 38"	14' 53.27"	262° 3' 29"	0.58079
16	71° 51' 01"	0°-25' 46"	70° 24' 03"	21° 46' 53"	0° 54' 39"	14' 53.53"	262° 15' 36"	0.58471
17	72° 20' 57"	0°-23' 07"	70° 55' 38"	21° 53' 27"	0° 54' 40"	14' 53.80"	262° 27' 49"	0.58864
18	72° 50' 54"	0°-20' 31"	71° 27' 17"	21° 59' 52"	0° 54' 41"	14' 54.07"	262° 40' 07"	0.59256
19	73° 20' 51"	0°-17' 52"	71° 59' 00"	22° 06' 14"	0° 54' 42"	14' 54.34"	262° 52' 33"	0.59648
20	73° 50' 50"	0°-15' 13"	72° 30' 47"	22° 12' 30"	0° 54' 43"	14' 54.62"	263° 5' 04"	0.60039
21	74° 20' 50"	0°-12' 34"	73° 02' 38"	22° 18' 41"	0° 54' 44"	14' 54.91"	263° 17' 41"	0.60430
22	74° 50' 52"	0° -9' 54"	73° 34' 34"	22° 24' 45"	0° 54' 45"	14' 55.20"	263° 30' 24"	0.60821
23	75° 20' 54"	0° -7' 15"	74° 06' 33"	22° 30' 43"	0° 54' 46"	14' 55.50"	263° 43' 13"	0.61211
24	75° 50' 58"	0° -4' 35"	74° 38' 37"	22° 36' 35"	0° 54' 47"	14' 55.79"	263° 56' 08"	0.61601

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	332° 34' 58"	0.16"	334° 32' 20"	-10° 33' 24"	0.9889252	16' 10.38"	23° 26' 14"	-13 m 38 s
1	332° 37' 29"	0.17"	334° 34' 44"	-10° 32' 30"	0.9889341	16' 10.37"	23° 26' 14"	-13 m 38 s
2	332° 40' 00"	0.17"	334° 37' 07"	-10° 31' 36"	0.9889429	16' 10.36"	23° 26' 14"	-13 m 38 s
3	332° 42' 31"	0.18"	334° 39' 31"	-10° 30' 41"	0.9889518	16' 10.35"	23° 26' 14"	-13 m 37 s
4	332° 45' 02"	0.18"	334° 41' 54"	-10° 29' 47"	0.9889607	16' 10.34"	23° 26' 14"	-13 m 37 s
5	332° 47' 34"	0.19"	334° 44' 18"	-10° 28' 53"	0.9889695	16' 10.33"	23° 26' 14"	-13 m 37 s
6	332° 50' 05"	0.20"	334° 46' 41"	-10° 27' 58"	0.9889784	16' 10.32"	23° 26' 14"	-13 m 36 s
7	332° 52' 36"	0.20"	334° 49' 04"	-10° 27' 04"	0.9889873	16' 10.32"	23° 26' 14"	-13 m 36 s
8	332° 55' 07"	0.21"	334° 51' 28"	-10° 26' 10"	0.9889962	16' 10.31"	23° 26' 14"	-13 m 36 s
9	332° 57' 38"	0.21"	334° 53' 51"	-10° 25' 15"	0.9890051	16' 10.30"	23° 26' 14"	-13 m 36 s
10	333° 00' 09"	0.22"	334° 56' 14"	-10° 24' 21"	0.9890140	16' 10.29"	23° 26' 14"	-13 m 35 s
11	333° 02' 40"	0.22"	334° 58' 38"	-10° 23' 26"	0.9890229	16' 10.28"	23° 26' 14"	-13 m 35 s
12	333° 05' 11"	0.23"	335° 01' 01"	-10° 22' 32"	0.9890318	16' 10.27"	23° 26' 14"	-13 m 35 s
13	333° 07' 42"	0.24"	335° 03' 24"	-10° 21' 37"	0.9890407	16' 10.26"	23° 26' 14"	-13 m 34 s
14	333° 10' 14"	0.24"	335° 05' 48"	-10° 20' 43"	0.9890496	16' 10.25"	23° 26' 14"	-13 m 34 s
15	333° 12' 45"	0.25"	335° 08' 11"	-10° 19' 48"	0.9890586	16' 10.25"	23° 26' 14"	-13 m 34 s
16	333° 15' 16"	0.25"	335° 10' 34"	-10° 18' 54"	0.9890675	16' 10.24"	23° 26' 14"	-13 m 33 s
17	333° 17' 47"	0.26"	335° 12' 57"	-10° 17' 59"	0.9890765	16' 10.23"	23° 26' 14"	-13 m 33 s
18	333° 20' 18"	0.26"	335° 15' 20"	-10° 17' 05"	0.9890854	16' 10.22"	23° 26' 14"	-13 m 33 s
19	333° 22' 49"	0.27"	335° 17' 44"	-10° 16' 10"	0.9890944	16' 10.21"	23° 26' 14"	-13 m 32 s
20	333° 25' 20"	0.27"	335° 20' 07"	-10° 15' 15"	0.9891033	16' 10.20"	23° 26' 14"	-13 m 32 s
21	333° 27' 51"	0.28"	335° 22' 30"	-10° 14' 21"	0.9891123	16' 10.19"	23° 26' 14"	-13 m 32 s
22	333° 30' 22"	0.29"	335° 24' 53"	-10° 13' 26"	0.9891213	16' 10.18"	23° 26' 14"	-13 m 32 s
23	333° 32' 53"	0.29"	335° 27' 16"	-10° 12' 31"	0.9891303	16' 10.18"	23° 26' 14"	-13 m 31 s
24	333° 35' 24"	0.30"	335° 29' 39"	-10° 11' 37"	0.9891393	16' 10.17"	23° 26' 14"	-13 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	75° 50' 58"	0° -4' 35"	74° 38' 37"	22° 36' 35"	0° 54' 47"	14' 55.79"	263° 56' 08"	0.61601
1	76° 21' 03"	0° -1' 55"	75° 10' 44"	22° 42' 21"	0° 54' 48"	14' 56.10"	264° 9' 10"	0.61990
2	76° 51' 10"	0° 00' 45"	75° 42' 56"	22° 48' 01"	0° 54' 50"	14' 56.41"	264° 22' 16"	0.62379
3	77° 21' 17"	0° 03' 25"	76° 15' 12"	22° 53' 34"	0° 54' 51"	14' 56.72"	264° 35' 29"	0.62767
4	77° 51' 26"	0° 06' 05"	76° 47' 32"	22° 59' 01"	0° 54' 52"	14' 57.04"	264° 48' 48"	0.63155
5	78° 21' 37"	0° 08' 46"	77° 19' 56"	23° 04' 22"	0° 54' 53"	14' 57.36"	265° 2' 12"	0.63542
6	78° 51' 49"	0° 11' 26"	77° 52' 24"	23° 09' 37"	0° 54' 54"	14' 57.69"	265° 15' 42"	0.63929
7	79° 22' 02"	0° 14' 06"	78° 24' 56"	23° 14' 45"	0° 54' 55"	14' 58.02"	265° 29' 18"	0.64315
8	79° 52' 17"	0° 16' 47"	78° 57' 32"	23° 19' 46"	0° 54' 57"	14' 58.35"	265° 42' 60"	0.64701
9	80° 22' 33"	0° 19' 27"	79° 30' 12"	23° 24' 42"	0° 54' 58"	14' 58.69"	265° 56' 47"	0.65086
10	80° 52' 51"	0° 22' 08"	80° 02' 56"	23° 29' 30"	0° 54' 59"	14' 59.04"	266° 10' 40"	0.65470
11	81° 23' 10"	0° 24' 49"	80° 35' 44"	23° 34' 12"	0° 55' 01"	14' 59.39"	266° 24' 38"	0.65853
12	81° 53' 31"	0° 27' 29"	81° 08' 36"	23° 38' 47"	0° 55' 02"	14' 59.74"	266° 38' 42"	0.66236
13	82° 23' 53"	0° 30' 10"	81° 41' 32"	23° 43' 16"	0° 55' 03"	15' 00.10"	266° 52' 52"	0.66618
14	82° 54' 17"	0° 32' 50"	82° 14' 32"	23° 47' 37"	0° 55' 04"	15' 00.46"	267° 7' 07"	0.67000
15	83° 24' 43"	0° 35' 31"	82° 47' 35"	23° 51' 52"	0° 55' 06"	15' 00.82"	267° 21' 27"	0.67380
16	83° 55' 10"	0° 38' 11"	83° 20' 43"	23° 56' 00"	0° 55' 07"	15' 01.19"	267° 35' 53"	0.67760
17	84° 25' 38"	0° 40' 52"	83° 53' 55"	24° 00' 01"	0° 55' 09"	15' 01.57"	267° 50' 24"	0.68139
18	84° 56' 09"	0° 43' 32"	84° 27' 10"	24° 03' 55"	0° 55' 10"	15' 01.94"	268° 5' 01"	0.68517
19	85° 26' 41"	0° 46' 13"	85° 00' 29"	24° 07' 43"	0° 55' 11"	15' 02.33"	268° 19' 43"	0.68895
20	85° 57' 15"	0° 48' 53"	85° 33' 52"	24° 11' 23"	0° 55' 13"	15' 02.71"	268° 34' 30"	0.69271
21	86° 27' 51"	0° 51' 33"	86° 07' 19"	24° 14' 56"	0° 55' 14"	15' 03.10"	268° 49' 23"	0.69646
22	86° 58' 28"	0° 54' 13"	86° 40' 49"	24° 18' 22"	0° 55' 16"	15' 03.50"	269° 4' 21"	0.70021
23	87° 29' 07"	0° 56' 53"	87° 14' 23"	24° 21' 40"	0° 55' 17"	15' 03.89"	269° 19' 24"	0.70395
24	87° 59' 48"	0° 59' 33"	87° 48' 01"	24° 24' 52"	0° 55' 19"	15' 04.30"	269° 34' 32"	0.70767

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	333° 35' 24"	0.30"	335° 29' 39"	-10° 11' 37"	0.9891393	16' 10.17"	23° 26' 14"	-13 m 31 s
1	333° 37' 55"	0.30"	335° 32' 02"	-10° 10' 42"	0.9891483	16' 10.16"	23° 26' 14"	-13 m 31 s
2	333° 40' 26"	0.31"	335° 34' 25"	-10° 09' 47"	0.9891573	16' 10.15"	23° 26' 14"	-13 m 30 s
3	333° 42' 58"	0.31"	335° 36' 48"	-10° 08' 53"	0.9891663	16' 10.14"	23° 26' 14"	-13 m 30 s
4	333° 45' 29"	0.32"	335° 39' 11"	-10° 07' 58"	0.9891753	16' 10.13"	23° 26' 14"	-13 m 30 s
5	333° 47' 60"	0.32"	335° 41' 34"	-10° 07' 03"	0.9891843	16' 10.12"	23° 26' 14"	-13 m 29 s
6	333° 50' 31"	0.33"	335° 43' 57"	-10° 06' 08"	0.9891933	16' 10.11"	23° 26' 14"	-13 m 29 s
7	333° 53' 02"	0.33"	335° 46' 20"	-10° 05' 14"	0.9892024	16' 10.10"	23° 26' 14"	-13 m 29 s
8	333° 55' 33"	0.34"	335° 48' 43"	-10° 04' 19"	0.9892114	16' 10.10"	23° 26' 14"	-13 m 28 s
9	333° 58' 04"	0.35"	335° 51' 06"	-10° 03' 24"	0.9892205	16' 10.09"	23° 26' 14"	-13 m 28 s
10	334° 00' 35"	0.35"	335° 53' 29"	-10° 02' 29"	0.9892295	16' 10.08"	23° 26' 14"	-13 m 28 s
11	334° 03' 06"	0.36"	335° 55' 52"	-10° 01' 34"	0.9892386	16' 10.07"	23° 26' 14"	-13 m 27 s
12	334° 05' 37"	0.36"	335° 58' 15"	-10° 00' 39"	0.9892477	16' 10.06"	23° 26' 14"	-13 m 27 s
13	334° 08' 08"	0.37"	336° 00' 38"	-9° 59' 45"	0.9892567	16' 10.05"	23° 26' 14"	-13 m 27 s
14	334° 10' 39"	0.37"	336° 03' 01"	-9° 58' 50"	0.9892658	16' 10.04"	23° 26' 14"	-13 m 26 s
15	334° 13' 10"	0.38"	336° 05' 23"	-9° 57' 55"	0.9892749	16' 10.03"	23° 26' 14"	-13 m 26 s
16	334° 15' 41"	0.38"	336° 07' 46"	-9° 56' 60"	0.9892840	16' 10.02"	23° 26' 14"	-13 m 26 s
17	334° 18' 12"	0.39"	336° 10' 09"	-9° 56' 05"	0.9892931	16' 10.02"	23° 26' 14"	-13 m 25 s
18	334° 20' 43"	0.39"	336° 12' 32"	-9° 55' 10"	0.9893022	16' 10.01"	23° 26' 14"	-13 m 25 s
19	334° 23' 14"	0.40"	336° 14' 55"	-9° 54' 15"	0.9893113	16' 10.00"	23° 26' 14"	-13 m 25 s
20	334° 25' 45"	0.40"	336° 17' 17"	-9° 53' 20"	0.9893205	16' 09.99"	23° 26' 14"	-13 m 24 s
21	334° 28' 16"	0.41"	336° 19' 40"	-9° 52' 25"	0.9893296	16' 09.98"	23° 26' 14"	-13 m 24 s
22	334° 30' 47"	0.41"	336° 22' 03"	-9° 51' 30"	0.9893387	16' 09.97"	23° 26' 14"	-13 m 24 s
23	334° 33' 18"	0.42"	336° 24' 26"	-9° 50' 35"	0.9893479	16' 09.96"	23° 26' 14"	-13 m 23 s
24	334° 35' 49"	0.42"	336° 26' 48"	-9° 49' 40"	0.9893570	16' 09.95"	23° 26' 14"	-13 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	87° 59' 48"	0° 59' 33"	87° 48' 01"	24° 24' 52"	0° 55' 19"	15' 04.30"	269° 34' 32"	0.70767
1	88° 30' 31"	1° 02' 12"	88° 21' 42"	24° 27' 56"	0° 55' 20"	15' 04.70"	269° 49' 45"	0.71139
2	89° 01' 15"	1° 04' 52"	88° 55' 27"	24° 30' 53"	0° 55' 22"	15' 05.11"	270° 5' 03"	0.71509
3	89° 32' 02"	1° 07' 31"	89° 29' 15"	24° 33' 42"	0° 55' 23"	15' 05.53"	270° 20' 26"	0.71878
4	90° 02' 50"	1° 10' 10"	90° 03' 07"	24° 36' 24"	0° 55' 25"	15' 05.94"	270° 35' 55"	0.72247
5	90° 33' 40"	1° 12' 49"	90° 37' 02"	24° 38' 59"	0° 55' 26"	15' 06.36"	270° 51' 28"	0.72614
6	91° 04' 32"	1° 15' 28"	91° 11' 01"	24° 41' 26"	0° 55' 28"	15' 06.79"	271° 7' 06"	0.72980
7	91° 35' 27"	1° 18' 07"	91° 45' 03"	24° 43' 46"	0° 55' 29"	15' 07.22"	271° 22' 49"	0.73345
8	92° 06' 23"	1° 20' 45"	92° 19' 09"	24° 45' 58"	0° 55' 31"	15' 07.65"	271° 38' 37"	0.73709
9	92° 37' 21"	1° 23' 23"	92° 53' 17"	24° 48' 02"	0° 55' 32"	15' 08.08"	271° 54' 29"	0.74071
10	93° 08' 21"	1° 26' 01"	93° 27' 29"	24° 49' 59"	0° 55' 34"	15' 08.52"	272° 10' 27"	0.74432
11	93° 39' 23"	1° 28' 38"	94° 01' 45"	24° 51' 48"	0° 55' 36"	15' 08.96"	272° 26' 29"	0.74792
12	94° 10' 27"	1° 31' 16"	94° 36' 03"	24° 53' 30"	0° 55' 37"	15' 09.41"	272° 42' 36"	0.75151
13	94° 41' 33"	1° 33' 53"	95° 10' 24"	24° 55' 03"	0° 55' 39"	15' 09.86"	272° 58' 47"	0.75508
14	95° 12' 41"	1° 36' 29"	95° 44' 49"	24° 56' 29"	0° 55' 41"	15' 10.31"	273° 15' 04"	0.75864
15	95° 43' 51"	1° 39' 06"	96° 19' 16"	24° 57' 47"	0° 55' 42"	15' 10.76"	273° 31' 24"	0.76218
16	96° 15' 04"	1° 41' 42"	96° 53' 46"	24° 58' 57"	0° 55' 44"	15' 11.22"	273° 47' 50"	0.76572
17	96° 46' 18"	1° 44' 17"	97° 28' 19"	24° 59' 60"	0° 55' 46"	15' 11.68"	274° 4' 20"	0.76923
18	97° 17' 35"	1° 46' 53"	98° 02' 55"	25° 00' 54"	0° 55' 47"	15' 12.15"	274° 20' 54"	0.77273
19	97° 48' 54"	1° 49' 27"	98° 37' 34"	25° 01' 40"	0° 55' 49"	15' 12.62"	274° 37' 33"	0.77622
20	98° 20' 14"	1° 52' 02"	99° 12' 16"	25° 02' 19"	0° 55' 51"	15' 13.09"	274° 54' 17"	0.77969
21	98° 51' 38"	1° 54' 36"	99° 46' 60"	25° 02' 49"	0° 55' 53"	15' 13.56"	275° 11' 04"	0.78315
22	99° 23' 03"	1° 57' 10"	100° 21' 47"	25° 03' 11"	0° 55' 54"	15' 14.04"	275° 27' 57"	0.78659
23	99° 54' 31"	1° 59' 43"	100° 56' 36"	25° 03' 25"	0° 55' 56"	15' 14.52"	275° 44' 54"	0.79001
24	100° 26' 00"	2° 02' 16"	101° 31' 27"	25° 03' 31"	0° 55' 58"	15' 15.00"	276° 1' 55"	0.79342

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	334° 35' 49"	0.42"	336° 26' 48"	-9° 49' 40"	0.9893570	16' 09.95"	23° 26' 14"	-13 m 23 s
1	334° 38' 20"	0.43"	336° 29' 11"	-9° 48' 45"	0.9893662	16' 09.94"	23° 26' 14"	-13 m 23 s
2	334° 40' 51"	0.43"	336° 31' 34"	-9° 47' 50"	0.9893753	16' 09.94"	23° 26' 14"	-13 m 22 s
3	334° 43' 22"	0.44"	336° 33' 56"	-9° 46' 55"	0.9893845	16' 09.93"	23° 26' 14"	-13 m 22 s
4	334° 45' 53"	0.44"	336° 36' 19"	-9° 45' 60"	0.9893937	16' 09.92"	23° 26' 14"	-13 m 21 s
5	334° 48' 24"	0.45"	336° 38' 42"	-9° 45' 04"	0.9894029	16' 09.91"	23° 26' 14"	-13 m 21 s
6	334° 50' 55"	0.45"	336° 41' 04"	-9° 44' 09"	0.9894121	16' 09.90"	23° 26' 14"	-13 m 21 s
7	334° 53' 26"	0.46"	336° 43' 27"	-9° 43' 14"	0.9894213	16' 09.89"	23° 26' 14"	-13 m 20 s
8	334° 55' 57"	0.46"	336° 45' 49"	-9° 42' 19"	0.9894305	16' 09.88"	23° 26' 14"	-13 m 20 s
9	334° 58' 28"	0.47"	336° 48' 12"	-9° 41' 24"	0.9894397	16' 09.87"	23° 26' 14"	-13 m 20 s
10	335° 00' 59"	0.47"	336° 50' 34"	-9° 40' 29"	0.9894489	16' 09.86"	23° 26' 14"	-13 m 19 s
11	335° 03' 29"	0.48"	336° 52' 57"	-9° 39' 33"	0.9894581	16' 09.85"	23° 26' 14"	-13 m 19 s
12	335° 06' 00"	0.48"	336° 55' 19"	-9° 38' 38"	0.9894674	16' 09.85"	23° 26' 14"	-13 m 19 s
13	335° 08' 31"	0.49"	336° 57' 42"	-9° 37' 43"	0.9894766	16' 09.84"	23° 26' 14"	-13 m 18 s
14	335° 11' 02"	0.49"	337° 00' 04"	-9° 36' 48"	0.9894859	16' 09.83"	23° 26' 14"	-13 m 18 s
15	335° 13' 33"	0.49"	337° 02' 27"	-9° 35' 52"	0.9894951	16' 09.82"	23° 26' 14"	-13 m 18 s
16	335° 16' 04"	0.50"	337° 04' 49"	-9° 34' 57"	0.9895044	16' 09.81"	23° 26' 14"	-13 m 17 s
17	335° 18' 35"	0.50"	337° 07' 12"	-9° 34' 02"	0.9895136	16' 09.80"	23° 26' 14"	-13 m 17 s
18	335° 21' 06"	0.51"	337° 09' 34"	-9° 33' 06"	0.9895229	16' 09.79"	23° 26' 14"	-13 m 16 s
19	335° 23' 37"	0.51"	337° 11' 56"	-9° 32' 11"	0.9895322	16' 09.78"	23° 26' 14"	-13 m 16 s
20	335° 26' 08"	0.52"	337° 14' 19"	-9° 31' 16"	0.9895415	16' 09.77"	23° 26' 14"	-13 m 16 s
21	335° 28' 39"	0.52"	337° 16' 41"	-9° 30' 20"	0.9895508	16' 09.76"	23° 26' 14"	-13 m 15 s
22	335° 31' 10"	0.53"	337° 19' 03"	-9° 29' 25"	0.9895601	16' 09.75"	23° 26' 14"	-13 m 15 s
23	335° 33' 41"	0.53"	337° 21' 26"	-9° 28' 30"	0.9895694	16' 09.75"	23° 26' 14"	-13 m 15 s
24	335° 36' 12"	0.53"	337° 23' 48"	-9° 27' 34"	0.9895787	16' 09.74"	23° 26' 14"	-13 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	100° 26' 00"	2° 02' 16"	101° 31' 27"	25° 03' 31"	0° 55' 58"	15' 15.00"	276° 1' 55"	0.79342
1	100° 57' 32"	2° 04' 48"	102° 06' 21"	25° 03' 29"	0° 55' 60"	15' 15.48"	276° 19' 00"	0.79681
2	101° 29' 07"	2° 07' 20"	102° 41' 18"	25° 03' 18"	0° 56' 01"	15' 15.97"	276° 36' 10"	0.80018
3	102° 00' 43"	2° 09' 52"	103° 16' 17"	25° 02' 60"	0° 56' 03"	15' 16.46"	276° 53' 25"	0.80354
4	102° 32' 22"	2° 12' 23"	103° 51' 18"	25° 02' 33"	0° 56' 05"	15' 16.95"	277° 10' 43"	0.80688
5	103° 04' 04"	2° 14' 53"	104° 26' 21"	25° 01' 58"	0° 56' 07"	15' 17.45"	277° 28' 06"	0.81020
6	103° 35' 47"	2° 17' 23"	105° 01' 26"	25° 01' 14"	0° 56' 09"	15' 17.95"	277° 45' 34"	0.81350
7	104° 07' 33"	2° 19' 52"	105° 36' 33"	25° 00' 23"	0° 56' 10"	15' 18.45"	278° 3' 06"	0.81678
8	104° 39' 21"	2° 22' 21"	106° 11' 42"	24° 59' 22"	0° 56' 12"	15' 18.95"	278° 20' 42"	0.82005
9	105° 11' 12"	2° 24' 49"	106° 46' 53"	24° 58' 14"	0° 56' 14"	15' 19.46"	278° 38' 22"	0.82329
10	105° 43' 05"	2° 27' 17"	107° 22' 06"	24° 56' 57"	0° 56' 16"	15' 19.96"	278° 56' 07"	0.82652
11	106° 15' 00"	2° 29' 44"	107° 57' 20"	24° 55' 32"	0° 56' 18"	15' 20.47"	279° 13' 57"	0.82972
12	106° 46' 58"	2° 32' 10"	108° 32' 36"	24° 53' 58"	0° 56' 20"	15' 20.98"	279° 31' 51"	0.83291
13	107° 18' 58"	2° 34' 36"	109° 07' 54"	24° 52' 16"	0° 56' 22"	15' 21.50"	279° 49' 49"	0.83608
14	107° 51' 01"	2° 37' 01"	109° 43' 13"	24° 50' 26"	0° 56' 24"	15' 22.01"	280° 7' 52"	0.83922
15	108° 23' 06"	2° 39' 25"	110° 18' 34"	24° 48' 27"	0° 56' 25"	15' 22.53"	280° 26' 00"	0.84235
16	108° 55' 14"	2° 41' 49"	110° 53' 56"	24° 46' 19"	0° 56' 27"	15' 23.05"	280° 44' 12"	0.84545
17	109° 27' 24"	2° 44' 12"	111° 29' 20"	24° 44' 03"	0° 56' 29"	15' 23.57"	281° 2' 29"	0.84853
18	109° 59' 36"	2° 46' 35"	112° 04' 44"	24° 41' 39"	0° 56' 31"	15' 24.09"	281° 20' 51"	0.85159
19	110° 31' 51"	2° 48' 56"	112° 40' 10"	24° 39' 06"	0° 56' 33"	15' 24.61"	281° 39' 18"	0.85463
20	111° 04' 09"	2° 51' 17"	113° 15' 37"	24° 36' 24"	0° 56' 35"	15' 25.14"	281° 57' 49"	0.85764
21	111° 36' 29"	2° 53' 37"	113° 51' 05"	24° 33' 34"	0° 56' 37"	15' 25.67"	282° 16' 26"	0.86063
22	112° 08' 51"	2° 55' 57"	114° 26' 34"	24° 30' 36"	0° 56' 39"	15' 26.19"	282° 35' 08"	0.86360
23	112° 41' 16"	2° 58' 15"	115° 02' 04"	24° 27' 29"	0° 56' 41"	15' 26.72"	282° 53' 55"	0.86655
24	113° 13' 43"	3° 00' 33"	115° 37' 35"	24° 24' 13"	0° 56' 43"	15' 27.26"	283° 12' 47"	0.86947

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	335° 36' 12"	0.53"	337° 23' 48"	-9° 27' 34"	0.9895787	16' 09.74"	23° 26' 14"	-13 m 14 s
1	335° 38' 42"	0.54"	337° 26' 10"	-9° 26' 39"	0.9895880	16' 09.73"	23° 26' 14"	-13 m 14 s
2	335° 41' 13"	0.54"	337° 28' 33"	-9° 25' 43"	0.9895974	16' 09.72"	23° 26' 14"	-13 m 13 s
3	335° 43' 44"	0.55"	337° 30' 55"	-9° 24' 48"	0.9896067	16' 09.71"	23° 26' 14"	-13 m 13 s
4	335° 46' 15"	0.55"	337° 33' 17"	-9° 23' 52"	0.9896161	16' 09.70"	23° 26' 14"	-13 m 13 s
5	335° 48' 46"	0.55"	337° 35' 39"	-9° 22' 57"	0.9896254	16' 09.69"	23° 26' 14"	-13 m 12 s
6	335° 51' 17"	0.56"	337° 38' 02"	-9° 22' 02"	0.9896348	16' 09.68"	23° 26' 14"	-13 m 12 s
7	335° 53' 48"	0.56"	337° 40' 24"	-9° 21' 06"	0.9896441	16' 09.67"	23° 26' 14"	-13 m 12 s
8	335° 56' 19"	0.57"	337° 42' 46"	-9° 20' 10"	0.9896535	16' 09.66"	23° 26' 14"	-13 m 11 s
9	335° 58' 50"	0.57"	337° 45' 08"	-9° 19' 15"	0.9896629	16' 09.65"	23° 26' 14"	-13 m 11 s
10	336° 01' 20"	0.57"	337° 47' 30"	-9° 18' 19"	0.9896723	16' 09.64"	23° 26' 14"	-13 m 10 s
11	336° 03' 51"	0.58"	337° 49' 52"	-9° 17' 24"	0.9896817	16' 09.63"	23° 26' 14"	-13 m 10 s
12	336° 06' 22"	0.58"	337° 52' 15"	-9° 16' 28"	0.9896911	16' 09.63"	23° 26' 14"	-13 m 10 s
13	336° 08' 53"	0.59"	337° 54' 37"	-9° 15' 33"	0.9897005	16' 09.62"	23° 26' 14"	-13 m 09 s
14	336° 11' 24"	0.59"	337° 56' 59"	-9° 14' 37"	0.9897099	16' 09.61"	23° 26' 14"	-13 m 09 s
15	336° 13' 55"	0.59"	337° 59' 21"	-9° 13' 41"	0.9897193	16' 09.60"	23° 26' 14"	-13 m 09 s
16	336° 16' 26"	0.60"	338° 01' 43"	-9° 12' 46"	0.9897288	16' 09.59"	23° 26' 14"	-13 m 08 s
17	336° 18' 56"	0.60"	338° 04' 05"	-9° 11' 50"	0.9897382	16' 09.58"	23° 26' 14"	-13 m 08 s
18	336° 21' 27"	0.60"	338° 06' 27"	-9° 10' 54"	0.9897477	16' 09.57"	23° 26' 14"	-13 m 07 s
19	336° 23' 58"	0.61"	338° 08' 49"	-9° 09' 59"	0.9897571	16' 09.56"	23° 26' 14"	-13 m 07 s
20	336° 26' 29"	0.61"	338° 11' 11"	-9° 09' 03"	0.9897666	16' 09.55"	23° 26' 14"	-13 m 07 s
21	336° 28' 60"	0.61"	338° 13' 33"	-9° 08' 07"	0.9897760	16' 09.54"	23° 26' 14"	-13 m 06 s
22	336° 31' 31"	0.62"	338° 15' 55"	-9° 07' 12"	0.9897855	16' 09.53"	23° 26' 14"	-13 m 06 s
23	336° 34' 01"	0.62"	338° 18' 17"	-9° 06' 16"	0.9897950	16' 09.52"	23° 26' 14"	-13 m 05 s
24	336° 36' 32"	0.62"	338° 20' 39"	-9° 05' 20"	0.9898045	16' 09.51"	23° 26' 14"	-13 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	113° 13' 43"	3° 00' 33"	115° 37' 35"	24° 24' 13"	0° 56' 43"	15' 27.26"	283° 12' 47"	0.86947
1	113° 46' 14"	3° 02' 50"	116° 13' 06"	24° 20' 49"	0° 56' 45"	15' 27.79"	283° 31' 45"	0.87237
2	114° 18' 46"	3° 05' 06"	116° 48' 38"	24° 17' 16"	0° 56' 47"	15' 28.32"	283° 50' 49"	0.87524
3	114° 51' 21"	3° 07' 21"	117° 24' 11"	24° 13' 35"	0° 56' 49"	15' 28.86"	284° 9' 59"	0.87809
4	115° 23' 59"	3° 09' 36"	117° 59' 44"	24° 09' 45"	0° 56' 51"	15' 29.39"	284° 29' 14"	0.88091
5	115° 56' 39"	3° 11' 49"	118° 35' 18"	24° 05' 47"	0° 56' 53"	15' 29.93"	284° 48' 36"	0.88370
6	116° 29' 22"	3° 14' 02"	119° 10' 52"	24° 01' 40"	0° 56' 55"	15' 30.47"	285° 8' 04"	0.88648
7	117° 02' 07"	3° 16' 14"	119° 46' 26"	23° 57' 24"	0° 56' 57"	15' 31.00"	285° 27' 39"	0.88922
8	117° 34' 55"	3° 18' 24"	120° 22' 01"	23° 53' 00"	0° 56' 59"	15' 31.54"	285° 47' 21"	0.89194
9	118° 07' 46"	3° 20' 34"	120° 57' 36"	23° 48' 28"	0° 57' 01"	15' 32.08"	286° 7' 10"	0.89463
10	118° 40' 39"	3° 22' 43"	121° 33' 11"	23° 43' 47"	0° 57' 02"	15' 32.62"	286° 27' 06"	0.89730
11	119° 13' 35"	3° 24' 51"	122° 08' 46"	23° 38' 57"	0° 57' 04"	15' 33.16"	286° 47' 10"	0.89993
12	119° 46' 33"	3° 26' 58"	122° 44' 21"	23° 33' 59"	0° 57' 06"	15' 33.71"	287° 7' 22"	0.90254
13	120° 19' 34"	3° 29' 04"	123° 19' 56"	23° 28' 52"	0° 57' 08"	15' 34.25"	287° 27' 43"	0.90513
14	120° 52' 38"	3° 31' 09"	123° 55' 30"	23° 23' 37"	0° 57' 10"	15' 34.79"	287° 48' 13"	0.90768
15	121° 25' 44"	3° 33' 13"	124° 31' 05"	23° 18' 14"	0° 57' 12"	15' 35.33"	288° 8' 52"	0.91020
16	121° 58' 53"	3° 35' 16"	125° 06' 39"	23° 12' 42"	0° 57' 14"	15' 35.87"	288° 29' 40"	0.91270
17	122° 32' 04"	3° 37' 17"	125° 42' 13"	23° 07' 01"	0° 57' 16"	15' 36.42"	288° 50' 39"	0.91517
18	123° 05' 18"	3° 39' 18"	126° 17' 46"	23° 01' 12"	0° 57' 18"	15' 36.96"	289° 11' 49"	0.91760
19	123° 38' 34"	3° 41' 17"	126° 53' 19"	22° 55' 15"	0° 57' 20"	15' 37.50"	289° 33' 10"	0.92001
20	124° 11' 54"	3° 43' 16"	127° 28' 52"	22° 49' 09"	0° 57' 22"	15' 38.04"	289° 54' 42"	0.92239
21	124° 45' 15"	3° 45' 13"	128° 04' 23"	22° 42' 55"	0° 57' 24"	15' 38.58"	290° 16' 28"	0.92473
22	125° 18' 40"	3° 47' 09"	128° 39' 54"	22° 36' 33"	0° 57' 26"	15' 39.13"	290° 38' 27"	0.92705
23	125° 52' 07"	3° 49' 04"	129° 15' 25"	22° 30' 02"	0° 57' 28"	15' 39.67"	291° 0' 39"	0.92933
24	126° 25' 36"	3° 50' 58"	129° 50' 55"	22° 23' 23"	0° 57' 30"	15' 40.21"	291° 23' 07"	0.93158

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	336° 36' 32"	0.62"	338° 20' 39"	-9° 05' 20"	0.9898045	16' 09.51"	23° 26' 14"	-13 m 05 s
1	336° 39' 03"	0.63"	338° 23' 01"	-9° 04' 24"	0.9898140	16' 09.51"	23° 26' 14"	-13 m 05 s
2	336° 41' 34"	0.63"	338° 25' 23"	-9° 03' 29"	0.9898235	16' 09.50"	23° 26' 14"	-13 m 04 s
3	336° 44' 05"	0.63"	338° 27' 44"	-9° 02' 33"	0.9898330	16' 09.49"	23° 26' 14"	-13 m 04 s
4	336° 46' 36"	0.64"	338° 30' 06"	-9° 01' 37"	0.9898425	16' 09.48"	23° 26' 14"	-13 m 03 s
5	336° 49' 06"	0.64"	338° 32' 28"	-9° 00' 41"	0.9898521	16' 09.47"	23° 26' 14"	-13 m 03 s
6	336° 51' 37"	0.64"	338° 34' 50"	-8° 59' 45"	0.9898616	16' 09.46"	23° 26' 14"	-13 m 03 s
7	336° 54' 08"	0.65"	338° 37' 12"	-8° 58' 49"	0.9898711	16' 09.45"	23° 26' 14"	-13 m 02 s
8	336° 56' 39"	0.65"	338° 39' 34"	-8° 57' 54"	0.9898807	16' 09.44"	23° 26' 14"	-13 m 02 s
9	336° 59' 10"	0.65"	338° 41' 55"	-8° 56' 58"	0.9898902	16' 09.43"	23° 26' 14"	-13 m 01 s
10	337° 01' 40"	0.65"	338° 44' 17"	-8° 56' 02"	0.9898998	16' 09.42"	23° 26' 14"	-13 m 01 s
11	337° 04' 11"	0.66"	338° 46' 39"	-8° 55' 06"	0.9899094	16' 09.41"	23° 26' 14"	-13 m 01 s
12	337° 06' 42"	0.66"	338° 49' 01"	-8° 54' 10"	0.9899190	16' 09.40"	23° 26' 14"	-13 m 00 s
13	337° 09' 13"	0.66"	338° 51' 23"	-8° 53' 14"	0.9899285	16' 09.39"	23° 26' 14"	-12 m 60 s
14	337° 11' 44"	0.66"	338° 53' 44"	-8° 52' 18"	0.9899381	16' 09.38"	23° 26' 14"	-12 m 59 s
15	337° 14' 14"	0.67"	338° 56' 06"	-8° 51' 22"	0.9899477	16' 09.37"	23° 26' 14"	-12 m 59 s
16	337° 16' 45"	0.67"	338° 58' 28"	-8° 50' 26"	0.9899573	16' 09.36"	23° 26' 14"	-12 m 59 s
17	337° 19' 16"	0.67"	339° 00' 49"	-8° 49' 30"	0.9899670	16' 09.36"	23° 26' 14"	-12 m 58 s
18	337° 21' 47"	0.67"	339° 03' 11"	-8° 48' 34"	0.9899766	16' 09.35"	23° 26' 14"	-12 m 58 s
19	337° 24' 17"	0.68"	339° 05' 33"	-8° 47' 38"	0.9899862	16' 09.34"	23° 26' 14"	-12 m 57 s
20	337° 26' 48"	0.68"	339° 07' 54"	-8° 46' 42"	0.9899959	16' 09.33"	23° 26' 14"	-12 m 57 s
21	337° 29' 19"	0.68"	339° 10' 16"	-8° 45' 46"	0.9900055	16' 09.32"	23° 26' 14"	-12 m 56 s
22	337° 31' 50"	0.68"	339° 12' 37"	-8° 44' 50"	0.9900152	16' 09.31"	23° 26' 14"	-12 m 56 s
23	337° 34' 21"	0.69"	339° 14' 59"	-8° 43' 54"	0.9900248	16' 09.30"	23° 26' 14"	-12 m 56 s
24	337° 36' 51"	0.69"	339° 17' 21"	-8° 42' 58"	0.9900345	16' 09.29"	23° 26' 14"	-12 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	126° 25' 36"	3° 50' 58"	129° 50' 55"	22° 23' 23"	0° 57' 30"	15' 40.21"	291° 23' 07"	0.93158
1	126° 59' 09"	3° 52' 51"	130° 26' 23"	22° 16' 36"	0° 57' 32"	15' 40.75"	291° 45' 50"	0.93380
2	127° 32' 43"	3° 54' 42"	131° 01' 51"	22° 09' 41"	0° 57' 34"	15' 41.29"	292° 8' 51"	0.93599
3	128° 06' 21"	3° 56' 32"	131° 37' 18"	22° 02' 37"	0° 57' 36"	15' 41.83"	292° 32' 08"	0.93814
4	128° 40' 01"	3° 58' 21"	132° 12' 44"	21° 55' 25"	0° 57' 38"	15' 42.36"	292° 55' 45"	0.94026
5	129° 13' 43"	4° 00' 09"	132° 48' 09"	21° 48' 06"	0° 57' 40"	15' 42.90"	293° 19' 42"	0.94235
6	129° 47' 28"	4° 01' 55"	133° 23' 33"	21° 40' 38"	0° 57' 42"	15' 43.44"	293° 44' 01"	0.94441
7	130° 21' 16"	4° 03' 40"	133° 58' 56"	21° 33' 01"	0° 57' 44"	15' 43.97"	294° 8' 42"	0.94643
8	130° 55' 06"	4° 05' 24"	134° 34' 17"	21° 25' 17"	0° 57' 46"	15' 44.51"	294° 33' 47"	0.94842
9	131° 28' 59"	4° 07' 06"	135° 09' 37"	21° 17' 25"	0° 57' 48"	15' 45.04"	294° 59' 19"	0.95037
10	132° 02' 55"	4° 08' 47"	135° 44' 56"	21° 09' 25"	0° 57' 50"	15' 45.57"	295° 25' 19"	0.95229
11	132° 36' 53"	4° 10' 27"	136° 20' 14"	21° 01' 17"	0° 57' 52"	15' 46.10"	295° 51' 48"	0.95417
12	133° 10' 53"	4° 12' 05"	136° 55' 30"	20° 53' 01"	0° 57' 54"	15' 46.63"	296° 18' 49"	0.95602
13	133° 44' 56"	4° 13' 42"	137° 30' 44"	20° 44' 38"	0° 57' 56"	15' 47.16"	296° 46' 25"	0.95783
14	134° 19' 02"	4° 15' 18"	138° 05' 58"	20° 36' 06"	0° 57' 58"	15' 47.68"	297° 14' 38"	0.95961
15	134° 53' 10"	4° 16' 52"	138° 41' 09"	20° 27' 27"	0° 57' 60"	15' 48.21"	297° 43' 30"	0.96135
16	135° 27' 21"	4° 18' 25"	139° 16' 19"	20° 18' 40"	0° 58' 02"	15' 48.73"	298° 13' 06"	0.96305
17	136° 01' 34"	4° 19' 56"	139° 51' 28"	20° 09' 45"	0° 58' 03"	15' 49.25"	298° 43' 27"	0.96472
18	136° 35' 50"	4° 21' 26"	140° 26' 35"	20° 00' 43"	0° 58' 05"	15' 49.77"	299° 14' 38"	0.96634
19	137° 10' 08"	4° 22' 54"	141° 01' 40"	19° 51' 33"	0° 58' 07"	15' 50.28"	299° 46' 44"	0.96794
20	137° 44' 28"	4° 24' 21"	141° 36' 44"	19° 42' 16"	0° 58' 09"	15' 50.80"	300° 19' 48"	0.96949
21	138° 18' 52"	4° 25' 46"	142° 11' 46"	19° 32' 51"	0° 58' 11"	15' 51.31"	300° 53' 55"	0.97101
22	138° 53' 17"	4° 27' 10"	142° 46' 46"	19° 23' 19"	0° 58' 13"	15' 51.82"	301° 29' 11"	0.97248
23	139° 27' 45"	4° 28' 32"	143° 21' 44"	19° 13' 39"	0° 58' 15"	15' 52.33"	302° 5' 42"	0.97392
24	140° 02' 15"	4° 29' 53"	143° 56' 41"	19° 03' 53"	0° 58' 17"	15' 52.83"	302° 43' 35"	0.97532

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	337° 36' 51"	0.69"	339° 17' 21"	-8° 42' 58"	0.9900345	16' 09.29"	23° 26' 14"	-12 m 55 s
1	337° 39' 22"	0.69"	339° 19' 42"	-8° 42' 02"	0.9900442	16' 09.28"	23° 26' 14"	-12 m 55 s
2	337° 41' 53"	0.69"	339° 22' 04"	-8° 41' 06"	0.9900538	16' 09.27"	23° 26' 14"	-12 m 54 s
3	337° 44' 23"	0.69"	339° 24' 25"	-8° 40' 10"	0.9900635	16' 09.26"	23° 26' 14"	-12 m 54 s
4	337° 46' 54"	0.70"	339° 26' 47"	-8° 39' 14"	0.9900732	16' 09.25"	23° 26' 14"	-12 m 54 s
5	337° 49' 25"	0.70"	339° 29' 08"	-8° 38' 17"	0.9900829	16' 09.24"	23° 26' 14"	-12 m 53 s
6	337° 51' 56"	0.70"	339° 31' 30"	-8° 37' 21"	0.9900927	16' 09.23"	23° 26' 14"	-12 m 53 s
7	337° 54' 26"	0.70"	339° 33' 51"	-8° 36' 25"	0.9901024	16' 09.22"	23° 26' 14"	-12 m 52 s
8	337° 56' 57"	0.70"	339° 36' 13"	-8° 35' 29"	0.9901121	16' 09.21"	23° 26' 14"	-12 m 52 s
9	337° 59' 28"	0.70"	339° 38' 34"	-8° 34' 33"	0.9901218	16' 09.20"	23° 26' 14"	-12 m 51 s
10	338° 01' 59"	0.71"	339° 40' 56"	-8° 33' 36"	0.9901316	16' 09.19"	23° 26' 14"	-12 m 51 s
11	338° 04' 29"	0.71"	339° 43' 17"	-8° 32' 40"	0.9901413	16' 09.18"	23° 26' 14"	-12 m 51 s
12	338° 07' 00"	0.71"	339° 45' 38"	-8° 31' 44"	0.9901511	16' 09.18"	23° 26' 14"	-12 m 50 s
13	338° 09' 31"	0.71"	339° 47' 60"	-8° 30' 48"	0.9901609	16' 09.17"	23° 26' 14"	-12 m 50 s
14	338° 12' 01"	0.71"	339° 50' 21"	-8° 29' 51"	0.9901706	16' 09.16"	23° 26' 14"	-12 m 49 s
15	338° 14' 32"	0.71"	339° 52' 42"	-8° 28' 55"	0.9901804	16' 09.15"	23° 26' 14"	-12 m 49 s
16	338° 17' 03"	0.71"	339° 55' 04"	-8° 27' 59"	0.9901902	16' 09.14"	23° 26' 14"	-12 m 48 s
17	338° 19' 34"	0.72"	339° 57' 25"	-8° 27' 03"	0.9902000	16' 09.13"	23° 26' 14"	-12 m 48 s
18	338° 22' 04"	0.72"	339° 59' 46"	-8° 26' 06"	0.9902098	16' 09.12"	23° 26' 14"	-12 m 47 s
19	338° 24' 35"	0.72"	340° 02' 08"	-8° 25' 10"	0.9902196	16' 09.11"	23° 26' 14"	-12 m 47 s
20	338° 27' 06"	0.72"	340° 04' 29"	-8° 24' 14"	0.9902294	16' 09.10"	23° 26' 14"	-12 m 47 s
21	338° 29' 36"	0.72"	340° 06' 50"	-8° 23' 17"	0.9902393	16' 09.09"	23° 26' 14"	-12 m 46 s
22	338° 32' 07"	0.72"	340° 09' 11"	-8° 22' 21"	0.9902491	16' 09.08"	23° 26' 14"	-12 m 46 s
23	338° 34' 38"	0.72"	340° 11' 33"	-8° 21' 25"	0.9902589	16' 09.07"	23° 26' 14"	-12 m 45 s
24	338° 37' 08"	0.72"	340° 13' 54"	-8° 20' 28"	0.9902688	16' 09.06"	23° 26' 14"	-12 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	140° 02' 15"	4° 29' 53"	143° 56' 41"	19° 03' 53"	0° 58' 17"	15' 52.83"	302° 43' 35"	0.97532
1	140° 36' 48"	4° 31' 12"	144° 31' 35"	18° 53' 58"	0° 58' 18"	15' 53.34"	303° 22' 57"	0.97668
2	141° 11' 23"	4° 32' 30"	145° 06' 28"	18° 43' 57"	0° 58' 20"	15' 53.84"	304° 3' 57"	0.97800
3	141° 46' 01"	4° 33' 46"	145° 41' 19"	18° 33' 49"	0° 58' 22"	15' 54.33"	304° 46' 45"	0.97929
4	142° 20' 41"	4° 35' 00"	146° 16' 08"	18° 23' 33"	0° 58' 24"	15' 54.83"	305° 31' 29"	0.98053
5	142° 55' 23"	4° 36' 13"	146° 50' 55"	18° 13' 11"	0° 58' 26"	15' 55.32"	306° 18' 24"	0.98173
6	143° 30' 08"	4° 37' 24"	147° 25' 40"	18° 02' 41"	0° 58' 28"	15' 55.81"	307° 7' 41"	0.98289
7	144° 04' 55"	4° 38' 33"	148° 00' 23"	17° 52' 05"	0° 58' 29"	15' 56.30"	307° 59' 37"	0.98401
8	144° 39' 44"	4° 39' 41"	148° 35' 04"	17° 41' 22"	0° 58' 31"	15' 56.78"	308° 54' 27"	0.98509
9	145° 14' 36"	4° 40' 47"	149° 09' 43"	17° 30' 32"	0° 58' 33"	15' 57.26"	309° 52' 33"	0.98613
10	145° 49' 30"	4° 41' 52"	149° 44' 20"	17° 19' 35"	0° 58' 35"	15' 57.74"	310° 54' 16"	0.98712
11	146° 24' 26"	4° 42' 55"	150° 18' 55"	17° 08' 32"	0° 58' 36"	15' 58.21"	312° 0' 01"	0.98808
12	146° 59' 24"	4° 43' 56"	150° 53' 28"	16° 57' 22"	0° 58' 38"	15' 58.68"	313° 10' 18"	0.98899
13	147° 34' 25"	4° 44' 55"	151° 27' 60"	16° 46' 05"	0° 58' 40"	15' 59.15"	314° 25' 40"	0.98986
14	148° 09' 27"	4° 45' 52"	152° 02' 28"	16° 34' 42"	0° 58' 42"	15' 59.62"	315° 46' 46"	0.99069
15	148° 44' 32"	4° 46' 48"	152° 36' 55"	16° 23' 13"	0° 58' 43"	16' 00.08"	317° 14' 21"	0.99148
16	149° 19' 39"	4° 47' 42"	153° 11' 20"	16° 11' 37"	0° 58' 45"	16' 00.53"	318° 49' 16"	0.99222
17	149° 54' 49"	4° 48' 35"	153° 45' 43"	15° 59' 56"	0° 58' 47"	16' 00.99"	320° 32' 31"	0.99292
18	150° 30' 00"	4° 49' 25"	154° 20' 04"	15° 48' 08"	0° 58' 48"	16' 01.44"	322° 25' 15"	0.99358
19	151° 05' 14"	4° 50' 14"	154° 54' 22"	15° 36' 14"	0° 58' 50"	16' 01.88"	324° 28' 46"	0.99419
20	151° 40' 29"	4° 51' 01"	155° 28' 39"	15° 24' 14"	0° 58' 51"	16' 02.32"	326° 44' 37"	0.99476
21	152° 15' 47"	4° 51' 46"	156° 02' 53"	15° 12' 08"	0° 58' 53"	16' 02.76"	329° 14' 31"	0.99529
22	152° 51' 06"	4° 52' 29"	156° 37' 06"	14° 59' 56"	0° 58' 55"	16' 03.20"	332° 0' 25"	0.99577
23	153° 26' 28"	4° 53' 10"	157° 11' 16"	14° 47' 38"	0° 58' 56"	16' 03.63"	335° 4' 26"	0.99621
24	154° 01' 51"	4° 53' 50"	157° 45' 24"	14° 35' 15"	0° 58' 58"	16' 04.05"	338° 28' 52"	0.99660

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	338° 37' 08"	0.72"	340° 13' 54"	-8° 20' 28"	0.9902688	16' 09.06"	23° 26' 14"	-12 m 45 s
1	338° 39' 39"	0.72"	340° 16' 15"	-8° 19' 32"	0.9902786	16' 09.05"	23° 26' 14"	-12 m 44 s
2	338° 42' 10"	0.72"	340° 18' 36"	-8° 18' 35"	0.9902885	16' 09.04"	23° 26' 14"	-12 m 44 s
3	338° 44' 40"	0.73"	340° 20' 58"	-8° 17' 39"	0.9902984	16' 09.03"	23° 26' 14"	-12 m 44 s
4	338° 47' 11"	0.73"	340° 23' 19"	-8° 16' 42"	0.9903083	16' 09.02"	23° 26' 14"	-12 m 43 s
5	338° 49' 42"	0.73"	340° 25' 40"	-8° 15' 46"	0.9903181	16' 09.01"	23° 26' 14"	-12 m 43 s
6	338° 52' 12"	0.73"	340° 28' 01"	-8° 14' 50"	0.9903280	16' 09.00"	23° 26' 14"	-12 m 42 s
7	338° 54' 43"	0.73"	340° 30' 22"	-8° 13' 53"	0.9903379	16' 08.99"	23° 26' 14"	-12 m 42 s
8	338° 57' 14"	0.73"	340° 32' 43"	-8° 12' 57"	0.9903478	16' 08.98"	23° 26' 14"	-12 m 41 s
9	338° 59' 44"	0.73"	340° 35' 04"	-8° 12' 00"	0.9903578	16' 08.97"	23° 26' 14"	-12 m 41 s
10	339° 02' 15"	0.73"	340° 37' 25"	-8° 11' 04"	0.9903677	16' 08.96"	23° 26' 14"	-12 m 40 s
11	339° 04' 46"	0.73"	340° 39' 46"	-8° 10' 07"	0.9903776	16' 08.95"	23° 26' 14"	-12 m 40 s
12	339° 07' 16"	0.73"	340° 42' 07"	-8° 09' 10"	0.9903876	16' 08.94"	23° 26' 14"	-12 m 39 s
13	339° 09' 47"	0.73"	340° 44' 29"	-8° 08' 14"	0.9903975	16' 08.93"	23° 26' 14"	-12 m 39 s
14	339° 12' 18"	0.73"	340° 46' 50"	-8° 07' 17"	0.9904075	16' 08.92"	23° 26' 14"	-12 m 39 s
15	339° 14' 48"	0.73"	340° 49' 11"	-8° 06' 21"	0.9904174	16' 08.91"	23° 26' 14"	-12 m 38 s
16	339° 17' 19"	0.73"	340° 51' 32"	-8° 05' 24"	0.9904274	16' 08.90"	23° 26' 14"	-12 m 38 s
17	339° 19' 49"	0.73"	340° 53' 53"	-8° 04' 28"	0.9904374	16' 08.90"	23° 26' 14"	-12 m 37 s
18	339° 22' 20"	0.73"	340° 56' 14"	-8° 03' 31"	0.9904473	16' 08.89"	23° 26' 14"	-12 m 37 s
19	339° 24' 51"	0.73"	340° 58' 34"	-8° 02' 34"	0.9904573	16' 08.88"	23° 26' 14"	-12 m 36 s
20	339° 27' 21"	0.73"	341° 00' 55"	-8° 01' 38"	0.9904673	16' 08.87"	23° 26' 14"	-12 m 36 s
21	339° 29' 52"	0.73"	341° 03' 16"	-8° 00' 41"	0.9904773	16' 08.86"	23° 26' 14"	-12 m 35 s
22	339° 32' 23"	0.73"	341° 05' 37"	-7° 59' 44"	0.9904874	16' 08.85"	23° 26' 14"	-12 m 35 s
23	339° 34' 53"	0.73"	341° 07' 58"	-7° 58' 48"	0.9904974	16' 08.84"	23° 26' 14"	-12 m 34 s
24	339° 37' 24"	0.73"	341° 10' 19"	-7° 57' 51"	0.9905074	16' 08.83"	23° 26' 14"	-12 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	154° 01' 51"	4° 53' 50"	157° 45' 24"	14° 35' 15"	0° 58' 58"	16' 04.05"	338° 28' 52"	0.99660
1	154° 37' 17"	4° 54' 28"	158° 19' 31"	14° 22' 46"	0° 58' 59"	16' 04.47"	342° 15' 59"	0.99695
2	155° 12' 45"	4° 55' 04"	158° 53' 35"	14° 10' 11"	0° 59' 01"	16' 04.89"	346° 27' 54"	0.99725
3	155° 48' 14"	4° 55' 38"	159° 27' 37"	13° 57' 31"	0° 59' 02"	16' 05.31"	351° 6' 14"	0.99751
4	156° 23' 45"	4° 56' 10"	160° 01' 38"	13° 44' 45"	0° 59' 04"	16' 05.71"	356° 11' 37"	0.99773
5	156° 59' 18"	4° 56' 40"	160° 35' 36"	13° 31' 54"	0° 59' 05"	16' 06.12"	1° 43' 16"	0.99789
6	157° 34' 53"	4° 57' 08"	161° 09' 32"	13° 18' 58"	0° 59' 07"	16' 06.52"	7° 38' 19"	0.99802
7	158° 10' 30"	4° 57' 35"	161° 43' 26"	13° 05' 57"	0° 59' 08"	16' 06.91"	13° 51' 40"	0.99810
8	158° 46' 09"	4° 57' 59"	162° 17' 19"	12° 52' 51"	0° 59' 10"	16' 07.31"	20° 16' 01"	0.99813
9	159° 21' 49"	4° 58' 22"	162° 51' 09"	12° 39' 39"	0° 59' 11"	16' 07.69"	26° 42' 36"	0.99812
10	159° 57' 31"	4° 58' 42"	163° 24' 58"	12° 26' 23"	0° 59' 13"	16' 08.07"	33° 2' 19"	0.99806
11	160° 33' 15"	4° 59' 01"	163° 58' 44"	12° 13' 02"	0° 59' 14"	16' 08.45"	39° 6' 59"	0.99795
12	161° 09' 01"	4° 59' 18"	164° 32' 29"	11° 59' 36"	0° 59' 15"	16' 08.82"	44° 50' 19"	0.99780
13	161° 44' 48"	4° 59' 33"	165° 06' 12"	11° 46' 05"	0° 59' 17"	16' 09.19"	50° 8' 19"	0.99761
14	162° 20' 37"	4° 59' 45"	165° 39' 53"	11° 32' 30"	0° 59' 18"	16' 09.55"	54° 59' 11"	0.99736
15	162° 56' 27"	4° 59' 56"	166° 13' 32"	11° 18' 51"	0° 59' 19"	16' 09.91"	59° 22' 53"	0.99707
16	163° 32' 19"	5° 00' 05"	166° 47' 10"	11° 05' 07"	0° 59' 21"	16' 10.26"	63° 20' 36"	0.99674
17	164° 08' 13"	5° 00' 12"	167° 20' 45"	10° 51' 18"	0° 59' 22"	16' 10.61"	66° 54' 14"	0.99636
18	164° 44' 08"	5° 00' 17"	167° 54' 19"	10° 37' 26"	0° 59' 23"	16' 10.95"	70° 5' 60"	0.99593
19	165° 20' 04"	5° 00' 20"	168° 27' 52"	10° 23' 29"	0° 59' 24"	16' 11.29"	72° 58' 12"	0.99545
20	165° 56' 02"	5° 00' 21"	169° 01' 22"	10° 09' 28"	0° 59' 26"	16' 11.62"	75° 33' 05"	0.99493
21	166° 32' 01"	5° 00' 20"	169° 34' 52"	9° 55' 23"	0° 59' 27"	16' 11.95"	77° 52' 40"	0.99436
22	167° 08' 02"	5° 00' 17"	170° 08' 19"	9° 41' 14"	0° 59' 28"	16' 12.27"	79° 58' 48"	0.99375
23	167° 44' 04"	5° 00' 12"	170° 41' 45"	9° 27' 02"	0° 59' 29"	16' 12.58"	81° 53' 06"	0.99309
24	168° 20' 08"	5° 00' 05"	171° 15' 09"	9° 12' 45"	0° 59' 30"	16' 12.89"	83° 37' 00"	0.99238

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	339° 37' 24"	0.73"	341° 10' 19"	-7° 57' 51"	0.9905074	16' 08.83"	23° 26' 14"	-12 m 34 s
1	339° 39' 54"	0.73"	341° 12' 40"	-7° 56' 54"	0.9905174	16' 08.82"	23° 26' 14"	-12 m 33 s
2	339° 42' 25"	0.73"	341° 15' 01"	-7° 55' 58"	0.9905275	16' 08.81"	23° 26' 14"	-12 m 33 s
3	339° 44' 56"	0.73"	341° 17' 22"	-7° 55' 01"	0.9905375	16' 08.80"	23° 26' 14"	-12 m 33 s
4	339° 47' 26"	0.73"	341° 19' 42"	-7° 54' 04"	0.9905476	16' 08.79"	23° 26' 14"	-12 m 32 s
5	339° 49' 57"	0.73"	341° 22' 03"	-7° 53' 07"	0.9905577	16' 08.78"	23° 26' 14"	-12 m 32 s
6	339° 52' 27"	0.72"	341° 24' 24"	-7° 52' 11"	0.9905677	16' 08.77"	23° 26' 14"	-12 m 31 s
7	339° 54' 58"	0.72"	341° 26' 45"	-7° 51' 14"	0.9905778	16' 08.76"	23° 26' 14"	-12 m 31 s
8	339° 57' 29"	0.72"	341° 29' 06"	-7° 50' 17"	0.9905879	16' 08.75"	23° 26' 14"	-12 m 30 s
9	339° 59' 59"	0.72"	341° 31' 26"	-7° 49' 20"	0.9905980	16' 08.74"	23° 26' 14"	-12 m 30 s
10	340° 02' 30"	0.72"	341° 33' 47"	-7° 48' 23"	0.9906081	16' 08.73"	23° 26' 14"	-12 m 29 s
11	340° 05' 00"	0.72"	341° 36' 08"	-7° 47' 27"	0.9906182	16' 08.72"	23° 26' 14"	-12 m 29 s
12	340° 07' 31"	0.72"	341° 38' 29"	-7° 46' 30"	0.9906283	16' 08.71"	23° 26' 14"	-12 m 28 s
13	340° 10' 01"	0.72"	341° 40' 49"	-7° 45' 33"	0.9906384	16' 08.70"	23° 26' 14"	-12 m 28 s
14	340° 12' 32"	0.72"	341° 43' 10"	-7° 44' 36"	0.9906486	16' 08.69"	23° 26' 14"	-12 m 27 s
15	340° 15' 03"	0.72"	341° 45' 31"	-7° 43' 39"	0.9906587	16' 08.68"	23° 26' 14"	-12 m 27 s
16	340° 17' 33"	0.71"	341° 47' 51"	-7° 42' 42"	0.9906689	16' 08.67"	23° 26' 14"	-12 m 26 s
17	340° 20' 04"	0.71"	341° 50' 12"	-7° 41' 45"	0.9906790	16' 08.66"	23° 26' 14"	-12 m 26 s
18	340° 22' 34"	0.71"	341° 52' 33"	-7° 40' 49"	0.9906892	16' 08.65"	23° 26' 14"	-12 m 25 s
19	340° 25' 05"	0.71"	341° 54' 53"	-7° 39' 52"	0.9906994	16' 08.64"	23° 26' 14"	-12 m 25 s
20	340° 27' 35"	0.71"	341° 57' 14"	-7° 38' 55"	0.9907095	16' 08.63"	23° 26' 14"	-12 m 24 s
21	340° 30' 06"	0.71"	341° 59' 35"	-7° 37' 58"	0.9907197	16' 08.62"	23° 26' 14"	-12 m 24 s
22	340° 32' 36"	0.71"	342° 01' 55"	-7° 37' 01"	0.9907299	16' 08.61"	23° 26' 14"	-12 m 23 s
23	340° 35' 07"	0.70"	342° 04' 16"	-7° 36' 04"	0.9907401	16' 08.60"	23° 26' 14"	-12 m 23 s
24	340° 37' 37"	0.70"	342° 06' 36"	-7° 35' 07"	0.9907503	16' 08.59"	23° 26' 14"	-12 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	168° 20' 08"	5° 00' 05"	171° 15' 09"	9° 12' 45"	0° 59' 30"	16' 12.89"	83° 37' 00"	0.99238
1	168° 56' 13"	4° 59' 56"	171° 48' 32"	8° 58' 25"	0° 59' 31"	16' 13.20"	85° 11' 44"	0.99163
2	169° 32' 19"	4° 59' 45"	172° 21' 54"	8° 44' 02"	0° 59' 32"	16' 13.50"	86° 38' 23"	0.99082
3	170° 08' 26"	4° 59' 32"	172° 55' 14"	8° 29' 35"	0° 59' 34"	16' 13.79"	87° 57' 51"	0.98997
4	170° 44' 35"	4° 59' 17"	173° 28' 32"	8° 15' 05"	0° 59' 35"	16' 14.08"	89° 10' 58"	0.98908
5	171° 20' 44"	4° 59' 00"	174° 01' 49"	8° 00' 31"	0° 59' 36"	16' 14.36"	90° 18' 24"	0.98814
6	171° 56' 55"	4° 58' 41"	174° 35' 05"	7° 45' 55"	0° 59' 37"	16' 14.64"	91° 20' 46"	0.98715
7	172° 33' 07"	4° 58' 20"	175° 08' 20"	7° 31' 15"	0° 59' 38"	16' 14.91"	92° 18' 36"	0.98611
8	173° 09' 20"	4° 57' 57"	175° 41' 34"	7° 16' 32"	0° 59' 39"	16' 15.18"	93° 12' 19"	0.98503
9	173° 45' 34"	4° 57' 32"	176° 14' 46"	7° 01' 47"	0° 59' 40"	16' 15.44"	94° 2' 22"	0.98390
10	174° 21' 49"	4° 57' 05"	176° 47' 57"	6° 46' 58"	0° 59' 41"	16' 15.69"	94° 49' 04"	0.98273
11	174° 58' 05"	4° 56' 36"	177° 21' 07"	6° 32' 07"	0° 59' 41"	16' 15.94"	95° 32' 43"	0.98150
12	175° 34' 23"	4° 56' 04"	177° 54' 16"	6° 17' 13"	0° 59' 42"	16' 16.19"	96° 13' 37"	0.98024
13	176° 10' 41"	4° 55' 31"	178° 27' 24"	6° 02' 17"	0° 59' 43"	16' 16.42"	96° 51' 59"	0.97892
14	176° 46' 60"	4° 54' 56"	179° 00' 31"	5° 47' 18"	0° 59' 44"	16' 16.66"	97° 28' 02"	0.97756
15	177° 23' 19"	4° 54' 19"	179° 33' 37"	5° 32' 17"	0° 59' 45"	16' 16.88"	98° 1' 58"	0.97615
16	177° 59' 40"	4° 53' 40"	180° 06' 43"	5° 17' 14"	0° 59' 46"	16' 17.10"	98° 33' 55"	0.97470
17	178° 36' 01"	4° 52' 59"	180° 39' 47"	5° 02' 09"	0° 59' 47"	16' 17.32"	99° 4' 04"	0.97320
18	179° 12' 24"	4° 52' 15"	181° 12' 51"	4° 47' 01"	0° 59' 47"	16' 17.52"	99° 32' 33"	0.97165
19	179° 48' 47"	4° 51' 30"	181° 45' 54"	4° 31' 52"	0° 59' 48"	16' 17.73"	99° 59' 28"	0.97006
20	180° 25' 10"	4° 50' 43"	182° 18' 56"	4° 16' 41"	0° 59' 49"	16' 17.92"	100° 24' 56"	0.96843
21	181° 01' 35"	4° 49' 54"	182° 51' 57"	4° 01' 28"	0° 59' 49"	16' 18.11"	100° 49' 03"	0.96674
22	181° 37' 59"	4° 49' 03"	183° 24' 58"	3° 46' 13"	0° 59' 50"	16' 18.30"	101° 11' 54"	0.96501
23	182° 14' 25"	4° 48' 10"	183° 57' 59"	3° 30' 57"	0° 59' 51"	16' 18.48"	101° 33' 34"	0.96324
24	182° 50' 51"	4° 47' 15"	184° 30' 59"	3° 15' 39"	0° 59' 51"	16' 18.65"	101° 54' 08"	0.96142

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	340° 37' 37"	0.70"	342° 06' 36"	-7° 35' 07"	0.9907503	16' 08.59"	23° 26' 14"	-12 m 22 s
1	340° 40' 08"	0.70"	342° 08' 57"	-7° 34' 10"	0.9907605	16' 08.58"	23° 26' 14"	-12 m 22 s
2	340° 42' 39"	0.70"	342° 11' 17"	-7° 33' 13"	0.9907707	16' 08.57"	23° 26' 14"	-12 m 22 s
3	340° 45' 09"	0.70"	342° 13' 38"	-7° 32' 16"	0.9907810	16' 08.56"	23° 26' 14"	-12 m 21 s
4	340° 47' 40"	0.70"	342° 15' 58"	-7° 31' 19"	0.9907912	16' 08.55"	23° 26' 14"	-12 m 21 s
5	340° 50' 10"	0.69"	342° 18' 19"	-7° 30' 22"	0.9908014	16' 08.54"	23° 26' 14"	-12 m 20 s
6	340° 52' 41"	0.69"	342° 20' 39"	-7° 29' 25"	0.9908117	16' 08.53"	23° 26' 14"	-12 m 20 s
7	340° 55' 11"	0.69"	342° 22' 60"	-7° 28' 28"	0.9908219	16' 08.52"	23° 26' 14"	-12 m 19 s
8	340° 57' 42"	0.69"	342° 25' 20"	-7° 27' 31"	0.9908322	16' 08.51"	23° 26' 14"	-12 m 19 s
9	341° 00' 12"	0.69"	342° 27' 41"	-7° 26' 34"	0.9908425	16' 08.50"	23° 26' 14"	-12 m 18 s
10	341° 02' 43"	0.68"	342° 30' 01"	-7° 25' 37"	0.9908527	16' 08.49"	23° 26' 14"	-12 m 18 s
11	341° 05' 13"	0.68"	342° 32' 22"	-7° 24' 39"	0.9908630	16' 08.48"	23° 26' 14"	-12 m 17 s
12	341° 07' 44"	0.68"	342° 34' 42"	-7° 23' 42"	0.9908733	16' 08.47"	23° 26' 14"	-12 m 17 s
13	341° 10' 14"	0.68"	342° 37' 02"	-7° 22' 45"	0.9908836	16' 08.46"	23° 26' 14"	-12 m 16 s
14	341° 12' 45"	0.67"	342° 39' 23"	-7° 21' 48"	0.9908939	16' 08.45"	23° 26' 14"	-12 m 16 s
15	341° 15' 15"	0.67"	342° 41' 43"	-7° 20' 51"	0.9909042	16' 08.44"	23° 26' 14"	-12 m 15 s
16	341° 17' 46"	0.67"	342° 44' 04"	-7° 19' 54"	0.9909145	16' 08.43"	23° 26' 14"	-12 m 15 s
17	341° 20' 16"	0.67"	342° 46' 24"	-7° 18' 57"	0.9909249	16' 08.42"	23° 26' 14"	-12 m 14 s
18	341° 22' 47"	0.66"	342° 48' 44"	-7° 17' 60"	0.9909352	16' 08.41"	23° 26' 14"	-12 m 14 s
19	341° 25' 17"	0.66"	342° 51' 05"	-7° 17' 02"	0.9909455	16' 08.40"	23° 26' 14"	-12 m 13 s
20	341° 27' 48"	0.66"	342° 53' 25"	-7° 16' 05"	0.9909559	16' 08.39"	23° 26' 14"	-12 m 13 s
21	341° 30' 18"	0.66"	342° 55' 45"	-7° 15' 08"	0.9909662	16' 08.38"	23° 26' 14"	-12 m 12 s
22	341° 32' 49"	0.65"	342° 58' 06"	-7° 14' 11"	0.9909766	16' 08.37"	23° 26' 14"	-12 m 12 s
23	341° 35' 19"	0.65"	343° 00' 26"	-7° 13' 14"	0.9909870	16' 08.36"	23° 26' 14"	-12 m 11 s
24	341° 37' 49"	0.65"	343° 02' 46"	-7° 12' 16"	0.9909973	16' 08.35"	23° 26' 14"	-12 m 11 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	182° 50' 51"	4° 47' 15"	184° 30' 59"	3° 15' 39"	0° 59' 51"	16' 18.65"	101° 54' 08"	0.96142
1	183° 27' 18"	4° 46' 17"	185° 03' 58"	3° 00' 20"	0° 59' 52"	16' 18.82"	102° 13' 39"	0.95956
2	184° 03' 45"	4° 45' 18"	185° 36' 58"	2° 44' 60"	0° 59' 53"	16' 18.98"	102° 32' 10"	0.95765
3	184° 40' 13"	4° 44' 17"	186° 09' 57"	2° 29' 38"	0° 59' 53"	16' 19.13"	102° 49' 47"	0.95570
4	185° 16' 41"	4° 43' 15"	186° 42' 55"	2° 14' 16"	0° 59' 54"	16' 19.28"	103° 6' 30"	0.95370
5	185° 53' 10"	4° 42' 10"	187° 15' 54"	1° 58' 52"	0° 59' 54"	16' 19.43"	103° 22' 23"	0.95166
6	186° 29' 38"	4° 41' 03"	187° 48' 52"	1° 43' 27"	0° 59' 55"	16' 19.56"	103° 37' 29"	0.94957
7	187° 06' 08"	4° 39' 54"	188° 21' 50"	1° 28' 02"	0° 59' 55"	16' 19.70"	103° 51' 50"	0.94744
8	187° 42' 37"	4° 38' 43"	188° 54' 48"	1° 12' 36"	0° 59' 56"	16' 19.82"	104° 5' 28"	0.94527
9	188° 19' 07"	4° 37' 31"	189° 27' 46"	0° 57' 10"	0° 59' 56"	16' 19.94"	104° 18' 25"	0.94305
10	188° 55' 38"	4° 36' 16"	190° 00' 44"	0° 41' 42"	0° 59' 57"	16' 20.06"	104° 30' 43"	0.94079
11	189° 32' 08"	4° 34' 60"	190° 33' 42"	0° 26' 15"	0° 59' 57"	16' 20.16"	104° 42' 23"	0.93849
12	190° 08' 39"	4° 33' 42"	191° 06' 40"	0° 10' 47"	0° 59' 57"	16' 20.27"	104° 53' 28"	0.93614
13	190° 45' 09"	4° 32' 21"	191° 39' 39"	0° -4' 41"	0° 59' 58"	16' 20.36"	105° 3' 58"	0.93375
14	191° 21' 40"	4° 30' 59"	192° 12' 38"	0° -20' 09"	0° 59' 58"	16' 20.45"	105° 13' 55"	0.93132
15	191° 58' 11"	4° 29' 35"	192° 45' 37"	0° -35' 37"	0° 59' 58"	16' 20.54"	105° 23' 20"	0.92885
16	192° 34' 43"	4° 28' 10"	193° 18' 36"	0° -51' 05"	0° 59' 59"	16' 20.61"	105° 32' 15"	0.92633
17	193° 11' 14"	4° 26' 42"	193° 51' 36"	-1° 06' 33"	0° 59' 59"	16' 20.69"	105° 40' 40"	0.92377
18	193° 47' 45"	4° 25' 13"	194° 24' 37"	-1° 22' 01"	0° 59' 59"	16' 20.75"	105° 48' 37"	0.92118
19	194° 24' 16"	4° 23' 41"	194° 57' 38"	-1° 37' 28"	0° 59' 59"	16' 20.82"	105° 56' 07"	0.91854
20	195° 00' 47"	4° 22' 08"	195° 30' 39"	-1° 52' 55"	0° 59' 60"	16' 20.87"	106° 3' 09"	0.91586
21	195° 37' 18"	4° 20' 33"	196° 03' 42"	-2° 08' 21"	0° 59' 60"	16' 20.92"	106° 9' 46"	0.91314
22	196° 13' 49"	4° 18' 57"	196° 36' 44"	-2° 23' 46"	0° 59' 60"	16' 20.96"	106° 15' 58"	0.91038
23	196° 50' 20"	4° 17' 18"	197° 09' 48"	-2° 39' 11"	1° 00' 00"	16' 21.00"	106° 21' 46"	0.90758
24	197° 26' 51"	4° 15' 38"	197° 42' 53"	-2° 54' 35"	1° 00' 00"	16' 21.03"	106° 27' 10"	0.90474

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	341° 37' 49"	0.65"	343° 02' 46"	-7° 12' 16"	0.9909973	16' 08.35"	23° 26' 14"	-12 m 11 s
1	341° 40' 20"	0.65"	343° 05' 06"	-7° 11' 19"	0.9910077	16' 08.34"	23° 26' 14"	-12 m 10 s
2	341° 42' 50"	0.64"	343° 07' 27"	-7° 10' 22"	0.9910181	16' 08.33"	23° 26' 14"	-12 m 10 s
3	341° 45' 21"	0.64"	343° 09' 47"	-7° 09' 24"	0.9910285	16' 08.32"	23° 26' 14"	-12 m 09 s
4	341° 47' 51"	0.64"	343° 12' 07"	-7° 08' 27"	0.9910389	16' 08.31"	23° 26' 14"	-12 m 09 s
5	341° 50' 22"	0.63"	343° 14' 27"	-7° 07' 30"	0.9910493	16' 08.30"	23° 26' 14"	-12 m 08 s
6	341° 52' 52"	0.63"	343° 16' 47"	-7° 06' 33"	0.9910597	16' 08.29"	23° 26' 14"	-12 m 07 s
7	341° 55' 23"	0.63"	343° 19' 08"	-7° 05' 35"	0.9910701	16' 08.28"	23° 26' 14"	-12 m 07 s
8	341° 57' 53"	0.62"	343° 21' 28"	-7° 04' 38"	0.9910806	16' 08.27"	23° 26' 14"	-12 m 06 s
9	342° 00' 24"	0.62"	343° 23' 48"	-7° 03' 41"	0.9910910	16' 08.26"	23° 26' 14"	-12 m 06 s
10	342° 02' 54"	0.62"	343° 26' 08"	-7° 02' 43"	0.9911014	16' 08.25"	23° 26' 14"	-12 m 05 s
11	342° 05' 24"	0.62"	343° 28' 28"	-7° 01' 46"	0.9911119	16' 08.24"	23° 26' 14"	-12 m 05 s
12	342° 07' 55"	0.61"	343° 30' 48"	-7° 00' 49"	0.9911223	16' 08.23"	23° 26' 14"	-12 m 04 s
13	342° 10' 25"	0.61"	343° 33' 08"	-6° 59' 51"	0.9911328	16' 08.22"	23° 26' 14"	-12 m 04 s
14	342° 12' 56"	0.60"	343° 35' 28"	-6° 58' 54"	0.9911433	16' 08.21"	23° 26' 14"	-12 m 03 s
15	342° 15' 26"	0.60"	343° 37' 49"	-6° 57' 56"	0.9911537	16' 08.19"	23° 26' 14"	-12 m 03 s
16	342° 17' 57"	0.60"	343° 40' 09"	-6° 56' 59"	0.9911642	16' 08.18"	23° 26' 14"	-12 m 02 s
17	342° 20' 27"	0.59"	343° 42' 29"	-6° 56' 02"	0.9911747	16' 08.17"	23° 26' 14"	-12 m 02 s
18	342° 22' 57"	0.59"	343° 44' 49"	-6° 55' 04"	0.9911852	16' 08.16"	23° 26' 14"	-12 m 01 s
19	342° 25' 28"	0.59"	343° 47' 09"	-6° 54' 07"	0.9911957	16' 08.15"	23° 26' 14"	-12 m 01 s
20	342° 27' 58"	0.58"	343° 49' 29"	-6° 53' 09"	0.9912062	16' 08.14"	23° 26' 14"	-12 m 00 s
21	342° 30' 29"	0.58"	343° 51' 49"	-6° 52' 12"	0.9912167	16' 08.13"	23° 26' 14"	-11 m 60 s
22	342° 32' 59"	0.58"	343° 54' 09"	-6° 51' 14"	0.9912272	16' 08.12"	23° 26' 14"	-11 m 59 s
23	342° 35' 29"	0.57"	343° 56' 29"	-6° 50' 17"	0.9912378	16' 08.11"	23° 26' 14"	-11 m 59 s
24	342° 37' 60"	0.57"	343° 58' 49"	-6° 49' 19"	0.9912483	16' 08.10"	23° 26' 14"	-11 m 58 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	197° 26' 51"	4° 15' 38"	197° 42' 53"	-2° 54' 35"	1° 00' 00"	16' 21.03"	106° 27' 10"	0.90474
1	198° 03' 21"	4° 13' 56"	198° 15' 58"	-3° 09' 58"	1° 00' 00"	16' 21.06"	106° 32' 11"	0.90186
2	198° 39' 52"	4° 12' 13"	198° 49' 04"	-3° 25' 20"	1° 00' 00"	16' 21.08"	106° 36' 50"	0.89894
3	199° 16' 22"	4° 10' 27"	199° 22' 12"	-3° 40' 41"	1° 00' 00"	16' 21.10"	106° 41' 07"	0.89598
4	199° 52' 52"	4° 08' 40"	199° 55' 20"	-3° 56' 00"	1° 00' 00"	16' 21.11"	106° 45' 03"	0.89299
5	200° 29' 21"	4° 06' 52"	200° 28' 29"	-4° 11' 18"	1° 00' 00"	16' 21.11"	106° 48' 38"	0.88995
6	201° 05' 50"	4° 05' 01"	201° 01' 40"	-4° 26' 35"	1° 00' 00"	16' 21.11"	106° 51' 53"	0.88688
7	201° 42' 19"	4° 03' 09"	201° 34' 52"	-4° 41' 50"	1° 00' 00"	16' 21.10"	106° 54' 49"	0.88377
8	202° 18' 48"	4° 01' 15"	202° 08' 05"	-4° 57' 04"	1° 00' 00"	16' 21.09"	106° 57' 25"	0.88063
9	202° 55' 16"	3° 59' 20"	202° 41' 19"	-5° 12' 16"	1° 00' 00"	16' 21.08"	106° 59' 42"	0.87745
10	203° 31' 43"	3° 57' 23"	203° 14' 35"	-5° 27' 26"	1° 00' 00"	16' 21.05"	107° 1' 41"	0.87423
11	204° 08' 11"	3° 55' 24"	203° 47' 52"	-5° 42' 34"	1° 00' 00"	16' 21.02"	107° 3' 22"	0.87097
12	204° 44' 37"	3° 53' 24"	204° 21' 11"	-5° 57' 40"	0° 59' 60"	16' 20.99"	107° 4' 45"	0.86769
13	205° 21' 04"	3° 51' 22"	204° 54' 31"	-6° 12' 44"	0° 59' 60"	16' 20.95"	107° 5' 50"	0.86436
14	205° 57' 29"	3° 49' 19"	205° 27' 52"	-6° 27' 45"	0° 59' 60"	16' 20.91"	107° 6' 39"	0.86100
15	206° 33' 55"	3° 47' 14"	206° 01' 16"	-6° 42' 45"	0° 59' 60"	16' 20.86"	107° 7' 10"	0.85761
16	207° 10' 19"	3° 45' 08"	206° 34' 41"	-6° 57' 42"	0° 59' 59"	16' 20.80"	107° 7' 25"	0.85418
17	207° 46' 43"	3° 42' 60"	207° 08' 08"	-7° 12' 36"	0° 59' 59"	16' 20.74"	107° 7' 24"	0.85072
18	208° 23' 07"	3° 40' 51"	207° 41' 36"	-7° 27' 28"	0° 59' 59"	16' 20.68"	107° 7' 07"	0.84723
19	208° 59' 29"	3° 38' 40"	208° 15' 07"	-7° 42' 18"	0° 59' 59"	16' 20.61"	107° 6' 35"	0.84370
20	209° 35' 51"	3° 36' 27"	208° 48' 39"	-7° 57' 04"	0° 59' 58"	16' 20.53"	107° 5' 46"	0.84014
21	210° 12' 13"	3° 34' 14"	209° 22' 13"	-8° 11' 48"	0° 59' 58"	16' 20.45"	107° 4' 43"	0.83655
22	210° 48' 34"	3° 31' 58"	209° 55' 49"	-8° 26' 28"	0° 59' 58"	16' 20.37"	107° 3' 24"	0.83292
23	211° 24' 54"	3° 29' 42"	210° 29' 28"	-8° 41' 06"	0° 59' 57"	16' 20.28"	107° 1' 51"	0.82927
24	212° 01' 13"	3° 27' 24"	211° 03' 08"	-8° 55' 40"	0° 59' 57"	16' 20.19"	107° 0' 03"	0.82558

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	342° 37' 60"	0.57"	343° 58' 49"	-6° 49' 19"	0.9912483	16' 08.10"	23° 26' 14"	-11 m 58 s
1	342° 40' 30"	0.56"	344° 01' 09"	-6° 48' 22"	0.9912588	16' 08.09"	23° 26' 14"	-11 m 58 s
2	342° 43' 01"	0.56"	344° 03' 29"	-6° 47' 24"	0.9912694	16' 08.08"	23° 26' 14"	-11 m 57 s
3	342° 45' 31"	0.56"	344° 05' 49"	-6° 46' 27"	0.9912799	16' 08.07"	23° 26' 14"	-11 m 57 s
4	342° 48' 01"	0.55"	344° 08' 08"	-6° 45' 29"	0.9912905	16' 08.06"	23° 26' 14"	-11 m 56 s
5	342° 50' 32"	0.55"	344° 10' 28"	-6° 44' 32"	0.9913010	16' 08.05"	23° 26' 14"	-11 m 55 s
6	342° 53' 02"	0.55"	344° 12' 48"	-6° 43' 34"	0.9913116	16' 08.04"	23° 26' 14"	-11 m 55 s
7	342° 55' 33"	0.54"	344° 15' 08"	-6° 42' 37"	0.9913222	16' 08.03"	23° 26' 14"	-11 m 54 s
8	342° 58' 03"	0.54"	344° 17' 28"	-6° 41' 39"	0.9913328	16' 08.02"	23° 26' 14"	-11 m 54 s
9	343° 00' 33"	0.53"	344° 19' 48"	-6° 40' 42"	0.9913434	16' 08.01"	23° 26' 14"	-11 m 53 s
10	343° 03' 04"	0.53"	344° 22' 08"	-6° 39' 44"	0.9913539	16' 08.00"	23° 26' 14"	-11 m 53 s
11	343° 05' 34"	0.52"	344° 24' 28"	-6° 38' 46"	0.9913645	16' 07.99"	23° 26' 14"	-11 m 52 s
12	343° 08' 05"	0.52"	344° 26' 47"	-6° 37' 49"	0.9913752	16' 07.98"	23° 26' 14"	-11 m 52 s
13	343° 10' 35"	0.52"	344° 29' 07"	-6° 36' 51"	0.9913858	16' 07.97"	23° 26' 14"	-11 m 51 s
14	343° 13' 05"	0.51"	344° 31' 27"	-6° 35' 54"	0.9913964	16' 07.96"	23° 26' 14"	-11 m 51 s
15	343° 15' 36"	0.51"	344° 33' 47"	-6° 34' 56"	0.9914070	16' 07.95"	23° 26' 14"	-11 m 50 s
16	343° 18' 06"	0.50"	344° 36' 07"	-6° 33' 58"	0.9914176	16' 07.94"	23° 26' 14"	-11 m 50 s
17	343° 20' 36"	0.50"	344° 38' 26"	-6° 33' 01"	0.9914283	16' 07.93"	23° 26' 14"	-11 m 49 s
18	343° 23' 07"	0.49"	344° 40' 46"	-6° 32' 03"	0.9914389	16' 07.92"	23° 26' 14"	-11 m 48 s
19	343° 25' 37"	0.49"	344° 43' 06"	-6° 31' 05"	0.9914495	16' 07.91"	23° 26' 14"	-11 m 48 s
20	343° 28' 07"	0.49"	344° 45' 26"	-6° 30' 08"	0.9914602	16' 07.90"	23° 26' 14"	-11 m 47 s
21	343° 30' 38"	0.48"	344° 47' 45"	-6° 29' 10"	0.9914709	16' 07.89"	23° 26' 14"	-11 m 47 s
22	343° 33' 08"	0.48"	344° 50' 05"	-6° 28' 12"	0.9914815	16' 07.87"	23° 26' 14"	-11 m 46 s
23	343° 35' 38"	0.47"	344° 52' 25"	-6° 27' 14"	0.9914922	16' 07.86"	23° 26' 14"	-11 m 46 s
24	343° 38' 09"	0.47"	344° 54' 45"	-6° 26' 17"	0.9915029	16' 07.85"	23° 26' 14"	-11 m 45 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	212° 01' 13"	3° 27' 24"	211° 03' 08"	-8° 55' 40"	0° 59' 57"	16' 20.19"	107° 0' 03"	0.82558
1	212° 37' 31"	3° 25' 05"	211° 36' 50"	-9° 10' 11"	0° 59' 57"	16' 20.09"	106° 58' 01"	0.82187
2	213° 13' 49"	3° 22' 44"	212° 10' 35"	-9° 24' 39"	0° 59' 56"	16' 19.98"	106° 55' 45"	0.81812
3	213° 50' 06"	3° 20' 22"	212° 44' 22"	-9° 39' 03"	0° 59' 56"	16' 19.87"	106° 53' 14"	0.81435
4	214° 26' 22"	3° 17' 59"	213° 18' 11"	-9° 53' 24"	0° 59' 55"	16' 19.76"	106° 50' 30"	0.81055
5	215° 02' 37"	3° 15' 34"	213° 52' 03"	-10° 07' 41"	0° 59' 55"	16' 19.64"	106° 47' 32"	0.80671
6	215° 38' 51"	3° 13' 08"	214° 25' 56"	-10° 21' 54"	0° 59' 55"	16' 19.52"	106° 44' 20"	0.80285
7	216° 15' 05"	3° 10' 41"	214° 59' 53"	-10° 36' 04"	0° 59' 54"	16' 19.39"	106° 40' 55"	0.79896
8	216° 51' 17"	3° 08' 13"	215° 33' 51"	-10° 50' 10"	0° 59' 54"	16' 19.26"	106° 37' 17"	0.79505
9	217° 27' 29"	3° 05' 43"	216° 07' 52"	-11° 04' 11"	0° 59' 53"	16' 19.13"	106° 33' 25"	0.79110
10	218° 03' 40"	3° 03' 12"	216° 41' 56"	-11° 18' 09"	0° 59' 53"	16' 18.99"	106° 29' 21"	0.78713
11	218° 39' 49"	3° 00' 41"	217° 16' 02"	-11° 32' 02"	0° 59' 52"	16' 18.84"	106° 25' 04"	0.78314
12	219° 15' 58"	2° 58' 07"	217° 50' 11"	-11° 45' 52"	0° 59' 52"	16' 18.69"	106° 20' 34"	0.77912
13	219° 52' 06"	2° 55' 33"	218° 24' 23"	-11° 59' 36"	0° 59' 51"	16' 18.54"	106° 15' 52"	0.77507
14	220° 28' 13"	2° 52' 58"	218° 58' 37"	-12° 13' 17"	0° 59' 50"	16' 18.38"	106° 10' 57"	0.77100
15	221° 04' 18"	2° 50' 21"	219° 32' 54"	-12° 26' 52"	0° 59' 50"	16' 18.22"	106° 5' 50"	0.76691
16	221° 40' 23"	2° 47' 44"	220° 07' 13"	-12° 40' 24"	0° 59' 49"	16' 18.06"	106° 0' 31"	0.76279
17	222° 16' 27"	2° 45' 05"	220° 41' 36"	-12° 53' 50"	0° 59' 49"	16' 17.89"	105° 54' 60"	0.75865
18	222° 52' 29"	2° 42' 26"	221° 16' 01"	-13° 07' 12"	0° 59' 48"	16' 17.71"	105° 49' 17"	0.75448
19	223° 28' 31"	2° 39' 45"	221° 50' 29"	-13° 20' 28"	0° 59' 47"	16' 17.54"	105° 43' 22"	0.75029
20	224° 04' 31"	2° 37' 03"	222° 25' 00"	-13° 33' 40"	0° 59' 47"	16' 17.36"	105° 37' 15"	0.74608
21	224° 40' 31"	2° 34' 21"	222° 59' 34"	-13° 46' 47"	0° 59' 46"	16' 17.17"	105° 30' 56"	0.74185
22	225° 16' 29"	2° 31' 37"	223° 34' 11"	-13° 59' 48"	0° 59' 45"	16' 16.98"	105° 24' 26"	0.73760
23	225° 52' 26"	2° 28' 53"	224° 08' 51"	-14° 12' 44"	0° 59' 45"	16' 16.79"	105° 17' 45"	0.73333
24	226° 28' 18"	2° 26' 08"	224° 43' 30"	-14° 25' 34"	0° 59' 44"	16' 16.59"	105° 10' 53"	0.72905

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	343° 38' 09"	0.47"	344° 54' 45"	-6° 26' 17"	0.9915029	16' 07.85"	23° 26' 14"	-11 m 45 s
1	343° 40' 39"	0.46"	344° 57' 04"	-6° 25' 19"	0.9915135	16' 07.84"	23° 26' 14"	-11 m 45 s
2	343° 43' 09"	0.46"	344° 59' 24"	-6° 24' 21"	0.9915242	16' 07.83"	23° 26' 14"	-11 m 44 s
3	343° 45' 40"	0.45"	345° 01' 44"	-6° 23' 23"	0.9915349	16' 07.82"	23° 26' 14"	-11 m 44 s
4	343° 48' 10"	0.45"	345° 04' 03"	-6° 22' 26"	0.9915456	16' 07.81"	23° 26' 14"	-11 m 43 s
5	343° 50' 40"	0.44"	345° 06' 23"	-6° 21' 28"	0.9915563	16' 07.80"	23° 26' 14"	-11 m 42 s
6	343° 53' 11"	0.44"	345° 08' 42"	-6° 20' 30"	0.9915670	16' 07.79"	23° 26' 14"	-11 m 42 s
7	343° 55' 41"	0.43"	345° 11' 02"	-6° 19' 32"	0.9915777	16' 07.78"	23° 26' 14"	-11 m 41 s
8	343° 58' 11"	0.43"	345° 13' 22"	-6° 18' 35"	0.9915885	16' 07.77"	23° 26' 14"	-11 m 41 s
9	344° 00' 42"	0.43"	345° 15' 41"	-6° 17' 37"	0.9915992	16' 07.76"	23° 26' 14"	-11 m 40 s
10	344° 03' 12"	0.42"	345° 18' 01"	-6° 16' 39"	0.9916099	16' 07.75"	23° 26' 14"	-11 m 40 s
11	344° 05' 42"	0.42"	345° 20' 20"	-6° 15' 41"	0.9916206	16' 07.74"	23° 26' 14"	-11 m 39 s
12	344° 08' 13"	0.41"	345° 22' 40"	-6° 14' 43"	0.9916314	16' 07.73"	23° 26' 14"	-11 m 39 s
13	344° 10' 43"	0.41"	345° 24' 60"	-6° 13' 45"	0.9916421	16' 07.72"	23° 26' 14"	-11 m 38 s
14	344° 13' 13"	0.40"	345° 27' 19"	-6° 12' 48"	0.9916529	16' 07.71"	23° 26' 14"	-11 m 37 s
15	344° 15' 43"	0.40"	345° 29' 39"	-6° 11' 50"	0.9916636	16' 07.70"	23° 26' 14"	-11 m 37 s
16	344° 18' 14"	0.39"	345° 31' 58"	-6° 10' 52"	0.9916744	16' 07.69"	23° 26' 14"	-11 m 36 s
17	344° 20' 44"	0.39"	345° 34' 18"	-6° 09' 54"	0.9916852	16' 07.68"	23° 26' 14"	-11 m 36 s
18	344° 23' 14"	0.38"	345° 36' 37"	-6° 08' 56"	0.9916959	16' 07.67"	23° 26' 14"	-11 m 35 s
19	344° 25' 45"	0.38"	345° 38' 57"	-6° 07' 58"	0.9917067	16' 07.66"	23° 26' 14"	-11 m 35 s
20	344° 28' 15"	0.37"	345° 41' 16"	-6° 07' 00"	0.9917175	16' 07.64"	23° 26' 14"	-11 m 34 s
21	344° 30' 45"	0.37"	345° 43' 36"	-6° 06' 02"	0.9917283	16' 07.63"	23° 26' 14"	-11 m 34 s
22	344° 33' 16"	0.36"	345° 45' 55"	-6° 05' 04"	0.9917391	16' 07.62"	23° 26' 14"	-11 m 33 s
23	344° 35' 46"	0.36"	345° 48' 14"	-6° 04' 06"	0.9917499	16' 07.61"	23° 26' 14"	-11 m 32 s
24	344° 38' 16"	0.35"	345° 50' 34"	-6° 03' 08"	0.9917607	16' 07.60"	23° 26' 14"	-11 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	226° 28' 18"	2° 26' 08"	224° 43' 30"	-14° 25' 34"	0° 59' 44"	16' 16.59"	105° 10' 53"	0.72905
1	227° 04' 13"	2° 23' 21"	225° 18' 16"	-14° 38' 19"	0° 59' 43"	16' 16.40"	105° 3' 49"	0.72473
2	227° 40' 07"	2° 20' 34"	225° 53' 05"	-14° 50' 59"	0° 59' 42"	16' 16.19"	104° 56' 34"	0.72040
3	228° 15' 59"	2° 17' 46"	226° 27' 57"	-15° 03' 34"	0° 59' 42"	16' 15.99"	104° 49' 08"	0.71605
4	228° 51' 50"	2° 14' 57"	227° 02' 52"	-15° 16' 02"	0° 59' 41"	16' 15.78"	104° 41' 31"	0.71169
5	229° 27' 41"	2° 12' 08"	227° 37' 50"	-15° 28' 25"	0° 59' 40"	16' 15.56"	104° 33' 43"	0.70730
6	230° 03' 29"	2° 09' 17"	228° 12' 51"	-15° 40' 42"	0° 59' 39"	16' 15.35"	104° 25' 45"	0.70290
7	230° 39' 17"	2° 06' 26"	228° 47' 55"	-15° 52' 53"	0° 59' 38"	16' 15.13"	104° 17' 35"	0.69848
8	231° 15' 04"	2° 03' 34"	229° 23' 03"	-16° 04' 58"	0° 59' 38"	16' 14.90"	104° 9' 16"	0.69404
9	231° 50' 49"	2° 00' 41"	229° 58' 14"	-16° 16' 57"	0° 59' 37"	16' 14.68"	104° 0' 45"	0.68959
10	232° 26' 33"	1° 57' 48"	230° 33' 28"	-16° 28' 50"	0° 59' 36"	16' 14.45"	103° 52' 05"	0.68512
11	233° 02' 15"	1° 54' 54"	231° 08' 45"	-16° 40' 37"	0° 59' 35"	16' 14.22"	103° 43' 14"	0.68064
12	233° 37' 57"	1° 51' 59"	231° 44' 05"	-16° 52' 17"	0° 59' 34"	16' 13.98"	103° 34' 13"	0.67614
13	234° 13' 37"	1° 49' 04"	232° 19' 28"	-17° 03' 51"	0° 59' 33"	16' 13.74"	103° 25' 01"	0.67163
14	234° 49' 16"	1° 46' 08"	232° 54' 55"	-17° 15' 18"	0° 59' 33"	16' 13.50"	103° 15' 40"	0.66711
15	235° 24' 54"	1° 43' 11"	233° 30' 25"	-17° 26' 39"	0° 59' 32"	16' 13.26"	103° 6' 09"	0.66257
16	236° 00' 30"	1° 40' 14"	234° 05' 58"	-17° 37' 53"	0° 59' 31"	16' 13.01"	102° 56' 27"	0.65802
17	236° 36' 05"	1° 37' 16"	234° 41' 34"	-17° 48' 60"	0° 59' 30"	16' 12.76"	102° 46' 37"	0.65346
18	237° 11' 39"	1° 34' 18"	235° 17' 14"	-18° 00' 00"	0° 59' 29"	16' 12.51"	102° 36' 36"	0.64889
19	237° 47' 11"	1° 31' 19"	235° 52' 57"	-18° 10' 54"	0° 59' 28"	16' 12.26"	102° 26' 26"	0.64430
20	238° 22' 42"	1° 28' 20"	236° 28' 43"	-18° 21' 40"	0° 59' 27"	16' 12.00"	102° 16' 06"	0.63971
21	238° 58' 12"	1° 25' 20"	237° 04' 32"	-18° 32' 20"	0° 59' 26"	16' 11.74"	102° 5' 37"	0.63510
22	239° 33' 41"	1° 22' 20"	237° 40' 25"	-18° 42' 52"	0° 59' 25"	16' 11.48"	101° 54' 59"	0.63049
23	240° 09' 08"	1° 19' 20"	238° 16' 20"	-18° 53' 18"	0° 59' 24"	16' 11.21"	101° 44' 11"	0.62586
24	240° 44' 34"	1° 16' 19"	238° 52' 19"	-19° 03' 36"	0° 59' 23"	16' 10.94"	101° 33' 14"	0.62123

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	344° 38' 16"	0.35"	345° 50' 34"	-6° 03' 08"	0.9917607	16' 07.60"	23° 26' 14"	-11 m 32 s
1	344° 40' 46"	0.35"	345° 52' 53"	-6° 02' 11"	0.9917715	16' 07.59"	23° 26' 14"	-11 m 31 s
2	344° 43' 17"	0.34"	345° 55' 13"	-6° 01' 13"	0.9917823	16' 07.58"	23° 26' 14"	-11 m 31 s
3	344° 45' 47"	0.34"	345° 57' 32"	-6° 00' 15"	0.9917931	16' 07.57"	23° 26' 14"	-11 m 30 s
4	344° 48' 17"	0.33"	345° 59' 52"	-5° 59' 17"	0.9918039	16' 07.56"	23° 26' 14"	-11 m 30 s
5	344° 50' 47"	0.32"	346° 02' 11"	-5° 58' 19"	0.9918147	16' 07.55"	23° 26' 14"	-11 m 29 s
6	344° 53' 18"	0.32"	346° 04' 30"	-5° 57' 21"	0.9918256	16' 07.54"	23° 26' 14"	-11 m 28 s
7	344° 55' 48"	0.31"	346° 06' 50"	-5° 56' 23"	0.9918364	16' 07.53"	23° 26' 14"	-11 m 28 s
8	344° 58' 18"	0.31"	346° 09' 09"	-5° 55' 25"	0.9918472	16' 07.52"	23° 26' 14"	-11 m 27 s
9	345° 00' 48"	0.30"	346° 11' 28"	-5° 54' 27"	0.9918581	16' 07.51"	23° 26' 14"	-11 m 27 s
10	345° 03' 19"	0.30"	346° 13' 48"	-5° 53' 29"	0.9918689	16' 07.50"	23° 26' 14"	-11 m 26 s
11	345° 05' 49"	0.29"	346° 16' 07"	-5° 52' 30"	0.9918798	16' 07.49"	23° 26' 14"	-11 m 26 s
12	345° 08' 19"	0.29"	346° 18' 26"	-5° 51' 32"	0.9918906	16' 07.48"	23° 26' 14"	-11 m 25 s
13	345° 10' 49"	0.28"	346° 20' 46"	-5° 50' 34"	0.9919015	16' 07.47"	23° 26' 14"	-11 m 24 s
14	345° 13' 20"	0.28"	346° 23' 05"	-5° 49' 36"	0.9919124	16' 07.45"	23° 26' 14"	-11 m 24 s
15	345° 15' 50"	0.27"	346° 25' 24"	-5° 48' 38"	0.9919232	16' 07.44"	23° 26' 14"	-11 m 23 s
16	345° 18' 20"	0.27"	346° 27' 43"	-5° 47' 40"	0.9919341	16' 07.43"	23° 26' 14"	-11 m 23 s
17	345° 20' 50"	0.26"	346° 30' 03"	-5° 46' 42"	0.9919450	16' 07.42"	23° 26' 14"	-11 m 22 s
18	345° 23' 21"	0.26"	346° 32' 22"	-5° 45' 44"	0.9919559	16' 07.41"	23° 26' 14"	-11 m 22 s
19	345° 25' 51"	0.25"	346° 34' 41"	-5° 44' 46"	0.9919668	16' 07.40"	23° 26' 14"	-11 m 21 s
20	345° 28' 21"	0.25"	346° 37' 00"	-5° 43' 48"	0.9919777	16' 07.39"	23° 26' 14"	-11 m 20 s
21	345° 30' 51"	0.24"	346° 39' 20"	-5° 42' 50"	0.9919886	16' 07.38"	23° 26' 14"	-11 m 20 s
22	345° 33' 21"	0.24"	346° 41' 39"	-5° 41' 51"	0.9919995	16' 07.37"	23° 26' 14"	-11 m 19 s
23	345° 35' 52"	0.23"	346° 43' 58"	-5° 40' 53"	0.9920104	16' 07.36"	23° 26' 14"	-11 m 19 s
24	345° 38' 22"	0.22"	346° 46' 17"	-5° 39' 55"	0.9920213	16' 07.35"	23° 26' 14"	-11 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	240° 44' 34"	1° 16' 19"	238° 52' 19"	-19° 03' 36"	0° 59' 23"	16' 10.94"	101° 33' 14"	0.62123
1	241° 19' 58"	1° 13' 17"	239° 28' 21"	-19° 13' 46"	0° 59' 22"	16' 10.68"	101° 22' 08"	0.61659
2	241° 55' 21"	1° 10' 16"	240° 04' 26"	-19° 23' 49"	0° 59' 21"	16' 10.40"	101° 10' 53"	0.61194
3	242° 30' 43"	1° 07' 13"	240° 40' 35"	-19° 33' 45"	0° 59' 20"	16' 10.13"	100° 59' 30"	0.60728
4	243° 06' 04"	1° 04' 11"	241° 16' 46"	-19° 43' 33"	0° 59' 19"	16' 09.85"	100° 47' 57"	0.60262
5	243° 41' 23"	1° 01' 08"	241° 53' 00"	-19° 53' 14"	0° 59' 18"	16' 09.57"	100° 36' 16"	0.59795
6	244° 16' 41"	0° 58' 05"	242° 29' 18"	-20° 02' 47"	0° 59' 17"	16' 09.29"	100° 24' 26"	0.59327
7	244° 51' 57"	0° 55' 02"	243° 05' 39"	-20° 12' 12"	0° 59' 16"	16' 09.01"	100° 12' 28"	0.58859
8	245° 27' 12"	0° 51' 59"	243° 42' 02"	-20° 21' 29"	0° 59' 15"	16' 08.73"	100° 0' 21"	0.58390
9	246° 02' 26"	0° 48' 55"	244° 18' 29"	-20° 30' 38"	0° 59' 14"	16' 08.44"	99° 48' 06"	0.57921
10	246° 37' 38"	0° 45' 51"	244° 54' 59"	-20° 39' 40"	0° 59' 13"	16' 08.15"	99° 35' 43"	0.57452
11	247° 12' 49"	0° 42' 47"	245° 31' 31"	-20° 48' 33"	0° 59' 12"	16' 07.86"	99° 23' 12"	0.56982
12	247° 47' 59"	0° 39' 42"	246° 08' 07"	-20° 57' 19"	0° 59' 11"	16' 07.57"	99° 10' 32"	0.56511
13	248° 23' 07"	0° 36' 38"	246° 44' 45"	-21° 05' 56"	0° 59' 10"	16' 07.27"	98° 57' 45"	0.56041
14	248° 58' 14"	0° 33' 34"	247° 21' 27"	-21° 14' 25"	0° 59' 09"	16' 06.98"	98° 44' 50"	0.55570
15	249° 33' 20"	0° 30' 29"	247° 58' 11"	-21° 22' 46"	0° 59' 07"	16' 06.68"	98° 31' 47"	0.55099
16	250° 08' 24"	0° 27' 24"	248° 34' 58"	-21° 30' 58"	0° 59' 06"	16' 06.38"	98° 18' 37"	0.54628
17	250° 43' 27"	0° 24' 20"	249° 11' 47"	-21° 39' 02"	0° 59' 05"	16' 06.08"	98° 5' 19"	0.54157
18	251° 18' 28"	0° 21' 15"	249° 48' 39"	-21° 46' 58"	0° 59' 04"	16' 05.78"	97° 51' 53"	0.53685
19	251° 53' 28"	0° 18' 10"	250° 25' 34"	-21° 54' 45"	0° 59' 03"	16' 05.47"	97° 38' 20"	0.53214
20	252° 28' 27"	0° 15' 05"	251° 02' 32"	-22° 02' 24"	0° 59' 02"	16' 05.17"	97° 24' 40"	0.52743
21	253° 03' 25"	0° 12' 00"	251° 39' 32"	-22° 09' 54"	0° 59' 01"	16' 04.86"	97° 10' 53"	0.52271
22	253° 38' 21"	0° 08' 56"	252° 16' 34"	-22° 17' 15"	0° 58' 60"	16' 04.55"	96° 56' 59"	0.51800
23	254° 13' 15"	0° 05' 51"	252° 53' 39"	-22° 24' 28"	0° 58' 59"	16' 04.24"	96° 42' 58"	0.51329
24	254° 48' 08"	0° 02' 46"	253° 30' 46"	-22° 31' 32"	0° 58' 57"	16' 03.93"	96° 28' 51"	0.50858

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	345° 38' 22"	0.22"	346° 46' 17"	-5° 39' 55"	0.9920213	16' 07.35"	23° 26' 14"	-11 m 18 s
1	345° 40' 52"	0.22"	346° 48' 36"	-5° 38' 57"	0.9920322	16' 07.34"	23° 26' 14"	-11 m 18 s
2	345° 43' 22"	0.21"	346° 50' 55"	-5° 37' 59"	0.9920431	16' 07.33"	23° 26' 14"	-11 m 17 s
3	345° 45' 52"	0.21"	346° 53' 15"	-5° 37' 01"	0.9920540	16' 07.32"	23° 26' 14"	-11 m 16 s
4	345° 48' 23"	0.20"	346° 55' 34"	-5° 36' 02"	0.9920650	16' 07.31"	23° 26' 14"	-11 m 16 s
5	345° 50' 53"	0.20"	346° 57' 53"	-5° 35' 04"	0.9920759	16' 07.29"	23° 26' 14"	-11 m 15 s
6	345° 53' 23"	0.19"	347° 00' 12"	-5° 34' 06"	0.9920868	16' 07.28"	23° 26' 14"	-11 m 15 s
7	345° 55' 53"	0.19"	347° 02' 31"	-5° 33' 08"	0.9920978	16' 07.27"	23° 26' 14"	-11 m 14 s
8	345° 58' 23"	0.18"	347° 04' 50"	-5° 32' 10"	0.9921087	16' 07.26"	23° 26' 14"	-11 m 13 s
9	346° 00' 54"	0.18"	347° 07' 09"	-5° 31' 11"	0.9921197	16' 07.25"	23° 26' 14"	-11 m 13 s
10	346° 03' 24"	0.17"	347° 09' 28"	-5° 30' 13"	0.9921306	16' 07.24"	23° 26' 14"	-11 m 12 s
11	346° 05' 54"	0.17"	347° 11' 47"	-5° 29' 15"	0.9921416	16' 07.23"	23° 26' 14"	-11 m 12 s
12	346° 08' 24"	0.16"	347° 14' 07"	-5° 28' 17"	0.9921525	16' 07.22"	23° 26' 14"	-11 m 11 s
13	346° 10' 54"	0.15"	347° 16' 26"	-5° 27' 18"	0.9921635	16' 07.21"	23° 26' 14"	-11 m 10 s
14	346° 13' 25"	0.15"	347° 18' 45"	-5° 26' 20"	0.9921744	16' 07.20"	23° 26' 14"	-11 m 10 s
15	346° 15' 55"	0.14"	347° 21' 04"	-5° 25' 22"	0.9921854	16' 07.19"	23° 26' 14"	-11 m 09 s
16	346° 18' 25"	0.14"	347° 23' 23"	-5° 24' 24"	0.9921964	16' 07.18"	23° 26' 14"	-11 m 09 s
17	346° 20' 55"	0.13"	347° 25' 42"	-5° 23' 25"	0.9922074	16' 07.17"	23° 26' 14"	-11 m 08 s
18	346° 23' 25"	0.13"	347° 28' 01"	-5° 22' 27"	0.9922183	16' 07.16"	23° 26' 14"	-11 m 07 s
19	346° 25' 55"	0.12"	347° 30' 20"	-5° 21' 29"	0.9922293	16' 07.15"	23° 26' 14"	-11 m 07 s
20	346° 28' 26"	0.12"	347° 32' 39"	-5° 20' 30"	0.9922403	16' 07.13"	23° 26' 14"	-11 m 06 s
21	346° 30' 56"	0.11"	347° 34' 58"	-5° 19' 32"	0.9922513	16' 07.12"	23° 26' 14"	-11 m 06 s
22	346° 33' 26"	0.11"	347° 37' 17"	-5° 18' 34"	0.9922623	16' 07.11"	23° 26' 14"	-11 m 05 s
23	346° 35' 56"	0.10"	347° 39' 36"	-5° 17' 35"	0.9922733	16' 07.10"	23° 26' 14"	-11 m 04 s
24	346° 38' 26"	0.10"	347° 41' 55"	-5° 16' 37"	0.9922843	16' 07.09"	23° 26' 14"	-11 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	254° 48' 08"	0° 02' 46"	253° 30' 46"	-22° 31' 32"	0° 58' 57"	16' 03.93"	96° 28' 51"	0.50858
1	255° 23' 00"	0° 00' -18"	254° 07' 56"	-22° 38' 27"	0° 58' 56"	16' 03.62"	96° 14' 36"	0.50388
2	255° 57' 51"	0° -3' 22"	254° 45' 07"	-22° 45' 13"	0° 58' 55"	16' 03.31"	96° 0' 15"	0.49917
3	256° 32' 40"	0° -6' 27"	255° 22' 21"	-22° 51' 51"	0° 58' 54"	16' 02.99"	95° 45' 48"	0.49448
4	257° 07' 28"	0° -9' 31"	255° 59' 38"	-22° 58' 19"	0° 58' 53"	16' 02.68"	95° 31' 14"	0.48978
5	257° 42' 14"	0° -12' 35"	256° 36' 56"	-23° 04' 39"	0° 58' 52"	16' 02.36"	95° 16' 34"	0.48509
6	258° 16' 60"	0° -15' 38"	257° 14' 16"	-23° 10' 49"	0° 58' 50"	16' 02.04"	95° 1' 48"	0.48040
7	258° 51' 43"	0° -18' 42"	257° 51' 38"	-23° 16' 51"	0° 58' 49"	16' 01.72"	94° 46' 55"	0.47572
8	259° 26' 26"	0° -21' 45"	258° 29' 02"	-23° 22' 43"	0° 58' 48"	16' 01.40"	94° 31' 57"	0.47104
9	260° 01' 07"	0° -24' 48"	259° 06' 28"	-23° 28' 27"	0° 58' 47"	16' 01.08"	94° 16' 53"	0.46637
10	260° 35' 47"	0° -27' 51"	259° 43' 55"	-23° 34' 01"	0° 58' 46"	16' 00.76"	94° 1' 44"	0.46170
11	261° 10' 25"	0° -30' 53"	260° 21' 25"	-23° 39' 26"	0° 58' 45"	16' 00.43"	93° 46' 29"	0.45705
12	261° 45' 02"	0° -33' 55"	260° 58' 55"	-23° 44' 41"	0° 58' 43"	16' 00.11"	93° 31' 08"	0.45239
13	262° 19' 38"	0° -36' 57"	261° 36' 28"	-23° 49' 48"	0° 58' 42"	15' 59.78"	93° 15' 43"	0.44775
14	262° 54' 12"	0° -39' 58"	262° 14' 01"	-23° 54' 45"	0° 58' 41"	15' 59.46"	93° 0' 12"	0.44311
15	263° 28' 45"	0° -42' 59"	262° 51' 36"	-23° 59' 32"	0° 58' 40"	15' 59.13"	92° 44' 35"	0.43849
16	264° 03' 17"	0° -46' 00"	263° 29' 12"	-24° 04' 11"	0° 58' 39"	15' 58.80"	92° 28' 54"	0.43387
17	264° 37' 47"	0° -49' 00"	264° 06' 50"	-24° 08' 40"	0° 58' 37"	15' 58.47"	92° 13' 09"	0.42926
18	265° 12' 16"	0° -52' 00"	264° 44' 28"	-24° 12' 59"	0° 58' 36"	15' 58.14"	91° 57' 18"	0.42465
19	265° 46' 44"	0° -54' 60"	265° 22' 08"	-24° 17' 10"	0° 58' 35"	15' 57.81"	91° 41' 23"	0.42006
20	266° 21' 11"	0° -57' 59"	265° 59' 48"	-24° 21' 10"	0° 58' 34"	15' 57.48"	91° 25' 23"	0.41548
21	266° 55' 36"	-1° 00' 57"	266° 37' 30"	-24° 25' 02"	0° 58' 32"	15' 57.15"	91° 9' 19"	0.41091
22	267° 29' 60"	-1° 03' 55"	267° 15' 12"	-24° 28' 43"	0° 58' 31"	15' 56.82"	90° 53' 11"	0.40635
23	268° 04' 22"	-1° 06' 52"	267° 52' 54"	-24° 32' 16"	0° 58' 30"	15' 56.49"	90° 36' 58"	0.40180
24	268° 38' 43"	-1° 09' 49"	268° 30' 38"	-24° 35' 39"	0° 58' 29"	15' 56.15"	90° 20' 42"	0.39726

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	346° 38' 26"	0.10"	347° 41' 55"	-5° 16' 37"	0.9922843	16' 07.09"	23° 26' 14"	-11 m 04 s
1	346° 40' 56"	0.09"	347° 44' 13"	-5° 15' 39"	0.9922953	16' 07.08"	23° 26' 14"	-11 m 03 s
2	346° 43' 26"	0.09"	347° 46' 32"	-5° 14' 40"	0.9923063	16' 07.07"	23° 26' 14"	-11 m 03 s
3	346° 45' 57"	0.08"	347° 48' 51"	-5° 13' 42"	0.9923173	16' 07.06"	23° 26' 14"	-11 m 02 s
4	346° 48' 27"	0.07"	347° 51' 10"	-5° 12' 44"	0.9923283	16' 07.05"	23° 26' 14"	-11 m 01 s
5	346° 50' 57"	0.07"	347° 53' 29"	-5° 11' 45"	0.9923393	16' 07.04"	23° 26' 14"	-11 m 01 s
6	346° 53' 27"	0.06"	347° 55' 48"	-5° 10' 47"	0.9923504	16' 07.03"	23° 26' 14"	-11 m 00 s
7	346° 55' 57"	0.06"	347° 58' 07"	-5° 09' 49"	0.9923614	16' 07.02"	23° 26' 14"	-10 m 60 s
8	346° 58' 27"	0.05"	348° 00' 26"	-5° 08' 50"	0.9923724	16' 07.01"	23° 26' 14"	-10 m 59 s
9	347° 00' 57"	0.05"	348° 02' 45"	-5° 07' 52"	0.9923834	16' 07.00"	23° 26' 14"	-10 m 58 s
10	347° 03' 27"	0.04"	348° 05' 03"	-5° 06' 53"	0.9923945	16' 06.98"	23° 26' 14"	-10 m 58 s
11	347° 05' 58"	0.04"	348° 07' 22"	-5° 05' 55"	0.9924055	16' 06.97"	23° 26' 14"	-10 m 57 s
12	347° 08' 28"	0.03"	348° 09' 41"	-5° 04' 56"	0.9924165	16' 06.96"	23° 26' 14"	-10 m 57 s
13	347° 10' 58"	0.03"	348° 11' 60"	-5° 03' 58"	0.9924276	16' 06.95"	23° 26' 14"	-10 m 56 s
14	347° 13' 28"	0.02"	348° 14' 19"	-5° 02' 60"	0.9924386	16' 06.94"	23° 26' 14"	-10 m 55 s
15	347° 15' 58"	0.02"	348° 16' 38"	-5° 02' 01"	0.9924497	16' 06.93"	23° 26' 14"	-10 m 55 s
16	347° 18' 28"	0.01"	348° 18' 56"	-5° 01' 03"	0.9924607	16' 06.92"	23° 26' 14"	-10 m 54 s
17	347° 20' 58"	0.01"	348° 21' 15"	-5° 00' 04"	0.9924718	16' 06.91"	23° 26' 14"	-10 m 54 s
18	347° 23' 28"	0.00"	348° 23' 34"	-4° 59' 06"	0.9924828	16' 06.90"	23° 26' 14"	-10 m 53 s
19	347° 25' 58"	-0.00"	348° 25' 53"	-4° 58' 07"	0.9924939	16' 06.89"	23° 26' 14"	-10 m 52 s
20	347° 28' 28"	-0.01"	348° 28' 11"	-4° 57' 09"	0.9925050	16' 06.88"	23° 26' 14"	-10 m 52 s
21	347° 30' 59"	-0.01"	348° 30' 30"	-4° 56' 10"	0.9925160	16' 06.87"	23° 26' 14"	-10 m 51 s
22	347° 33' 29"	-0.02"	348° 32' 49"	-4° 55' 12"	0.9925271	16' 06.86"	23° 26' 14"	-10 m 51 s
23	347° 35' 59"	-0.02"	348° 35' 08"	-4° 54' 13"	0.9925382	16' 06.84"	23° 26' 14"	-10 m 50 s
24	347° 38' 29"	-0.03"	348° 37' 26"	-4° 53' 15"	0.9925492	16' 06.83"	23° 26' 14"	-10 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	268° 38' 43"	-1° 09' 49"	268° 30' 38"	-24° 35' 39"	0° 58' 29"	15' 56.15"	90° 20' 42"	0.39726
1	269° 13' 03"	-1° 12' 46"	269° 08' 22"	-24° 38' 52"	0° 58' 28"	15' 55.82"	90° 4' 22"	0.39274
2	269° 47' 22"	-1° 15' 42"	269° 46' 06"	-24° 41' 55"	0° 58' 26"	15' 55.48"	89° 47' 58"	0.38823
3	270° 21' 39"	-1° 18' 37"	270° 23' 50"	-24° 44' 49"	0° 58' 25"	15' 55.15"	89° 31' 30"	0.38373
4	270° 55' 55"	-1° 21' 32"	271° 01' 35"	-24° 47' 34"	0° 58' 24"	15' 54.81"	89° 14' 59"	0.37924
5	271° 30' 10"	-1° 24' 26"	271° 39' 20"	-24° 50' 09"	0° 58' 23"	15' 54.48"	88° 58' 25"	0.37477
6	272° 04' 23"	-1° 27' 19"	272° 17' 04"	-24° 52' 34"	0° 58' 21"	15' 54.14"	88° 41' 47"	0.37031
7	272° 38' 35"	-1° 30' 12"	272° 54' 49"	-24° 54' 50"	0° 58' 20"	15' 53.80"	88° 25' 06"	0.36586
8	273° 12' 46"	-1° 33' 04"	273° 32' 34"	-24° 56' 56"	0° 58' 19"	15' 53.47"	88° 8' 22"	0.36143
9	273° 46' 56"	-1° 35' 56"	274° 10' 18"	-24° 58' 53"	0° 58' 18"	15' 53.13"	87° 51' 35"	0.35701
10	274° 21' 04"	-1° 38' 46"	274° 48' 02"	-25° 00' 40"	0° 58' 16"	15' 52.79"	87° 34' 45"	0.35261
11	274° 55' 11"	-1° 41' 37"	275° 25' 45"	-25° 02' 17"	0° 58' 15"	15' 52.45"	87° 17' 53"	0.34823
12	275° 29' 17"	-1° 44' 26"	276° 03' 28"	-25° 03' 45"	0° 58' 14"	15' 52.11"	87° 0' 58"	0.34386
13	276° 03' 22"	-1° 47' 15"	276° 41' 10"	-25° 05' 03"	0° 58' 13"	15' 51.78"	86° 44' 00"	0.33951
14	276° 37' 25"	-1° 50' 02"	277° 18' 52"	-25° 06' 12"	0° 58' 12"	15' 51.44"	86° 27' 00"	0.33517
15	277° 11' 27"	-1° 52' 50"	277° 56' 32"	-25° 07' 11"	0° 58' 10"	15' 51.10"	86° 9' 58"	0.33085
16	277° 45' 28"	-1° 55' 36"	278° 34' 12"	-25° 08' 00"	0° 58' 09"	15' 50.76"	85° 52' 54"	0.32655
17	278° 19' 28"	-1° 58' 21"	279° 11' 51"	-25° 08' 40"	0° 58' 08"	15' 50.42"	85° 35' 48"	0.32226
18	278° 53' 26"	-2° 01' 06"	279° 49' 28"	-25° 09' 11"	0° 58' 07"	15' 50.08"	85° 18' 40"	0.31800
19	279° 27' 23"	-2° 03' 50"	280° 27' 05"	-25° 09' 32"	0° 58' 05"	15' 49.74"	85° 1' 30"	0.31375
20	280° 01' 19"	-2° 06' 33"	281° 04' 40"	-25° 09' 43"	0° 58' 04"	15' 49.39"	84° 44' 19"	0.30952
21	280° 35' 14"	-2° 09' 15"	281° 42' 13"	-25° 09' 45"	0° 58' 03"	15' 49.05"	84° 27' 06"	0.30531
22	281° 09' 07"	-2° 11' 57"	282° 19' 45"	-25° 09' 37"	0° 58' 02"	15' 48.71"	84° 9' 51"	0.30112
23	281° 42' 59"	-2° 14' 37"	282° 57' 16"	-25° 09' 20"	0° 58' 00"	15' 48.37"	83° 52' 35"	0.29695
24	282° 16' 50"	-2° 17' 16"	283° 34' 44"	-25° 08' 54"	0° 57' 59"	15' 48.03"	83° 35' 18"	0.29279

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	347° 38' 29"	-0.03"	348° 37' 26"	-4° 53' 15"	0.9925492	16' 06.83"	23° 26' 14"	-10 m 49 s
1	347° 40' 59"	-0.03"	348° 39' 45"	-4° 52' 16"	0.9925603	16' 06.82"	23° 26' 14"	-10 m 49 s
2	347° 43' 29"	-0.04"	348° 42' 04"	-4° 51' 18"	0.9925714	16' 06.81"	23° 26' 14"	-10 m 48 s
3	347° 45' 59"	-0.04"	348° 44' 22"	-4° 50' 19"	0.9925825	16' 06.80"	23° 26' 14"	-10 m 47 s
4	347° 48' 29"	-0.05"	348° 46' 41"	-4° 49' 21"	0.9925936	16' 06.79"	23° 26' 14"	-10 m 47 s
5	347° 50' 59"	-0.05"	348° 48' 60"	-4° 48' 22"	0.9926047	16' 06.78"	23° 26' 14"	-10 m 46 s
6	347° 53' 29"	-0.06"	348° 51' 18"	-4° 47' 24"	0.9926157	16' 06.77"	23° 26' 14"	-10 m 46 s
7	347° 55' 59"	-0.06"	348° 53' 37"	-4° 46' 25"	0.9926268	16' 06.76"	23° 26' 14"	-10 m 45 s
8	347° 58' 29"	-0.07"	348° 55' 56"	-4° 45' 26"	0.9926379	16' 06.75"	23° 26' 14"	-10 m 44 s
9	348° 00' 59"	-0.07"	348° 58' 14"	-4° 44' 28"	0.9926490	16' 06.74"	23° 26' 14"	-10 m 44 s
10	348° 03' 29"	-0.08"	349° 00' 33"	-4° 43' 29"	0.9926601	16' 06.73"	23° 26' 14"	-10 m 43 s
11	348° 05' 60"	-0.08"	349° 02' 52"	-4° 42' 31"	0.9926712	16' 06.71"	23° 26' 14"	-10 m 43 s
12	348° 08' 30"	-0.09"	349° 05' 10"	-4° 41' 32"	0.9926823	16' 06.70"	23° 26' 14"	-10 m 42 s
13	348° 10' 60"	-0.09"	349° 07' 29"	-4° 40' 33"	0.9926934	16' 06.69"	23° 26' 14"	-10 m 41 s
14	348° 13' 30"	-0.10"	349° 09' 47"	-4° 39' 35"	0.9927045	16' 06.68"	23° 26' 14"	-10 m 41 s
15	348° 15' 60"	-0.10"	349° 12' 06"	-4° 38' 36"	0.9927157	16' 06.67"	23° 26' 14"	-10 m 40 s
16	348° 18' 30"	-0.10"	349° 14' 24"	-4° 37' 38"	0.9927268	16' 06.66"	23° 26' 14"	-10 m 39 s
17	348° 20' 60"	-0.11"	349° 16' 43"	-4° 36' 39"	0.9927379	16' 06.65"	23° 26' 14"	-10 m 39 s
18	348° 23' 30"	-0.11"	349° 19' 02"	-4° 35' 40"	0.9927490	16' 06.64"	23° 26' 14"	-10 m 38 s
19	348° 25' 60"	-0.12"	349° 21' 20"	-4° 34' 42"	0.9927601	16' 06.63"	23° 26' 14"	-10 m 38 s
20	348° 28' 30"	-0.12"	349° 23' 39"	-4° 33' 43"	0.9927712	16' 06.62"	23° 26' 14"	-10 m 37 s
21	348° 30' 60"	-0.13"	349° 25' 57"	-4° 32' 44"	0.9927824	16' 06.61"	23° 26' 14"	-10 m 36 s
22	348° 33' 30"	-0.13"	349° 28' 16"	-4° 31' 46"	0.9927935	16' 06.60"	23° 26' 14"	-10 m 36 s
23	348° 35' 60"	-0.14"	349° 30' 34"	-4° 30' 47"	0.9928046	16' 06.58"	23° 26' 14"	-10 m 35 s
24	348° 38' 30"	-0.14"	349° 32' 53"	-4° 29' 48"	0.9928158	16' 06.57"	23° 26' 14"	-10 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	282° 16' 50"	-2° 17' 16"	283° 34' 44"	-25° 08' 54"	0° 57' 59"	15' 48.03"	83° 35' 18"	0.29279
1	282° 50' 40"	-2° 19' 55"	284° 12' 11"	-25° 08' 18"	0° 57' 58"	15' 47.69"	83° 17' 59"	0.28866
2	283° 24' 28"	-2° 22' 33"	284° 49' 36"	-25° 07' 32"	0° 57' 57"	15' 47.35"	83° 0' 40"	0.28455
3	283° 58' 16"	-2° 25' 10"	285° 26' 59"	-25° 06' 38"	0° 57' 55"	15' 47.00"	82° 43' 19"	0.28046
4	284° 32' 02"	-2° 27' 45"	286° 04' 20"	-25° 05' 34"	0° 57' 54"	15' 46.66"	82° 25' 58"	0.27639
5	285° 05' 47"	-2° 30' 20"	286° 41' 39"	-25° 04' 20"	0° 57' 53"	15' 46.32"	82° 8' 35"	0.27234
6	285° 39' 31"	-2° 32' 54"	287° 18' 55"	-25° 02' 58"	0° 57' 51"	15' 45.98"	81° 51' 12"	0.26832
7	286° 13' 13"	-2° 35' 27"	287° 56' 09"	-25° 01' 26"	0° 57' 50"	15' 45.64"	81° 33' 48"	0.26431
8	286° 46' 55"	-2° 37' 59"	288° 33' 21"	-24° 59' 45"	0° 57' 49"	15' 45.30"	81° 16' 24"	0.26033
9	287° 20' 35"	-2° 40' 29"	289° 10' 30"	-24° 57' 54"	0° 57' 48"	15' 44.95"	80° 58' 59"	0.25637
10	287° 54' 14"	-2° 42' 59"	289° 47' 37"	-24° 55' 55"	0° 57' 46"	15' 44.61"	80° 41' 34"	0.25243
11	288° 27' 51"	-2° 45' 28"	290° 24' 41"	-24° 53' 47"	0° 57' 45"	15' 44.27"	80° 24' 08"	0.24852
12	289° 01' 28"	-2° 47' 56"	291° 01' 42"	-24° 51' 29"	0° 57' 44"	15' 43.93"	80° 6' 43"	0.24463
13	289° 35' 04"	-2° 50' 22"	291° 38' 40"	-24° 49' 02"	0° 57' 43"	15' 43.58"	79° 49' 16"	0.24076
14	290° 08' 38"	-2° 52' 48"	292° 15' 35"	-24° 46' 27"	0° 57' 41"	15' 43.24"	79° 31' 50"	0.23692
15	290° 42' 11"	-2° 55' 12"	292° 52' 27"	-24° 43' 42"	0° 57' 40"	15' 42.90"	79° 14' 24"	0.23310
16	291° 15' 43"	-2° 57' 35"	293° 29' 16"	-24° 40' 49"	0° 57' 39"	15' 42.56"	78° 56' 57"	0.22931
17	291° 49' 14"	-2° 59' 58"	294° 06' 02"	-24° 37' 46"	0° 57' 38"	15' 42.22"	78° 39' 30"	0.22554
18	292° 22' 43"	-3° 02' 19"	294° 42' 45"	-24° 34' 35"	0° 57' 36"	15' 41.87"	78° 22' 04"	0.22179
19	292° 56' 12"	-3° 04' 39"	295° 19' 24"	-24° 31' 15"	0° 57' 35"	15' 41.53"	78° 4' 37"	0.21807
20	293° 29' 39"	-3° 06' 57"	295° 55' 60"	-24° 27' 47"	0° 57' 34"	15' 41.19"	77° 47' 11"	0.21438
21	294° 03' 05"	-3° 09' 15"	296° 32' 32"	-24° 24' 09"	0° 57' 33"	15' 40.85"	77° 29' 45"	0.21071
22	294° 36' 30"	-3° 11' 31"	297° 09' 01"	-24° 20' 23"	0° 57' 31"	15' 40.51"	77° 12' 19"	0.20707
23	295° 09' 54"	-3° 13' 47"	297° 45' 26"	-24° 16' 29"	0° 57' 30"	15' 40.17"	76° 54' 53"	0.20345
24	295° 43' 16"	-3° 16' 01"	298° 21' 48"	-24° 12' 26"	0° 57' 29"	15' 39.82"	76° 37' 27"	0.19987

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	348° 38' 30"	-0.14"	349° 32' 53"	-4° 29' 48"	0.9928158	16' 06.57"	23° 26' 14"	-10 m 34 s
1	348° 40' 60"	-0.14"	349° 35' 11"	-4° 28' 50"	0.9928269	16' 06.56"	23° 26' 14"	-10 m 34 s
2	348° 43' 30"	-0.15"	349° 37' 30"	-4° 27' 51"	0.9928380	16' 06.55"	23° 26' 14"	-10 m 33 s
3	348° 45' 60"	-0.15"	349° 39' 48"	-4° 26' 52"	0.9928492	16' 06.54"	23° 26' 14"	-10 m 32 s
4	348° 48' 30"	-0.16"	349° 42' 07"	-4° 25' 54"	0.9928603	16' 06.53"	23° 26' 14"	-10 m 32 s
5	348° 50' 60"	-0.16"	349° 44' 25"	-4° 24' 55"	0.9928714	16' 06.52"	23° 26' 14"	-10 m 31 s
6	348° 53' 30"	-0.17"	349° 46' 43"	-4° 23' 56"	0.9928826	16' 06.51"	23° 26' 14"	-10 m 31 s
7	348° 55' 60"	-0.17"	349° 49' 02"	-4° 22' 58"	0.9928937	16' 06.50"	23° 26' 14"	-10 m 30 s
8	348° 58' 30"	-0.17"	349° 51' 20"	-4° 21' 59"	0.9929049	16' 06.49"	23° 26' 14"	-10 m 29 s
9	349° 00' 60"	-0.18"	349° 53' 39"	-4° 21' 00"	0.9929160	16' 06.48"	23° 26' 14"	-10 m 29 s
10	349° 03' 30"	-0.18"	349° 55' 57"	-4° 20' 01"	0.9929272	16' 06.47"	23° 26' 14"	-10 m 28 s
11	349° 05' 60"	-0.19"	349° 58' 16"	-4° 19' 03"	0.9929383	16' 06.45"	23° 26' 14"	-10 m 27 s
12	349° 08' 30"	-0.19"	350° 00' 34"	-4° 18' 04"	0.9929495	16' 06.44"	23° 26' 14"	-10 m 27 s
13	349° 10' 60"	-0.19"	350° 02' 52"	-4° 17' 05"	0.9929606	16' 06.43"	23° 26' 14"	-10 m 26 s
14	349° 13' 30"	-0.20"	350° 05' 11"	-4° 16' 06"	0.9929718	16' 06.42"	23° 26' 14"	-10 m 25 s
15	349° 15' 60"	-0.20"	350° 07' 29"	-4° 15' 08"	0.9929830	16' 06.41"	23° 26' 14"	-10 m 25 s
16	349° 18' 30"	-0.21"	350° 09' 47"	-4° 14' 09"	0.9929941	16' 06.40"	23° 26' 14"	-10 m 24 s
17	349° 20' 60"	-0.21"	350° 12' 06"	-4° 13' 10"	0.9930053	16' 06.39"	23° 26' 14"	-10 m 24 s
18	349° 23' 30"	-0.21"	350° 14' 24"	-4° 12' 11"	0.9930164	16' 06.38"	23° 26' 14"	-10 m 23 s
19	349° 25' 60"	-0.22"	350° 16' 42"	-4° 11' 13"	0.9930276	16' 06.37"	23° 26' 14"	-10 m 22 s
20	349° 28' 30"	-0.22"	350° 19' 01"	-4° 10' 14"	0.9930388	16' 06.36"	23° 26' 14"	-10 m 22 s
21	349° 30' 60"	-0.22"	350° 21' 19"	-4° 09' 15"	0.9930499	16' 06.35"	23° 26' 14"	-10 m 21 s
22	349° 33' 30"	-0.23"	350° 23' 37"	-4° 08' 16"	0.9930611	16' 06.34"	23° 26' 14"	-10 m 20 s
23	349° 35' 59"	-0.23"	350° 25' 56"	-4° 07' 17"	0.9930723	16' 06.32"	23° 26' 14"	-10 m 20 s
24	349° 38' 29"	-0.24"	350° 28' 14"	-4° 06' 19"	0.9930835	16' 06.31"	23° 26' 14"	-10 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	295° 43' 16"	-3° 16' 01"	298° 21' 48"	-24° 12' 26"	0° 57' 29"	15' 39.82"	76° 37' 27"	0.19987
1	296° 16' 38"	-3° 18' 13"	298° 58' 05"	-24° 08' 14"	0° 57' 28"	15' 39.48"	76° 20' 01"	0.19630
2	296° 49' 58"	-3° 20' 25"	299° 34' 19"	-24° 03' 54"	0° 57' 26"	15' 39.14"	76° 2' 36"	0.19277
3	297° 23' 17"	-3° 22' 35"	300° 10' 29"	-23° 59' 26"	0° 57' 25"	15' 38.80"	75° 45' 11"	0.18926
4	297° 56' 35"	-3° 24' 44"	300° 46' 35"	-23° 54' 50"	0° 57' 24"	15' 38.46"	75° 27' 46"	0.18578
5	298° 29' 52"	-3° 26' 52"	301° 22' 37"	-23° 50' 05"	0° 57' 23"	15' 38.12"	75° 10' 21"	0.18232
6	299° 03' 08"	-3° 28' 59"	301° 58' 35"	-23° 45' 12"	0° 57' 21"	15' 37.78"	74° 52' 57"	0.17890
7	299° 36' 22"	-3° 31' 04"	302° 34' 29"	-23° 40' 11"	0° 57' 20"	15' 37.44"	74° 35' 32"	0.17550
8	300° 09' 36"	-3° 33' 08"	303° 10' 18"	-23° 35' 01"	0° 57' 19"	15' 37.09"	74° 18' 08"	0.17213
9	300° 42' 48"	-3° 35' 11"	303° 46' 04"	-23° 29' 44"	0° 57' 18"	15' 36.75"	74° 0' 44"	0.16879
10	301° 15' 59"	-3° 37' 13"	304° 21' 45"	-23° 24' 19"	0° 57' 16"	15' 36.41"	73° 43' 20"	0.16548
11	301° 49' 10"	-3° 39' 13"	304° 57' 22"	-23° 18' 46"	0° 57' 15"	15' 36.07"	73° 25' 56"	0.16220
12	302° 22' 18"	-3° 41' 12"	305° 32' 54"	-23° 13' 05"	0° 57' 14"	15' 35.73"	73° 8' 31"	0.15894
13	302° 55' 26"	-3° 43' 09"	306° 08' 22"	-23° 07' 16"	0° 57' 13"	15' 35.39"	72° 51' 07"	0.15572
14	303° 28' 33"	-3° 45' 05"	306° 43' 45"	-23° 01' 20"	0° 57' 11"	15' 35.05"	72° 33' 43"	0.15252
15	304° 01' 38"	-3° 47' 00"	307° 19' 04"	-22° 55' 16"	0° 57' 10"	15' 34.71"	72° 16' 18"	0.14936
16	304° 34' 43"	-3° 48' 54"	307° 54' 18"	-22° 49' 04"	0° 57' 09"	15' 34.37"	71° 58' 52"	0.14622
17	305° 07' 46"	-3° 50' 46"	308° 29' 28"	-22° 42' 45"	0° 57' 08"	15' 34.03"	71° 41' 27"	0.14312
18	305° 40' 48"	-3° 52' 37"	309° 04' 33"	-22° 36' 19"	0° 57' 06"	15' 33.70"	71° 24' 00"	0.14004
19	306° 13' 49"	-3° 54' 26"	309° 39' 34"	-22° 29' 45"	0° 57' 05"	15' 33.36"	71° 6' 33"	0.13700
20	306° 46' 49"	-3° 56' 14"	310° 14' 29"	-22° 23' 03"	0° 57' 04"	15' 33.02"	70° 49' 05"	0.13398
21	307° 19' 48"	-3° 58' 01"	310° 49' 20"	-22° 16' 15"	0° 57' 03"	15' 32.68"	70° 31' 36"	0.13100
22	307° 52' 45"	-3° 59' 46"	311° 24' 07"	-22° 09' 19"	0° 57' 01"	15' 32.34"	70° 14' 06"	0.12805
23	308° 25' 42"	-4° 01' 30"	311° 58' 48"	-22° 02' 16"	0° 57' 00"	15' 32.00"	69° 56' 35"	0.12513
24	308° 58' 37"	-4° 03' 12"	312° 33' 25"	-21° 55' 07"	0° 56' 59"	15' 31.66"	69° 39' 02"	0.12224

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	349° 38' 29"	-0.24"	350° 28' 14"	-4° 06' 19"	0.9930835	16' 06.31"	23° 26' 14"	-10 m 19 s
1	349° 40' 59"	-0.24"	350° 30' 32"	-4° 05' 20"	0.9930946	16' 06.30"	23° 26' 14"	-10 m 18 s
2	349° 43' 29"	-0.24"	350° 32' 50"	-4° 04' 21"	0.9931058	16' 06.29"	23° 26' 14"	-10 m 18 s
3	349° 45' 59"	-0.25"	350° 35' 09"	-4° 03' 22"	0.9931170	16' 06.28"	23° 26' 14"	-10 m 17 s
4	349° 48' 29"	-0.25"	350° 37' 27"	-4° 02' 23"	0.9931282	16' 06.27"	23° 26' 14"	-10 m 16 s
5	349° 50' 59"	-0.25"	350° 39' 45"	-4° 01' 24"	0.9931394	16' 06.26"	23° 26' 14"	-10 m 16 s
6	349° 53' 29"	-0.26"	350° 42' 03"	-4° 00' 26"	0.9931505	16' 06.25"	23° 26' 14"	-10 m 15 s
7	349° 55' 59"	-0.26"	350° 44' 22"	-3° 59' 27"	0.9931617	16' 06.24"	23° 26' 14"	-10 m 15 s
8	349° 58' 29"	-0.26"	350° 46' 40"	-3° 58' 28"	0.9931729	16' 06.23"	23° 26' 14"	-10 m 14 s
9	350° 00' 59"	-0.27"	350° 48' 58"	-3° 57' 29"	0.9931841	16' 06.22"	23° 26' 14"	-10 m 13 s
10	350° 03' 29"	-0.27"	350° 51' 16"	-3° 56' 30"	0.9931953	16' 06.20"	23° 26' 14"	-10 m 13 s
11	350° 05' 59"	-0.27"	350° 53' 34"	-3° 55' 31"	0.9932065	16' 06.19"	23° 26' 14"	-10 m 12 s
12	350° 08' 28"	-0.27"	350° 55' 53"	-3° 54' 32"	0.9932177	16' 06.18"	23° 26' 14"	-10 m 11 s
13	350° 10' 58"	-0.28"	350° 58' 11"	-3° 53' 34"	0.9932289	16' 06.17"	23° 26' 14"	-10 m 11 s
14	350° 13' 28"	-0.28"	351° 00' 29"	-3° 52' 35"	0.9932401	16' 06.16"	23° 26' 14"	-10 m 10 s
15	350° 15' 58"	-0.28"	351° 02' 47"	-3° 51' 36"	0.9932513	16' 06.15"	23° 26' 14"	-10 m 09 s
16	350° 18' 28"	-0.29"	351° 05' 05"	-3° 50' 37"	0.9932625	16' 06.14"	23° 26' 14"	-10 m 09 s
17	350° 20' 58"	-0.29"	351° 07' 23"	-3° 49' 38"	0.9932737	16' 06.13"	23° 26' 14"	-10 m 08 s
18	350° 23' 28"	-0.29"	351° 09' 42"	-3° 48' 39"	0.9932849	16' 06.12"	23° 26' 14"	-10 m 07 s
19	350° 25' 58"	-0.29"	351° 11' 60"	-3° 47' 40"	0.9932961	16' 06.11"	23° 26' 14"	-10 m 07 s
20	350° 28' 28"	-0.30"	351° 14' 18"	-3° 46' 41"	0.9933073	16' 06.10"	23° 26' 14"	-10 m 06 s
21	350° 30' 58"	-0.30"	351° 16' 36"	-3° 45' 42"	0.9933185	16' 06.08"	23° 26' 14"	-10 m 05 s
22	350° 33' 27"	-0.30"	351° 18' 54"	-3° 44' 43"	0.9933297	16' 06.07"	23° 26' 14"	-10 m 05 s
23	350° 35' 57"	-0.30"	351° 21' 12"	-3° 43' 45"	0.9933409	16' 06.06"	23° 26' 14"	-10 m 04 s
24	350° 38' 27"	-0.31"	351° 23' 30"	-3° 42' 46"	0.9933521	16' 06.05"	23° 26' 14"	-10 m 03 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	308° 58' 37"	-4° 03' 12"	312° 33' 25"	-21° 55' 07"	0° 56' 59"	15' 31.66"	69° 39' 02"	0.12224
1	309° 31' 31"	-4° 04' 53"	313° 07' 56"	-21° 47' 50"	0° 56' 58"	15' 31.33"	69° 21' 27"	0.11938
2	310° 04' 24"	-4° 06' 33"	313° 42' 23"	-21° 40' 26"	0° 56' 56"	15' 30.99"	69° 3' 51"	0.11656
3	310° 37' 16"	-4° 08' 11"	314° 16' 45"	-21° 32' 56"	0° 56' 55"	15' 30.65"	68° 46' 12"	0.11376
4	311° 10' 07"	-4° 09' 48"	314° 51' 02"	-21° 25' 19"	0° 56' 54"	15' 30.31"	68° 28' 31"	0.11100
5	311° 42' 56"	-4° 11' 23"	315° 25' 14"	-21° 17' 35"	0° 56' 53"	15' 29.98"	68° 10' 47"	0.10827
6	312° 15' 45"	-4° 12' 57"	315° 59' 22"	-21° 09' 44"	0° 56' 52"	15' 29.64"	67° 53' 01"	0.10557
7	312° 48' 32"	-4° 14' 29"	316° 33' 24"	-21° 01' 47"	0° 56' 50"	15' 29.30"	67° 35' 11"	0.10291
8	313° 21' 18"	-4° 15' 60"	317° 07' 21"	-20° 53' 44"	0° 56' 49"	15' 28.97"	67° 17' 18"	0.10027
9	313° 54' 04"	-4° 17' 29"	317° 41' 13"	-20° 45' 34"	0° 56' 48"	15' 28.63"	66° 59' 20"	0.09768
10	314° 26' 48"	-4° 18' 57"	318° 15' 01"	-20° 37' 17"	0° 56' 47"	15' 28.29"	66° 41' 19"	0.09511
11	314° 59' 30"	-4° 20' 23"	318° 48' 43"	-20° 28' 55"	0° 56' 45"	15' 27.96"	66° 23' 13"	0.09257
12	315° 32' 12"	-4° 21' 48"	319° 22' 20"	-20° 20' 26"	0° 56' 44"	15' 27.62"	66° 5' 02"	0.09007
13	316° 04' 52"	-4° 23' 12"	319° 55' 52"	-20° 11' 51"	0° 56' 43"	15' 27.29"	65° 46' 46"	0.08761
14	316° 37' 32"	-4° 24' 34"	320° 29' 20"	-20° 03' 11"	0° 56' 42"	15' 26.95"	65° 28' 24"	0.08517
15	317° 10' 10"	-4° 25' 54"	321° 02' 42"	-19° 54' 24"	0° 56' 40"	15' 26.62"	65° 9' 55"	0.08277
16	317° 42' 47"	-4° 27' 13"	321° 35' 59"	-19° 45' 31"	0° 56' 39"	15' 26.28"	64° 51' 20"	0.08040
17	318° 15' 23"	-4° 28' 31"	322° 09' 11"	-19° 36' 33"	0° 56' 38"	15' 25.95"	64° 32' 37"	0.07807
18	318° 47' 58"	-4° 29' 47"	322° 42' 18"	-19° 27' 28"	0° 56' 37"	15' 25.62"	64° 13' 46"	0.07577
19	319° 20' 31"	-4° 31' 01"	323° 15' 21"	-19° 18' 19"	0° 56' 36"	15' 25.28"	63° 54' 46"	0.07351
20	319° 53' 04"	-4° 32' 14"	323° 48' 18"	-19° 09' 03"	0° 56' 34"	15' 24.95"	63° 35' 37"	0.07128
21	320° 25' 35"	-4° 33' 25"	324° 21' 10"	-18° 59' 42"	0° 56' 33"	15' 24.62"	63° 16' 18"	0.06908
22	320° 58' 05"	-4° 34' 35"	324° 53' 57"	-18° 50' 16"	0° 56' 32"	15' 24.28"	62° 56' 49"	0.06692
23	321° 30' 34"	-4° 35' 43"	325° 26' 39"	-18° 40' 44"	0° 56' 31"	15' 23.95"	62° 37' 07"	0.06479
24	322° 03' 02"	-4° 36' 50"	325° 59' 17"	-18° 31' 07"	0° 56' 29"	15' 23.62"	62° 17' 14"	0.06269

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	350° 38' 27"	-0.31"	351° 23' 30"	-3° 42' 46"	0.9933521	16' 06.05"	23° 26' 14"	-10 m 03 s
1	350° 40' 57"	-0.31"	351° 25' 48"	-3° 41' 47"	0.9933633	16' 06.04"	23° 26' 14"	-10 m 03 s
2	350° 43' 27"	-0.31"	351° 28' 06"	-3° 40' 48"	0.9933745	16' 06.03"	23° 26' 14"	-10 m 02 s
3	350° 45' 57"	-0.31"	351° 30' 24"	-3° 39' 49"	0.9933857	16' 06.02"	23° 26' 14"	-10 m 01 s
4	350° 48' 27"	-0.32"	351° 32' 42"	-3° 38' 50"	0.9933969	16' 06.01"	23° 26' 14"	-10 m 01 s
5	350° 50' 56"	-0.32"	351° 35' 01"	-3° 37' 51"	0.9934082	16' 06.00"	23° 26' 14"	-10 m 00 s
6	350° 53' 26"	-0.32"	351° 37' 19"	-3° 36' 52"	0.9934194	16' 05.99"	23° 26' 14"	-9 m 59 s
7	350° 55' 56"	-0.32"	351° 39' 37"	-3° 35' 53"	0.9934306	16' 05.98"	23° 26' 14"	-9 m 59 s
8	350° 58' 26"	-0.33"	351° 41' 55"	-3° 34' 54"	0.9934418	16' 05.96"	23° 26' 14"	-9 m 58 s
9	351° 00' 56"	-0.33"	351° 44' 13"	-3° 33' 55"	0.9934530	16' 05.95"	23° 26' 14"	-9 m 57 s
10	351° 03' 26"	-0.33"	351° 46' 31"	-3° 32' 56"	0.9934642	16' 05.94"	23° 26' 14"	-9 m 57 s
11	351° 05' 56"	-0.33"	351° 48' 49"	-3° 31' 57"	0.9934755	16' 05.93"	23° 26' 14"	-9 m 56 s
12	351° 08' 25"	-0.33"	351° 51' 07"	-3° 30' 58"	0.9934867	16' 05.92"	23° 26' 14"	-9 m 56 s
13	351° 10' 55"	-0.33"	351° 53' 25"	-3° 29' 59"	0.9934979	16' 05.91"	23° 26' 14"	-9 m 55 s
14	351° 13' 25"	-0.34"	351° 55' 43"	-3° 29' 00"	0.9935091	16' 05.90"	23° 26' 14"	-9 m 54 s
15	351° 15' 55"	-0.34"	351° 58' 01"	-3° 28' 01"	0.9935204	16' 05.89"	23° 26' 14"	-9 m 54 s
16	351° 18' 25"	-0.34"	352° 00' 19"	-3° 27' 02"	0.9935316	16' 05.88"	23° 26' 14"	-9 m 53 s
17	351° 20' 54"	-0.34"	352° 02' 36"	-3° 26' 03"	0.9935428	16' 05.87"	23° 26' 14"	-9 m 52 s
18	351° 23' 24"	-0.34"	352° 04' 54"	-3° 25' 04"	0.9935540	16' 05.86"	23° 26' 14"	-9 m 52 s
19	351° 25' 54"	-0.35"	352° 07' 12"	-3° 24' 05"	0.9935653	16' 05.84"	23° 26' 14"	-9 m 51 s
20	351° 28' 24"	-0.35"	352° 09' 30"	-3° 23' 06"	0.9935765	16' 05.83"	23° 26' 14"	-9 m 50 s
21	351° 30' 54"	-0.35"	352° 11' 48"	-3° 22' 07"	0.9935877	16' 05.82"	23° 26' 14"	-9 m 50 s
22	351° 33' 23"	-0.35"	352° 14' 06"	-3° 21' 08"	0.9935990	16' 05.81"	23° 26' 14"	-9 m 49 s
23	351° 35' 53"	-0.35"	352° 16' 24"	-3° 20' 09"	0.9936102	16' 05.80"	23° 26' 14"	-9 m 48 s
24	351° 38' 23"	-0.35"	352° 18' 42"	-3° 19' 10"	0.9936214	16' 05.79"	23° 26' 14"	-9 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	322° 03' 02"	-4° 36' 50"	325° 59' 17"	-18° 31' 07"	0° 56' 29"	15' 23.62"	62° 17' 14"	0.06269
1	322° 35' 29"	-4° 37' 55"	326° 31' 49"	-18° 21' 24"	0° 56' 28"	15' 23.29"	61° 57' 06"	0.06063
2	323° 07' 54"	-4° 38' 59"	327° 04' 16"	-18° 11' 37"	0° 56' 27"	15' 22.95"	61° 36' 45"	0.05861
3	323° 40' 19"	-4° 40' 01"	327° 36' 38"	-18° 01' 44"	0° 56' 26"	15' 22.62"	61° 16' 08"	0.05662
4	324° 12' 42"	-4° 41' 02"	328° 08' 56"	-17° 51' 47"	0° 56' 25"	15' 22.29"	60° 55' 14"	0.05466
5	324° 45' 04"	-4° 42' 01"	328° 41' 09"	-17° 41' 44"	0° 56' 23"	15' 21.96"	60° 34' 02"	0.05274
6	325° 17' 25"	-4° 42' 58"	329° 13' 16"	-17° 31' 37"	0° 56' 22"	15' 21.63"	60° 12' 31"	0.05086
7	325° 49' 44"	-4° 43' 54"	329° 45' 19"	-17° 21' 25"	0° 56' 21"	15' 21.30"	59° 50' 40"	0.04901
8	326° 22' 03"	-4° 44' 48"	330° 17' 17"	-17° 11' 08"	0° 56' 20"	15' 20.97"	59° 28' 26"	0.04719
9	326° 54' 20"	-4° 45' 41"	330° 49' 10"	-17° 00' 46"	0° 56' 19"	15' 20.64"	59° 5' 49"	0.04541
10	327° 26' 36"	-4° 46' 32"	331° 20' 59"	-16° 50' 20"	0° 56' 17"	15' 20.31"	58° 42' 46"	0.04367
11	327° 58' 51"	-4° 47' 22"	331° 52' 42"	-16° 39' 50"	0° 56' 16"	15' 19.98"	58° 19' 16"	0.04196
12	328° 31' 05"	-4° 48' 10"	332° 24' 21"	-16° 29' 15"	0° 56' 15"	15' 19.66"	57° 55' 16"	0.04029
13	329° 03' 18"	-4° 48' 57"	332° 55' 55"	-16° 18' 35"	0° 56' 14"	15' 19.33"	57° 30' 44"	0.03865
14	329° 35' 29"	-4° 49' 42"	333° 27' 25"	-16° 07' 52"	0° 56' 12"	15' 19.00"	57° 5' 38"	0.03705
15	330° 07' 39"	-4° 50' 25"	333° 58' 50"	-15° 57' 04"	0° 56' 11"	15' 18.67"	56° 39' 56"	0.03548
16	330° 39' 48"	-4° 51' 07"	334° 30' 10"	-15° 46' 12"	0° 56' 10"	15' 18.35"	56° 13' 33"	0.03395
17	331° 11' 56"	-4° 51' 47"	335° 01' 25"	-15° 35' 16"	0° 56' 09"	15' 18.02"	55° 46' 28"	0.03245
18	331° 44' 03"	-4° 52' 26"	335° 32' 36"	-15° 24' 16"	0° 56' 08"	15' 17.70"	55° 18' 37"	0.03099
19	332° 16' 08"	-4° 53' 03"	336° 03' 43"	-15° 13' 12"	0° 56' 07"	15' 17.37"	54° 49' 56"	0.02956
20	332° 48' 12"	-4° 53' 38"	336° 34' 45"	-15° 02' 04"	0° 56' 05"	15' 17.05"	54° 20' 21"	0.02817
21	333° 20' 15"	-4° 54' 12"	337° 05' 42"	-14° 50' 52"	0° 56' 04"	15' 16.72"	53° 49' 48"	0.02682
22	333° 52' 17"	-4° 54' 44"	337° 36' 35"	-14° 39' 37"	0° 56' 03"	15' 16.40"	53° 18' 11"	0.02550
23	334° 24' 17"	-4° 55' 15"	338° 07' 24"	-14° 28' 18"	0° 56' 02"	15' 16.08"	52° 45' 27"	0.02422
24	334° 56' 17"	-4° 55' 44"	338° 38' 08"	-14° 16' 55"	0° 56' 01"	15' 15.75"	52° 11' 28"	0.02298

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	351° 38' 23"	-0.35"	352° 18' 42"	-3° 19' 10"	0.9936214	16' 05.79"	23° 26' 14"	-9 m 47 s
1	351° 40' 53"	-0.35"	352° 20' 60"	-3° 18' 11"	0.9936327	16' 05.78"	23° 26' 14"	-9 m 47 s
2	351° 43' 23"	-0.35"	352° 23' 18"	-3° 17' 12"	0.9936439	16' 05.77"	23° 26' 14"	-9 m 46 s
3	351° 45' 52"	-0.36"	352° 25' 36"	-3° 16' 13"	0.9936551	16' 05.76"	23° 26' 14"	-9 m 45 s
4	351° 48' 22"	-0.36"	352° 27' 53"	-3° 15' 14"	0.9936664	16' 05.75"	23° 26' 14"	-9 m 45 s
5	351° 50' 52"	-0.36"	352° 30' 11"	-3° 14' 15"	0.9936776	16' 05.74"	23° 26' 14"	-9 m 44 s
6	351° 53' 22"	-0.36"	352° 32' 29"	-3° 13' 16"	0.9936888	16' 05.72"	23° 26' 14"	-9 m 43 s
7	351° 55' 52"	-0.36"	352° 34' 47"	-3° 12' 16"	0.9937001	16' 05.71"	23° 26' 14"	-9 m 43 s
8	351° 58' 21"	-0.36"	352° 37' 05"	-3° 11' 17"	0.9937113	16' 05.70"	23° 26' 14"	-9 m 42 s
9	352° 00' 51"	-0.36"	352° 39' 23"	-3° 10' 18"	0.9937226	16' 05.69"	23° 26' 15"	-9 m 41 s
10	352° 03' 21"	-0.36"	352° 41' 40"	-3° 09' 19"	0.9937338	16' 05.68"	23° 26' 15"	-9 m 41 s
11	352° 05' 51"	-0.36"	352° 43' 58"	-3° 08' 20"	0.9937451	16' 05.67"	23° 26' 15"	-9 m 40 s
12	352° 08' 20"	-0.36"	352° 46' 16"	-3° 07' 21"	0.9937563	16' 05.66"	23° 26' 15"	-9 m 39 s
13	352° 10' 50"	-0.36"	352° 48' 34"	-3° 06' 22"	0.9937675	16' 05.65"	23° 26' 15"	-9 m 39 s
14	352° 13' 20"	-0.36"	352° 50' 52"	-3° 05' 23"	0.9937788	16' 05.64"	23° 26' 15"	-9 m 38 s
15	352° 15' 50"	-0.37"	352° 53' 09"	-3° 04' 24"	0.9937900	16' 05.63"	23° 26' 15"	-9 m 37 s
16	352° 18' 19"	-0.37"	352° 55' 27"	-3° 03' 25"	0.9938013	16' 05.62"	23° 26' 15"	-9 m 37 s
17	352° 20' 49"	-0.37"	352° 57' 45"	-3° 02' 26"	0.9938125	16' 05.60"	23° 26' 15"	-9 m 36 s
18	352° 23' 19"	-0.37"	353° 00' 03"	-3° 01' 26"	0.9938238	16' 05.59"	23° 26' 15"	-9 m 35 s
19	352° 25' 49"	-0.37"	353° 02' 21"	-3° 00' 27"	0.9938350	16' 05.58"	23° 26' 15"	-9 m 35 s
20	352° 28' 18"	-0.37"	353° 04' 38"	-2° 59' 28"	0.9938463	16' 05.57"	23° 26' 15"	-9 m 34 s
21	352° 30' 48"	-0.37"	353° 06' 56"	-2° 58' 29"	0.9938575	16' 05.56"	23° 26' 15"	-9 m 33 s
22	352° 33' 18"	-0.37"	353° 09' 14"	-2° 57' 30"	0.9938688	16' 05.55"	23° 26' 15"	-9 m 33 s
23	352° 35' 47"	-0.37"	353° 11' 31"	-2° 56' 31"	0.9938800	16' 05.54"	23° 26' 15"	-9 m 32 s
24	352° 38' 17"	-0.37"	353° 13' 49"	-2° 55' 32"	0.9938913	16' 05.53"	23° 26' 15"	-9 m 31 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	334° 56' 17"	-4° 55' 44"	338° 38' 08"	-14° 16' 55"	0° 56' 01"	15' 15.75"	52° 11' 28"	0.02298
1	335° 28' 15"	-4° 56' 12"	339° 08' 48"	-14° 05' 29"	0° 55' 59"	15' 15.43"	51° 36' 08"	0.02176
2	336° 00' 12"	-4° 56' 38"	339° 39' 24"	-13° 53' 60"	0° 55' 58"	15' 15.11"	50° 59' 20"	0.02059
3	336° 32' 07"	-4° 57' 03"	340° 09' 55"	-13° 42' 27"	0° 55' 57"	15' 14.79"	50° 20' 57"	0.01945
4	337° 04' 02"	-4° 57' 26"	340° 40' 23"	-13° 30' 50"	0° 55' 56"	15' 14.47"	49° 40' 49"	0.01835
5	337° 35' 55"	-4° 57' 47"	341° 10' 46"	-13° 19' 11"	0° 55' 55"	15' 14.15"	48° 58' 46"	0.01728
6	338° 07' 47"	-4° 58' 07"	341° 41' 04"	-13° 07' 28"	0° 55' 54"	15' 13.83"	48° 14' 39"	0.01625
7	338° 39' 38"	-4° 58' 25"	342° 11' 19"	-12° 55' 43"	0° 55' 52"	15' 13.51"	47° 28' 14"	0.01526
8	339° 11' 28"	-4° 58' 42"	342° 41' 30"	-12° 43' 54"	0° 55' 51"	15' 13.19"	46° 39' 18"	0.01430
9	339° 43' 16"	-4° 58' 57"	343° 11' 37"	-12° 32' 02"	0° 55' 50"	15' 12.87"	45° 47' 37"	0.01337
10	340° 15' 03"	-4° 59' 10"	343° 41' 39"	-12° 20' 08"	0° 55' 49"	15' 12.56"	44° 52' 52"	0.01249
11	340° 46' 49"	-4° 59' 22"	344° 11' 38"	-12° 08' 10"	0° 55' 48"	15' 12.24"	43° 54' 44"	0.01163
12	341° 18' 33"	-4° 59' 32"	344° 41' 33"	-11° 56' 10"	0° 55' 47"	15' 11.93"	42° 52' 53"	0.01082
13	341° 50' 17"	-4° 59' 41"	345° 11' 24"	-11° 44' 07"	0° 55' 45"	15' 11.61"	41° 46' 52"	0.01004
14	342° 21' 59"	-4° 59' 49"	345° 41' 11"	-11° 32' 02"	0° 55' 44"	15' 11.30"	40° 36' 15"	0.00929
15	342° 53' 40"	-4° 59' 54"	346° 10' 55"	-11° 19' 53"	0° 55' 43"	15' 10.98"	39° 20' 30"	0.00859
16	343° 25' 19"	-4° 59' 59"	346° 40' 34"	-11° 07' 43"	0° 55' 42"	15' 10.67"	37° 59' 01"	0.00791
17	343° 56' 58"	-5° 00' 01"	347° 10' 11"	-10° 55' 30"	0° 55' 41"	15' 10.36"	36° 31' 07"	0.00728
18	344° 28' 35"	-5° 00' 02"	347° 39' 43"	-10° 43' 14"	0° 55' 40"	15' 10.05"	34° 56' 03"	0.00668
19	345° 00' 11"	-5° 00' 02"	348° 09' 12"	-10° 30' 57"	0° 55' 38"	15' 09.74"	33° 12' 55"	0.00611
20	345° 31' 46"	-4° 59' 60"	348° 38' 37"	-10° 18' 37"	0° 55' 37"	15' 09.43"	31° 20' 46"	0.00558
21	346° 03' 19"	-4° 59' 56"	349° 07' 59"	-10° 06' 14"	0° 55' 36"	15' 09.12"	29° 18' 29"	0.00509
22	346° 34' 51"	-4° 59' 51"	349° 37' 18"	-9° 53' 50"	0° 55' 35"	15' 08.81"	27° 4' 51"	0.00463
23	347° 06' 22"	-4° 59' 45"	350° 06' 33"	-9° 41' 24"	0° 55' 34"	15' 08.50"	24° 38' 31"	0.00420
24	347° 37' 52"	-4° 59' 36"	350° 35' 45"	-9° 28' 55"	0° 55' 33"	15' 08.20"	21° 58' 03"	0.00382

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	352° 38' 17"	-0.37"	353° 13' 49"	-2° 55' 32"	0.9938913	16' 05.53"	23° 26' 15"	-9 m 31 s
1	352° 40' 47"	-0.37"	353° 16' 07"	-2° 54' 33"	0.9939026	16' 05.52"	23° 26' 15"	-9 m 31 s
2	352° 43' 17"	-0.37"	353° 18' 25"	-2° 53' 33"	0.9939138	16' 05.51"	23° 26' 15"	-9 m 30 s
3	352° 45' 46"	-0.37"	353° 20' 42"	-2° 52' 34"	0.9939251	16' 05.50"	23° 26' 15"	-9 m 29 s
4	352° 48' 16"	-0.37"	353° 23' 00"	-2° 51' 35"	0.9939363	16' 05.48"	23° 26' 15"	-9 m 29 s
5	352° 50' 46"	-0.37"	353° 25' 18"	-2° 50' 36"	0.9939476	16' 05.47"	23° 26' 15"	-9 m 28 s
6	352° 53' 15"	-0.37"	353° 27' 35"	-2° 49' 37"	0.9939588	16' 05.46"	23° 26' 15"	-9 m 27 s
7	352° 55' 45"	-0.37"	353° 29' 53"	-2° 48' 38"	0.9939701	16' 05.45"	23° 26' 15"	-9 m 26 s
8	352° 58' 15"	-0.37"	353° 32' 11"	-2° 47' 39"	0.9939814	16' 05.44"	23° 26' 15"	-9 m 26 s
9	353° 00' 44"	-0.37"	353° 34' 28"	-2° 46' 39"	0.9939926	16' 05.43"	23° 26' 15"	-9 m 25 s
10	353° 03' 14"	-0.36"	353° 36' 46"	-2° 45' 40"	0.9940039	16' 05.42"	23° 26' 15"	-9 m 24 s
11	353° 05' 44"	-0.36"	353° 39' 04"	-2° 44' 41"	0.9940151	16' 05.41"	23° 26' 15"	-9 m 24 s
12	353° 08' 13"	-0.36"	353° 41' 21"	-2° 43' 42"	0.9940264	16' 05.40"	23° 26' 15"	-9 m 23 s
13	353° 10' 43"	-0.36"	353° 43' 39"	-2° 42' 43"	0.9940377	16' 05.39"	23° 26' 15"	-9 m 22 s
14	353° 13' 13"	-0.36"	353° 45' 57"	-2° 41' 44"	0.9940489	16' 05.38"	23° 26' 15"	-9 m 22 s
15	353° 15' 42"	-0.36"	353° 48' 14"	-2° 40' 44"	0.9940602	16' 05.36"	23° 26' 15"	-9 m 21 s
16	353° 18' 12"	-0.36"	353° 50' 32"	-2° 39' 45"	0.9940715	16' 05.35"	23° 26' 15"	-9 m 20 s
17	353° 20' 42"	-0.36"	353° 52' 49"	-2° 38' 46"	0.9940827	16' 05.34"	23° 26' 15"	-9 m 20 s
18	353° 23' 11"	-0.36"	353° 55' 07"	-2° 37' 47"	0.9940940	16' 05.33"	23° 26' 15"	-9 m 19 s
19	353° 25' 41"	-0.36"	353° 57' 25"	-2° 36' 48"	0.9941053	16' 05.32"	23° 26' 15"	-9 m 18 s
20	353° 28' 11"	-0.36"	353° 59' 42"	-2° 35' 48"	0.9941165	16' 05.31"	23° 26' 15"	-9 m 18 s
21	353° 30' 40"	-0.36"	354° 01' 60"	-2° 34' 49"	0.9941278	16' 05.30"	23° 26' 15"	-9 m 17 s
22	353° 33' 10"	-0.35"	354° 04' 17"	-2° 33' 50"	0.9941391	16' 05.29"	23° 26' 15"	-9 m 16 s
23	353° 35' 40"	-0.35"	354° 06' 35"	-2° 32' 51"	0.9941504	16' 05.28"	23° 26' 15"	-9 m 15 s
24	353° 38' 09"	-0.35"	354° 08' 52"	-2° 31' 52"	0.9941616	16' 05.27"	23° 26' 15"	-9 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	347° 37' 52"	-4° 59' 36"	350° 35' 45"	-9° 28' 55"	0° 55' 33"	15' 08.20"	21° 58' 03"	0.00382
1	348° 09' 20"	-4° 59' 27"	351° 04' 53"	-9° 16' 25"	0° 55' 32"	15' 07.89"	19° 1' 54"	0.00346
2	348° 40' 47"	-4° 59' 16"	351° 33' 58"	-9° 03' 53"	0° 55' 31"	15' 07.59"	15° 48' 35"	0.00315
3	349° 12' 13"	-4° 59' 03"	352° 03' 00"	-8° 51' 18"	0° 55' 29"	15' 07.28"	12° 16' 39"	0.00286
4	349° 43' 37"	-4° 58' 49"	352° 31' 59"	-8° 38' 43"	0° 55' 28"	15' 06.98"	8° 24' 56"	0.00262
5	350° 15' 01"	-4° 58' 33"	353° 00' 55"	-8° 26' 05"	0° 55' 27"	15' 06.68"	4° 12' 45"	0.00241
6	350° 46' 23"	-4° 58' 16"	353° 29' 48"	-8° 13' 26"	0° 55' 26"	15' 06.38"	359° 40' 07"	0.00223
7	351° 17' 44"	-4° 57' 57"	353° 58' 38"	-8° 00' 45"	0° 55' 25"	15' 06.08"	354° 48' 02"	0.00209
8	351° 49' 03"	-4° 57' 37"	354° 27' 24"	-7° 48' 03"	0° 55' 24"	15' 05.78"	349° 38' 47"	0.00198
9	352° 20' 21"	-4° 57' 15"	354° 56' 08"	-7° 35' 19"	0° 55' 23"	15' 05.48"	344° 15' 58"	0.00191
10	352° 51' 38"	-4° 56' 52"	355° 24' 49"	-7° 22' 34"	0° 55' 22"	15' 05.18"	338° 44' 28"	0.00188
11	353° 22' 54"	-4° 56' 28"	355° 53' 28"	-7° 09' 47"	0° 55' 21"	15' 04.89"	333° 9' 60"	0.00187
12	353° 54' 09"	-4° 56' 01"	356° 22' 03"	-6° 56' 60"	0° 55' 20"	15' 04.59"	327° 38' 39"	0.00191
13	354° 25' 22"	-4° 55' 34"	356° 50' 36"	-6° 44' 11"	0° 55' 19"	15' 04.30"	322° 16' 11"	0.00198
14	354° 56' 34"	-4° 55' 05"	357° 19' 06"	-6° 31' 20"	0° 55' 17"	15' 04.01"	317° 7' 29"	0.00208
15	355° 27' 45"	-4° 54' 34"	357° 47' 34"	-6° 18' 29"	0° 55' 16"	15' 03.72"	312° 16' 06"	0.00222
16	355° 58' 54"	-4° 54' 02"	358° 15' 59"	-6° 05' 36"	0° 55' 15"	15' 03.43"	307° 44' 24"	0.00239
17	356° 30' 02"	-4° 53' 29"	358° 44' 22"	-5° 52' 43"	0° 55' 14"	15' 03.14"	303° 33' 23"	0.00259
18	357° 01' 09"	-4° 52' 54"	359° 12' 42"	-5° 39' 49"	0° 55' 13"	15' 02.85"	299° 43' 03"	0.00283
19	357° 32' 15"	-4° 52' 18"	359° 41' 00"	-5° 26' 53"	0° 55' 12"	15' 02.56"	296° 12' 44"	0.00311
20	358° 03' 19"	-4° 51' 40"	0° 09' 16"	-5° 13' 57"	0° 55' 11"	15' 02.28"	293° 1' 16"	0.00342
21	358° 34' 22"	-4° 51' 01"	0° 37' 29"	-5° 01' 00"	0° 55' 10"	15' 02.00"	290° 7' 12"	0.00376
22	359° 05' 24"	-4° 50' 20"	1° 05' 40"	-4° 48' 03"	0° 55' 09"	15' 01.71"	287° 29' 03"	0.00413
23	359° 36' 25"	-4° 49' 39"	1° 33' 49"	-4° 35' 04"	0° 55' 08"	15' 01.43"	285° 5' 16"	0.00454
24	0° 07' 24"	-4° 48' 55"	2° 01' 56"	-4° 22' 05"	0° 55' 07"	15' 01.15"	282° 54' 25"	0.00499

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	353° 38' 09"	-0.35"	354° 08' 52"	-2° 31' 52"	0.9941616	16' 05.27"	23° 26' 15"	-9 m 15 s
1	353° 40' 39"	-0.35"	354° 11' 10"	-2° 30' 52"	0.9941729	16' 05.25"	23° 26' 15"	-9 m 14 s
2	353° 43' 09"	-0.35"	354° 13' 27"	-2° 29' 53"	0.9941842	16' 05.24"	23° 26' 15"	-9 m 13 s
3	353° 45' 38"	-0.35"	354° 15' 45"	-2° 28' 54"	0.9941955	16' 05.23"	23° 26' 15"	-9 m 13 s
4	353° 48' 08"	-0.35"	354° 18' 02"	-2° 27' 55"	0.9942067	16' 05.22"	23° 26' 15"	-9 m 12 s
5	353° 50' 37"	-0.35"	354° 20' 20"	-2° 26' 56"	0.9942180	16' 05.21"	23° 26' 15"	-9 m 11 s
6	353° 53' 07"	-0.34"	354° 22' 38"	-2° 25' 56"	0.9942293	16' 05.20"	23° 26' 15"	-9 m 11 s
7	353° 55' 37"	-0.34"	354° 24' 55"	-2° 24' 57"	0.9942406	16' 05.19"	23° 26' 15"	-9 m 10 s
8	353° 58' 06"	-0.34"	354° 27' 13"	-2° 23' 58"	0.9942518	16' 05.18"	23° 26' 15"	-9 m 09 s
9	354° 00' 36"	-0.34"	354° 29' 30"	-2° 22' 59"	0.9942631	16' 05.17"	23° 26' 15"	-9 m 09 s
10	354° 03' 05"	-0.34"	354° 31' 48"	-2° 21' 60"	0.9942744	16' 05.16"	23° 26' 15"	-9 m 08 s
11	354° 05' 35"	-0.34"	354° 34' 05"	-2° 21' 00"	0.9942857	16' 05.15"	23° 26' 15"	-9 m 07 s
12	354° 08' 05"	-0.33"	354° 36' 22"	-2° 20' 01"	0.9942970	16' 05.13"	23° 26' 15"	-9 m 06 s
13	354° 10' 34"	-0.33"	354° 38' 40"	-2° 19' 02"	0.9943082	16' 05.12"	23° 26' 15"	-9 m 06 s
14	354° 13' 04"	-0.33"	354° 40' 57"	-2° 18' 03"	0.9943195	16' 05.11"	23° 26' 15"	-9 m 05 s
15	354° 15' 33"	-0.33"	354° 43' 15"	-2° 17' 03"	0.9943308	16' 05.10"	23° 26' 15"	-9 m 04 s
16	354° 18' 03"	-0.33"	354° 45' 32"	-2° 16' 04"	0.9943421	16' 05.09"	23° 26' 15"	-9 m 04 s
17	354° 20' 33"	-0.32"	354° 47' 50"	-2° 15' 05"	0.9943534	16' 05.08"	23° 26' 15"	-9 m 03 s
18	354° 23' 02"	-0.32"	354° 50' 07"	-2° 14' 06"	0.9943647	16' 05.07"	23° 26' 15"	-9 m 02 s
19	354° 25' 32"	-0.32"	354° 52' 25"	-2° 13' 06"	0.9943759	16' 05.06"	23° 26' 15"	-9 m 02 s
20	354° 28' 01"	-0.32"	354° 54' 42"	-2° 12' 07"	0.9943872	16' 05.05"	23° 26' 15"	-9 m 01 s
21	354° 30' 31"	-0.31"	354° 56' 59"	-2° 11' 08"	0.9943985	16' 05.04"	23° 26' 15"	-9 m 00 s
22	354° 33' 00"	-0.31"	354° 59' 17"	-2° 10' 09"	0.9944098	16' 05.02"	23° 26' 15"	-8 m 59 s
23	354° 35' 30"	-0.31"	355° 01' 34"	-2° 09' 09"	0.9944211	16' 05.01"	23° 26' 15"	-8 m 59 s
24	354° 37' 59"	-0.31"	355° 03' 52"	-2° 08' 10"	0.9944324	16' 05.00"	23° 26' 15"	-8 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	0° 07' 24"	-4° 48' 55"	2° 01' 56"	-4° 22' 05"	0° 55' 07"	15' 01.15"	282° 54' 25"	0.00499
1	0° 38' 22"	-4° 48' 10"	2° 30' 00"	-4° 09' 06"	0° 55' 06"	15' 00.87"	280° 55' 09"	0.00546
2	1° 09' 19"	-4° 47' 24"	2° 58' 03"	-3° 56' 06"	0° 55' 05"	15' 00.60"	279° 6' 14"	0.00598
3	1° 40' 15"	-4° 46' 37"	3° 26' 04"	-3° 43' 05"	0° 55' 04"	15' 00.32"	277° 26' 35"	0.00652
4	2° 11' 09"	-4° 45' 48"	3° 54' 03"	-3° 30' 04"	0° 55' 03"	15' 00.05"	275° 55' 13"	0.00710
5	2° 42' 02"	-4° 44' 57"	4° 21' 60"	-3° 17' 03"	0° 55' 02"	14' 59.78"	274° 31' 15"	0.00771
6	3° 12' 54"	-4° 44' 06"	4° 49' 55"	-3° 04' 01"	0° 55' 01"	14' 59.51"	273° 13' 55"	0.00835
7	3° 43' 44"	-4° 43' 13"	5° 17' 48"	-2° 50' 60"	0° 54' 60"	14' 59.24"	272° 2' 33"	0.00903
8	4° 14' 34"	-4° 42' 18"	5° 45' 40"	-2° 37' 58"	0° 54' 59"	14' 58.97"	270° 56' 33"	0.00974
9	4° 45' 22"	-4° 41' 22"	6° 13' 30"	-2° 24' 55"	0° 54' 58"	14' 58.70"	269° 55' 23"	0.01048
10	5° 16' 09"	-4° 40' 25"	6° 41' 19"	-2° 11' 53"	0° 54' 57"	14' 58.44"	268° 58' 35"	0.01125
11	5° 46' 54"	-4° 39' 27"	7° 09' 06"	-1° 58' 51"	0° 54' 56"	14' 58.17"	268° 5' 44"	0.01206
12	6° 17' 39"	-4° 38' 27"	7° 36' 51"	-1° 45' 48"	0° 54' 55"	14' 57.91"	267° 16' 30"	0.01290
13	6° 48' 22"	-4° 37' 26"	8° 04' 35"	-1° 32' 46"	0° 54' 54"	14' 57.65"	266° 30' 32"	0.01377
14	7° 19' 04"	-4° 36' 24"	8° 32' 18"	-1° 19' 44"	0° 54' 53"	14' 57.40"	265° 47' 34"	0.01468
15	7° 49' 45"	-4° 35' 20"	8° 59' 59"	-1° 06' 41"	0° 54' 52"	14' 57.14"	265° 7' 19"	0.01561
16	8° 20' 24"	-4° 34' 15"	9° 27' 39"	0°-53' 39"	0° 54' 51"	14' 56.89"	264° 29' 36"	0.01658
17	8° 51' 03"	-4° 33' 09"	9° 55' 18"	0°-40' 38"	0° 54' 50"	14' 56.63"	263° 54' 11"	0.01758
18	9° 21' 40"	-4° 32' 01"	10° 22' 56"	0°-27' 36"	0° 54' 49"	14' 56.38"	263° 20' 53"	0.01861
19	9° 52' 16"	-4° 30' 52"	10° 50' 33"	0°-14' 35"	0° 54' 49"	14' 56.13"	262° 49' 33"	0.01967
20	10° 22' 51"	-4° 29' 42"	11° 18' 08"	0° -1' 35"	0° 54' 48"	14' 55.89"	262° 20' 03"	0.02077
21	10° 53' 24"	-4° 28' 31"	11° 45' 43"	0° 11' 26"	0° 54' 47"	14' 55.64"	261° 52' 13"	0.02189
22	11° 23' 56"	-4° 27' 18"	12° 13' 17"	0° 24' 25"	0° 54' 46"	14' 55.40"	261° 25' 58"	0.02305
23	11° 54' 28"	-4° 26' 05"	12° 40' 49"	0° 37' 25"	0° 54' 45"	14' 55.16"	261° 1' 10"	0.02423
24	12° 24' 58"	-4° 24' 49"	13° 08' 21"	0° 50' 23"	0° 54' 44"	14' 54.92"	260° 37' 43"	0.02545

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	354° 37' 59"	-0.31"	355° 03' 52"	-2° 08' 10"	0.9944324	16' 05.00"	23° 26' 15"	-8 m 58 s
1	354° 40' 29"	-0.31"	355° 06' 09"	-2° 07' 11"	0.9944437	16' 04.99"	23° 26' 15"	-8 m 57 s
2	354° 42' 59"	-0.30"	355° 08' 26"	-2° 06' 12"	0.9944550	16' 04.98"	23° 26' 15"	-8 m 57 s
3	354° 45' 28"	-0.30"	355° 10' 44"	-2° 05' 12"	0.9944663	16' 04.97"	23° 26' 15"	-8 m 56 s
4	354° 47' 58"	-0.30"	355° 13' 01"	-2° 04' 13"	0.9944775	16' 04.96"	23° 26' 15"	-8 m 55 s
5	354° 50' 27"	-0.29"	355° 15' 19"	-2° 03' 14"	0.9944888	16' 04.95"	23° 26' 15"	-8 m 55 s
6	354° 52' 57"	-0.29"	355° 17' 36"	-2° 02' 14"	0.9945001	16' 04.94"	23° 26' 15"	-8 m 54 s
7	354° 55' 26"	-0.29"	355° 19' 53"	-2° 01' 15"	0.9945114	16' 04.93"	23° 26' 15"	-8 m 53 s
8	354° 57' 56"	-0.29"	355° 22' 11"	-2° 00' 16"	0.9945227	16' 04.92"	23° 26' 15"	-8 m 52 s
9	355° 00' 25"	-0.28"	355° 24' 28"	-1° 59' 17"	0.9945340	16' 04.90"	23° 26' 15"	-8 m 52 s
10	355° 02' 55"	-0.28"	355° 26' 45"	-1° 58' 17"	0.9945453	16' 04.89"	23° 26' 15"	-8 m 51 s
11	355° 05' 24"	-0.28"	355° 29' 03"	-1° 57' 18"	0.9945566	16' 04.88"	23° 26' 15"	-8 m 50 s
12	355° 07' 54"	-0.27"	355° 31' 20"	-1° 56' 19"	0.9945679	16' 04.87"	23° 26' 15"	-8 m 50 s
13	355° 10' 23"	-0.27"	355° 33' 37"	-1° 55' 20"	0.9945792	16' 04.86"	23° 26' 15"	-8 m 49 s
14	355° 12' 53"	-0.27"	355° 35' 55"	-1° 54' 20"	0.9945905	16' 04.85"	23° 26' 15"	-8 m 48 s
15	355° 15' 22"	-0.27"	355° 38' 12"	-1° 53' 21"	0.9946018	16' 04.84"	23° 26' 15"	-8 m 47 s
16	355° 17' 52"	-0.26"	355° 40' 29"	-1° 52' 22"	0.9946131	16' 04.83"	23° 26' 15"	-8 m 47 s
17	355° 20' 21"	-0.26"	355° 42' 46"	-1° 51' 22"	0.9946244	16' 04.82"	23° 26' 15"	-8 m 46 s
18	355° 22' 51"	-0.26"	355° 45' 04"	-1° 50' 23"	0.9946357	16' 04.81"	23° 26' 15"	-8 m 45 s
19	355° 25' 20"	-0.25"	355° 47' 21"	-1° 49' 24"	0.9946470	16' 04.79"	23° 26' 15"	-8 m 45 s
20	355° 27' 50"	-0.25"	355° 49' 38"	-1° 48' 24"	0.9946583	16' 04.78"	23° 26' 15"	-8 m 44 s
21	355° 30' 19"	-0.25"	355° 51' 56"	-1° 47' 25"	0.9946696	16' 04.77"	23° 26' 15"	-8 m 43 s
22	355° 32' 49"	-0.24"	355° 54' 13"	-1° 46' 26"	0.9946809	16' 04.76"	23° 26' 15"	-8 m 42 s
23	355° 35' 18"	-0.24"	355° 56' 30"	-1° 45' 27"	0.9946922	16' 04.75"	23° 26' 15"	-8 m 42 s
24	355° 37' 48"	-0.23"	355° 58' 47"	-1° 44' 27"	0.9947035	16' 04.74"	23° 26' 15"	-8 m 41 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	12° 24' 58"	-4° 24' 49"	13° 08' 21"	0° 50' 23"	0° 54' 44"	14' 54.92"	260° 37' 43"	0.02545
1	12° 55' 26"	-4° 23' 33"	13° 35' 52"	1° 03' 21"	0° 54' 43"	14' 54.68"	260° 15' 33"	0.02670
2	13° 25' 54"	-4° 22' 16"	14° 03' 23"	1° 16' 19"	0° 54' 42"	14' 54.44"	259° 54' 34"	0.02798
3	13° 56' 21"	-4° 20' 57"	14° 30' 52"	1° 29' 15"	0° 54' 42"	14' 54.21"	259° 34' 43"	0.02929
4	14° 26' 46"	-4° 19' 37"	14° 58' 21"	1° 42' 11"	0° 54' 41"	14' 53.98"	259° 15' 54"	0.03063
5	14° 57' 10"	-4° 18' 16"	15° 25' 50"	1° 55' 06"	0° 54' 40"	14' 53.75"	258° 58' 05"	0.03200
6	15° 27' 33"	-4° 16' 53"	15° 53' 18"	2° 08' 00"	0° 54' 39"	14' 53.52"	258° 41' 11"	0.03340
7	15° 57' 55"	-4° 15' 30"	16° 20' 45"	2° 20' 54"	0° 54' 38"	14' 53.30"	258° 25' 10"	0.03483
8	16° 28' 16"	-4° 14' 05"	16° 48' 12"	2° 33' 46"	0° 54' 37"	14' 53.08"	258° 9' 59"	0.03629
9	16° 58' 36"	-4° 12' 39"	17° 15' 39"	2° 46' 37"	0° 54' 37"	14' 52.86"	257° 55' 36"	0.03778
10	17° 28' 54"	-4° 11' 12"	17° 43' 05"	2° 59' 28"	0° 54' 36"	14' 52.64"	257° 41' 57"	0.03929
11	17° 59' 12"	-4° 09' 44"	18° 10' 31"	3° 12' 17"	0° 54' 35"	14' 52.42"	257° 29' 00"	0.04084
12	18° 29' 28"	-4° 08' 15"	18° 37' 57"	3° 25' 05"	0° 54' 34"	14' 52.21"	257° 16' 44"	0.04242
13	18° 59' 43"	-4° 06' 45"	19° 05' 23"	3° 37' 52"	0° 54' 33"	14' 52.00"	257° 5' 07"	0.04402
14	19° 29' 57"	-4° 05' 13"	19° 32' 48"	3° 50' 38"	0° 54' 33"	14' 51.79"	256° 54' 06"	0.04566
15	20° 00' 10"	-4° 03' 40"	20° 00' 14"	4° 03' 22"	0° 54' 32"	14' 51.59"	256° 43' 41"	0.04732
16	20° 30' 22"	-4° 02' 07"	20° 27' 39"	4° 16' 06"	0° 54' 31"	14' 51.38"	256° 33' 49"	0.04901
17	21° 00' 33"	-4° 00' 32"	20° 55' 05"	4° 28' 47"	0° 54' 30"	14' 51.18"	256° 24' 29"	0.05073
18	21° 30' 43"	-3° 58' 56"	21° 22' 30"	4° 41' 28"	0° 54' 30"	14' 50.98"	256° 15' 39"	0.05248
19	22° 00' 52"	-3° 57' 19"	21° 49' 56"	4° 54' 07"	0° 54' 29"	14' 50.79"	256° 7' 19"	0.05426
20	22° 30' 60"	-3° 55' 41"	22° 17' 22"	5° 06' 44"	0° 54' 28"	14' 50.59"	255° 59' 28"	0.05606
21	23° 01' 07"	-3° 54' 02"	22° 44' 48"	5° 19' 20"	0° 54' 28"	14' 50.40"	255° 52' 03"	0.05789
22	23° 31' 12"	-3° 52' 22"	23° 12' 15"	5° 31' 55"	0° 54' 27"	14' 50.21"	255° 45' 05"	0.05975
23	24° 01' 17"	-3° 50' 41"	23° 39' 42"	5° 44' 27"	0° 54' 26"	14' 50.03"	255° 38' 32"	0.06164
24	24° 31' 21"	-3° 48' 58"	24° 07' 09"	5° 56' 59"	0° 54' 25"	14' 49.84"	255° 32' 23"	0.06355

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	355° 37' 48"	-0.23"	355° 58' 47"	-1° 44' 27"	0.9947035	16' 04.74"	23° 26' 15"	-8 m 41 s
1	355° 40' 17"	-0.23"	356° 01' 05"	-1° 43' 28"	0.9947149	16' 04.73"	23° 26' 15"	-8 m 40 s
2	355° 42' 46"	-0.23"	356° 03' 22"	-1° 42' 29"	0.9947262	16' 04.72"	23° 26' 15"	-8 m 40 s
3	355° 45' 16"	-0.22"	356° 05' 39"	-1° 41' 29"	0.9947375	16' 04.71"	23° 26' 15"	-8 m 39 s
4	355° 47' 45"	-0.22"	356° 07' 56"	-1° 40' 30"	0.9947488	16' 04.70"	23° 26' 15"	-8 m 38 s
5	355° 50' 15"	-0.22"	356° 10' 14"	-1° 39' 31"	0.9947601	16' 04.68"	23° 26' 15"	-8 m 38 s
6	355° 52' 44"	-0.21"	356° 12' 31"	-1° 38' 31"	0.9947714	16' 04.67"	23° 26' 15"	-8 m 37 s
7	355° 55' 14"	-0.21"	356° 14' 48"	-1° 37' 32"	0.9947827	16' 04.66"	23° 26' 15"	-8 m 36 s
8	355° 57' 43"	-0.21"	356° 17' 05"	-1° 36' 33"	0.9947940	16' 04.65"	23° 26' 15"	-8 m 35 s
9	356° 00' 13"	-0.20"	356° 19' 22"	-1° 35' 34"	0.9948053	16' 04.64"	23° 26' 15"	-8 m 35 s
10	356° 02' 42"	-0.20"	356° 21' 40"	-1° 34' 34"	0.9948167	16' 04.63"	23° 26' 15"	-8 m 34 s
11	356° 05' 11"	-0.19"	356° 23' 57"	-1° 33' 35"	0.9948280	16' 04.62"	23° 26' 15"	-8 m 33 s
12	356° 07' 41"	-0.19"	356° 26' 14"	-1° 32' 36"	0.9948393	16' 04.61"	23° 26' 15"	-8 m 32 s
13	356° 10' 10"	-0.19"	356° 28' 31"	-1° 31' 36"	0.9948506	16' 04.60"	23° 26' 15"	-8 m 32 s
14	356° 12' 40"	-0.18"	356° 30' 48"	-1° 30' 37"	0.9948619	16' 04.59"	23° 26' 15"	-8 m 31 s
15	356° 15' 09"	-0.18"	356° 33' 05"	-1° 29' 38"	0.9948732	16' 04.58"	23° 26' 15"	-8 m 30 s
16	356° 17' 38"	-0.17"	356° 35' 23"	-1° 28' 38"	0.9948846	16' 04.56"	23° 26' 15"	-8 m 30 s
17	356° 20' 08"	-0.17"	356° 37' 40"	-1° 27' 39"	0.9948959	16' 04.55"	23° 26' 15"	-8 m 29 s
18	356° 22' 37"	-0.16"	356° 39' 57"	-1° 26' 40"	0.9949072	16' 04.54"	23° 26' 15"	-8 m 28 s
19	356° 25' 07"	-0.16"	356° 42' 14"	-1° 25' 40"	0.9949185	16' 04.53"	23° 26' 15"	-8 m 27 s
20	356° 27' 36"	-0.16"	356° 44' 31"	-1° 24' 41"	0.9949299	16' 04.52"	23° 26' 15"	-8 m 27 s
21	356° 30' 05"	-0.15"	356° 46' 48"	-1° 23' 42"	0.9949412	16' 04.51"	23° 26' 15"	-8 m 26 s
22	356° 32' 35"	-0.15"	356° 49' 05"	-1° 22' 42"	0.9949525	16' 04.50"	23° 26' 15"	-8 m 25 s
23	356° 35' 04"	-0.14"	356° 51' 23"	-1° 21' 43"	0.9949638	16' 04.49"	23° 26' 15"	-8 m 25 s
24	356° 37' 34"	-0.14"	356° 53' 40"	-1° 20' 44"	0.9949752	16' 04.48"	23° 26' 15"	-8 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	24° 31' 21"	-3° 48' 58"	24° 07' 09"	5° 56' 59"	0° 54' 25"	14' 49.84"	255° 32' 23"	0.06355
1	25° 01' 23"	-3° 47' 15"	24° 34' 36"	6° 09' 28"	0° 54' 25"	14' 49.66"	255° 26' 38"	0.06549
2	25° 31' 25"	-3° 45' 31"	25° 02' 05"	6° 21' 56"	0° 54' 24"	14' 49.49"	255° 21' 16"	0.06746
3	26° 01' 26"	-3° 43' 46"	25° 29' 33"	6° 34' 22"	0° 54' 24"	14' 49.31"	255° 16' 15"	0.06946
4	26° 31' 26"	-3° 41' 59"	25° 57' 02"	6° 46' 46"	0° 54' 23"	14' 49.14"	255° 11' 35"	0.07148
5	27° 01' 25"	-3° 40' 12"	26° 24' 32"	6° 59' 08"	0° 54' 22"	14' 48.97"	255° 7' 16"	0.07353
6	27° 31' 22"	-3° 38' 24"	26° 52' 03"	7° 11' 28"	0° 54' 22"	14' 48.80"	255° 3' 17"	0.07560
7	28° 01' 19"	-3° 36' 35"	27° 19' 34"	7° 23' 47"	0° 54' 21"	14' 48.64"	254° 59' 37"	0.07770
8	28° 31' 15"	-3° 34' 44"	27° 47' 06"	7° 36' 03"	0° 54' 20"	14' 48.48"	254° 56' 16"	0.07983
9	29° 01' 11"	-3° 32' 53"	28° 14' 39"	7° 48' 17"	0° 54' 20"	14' 48.32"	254° 53' 13"	0.08198
10	29° 31' 05"	-3° 31' 01"	28° 42' 13"	8° 00' 30"	0° 54' 19"	14' 48.17"	254° 50' 28"	0.08416
11	30° 00' 58"	-3° 29' 08"	29° 09' 48"	8° 12' 40"	0° 54' 19"	14' 48.01"	254° 48' 00"	0.08636
12	30° 30' 51"	-3° 27' 15"	29° 37' 24"	8° 24' 48"	0° 54' 18"	14' 47.86"	254° 45' 49"	0.08859
13	31° 00' 42"	-3° 25' 20"	30° 05' 00"	8° 36' 53"	0° 54' 18"	14' 47.72"	254° 43' 54"	0.09084
14	31° 30' 33"	-3° 23' 24"	30° 32' 38"	8° 48' 57"	0° 54' 17"	14' 47.58"	254° 42' 15"	0.09312
15	32° 00' 23"	-3° 21' 27"	31° 00' 17"	9° 00' 58"	0° 54' 17"	14' 47.44"	254° 40' 52"	0.09542
16	32° 30' 12"	-3° 19' 30"	31° 27' 57"	9° 12' 57"	0° 54' 16"	14' 47.30"	254° 39' 44"	0.09775
17	33° 00' 00"	-3° 17' 32"	31° 55' 39"	9° 24' 54"	0° 54' 16"	14' 47.17"	254° 38' 50"	0.10010
18	33° 29' 48"	-3° 15' 32"	32° 23' 21"	9° 36' 48"	0° 54' 15"	14' 47.04"	254° 38' 11"	0.10248
19	33° 59' 34"	-3° 13' 32"	32° 51' 05"	9° 48' 39"	0° 54' 15"	14' 46.91"	254° 37' 47"	0.10488
20	34° 29' 20"	-3° 11' 31"	33° 18' 51"	10° 00' 28"	0° 54' 14"	14' 46.78"	254° 37' 36"	0.10731
21	34° 59' 05"	-3° 09' 30"	33° 46' 37"	10° 12' 15"	0° 54' 14"	14' 46.66"	254° 37' 39"	0.10976
22	35° 28' 50"	-3° 07' 27"	34° 14' 26"	10° 23' 59"	0° 54' 13"	14' 46.55"	254° 37' 55"	0.11223
23	35° 58' 33"	-3° 05' 24"	34° 42' 15"	10° 35' 41"	0° 54' 13"	14' 46.43"	254° 38' 24"	0.11473
24	36° 28' 16"	-3° 03' 20"	35° 10' 06"	10° 47' 19"	0° 54' 13"	14' 46.32"	254° 39' 06"	0.11724

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	356° 37' 34"	-0.14"	356° 53' 40"	-1° 20' 44"	0.9949752	16' 04.48"	23° 26' 15"	-8 m 24 s
1	356° 40' 03"	-0.13"	356° 55' 57"	-1° 19' 44"	0.9949865	16' 04.47"	23° 26' 15"	-8 m 23 s
2	356° 42' 32"	-0.13"	356° 58' 14"	-1° 18' 45"	0.9949978	16' 04.45"	23° 26' 15"	-8 m 22 s
3	356° 45' 02"	-0.12"	357° 00' 31"	-1° 17' 46"	0.9950091	16' 04.44"	23° 26' 15"	-8 m 22 s
4	356° 47' 31"	-0.12"	357° 02' 48"	-1° 16' 46"	0.9950205	16' 04.43"	23° 26' 15"	-8 m 21 s
5	356° 50' 00"	-0.12"	357° 05' 05"	-1° 15' 47"	0.9950318	16' 04.42"	23° 26' 15"	-8 m 20 s
6	356° 52' 30"	-0.11"	357° 07' 22"	-1° 14' 48"	0.9950431	16' 04.41"	23° 26' 15"	-8 m 20 s
7	356° 54' 59"	-0.11"	357° 09' 39"	-1° 13' 48"	0.9950545	16' 04.40"	23° 26' 15"	-8 m 19 s
8	356° 57' 28"	-0.10"	357° 11' 57"	-1° 12' 49"	0.9950658	16' 04.39"	23° 26' 15"	-8 m 18 s
9	356° 59' 58"	-0.10"	357° 14' 14"	-1° 11' 50"	0.9950771	16' 04.38"	23° 26' 15"	-8 m 17 s
10	357° 02' 27"	-0.09"	357° 16' 31"	-1° 10' 50"	0.9950885	16' 04.37"	23° 26' 15"	-8 m 17 s
11	357° 04' 56"	-0.09"	357° 18' 48"	-1° 09' 51"	0.9950998	16' 04.36"	23° 26' 15"	-8 m 16 s
12	357° 07' 26"	-0.08"	357° 21' 05"	-1° 08' 52"	0.9951111	16' 04.34"	23° 26' 15"	-8 m 15 s
13	357° 09' 55"	-0.08"	357° 23' 22"	-1° 07' 52"	0.9951225	16' 04.33"	23° 26' 15"	-8 m 15 s
14	357° 12' 24"	-0.07"	357° 25' 39"	-1° 06' 53"	0.9951338	16' 04.32"	23° 26' 15"	-8 m 14 s
15	357° 14' 54"	-0.07"	357° 27' 56"	-1° 05' 54"	0.9951452	16' 04.31"	23° 26' 15"	-8 m 13 s
16	357° 17' 23"	-0.06"	357° 30' 13"	-1° 04' 54"	0.9951565	16' 04.30"	23° 26' 15"	-8 m 12 s
17	357° 19' 52"	-0.06"	357° 32' 30"	-1° 03' 55"	0.9951678	16' 04.29"	23° 26' 15"	-8 m 12 s
18	357° 22' 22"	-0.05"	357° 34' 47"	-1° 02' 56"	0.9951792	16' 04.28"	23° 26' 15"	-8 m 11 s
19	357° 24' 51"	-0.05"	357° 37' 04"	-1° 01' 56"	0.9951905	16' 04.27"	23° 26' 15"	-8 m 10 s
20	357° 27' 20"	-0.04"	357° 39' 21"	-1° 00' 57"	0.9952019	16' 04.26"	23° 26' 15"	-8 m 09 s
21	357° 29' 49"	-0.04"	357° 41' 38"	0°-59' 58"	0.9952132	16' 04.25"	23° 26' 15"	-8 m 09 s
22	357° 32' 19"	-0.03"	357° 43' 55"	0°-58' 58"	0.9952246	16' 04.23"	23° 26' 15"	-8 m 08 s
23	357° 34' 48"	-0.03"	357° 46' 12"	0°-57' 59"	0.9952359	16' 04.22"	23° 26' 15"	-8 m 07 s
24	357° 37' 17"	-0.02"	357° 48' 29"	0°-56' 60"	0.9952473	16' 04.21"	23° 26' 15"	-8 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	36° 28' 16"	-3° 03' 20"	35° 10' 06"	10° 47' 19"	0° 54' 13"	14' 46.32"	254° 39' 06"	0.11724
1	36° 57' 58"	-3° 01' 15"	35° 37' 59"	10° 58' 55"	0° 54' 12"	14' 46.22"	254° 40' 01"	0.11979
2	37° 27' 40"	-2° 59' 09"	36° 05' 54"	11° 10' 29"	0° 54' 12"	14' 46.11"	254° 41' 08"	0.12235
3	37° 57' 21"	-2° 57' 02"	36° 33' 50"	11° 21' 59"	0° 54' 11"	14' 46.01"	254° 42' 27"	0.12494
4	38° 27' 01"	-2° 54' 55"	37° 01' 47"	11° 33' 27"	0° 54' 11"	14' 45.91"	254° 43' 58"	0.12755
5	38° 56' 40"	-2° 52' 47"	37° 29' 47"	11° 44' 52"	0° 54' 11"	14' 45.82"	254° 45' 41"	0.13019
6	39° 26' 19"	-2° 50' 38"	37° 57' 48"	11° 56' 13"	0° 54' 10"	14' 45.73"	254° 47' 35"	0.13284
7	39° 55' 57"	-2° 48' 28"	38° 25' 52"	12° 07' 32"	0° 54' 10"	14' 45.64"	254° 49' 40"	0.13552
8	40° 25' 35"	-2° 46' 18"	38° 53' 57"	12° 18' 48"	0° 54' 10"	14' 45.56"	254° 51' 57"	0.13822
9	40° 55' 12"	-2° 44' 07"	39° 22' 04"	12° 30' 01"	0° 54' 09"	14' 45.48"	254° 54' 25"	0.14094
10	41° 24' 48"	-2° 41' 55"	39° 50' 13"	12° 41' 11"	0° 54' 09"	14' 45.41"	254° 57' 04"	0.14369
11	41° 54' 24"	-2° 39' 43"	40° 18' 24"	12° 52' 18"	0° 54' 09"	14' 45.33"	254° 59' 53"	0.14645
12	42° 23' 59"	-2° 37' 29"	40° 46' 37"	13° 03' 21"	0° 54' 09"	14' 45.27"	255° 2' 53"	0.14924
13	42° 53' 34"	-2° 35' 16"	41° 14' 52"	13° 14' 22"	0° 54' 08"	14' 45.20"	255° 6' 03"	0.15205
14	43° 23' 08"	-2° 33' 01"	41° 43' 10"	13° 25' 19"	0° 54' 08"	14' 45.14"	255° 9' 23"	0.15487
15	43° 52' 42"	-2° 30' 46"	42° 11' 29"	13° 36' 12"	0° 54' 08"	14' 45.08"	255° 12' 54"	0.15772
16	44° 22' 15"	-2° 28' 30"	42° 39' 51"	13° 47' 03"	0° 54' 08"	14' 45.03"	255° 16' 35"	0.16059
17	44° 51' 48"	-2° 26' 13"	43° 08' 15"	13° 57' 50"	0° 54' 08"	14' 44.98"	255° 20' 25"	0.16348
18	45° 21' 20"	-2° 23' 56"	43° 36' 42"	14° 08' 34"	0° 54' 07"	14' 44.93"	255° 24' 25"	0.16640
19	45° 50' 52"	-2° 21' 38"	44° 05' 10"	14° 19' 14"	0° 54' 07"	14' 44.89"	255° 28' 35"	0.16933
20	46° 20' 24"	-2° 19' 20"	44° 33' 41"	14° 29' 51"	0° 54' 07"	14' 44.85"	255° 32' 54"	0.17228
21	46° 49' 55"	-2° 17' 01"	45° 02' 15"	14° 40' 24"	0° 54' 07"	14' 44.82"	255° 37' 23"	0.17525
22	47° 19' 26"	-2° 14' 41"	45° 30' 51"	14° 50' 53"	0° 54' 07"	14' 44.79"	255° 42' 01"	0.17824
23	47° 48' 56"	-2° 12' 21"	45° 59' 29"	15° 01' 19"	0° 54' 07"	14' 44.76"	255° 46' 48"	0.18125
24	48° 18' 26"	-2° 10' 00"	46° 28' 11"	15° 11' 42"	0° 54' 07"	14' 44.74"	255° 51' 44"	0.18428

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	357° 37' 17"	-0.02"	357° 48' 29"	0°-56' 60"	0.9952473	16' 04.21"	23° 26' 15"	-8 m 07 s
1	357° 39' 47"	-0.02"	357° 50' 46"	0°-56' 00"	0.9952586	16' 04.20"	23° 26' 15"	-8 m 06 s
2	357° 42' 16"	-0.01"	357° 53' 03"	0°-55' 01"	0.9952700	16' 04.19"	23° 26' 15"	-8 m 05 s
3	357° 44' 45"	-0.01"	357° 55' 20"	0°-54' 02"	0.9952813	16' 04.18"	23° 26' 15"	-8 m 04 s
4	357° 47' 14"	-0.00"	357° 57' 37"	0°-53' 02"	0.9952927	16' 04.17"	23° 26' 15"	-8 m 04 s
5	357° 49' 44"	0.00"	357° 59' 54"	0°-52' 03"	0.9953040	16' 04.16"	23° 26' 15"	-8 m 03 s
6	357° 52' 13"	0.01"	358° 02' 11"	0°-51' 04"	0.9953154	16' 04.15"	23° 26' 15"	-8 m 02 s
7	357° 54' 42"	0.01"	358° 04' 28"	0°-50' 04"	0.9953267	16' 04.14"	23° 26' 15"	-8 m 01 s
8	357° 57' 11"	0.02"	358° 06' 45"	0°-49' 05"	0.9953381	16' 04.12"	23° 26' 15"	-8 m 01 s
9	357° 59' 41"	0.02"	358° 09' 02"	0°-48' 06"	0.9953494	16' 04.11"	23° 26' 15"	-7 m 60 s
10	358° 02' 10"	0.03"	358° 11' 19"	0°-47' 06"	0.9953608	16' 04.10"	23° 26' 15"	-7 m 59 s
11	358° 04' 39"	0.04"	358° 13' 36"	0°-46' 07"	0.9953722	16' 04.09"	23° 26' 15"	-7 m 59 s
12	358° 07' 08"	0.04"	358° 15' 53"	0°-45' 08"	0.9953835	16' 04.08"	23° 26' 15"	-7 m 58 s
13	358° 09' 38"	0.05"	358° 18' 10"	0°-44' 08"	0.9953949	16' 04.07"	23° 26' 15"	-7 m 57 s
14	358° 12' 07"	0.05"	358° 20' 27"	0°-43' 09"	0.9954062	16' 04.06"	23° 26' 15"	-7 m 56 s
15	358° 14' 36"	0.06"	358° 22' 44"	0°-42' 10"	0.9954176	16' 04.05"	23° 26' 15"	-7 m 56 s
16	358° 17' 05"	0.06"	358° 25' 00"	0°-41' 10"	0.9954290	16' 04.04"	23° 26' 15"	-7 m 55 s
17	358° 19' 35"	0.07"	358° 27' 17"	0°-40' 11"	0.9954403	16' 04.03"	23° 26' 14"	-7 m 54 s
18	358° 22' 04"	0.07"	358° 29' 34"	0°-39' 12"	0.9954517	16' 04.01"	23° 26' 14"	-7 m 53 s
19	358° 24' 33"	0.08"	358° 31' 51"	0°-38' 12"	0.9954631	16' 04.00"	23° 26' 14"	-7 m 53 s
20	358° 27' 02"	0.08"	358° 34' 08"	0°-37' 13"	0.9954745	16' 03.99"	23° 26' 14"	-7 m 52 s
21	358° 29' 31"	0.09"	358° 36' 25"	0°-36' 14"	0.9954858	16' 03.98"	23° 26' 14"	-7 m 51 s
22	358° 32' 01"	0.10"	358° 38' 42"	0°-35' 14"	0.9954972	16' 03.97"	23° 26' 14"	-7 m 50 s
23	358° 34' 30"	0.10"	358° 40' 59"	0°-34' 15"	0.9955086	16' 03.96"	23° 26' 14"	-7 m 50 s
24	358° 36' 59"	0.11"	358° 43' 16"	0°-33' 16"	0.9955199	16' 03.95"	23° 26' 14"	-7 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	48° 18' 26"	-2° 10' 00"	46° 28' 11"	15° 11' 42"	0° 54' 07"	14' 44.74"	255° 51' 44"	0.18428
1	48° 47' 56"	-2° 07' 39"	46° 56' 54"	15° 22' 00"	0° 54' 07"	14' 44.72"	255° 56' 50"	0.18733
2	49° 17' 25"	-2° 05' 17"	47° 25' 40"	15° 32' 15"	0° 54' 07"	14' 44.71"	256° 2' 04"	0.19039
3	49° 46' 54"	-2° 02' 55"	47° 54' 29"	15° 42' 26"	0° 54' 07"	14' 44.70"	256° 7' 27"	0.19348
4	50° 16' 23"	-2° 00' 32"	48° 23' 21"	15° 52' 34"	0° 54' 07"	14' 44.69"	256° 12' 59"	0.19659
5	50° 45' 51"	-1° 58' 08"	48° 52' 15"	16° 02' 37"	0° 54' 07"	14' 44.69"	256° 18' 39"	0.19971
6	51° 15' 19"	-1° 55' 44"	49° 21' 12"	16° 12' 37"	0° 54' 07"	14' 44.69"	256° 24' 28"	0.20285
7	51° 44' 47"	-1° 53' 19"	49° 50' 12"	16° 22' 32"	0° 54' 07"	14' 44.70"	256° 30' 25"	0.20601
8	52° 14' 15"	-1° 50' 54"	50° 19' 15"	16° 32' 24"	0° 54' 07"	14' 44.71"	256° 36' 31"	0.20919
9	52° 43' 43"	-1° 48' 29"	50° 48' 20"	16° 42' 11"	0° 54' 07"	14' 44.72"	256° 42' 45"	0.21238
10	53° 13' 10"	-1° 46' 03"	51° 17' 28"	16° 51' 54"	0° 54' 07"	14' 44.74"	256° 49' 08"	0.21560
11	53° 42' 38"	-1° 43' 36"	51° 46' 40"	17° 01' 34"	0° 54' 07"	14' 44.76"	256° 55' 38"	0.21883
12	54° 12' 05"	-1° 41' 09"	52° 15' 54"	17° 11' 09"	0° 54' 07"	14' 44.79"	257° 2' 17"	0.22208
13	54° 41' 32"	-1° 38' 42"	52° 45' 11"	17° 20' 40"	0° 54' 07"	14' 44.82"	257° 9' 04"	0.22534
14	55° 10' 59"	-1° 36' 14"	53° 14' 31"	17° 30' 06"	0° 54' 07"	14' 44.86"	257° 15' 59"	0.22862
15	55° 40' 26"	-1° 33' 45"	53° 43' 55"	17° 39' 29"	0° 54' 07"	14' 44.89"	257° 23' 01"	0.23192
16	56° 09' 53"	-1° 31' 17"	54° 13' 21"	17° 48' 47"	0° 54' 07"	14' 44.94"	257° 30' 12"	0.23524
17	56° 39' 20"	-1° 28' 47"	54° 42' 50"	17° 58' 00"	0° 54' 08"	14' 44.99"	257° 37' 30"	0.23857
18	57° 08' 47"	-1° 26' 18"	55° 12' 23"	18° 07' 09"	0° 54' 08"	14' 45.04"	257° 44' 56"	0.24192
19	57° 38' 13"	-1° 23' 48"	55° 41' 59"	18° 16' 14"	0° 54' 08"	14' 45.10"	257° 52' 30"	0.24528
20	58° 07' 40"	-1° 21' 17"	56° 11' 38"	18° 25' 14"	0° 54' 08"	14' 45.16"	258° 0' 11"	0.24866
21	58° 37' 07"	-1° 18' 47"	56° 41' 20"	18° 34' 10"	0° 54' 09"	14' 45.22"	258° 7' 60"	0.25206
22	59° 06' 34"	-1° 16' 15"	57° 11' 05"	18° 43' 01"	0° 54' 09"	14' 45.29"	258° 15' 56"	0.25547
23	59° 36' 01"	-1° 13' 44"	57° 40' 54"	18° 51' 47"	0° 54' 09"	14' 45.37"	258° 23' 60"	0.25890
24	60° 05' 29"	-1° 11' 12"	58° 10' 45"	19° 00' 29"	0° 54' 09"	14' 45.45"	258° 32' 11"	0.26234

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	358° 36' 59"	0.11"	358° 43' 16"	0°-33' 16"	0.9955199	16' 03.95"	23° 26' 14"	-7 m 49 s
1	358° 39' 28"	0.11"	358° 45' 33"	0°-32' 16"	0.9955313	16' 03.94"	23° 26' 14"	-7 m 48 s
2	358° 41' 57"	0.12"	358° 47' 49"	0°-31' 17"	0.9955427	16' 03.93"	23° 26' 14"	-7 m 48 s
3	358° 44' 27"	0.12"	358° 50' 06"	0°-30' 18"	0.9955541	16' 03.92"	23° 26' 14"	-7 m 47 s
4	358° 46' 56"	0.13"	358° 52' 23"	0°-29' 18"	0.9955655	16' 03.90"	23° 26' 14"	-7 m 46 s
5	358° 49' 25"	0.13"	358° 54' 40"	0°-28' 19"	0.9955768	16' 03.89"	23° 26' 14"	-7 m 45 s
6	358° 51' 54"	0.14"	358° 56' 57"	0°-27' 20"	0.9955882	16' 03.88"	23° 26' 14"	-7 m 45 s
7	358° 54' 23"	0.15"	358° 59' 14"	0°-26' 20"	0.9955996	16' 03.87"	23° 26' 14"	-7 m 44 s
8	358° 56' 52"	0.15"	359° 01' 31"	0°-25' 21"	0.9956110	16' 03.86"	23° 26' 14"	-7 m 43 s
9	358° 59' 22"	0.16"	359° 03' 48"	0°-24' 22"	0.9956224	16' 03.85"	23° 26' 14"	-7 m 42 s
10	359° 01' 51"	0.16"	359° 06' 04"	0°-23' 22"	0.9956338	16' 03.84"	23° 26' 14"	-7 m 42 s
11	359° 04' 20"	0.17"	359° 08' 21"	0°-22' 23"	0.9956451	16' 03.83"	23° 26' 14"	-7 m 41 s
12	359° 06' 49"	0.17"	359° 10' 38"	0°-21' 24"	0.9956565	16' 03.82"	23° 26' 14"	-7 m 40 s
13	359° 09' 18"	0.18"	359° 12' 55"	0°-20' 24"	0.9956679	16' 03.81"	23° 26' 14"	-7 m 39 s
14	359° 11' 47"	0.19"	359° 15' 12"	0°-19' 25"	0.9956793	16' 03.79"	23° 26' 14"	-7 m 39 s
15	359° 14' 16"	0.19"	359° 17' 29"	0°-18' 26"	0.9956907	16' 03.78"	23° 26' 14"	-7 m 38 s
16	359° 16' 46"	0.20"	359° 19' 45"	0°-17' 27"	0.9957021	16' 03.77"	23° 26' 14"	-7 m 37 s
17	359° 19' 15"	0.20"	359° 22' 02"	0°-16' 27"	0.9957135	16' 03.76"	23° 26' 14"	-7 m 37 s
18	359° 21' 44"	0.21"	359° 24' 19"	0°-15' 28"	0.9957249	16' 03.75"	23° 26' 14"	-7 m 36 s
19	359° 24' 13"	0.21"	359° 26' 36"	0°-14' 29"	0.9957363	16' 03.74"	23° 26' 14"	-7 m 35 s
20	359° 26' 42"	0.22"	359° 28' 53"	0°-13' 29"	0.9957477	16' 03.73"	23° 26' 14"	-7 m 34 s
21	359° 29' 11"	0.22"	359° 31' 09"	0°-12' 30"	0.9957591	16' 03.72"	23° 26' 14"	-7 m 34 s
22	359° 31' 40"	0.23"	359° 33' 26"	0°-11' 31"	0.9957705	16' 03.71"	23° 26' 14"	-7 m 33 s
23	359° 34' 09"	0.24"	359° 35' 43"	0°-10' 31"	0.9957819	16' 03.69"	23° 26' 14"	-7 m 32 s
24	359° 36' 38"	0.24"	359° 37' 60"	0° -9' 32"	0.9957933	16' 03.68"	23° 26' 14"	-7 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	60° 05' 29"	-1° 11' 12"	58° 10' 45"	19° 00' 29"	0° 54' 09"	14' 45.45"	258° 32' 11"	0.26234
1	60° 34' 56"	-1° 08' 40"	58° 40' 41"	19° 09' 06"	0° 54' 10"	14' 45.53"	258° 40' 29"	0.26580
2	61° 04' 23"	-1° 06' 07"	59° 10' 39"	19° 17' 38"	0° 54' 10"	14' 45.62"	258° 48' 55"	0.26927
3	61° 33' 51"	-1° 03' 34"	59° 40' 41"	19° 26' 05"	0° 54' 10"	14' 45.71"	258° 57' 28"	0.27276
4	62° 03' 19"	-1° 01' 01"	60° 10' 46"	19° 34' 28"	0° 54' 11"	14' 45.81"	259° 6' 08"	0.27626
5	62° 32' 47"	0°-58' 28"	60° 40' 55"	19° 42' 45"	0° 54' 11"	14' 45.91"	259° 14' 55"	0.27978
6	63° 02' 15"	0°-55' 54"	61° 11' 07"	19° 50' 58"	0° 54' 11"	14' 46.01"	259° 23' 49"	0.28331
7	63° 31' 44"	0°-53' 20"	61° 41' 22"	19° 59' 05"	0° 54' 12"	14' 46.12"	259° 32' 50"	0.28685
8	64° 01' 13"	0°-50' 45"	62° 11' 41"	20° 07' 08"	0° 54' 12"	14' 46.24"	259° 41' 58"	0.29041
9	64° 30' 42"	0°-48' 11"	62° 42' 03"	20° 15' 05"	0° 54' 13"	14' 46.36"	259° 51' 13"	0.29398
10	65° 00' 12"	0°-45' 36"	63° 12' 29"	20° 22' 58"	0° 54' 13"	14' 46.48"	260° 0' 35"	0.29757
11	65° 29' 42"	0°-43' 01"	63° 42' 58"	20° 30' 45"	0° 54' 14"	14' 46.61"	260° 10' 03"	0.30117
12	65° 59' 12"	0°-40' 25"	64° 13' 31"	20° 38' 27"	0° 54' 14"	14' 46.75"	260° 19' 38"	0.30478
13	66° 28' 42"	0°-37' 50"	64° 44' 07"	20° 46' 04"	0° 54' 15"	14' 46.88"	260° 29' 20"	0.30841
14	66° 58' 14"	0°-35' 14"	65° 14' 47"	20° 53' 35"	0° 54' 15"	14' 47.03"	260° 39' 09"	0.31205
15	67° 27' 45"	0°-32' 38"	65° 45' 30"	21° 01' 01"	0° 54' 16"	14' 47.17"	260° 49' 04"	0.31570
16	67° 57' 17"	0°-30' 02"	66° 16' 17"	21° 08' 22"	0° 54' 16"	14' 47.33"	260° 59' 06"	0.31936
17	68° 26' 49"	0°-27' 25"	66° 47' 08"	21° 15' 37"	0° 54' 17"	14' 47.48"	261° 9' 14"	0.32304
18	68° 56' 22"	0°-24' 49"	67° 18' 02"	21° 22' 47"	0° 54' 17"	14' 47.64"	261° 19' 28"	0.32673
19	69° 25' 56"	0°-22' 12"	67° 48' 59"	21° 29' 51"	0° 54' 18"	14' 47.81"	261° 29' 49"	0.33043
20	69° 55' 30"	0°-19' 35"	68° 20' 00"	21° 36' 49"	0° 54' 19"	14' 47.98"	261° 40' 16"	0.33414
21	70° 25' 05"	0°-16' 58"	68° 51' 05"	21° 43' 42"	0° 54' 19"	14' 48.16"	261° 50' 50"	0.33787
22	70° 54' 40"	0°-14' 21"	69° 22' 14"	21° 50' 30"	0° 54' 20"	14' 48.34"	262° 1' 29"	0.34160
23	71° 24' 16"	0°-11' 46"	69° 53' 26"	21° 57' 09"	0° 54' 21"	14' 48.52"	262° 12' 16"	0.34535
24	71° 53' 52"	0° -9' 09"	70° 24' 42"	22° 03' 45"	0° 54' 21"	14' 48.71"	262° 23' 08"	0.34911

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	359° 36' 38"	0.24"	359° 37' 60"	0° -9' 32"	0.9957933	16' 03.68"	23° 26' 14"	-7 m 31 s
1	359° 39' 07"	0.25"	359° 40' 17"	0° -8' 33"	0.9958047	16' 03.67"	23° 26' 14"	-7 m 31 s
2	359° 41' 37"	0.25"	359° 42' 33"	0° -7' 33"	0.9958161	16' 03.66"	23° 26' 14"	-7 m 30 s
3	359° 44' 06"	0.26"	359° 44' 50"	0° -6' 34"	0.9958275	16' 03.65"	23° 26' 14"	-7 m 29 s
4	359° 46' 35"	0.26"	359° 47' 07"	0° -5' 35"	0.9958389	16' 03.64"	23° 26' 14"	-7 m 28 s
5	359° 49' 04"	0.27"	359° 49' 24"	0° -4' 36"	0.9958503	16' 03.63"	23° 26' 14"	-7 m 28 s
6	359° 51' 33"	0.28"	359° 51' 41"	0° -3' 36"	0.9958618	16' 03.62"	23° 26' 14"	-7 m 27 s
7	359° 54' 02"	0.28"	359° 53' 57"	0° -2' 37"	0.9958732	16' 03.61"	23° 26' 14"	-7 m 26 s
8	359° 56' 31"	0.29"	359° 56' 14"	0° -1' 38"	0.9958846	16' 03.60"	23° 26' 14"	-7 m 25 s
9	359° 59' 00"	0.29"	359° 58' 31"	0° 00' -38"	0.9958960	16' 03.58"	23° 26' 14"	-7 m 25 s
10	0° 01' 29"	0.30"	0° 00' 48"	0° 00' 21"	0.9959074	16' 03.57"	23° 26' 14"	-7 m 24 s
11	0° 03' 58"	0.30"	0° 03' 04"	0° 01' 20"	0.9959188	16' 03.56"	23° 26' 14"	-7 m 23 s
12	0° 06' 27"	0.31"	0° 05' 21"	0° 02' 20"	0.9959303	16' 03.55"	23° 26' 14"	-7 m 22 s
13	0° 08' 56"	0.32"	0° 07' 38"	0° 03' 19"	0.9959417	16' 03.54"	23° 26' 14"	-7 m 22 s
14	0° 11' 25"	0.32"	0° 09' 55"	0° 04' 18"	0.9959531	16' 03.53"	23° 26' 14"	-7 m 21 s
15	0° 13' 54"	0.33"	0° 12' 11"	0° 05' 17"	0.9959645	16' 03.52"	23° 26' 14"	-7 m 20 s
16	0° 16' 23"	0.33"	0° 14' 28"	0° 06' 17"	0.9959760	16' 03.51"	23° 26' 14"	-7 m 19 s
17	0° 18' 52"	0.34"	0° 16' 45"	0° 07' 16"	0.9959874	16' 03.50"	23° 26' 14"	-7 m 19 s
18	0° 21' 21"	0.34"	0° 19' 02"	0° 08' 15"	0.9959988	16' 03.49"	23° 26' 14"	-7 m 18 s
19	0° 23' 50"	0.35"	0° 21' 18"	0° 09' 15"	0.9960103	16' 03.47"	23° 26' 14"	-7 m 17 s
20	0° 26' 19"	0.35"	0° 23' 35"	0° 10' 14"	0.9960217	16' 03.46"	23° 26' 14"	-7 m 17 s
21	0° 28' 49"	0.36"	0° 25' 52"	0° 11' 13"	0.9960331	16' 03.45"	23° 26' 14"	-7 m 16 s
22	0° 31' 18"	0.37"	0° 28' 08"	0° 12' 12"	0.9960446	16' 03.44"	23° 26' 14"	-7 m 15 s
23	0° 33' 47"	0.37"	0° 30' 25"	0° 13' 12"	0.9960560	16' 03.43"	23° 26' 14"	-7 m 14 s
24	0° 36' 16"	0.38"	0° 32' 42"	0° 14' 11"	0.9960674	16' 03.42"	23° 26' 14"	-7 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	71° 53' 52"	0° -9' 09"	70° 24' 42"	22° 03' 45"	0° 54' 21"	14' 48.71"	262° 23' 08"	0.34911
1	72° 23' 29"	0° -6' 31"	70° 56' 01"	22° 10' 15"	0° 54' 22"	14' 48.91"	262° 34' 06"	0.35288
2	72° 53' 07"	0° -3' 54"	71° 27' 24"	22° 16' 39"	0° 54' 23"	14' 49.10"	262° 45' 09"	0.35666
3	73° 22' 46"	0° -1' 16"	71° 58' 50"	22° 22' 58"	0° 54' 24"	14' 49.31"	262° 56' 19"	0.36045
4	73° 52' 25"	0° 01' 22"	72° 30' 20"	22° 29' 10"	0° 54' 24"	14' 49.52"	263° 7' 35"	0.36425
5	74° 22' 05"	0° 03' 60"	73° 01' 54"	22° 35' 17"	0° 54' 25"	14' 49.73"	263° 18' 56"	0.36806
6	74° 51' 46"	0° 06' 38"	73° 33' 31"	22° 41' 17"	0° 54' 26"	14' 49.95"	263° 30' 24"	0.37188
7	75° 21' 27"	0° 09' 16"	74° 05' 12"	22° 47' 12"	0° 54' 27"	14' 50.17"	263° 41' 57"	0.37571
8	75° 51' 10"	0° 11' 54"	74° 36' 57"	22° 52' 60"	0° 54' 28"	14' 50.40"	263° 53' 35"	0.37955
9	76° 20' 53"	0° 14' 32"	75° 08' 45"	22° 58' 42"	0° 54' 28"	14' 50.63"	264° 5' 20"	0.38340
10	76° 50' 37"	0° 17' 10"	75° 40' 36"	23° 04' 18"	0° 54' 29"	14' 50.87"	264° 17' 09"	0.38726
11	77° 20' 23"	0° 19' 48"	76° 12' 32"	23° 09' 48"	0° 54' 30"	14' 51.11"	264° 29' 05"	0.39113
12	77° 50' 09"	0° 22' 26"	76° 44' 30"	23° 15' 11"	0° 54' 31"	14' 51.36"	264° 41' 05"	0.39501
13	78° 19' 56"	0° 25' 04"	77° 16' 33"	23° 20' 29"	0° 54' 32"	14' 51.61"	264° 53' 12"	0.39890
14	78° 49' 44"	0° 27' 42"	77° 48' 39"	23° 25' 40"	0° 54' 33"	14' 51.87"	265° 5' 23"	0.40280
15	79° 19' 33"	0° 30' 20"	78° 20' 48"	23° 30' 44"	0° 54' 34"	14' 52.13"	265° 17' 40"	0.40670
16	79° 49' 23"	0° 32' 58"	78° 53' 01"	23° 35' 42"	0° 54' 35"	14' 52.39"	265° 30' 01"	0.41061
17	80° 19' 14"	0° 35' 36"	79° 25' 18"	23° 40' 33"	0° 54' 36"	14' 52.66"	265° 42' 28"	0.41453
18	80° 49' 06"	0° 38' 14"	79° 57' 38"	23° 45' 18"	0° 54' 37"	14' 52.94"	265° 55' 01"	0.41846
19	81° 18' 59"	0° 40' 52"	80° 30' 01"	23° 49' 57"	0° 54' 38"	14' 53.22"	266° 7' 38"	0.42240
20	81° 48' 53"	0° 43' 29"	81° 02' 28"	23° 54' 29"	0° 54' 39"	14' 53.51"	266° 20' 20"	0.42634
21	82° 18' 49"	0° 46' 07"	81° 34' 59"	23° 58' 54"	0° 54' 40"	14' 53.79"	266° 33' 07"	0.43029
22	82° 48' 45"	0° 48' 44"	82° 07' 33"	24° 03' 12"	0° 54' 41"	14' 54.09"	266° 45' 58"	0.43425
23	83° 18' 43"	0° 51' 22"	82° 40' 10"	24° 07' 24"	0° 54' 42"	14' 54.39"	266° 58' 55"	0.43822
24	83° 48' 42"	0° 53' 59"	83° 12' 51"	24° 11' 29"	0° 54' 43"	14' 54.69"	267° 11' 56"	0.44219

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	0° 36' 16"	0.38"	0° 32' 42"	0° 14' 11"	0.9960674	16' 03.42"	23° 26' 14"	-7 m 14 s
1	0° 38' 45"	0.38"	0° 34' 59"	0° 15' 10"	0.9960789	16' 03.41"	23° 26' 14"	-7 m 13 s
2	0° 41' 14"	0.39"	0° 37' 15"	0° 16' 09"	0.9960903	16' 03.40"	23° 26' 14"	-7 m 12 s
3	0° 43' 43"	0.39"	0° 39' 32"	0° 17' 09"	0.9961018	16' 03.39"	23° 26' 14"	-7 m 11 s
4	0° 46' 11"	0.40"	0° 41' 49"	0° 18' 08"	0.9961132	16' 03.37"	23° 26' 14"	-7 m 11 s
5	0° 48' 40"	0.40"	0° 44' 05"	0° 19' 07"	0.9961247	16' 03.36"	23° 26' 14"	-7 m 10 s
6	0° 51' 09"	0.41"	0° 46' 22"	0° 20' 06"	0.9961361	16' 03.35"	23° 26' 14"	-7 m 09 s
7	0° 53' 38"	0.41"	0° 48' 39"	0° 21' 06"	0.9961476	16' 03.34"	23° 26' 14"	-7 m 08 s
8	0° 56' 07"	0.42"	0° 50' 55"	0° 22' 05"	0.9961590	16' 03.33"	23° 26' 14"	-7 m 08 s
9	0° 58' 36"	0.43"	0° 53' 12"	0° 23' 04"	0.9961705	16' 03.32"	23° 26' 14"	-7 m 07 s
10	1° 01' 05"	0.43"	0° 55' 29"	0° 24' 03"	0.9961819	16' 03.31"	23° 26' 14"	-7 m 06 s
11	1° 03' 34"	0.44"	0° 57' 45"	0° 25' 03"	0.9961934	16' 03.30"	23° 26' 14"	-7 m 05 s
12	1° 06' 03"	0.44"	1° 00' 02"	0° 26' 02"	0.9962049	16' 03.29"	23° 26' 14"	-7 m 05 s
13	1° 08' 32"	0.45"	1° 02' 19"	0° 27' 01"	0.9962163	16' 03.27"	23° 26' 14"	-7 m 04 s
14	1° 11' 01"	0.45"	1° 04' 35"	0° 28' 00"	0.9962278	16' 03.26"	23° 26' 14"	-7 m 03 s
15	1° 13' 30"	0.46"	1° 06' 52"	0° 28' 60"	0.9962392	16' 03.25"	23° 26' 14"	-7 m 02 s
16	1° 15' 59"	0.46"	1° 09' 09"	0° 29' 59"	0.9962507	16' 03.24"	23° 26' 14"	-7 m 02 s
17	1° 18' 28"	0.47"	1° 11' 25"	0° 30' 58"	0.9962622	16' 03.23"	23° 26' 14"	-7 m 01 s
18	1° 20' 57"	0.47"	1° 13' 42"	0° 31' 57"	0.9962737	16' 03.22"	23° 26' 14"	-7 m 00 s
19	1° 23' 26"	0.48"	1° 15' 59"	0° 32' 57"	0.9962851	16' 03.21"	23° 26' 14"	-6 m 59 s
20	1° 25' 55"	0.48"	1° 18' 15"	0° 33' 56"	0.9962966	16' 03.20"	23° 26' 14"	-6 m 59 s
21	1° 28' 24"	0.49"	1° 20' 32"	0° 34' 55"	0.9963081	16' 03.19"	23° 26' 14"	-6 m 58 s
22	1° 30' 53"	0.49"	1° 22' 49"	0° 35' 54"	0.9963196	16' 03.17"	23° 26' 14"	-6 m 57 s
23	1° 33' 21"	0.50"	1° 25' 05"	0° 36' 53"	0.9963310	16' 03.16"	23° 26' 14"	-6 m 56 s
24	1° 35' 50"	0.50"	1° 27' 22"	0° 37' 53"	0.9963425	16' 03.15"	23° 26' 14"	-6 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	83° 48' 42"	0° 53' 59"	83° 12' 51"	24° 11' 29"	0° 54' 43"	14' 54.69"	267° 11' 56"	0.44219
1	84° 18' 42"	0° 56' 36"	83° 45' 35"	24° 15' 27"	0° 54' 44"	14' 55.00"	267° 25' 02"	0.44617
2	84° 48' 44"	0° 59' 13"	84° 18' 22"	24° 19' 19"	0° 54' 46"	14' 55.32"	267° 38' 12"	0.45015
3	85° 18' 47"	1° 01' 50"	84° 51' 13"	24° 23' 03"	0° 54' 47"	14' 55.63"	267° 51' 27"	0.45414
4	85° 48' 51"	1° 04' 26"	85° 24' 07"	24° 26' 40"	0° 54' 48"	14' 55.96"	268° 4' 46"	0.45814
5	86° 18' 56"	1° 07' 03"	85° 57' 04"	24° 30' 11"	0° 54' 49"	14' 56.29"	268° 18' 10"	0.46214
6	86° 49' 03"	1° 09' 39"	86° 30' 05"	24° 33' 34"	0° 54' 50"	14' 56.62"	268° 31' 38"	0.46615
7	87° 19' 12"	1° 12' 15"	87° 03' 09"	24° 36' 51"	0° 54' 52"	14' 56.96"	268° 45' 10"	0.47016
8	87° 49' 21"	1° 14' 51"	87° 36' 16"	24° 40' 00"	0° 54' 53"	14' 57.30"	268° 58' 46"	0.47418
9	88° 19' 32"	1° 17' 26"	88° 09' 26"	24° 43' 02"	0° 54' 54"	14' 57.64"	269° 12' 26"	0.47821
10	88° 49' 45"	1° 20' 02"	88° 42' 39"	24° 45' 57"	0° 54' 55"	14' 58.00"	269° 26' 11"	0.48224
11	89° 19' 59"	1° 22' 37"	89° 15' 55"	24° 48' 45"	0° 54' 57"	14' 58.35"	269° 39' 59"	0.48627
12	89° 50' 14"	1° 25' 12"	89° 49' 15"	24° 51' 26"	0° 54' 58"	14' 58.71"	269° 53' 51"	0.49031
13	90° 20' 31"	1° 27' 46"	90° 22' 37"	24° 53' 59"	0° 54' 59"	14' 59.08"	270° 7' 47"	0.49435
14	90° 50' 50"	1° 30' 21"	90° 56' 02"	24° 56' 25"	0° 55' 01"	14' 59.45"	270° 21' 47"	0.49839
15	91° 21' 10"	1° 32' 55"	91° 29' 31"	24° 58' 44"	0° 55' 02"	14' 59.82"	270° 35' 50"	0.50244
16	91° 51' 32"	1° 35' 28"	92° 03' 02"	25° 00' 55"	0° 55' 03"	15' 00.20"	270° 49' 57"	0.50649
17	92° 21' 55"	1° 38' 02"	92° 36' 36"	25° 02' 59"	0° 55' 05"	15' 00.59"	271° 4' 07"	0.51055
18	92° 52' 20"	1° 40' 35"	93° 10' 13"	25° 04' 55"	0° 55' 06"	15' 00.98"	271° 18' 21"	0.51461
19	93° 22' 47"	1° 43' 07"	93° 43' 53"	25° 06' 44"	0° 55' 08"	15' 01.37"	271° 32' 38"	0.51867
20	93° 53' 15"	1° 45' 40"	94° 17' 35"	25° 08' 26"	0° 55' 09"	15' 01.77"	271° 46' 58"	0.52274
21	94° 23' 46"	1° 48' 12"	94° 51' 20"	25° 09' 60"	0° 55' 11"	15' 02.17"	272° 1' 21"	0.52680
22	94° 54' 17"	1° 50' 43"	95° 25' 08"	25° 11' 26"	0° 55' 12"	15' 02.57"	272° 15' 48"	0.53087
23	95° 24' 51"	1° 53' 15"	95° 58' 59"	25° 12' 45"	0° 55' 14"	15' 02.99"	272° 30' 17"	0.53494
24	95° 55' 26"	1° 55' 45"	96° 32' 52"	25° 13' 56"	0° 55' 15"	15' 03.40"	272° 44' 50"	0.53902

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	1° 35' 50"	0.50"	1° 27' 22"	0° 37' 53"	0.9963425	16' 03.15"	23° 26' 14"	-6 m 56 s
1	1° 38' 19"	0.51"	1° 29' 39"	0° 38' 52"	0.9963540	16' 03.14"	23° 26' 14"	-6 m 55 s
2	1° 40' 48"	0.51"	1° 31' 55"	0° 39' 51"	0.9963655	16' 03.13"	23° 26' 14"	-6 m 54 s
3	1° 43' 17"	0.52"	1° 34' 12"	0° 40' 50"	0.9963770	16' 03.12"	23° 26' 14"	-6 m 53 s
4	1° 45' 46"	0.52"	1° 36' 29"	0° 41' 50"	0.9963885	16' 03.11"	23° 26' 14"	-6 m 53 s
5	1° 48' 15"	0.53"	1° 38' 45"	0° 42' 49"	0.9964000	16' 03.10"	23° 26' 14"	-6 m 52 s
6	1° 50' 44"	0.53"	1° 41' 02"	0° 43' 48"	0.9964115	16' 03.09"	23° 26' 14"	-6 m 51 s
7	1° 53' 13"	0.54"	1° 43' 18"	0° 44' 47"	0.9964230	16' 03.07"	23° 26' 14"	-6 m 50 s
8	1° 55' 41"	0.54"	1° 45' 35"	0° 45' 46"	0.9964344	16' 03.06"	23° 26' 14"	-6 m 50 s
9	1° 58' 10"	0.55"	1° 47' 52"	0° 46' 45"	0.9964459	16' 03.05"	23° 26' 14"	-6 m 49 s
10	2° 00' 39"	0.55"	1° 50' 08"	0° 47' 45"	0.9964575	16' 03.04"	23° 26' 14"	-6 m 48 s
11	2° 03' 08"	0.56"	1° 52' 25"	0° 48' 44"	0.9964690	16' 03.03"	23° 26' 14"	-6 m 47 s
12	2° 05' 37"	0.56"	1° 54' 41"	0° 49' 43"	0.9964805	16' 03.02"	23° 26' 14"	-6 m 47 s
13	2° 08' 06"	0.57"	1° 56' 58"	0° 50' 42"	0.9964920	16' 03.01"	23° 26' 14"	-6 m 46 s
14	2° 10' 35"	0.57"	1° 59' 15"	0° 51' 41"	0.9965035	16' 03.00"	23° 26' 14"	-6 m 45 s
15	2° 13' 03"	0.58"	2° 01' 31"	0° 52' 41"	0.9965150	16' 02.99"	23° 26' 14"	-6 m 44 s
16	2° 15' 32"	0.58"	2° 03' 48"	0° 53' 40"	0.9965265	16' 02.97"	23° 26' 14"	-6 m 44 s
17	2° 18' 01"	0.59"	2° 06' 04"	0° 54' 39"	0.9965380	16' 02.96"	23° 26' 14"	-6 m 43 s
18	2° 20' 30"	0.59"	2° 08' 21"	0° 55' 38"	0.9965495	16' 02.95"	23° 26' 14"	-6 m 42 s
19	2° 22' 59"	0.60"	2° 10' 38"	0° 56' 37"	0.9965611	16' 02.94"	23° 26' 14"	-6 m 41 s
20	2° 25' 28"	0.60"	2° 12' 54"	0° 57' 36"	0.9965726	16' 02.93"	23° 26' 14"	-6 m 41 s
21	2° 27' 56"	0.60"	2° 15' 11"	0° 58' 36"	0.9965841	16' 02.92"	23° 26' 14"	-6 m 40 s
22	2° 30' 25"	0.61"	2° 17' 27"	0° 59' 35"	0.9965956	16' 02.91"	23° 26' 14"	-6 m 39 s
23	2° 32' 54"	0.61"	2° 19' 44"	1° 00' 34"	0.9966072	16' 02.90"	23° 26' 14"	-6 m 38 s
24	2° 35' 23"	0.62"	2° 22' 00"	1° 01' 33"	0.9966187	16' 02.89"	23° 26' 14"	-6 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	95° 55' 26"	1° 55' 45"	96° 32' 52"	25° 13' 56"	0° 55' 15"	15' 03.40"	272° 44' 50"	0.53902
1	96° 26' 04"	1° 58' 16"	97° 06' 47"	25° 14' 59"	0° 55' 17"	15' 03.82"	272° 59' 25"	0.54309
2	96° 56' 43"	2° 00' 46"	97° 40' 45"	25° 15' 55"	0° 55' 18"	15' 04.24"	273° 14' 03"	0.54716
3	97° 27' 24"	2° 03' 15"	98° 14' 46"	25° 16' 42"	0° 55' 20"	15' 04.67"	273° 28' 44"	0.55124
4	97° 58' 06"	2° 05' 45"	98° 48' 49"	25° 17' 23"	0° 55' 21"	15' 05.11"	273° 43' 28"	0.55532
5	98° 28' 51"	2° 08' 13"	99° 22' 54"	25° 17' 55"	0° 55' 23"	15' 05.54"	273° 58' 13"	0.55940
6	98° 59' 38"	2° 10' 41"	99° 57' 02"	25° 18' 19"	0° 55' 25"	15' 05.99"	274° 13' 02"	0.56347
7	99° 30' 26"	2° 13' 09"	100° 31' 11"	25° 18' 36"	0° 55' 26"	15' 06.43"	274° 27' 53"	0.56755
8	100° 01' 17"	2° 15' 36"	101° 05' 23"	25° 18' 45"	0° 55' 28"	15' 06.88"	274° 42' 46"	0.57163
9	100° 32' 10"	2° 18' 03"	101° 39' 38"	25° 18' 46"	0° 55' 30"	15' 07.34"	274° 57' 41"	0.57571
10	101° 03' 04"	2° 20' 29"	102° 13' 54"	25° 18' 39"	0° 55' 31"	15' 07.79"	275° 12' 38"	0.57978
11	101° 34' 01"	2° 22' 55"	102° 48' 12"	25° 18' 24"	0° 55' 33"	15' 08.26"	275° 27' 38"	0.58386
12	102° 04' 59"	2° 25' 20"	103° 22' 32"	25° 18' 01"	0° 55' 35"	15' 08.72"	275° 42' 39"	0.58793
13	102° 36' 00"	2° 27' 44"	103° 56' 54"	25° 17' 30"	0° 55' 36"	15' 09.19"	275° 57' 42"	0.59201
14	103° 07' 03"	2° 30' 08"	104° 31' 18"	25° 16' 51"	0° 55' 38"	15' 09.67"	276° 12' 47"	0.59608
15	103° 38' 08"	2° 32' 32"	105° 05' 44"	25° 16' 04"	0° 55' 40"	15' 10.15"	276° 27' 54"	0.60015
16	104° 09' 15"	2° 34' 55"	105° 40' 12"	25° 15' 09"	0° 55' 42"	15' 10.63"	276° 43' 03"	0.60422
17	104° 40' 25"	2° 37' 17"	106° 14' 41"	25° 14' 06"	0° 55' 44"	15' 11.12"	276° 58' 13"	0.60828
18	105° 11' 36"	2° 39' 38"	106° 49' 12"	25° 12' 55"	0° 55' 45"	15' 11.61"	277° 13' 24"	0.61234
19	105° 42' 50"	2° 41' 59"	107° 23' 45"	25° 11' 36"	0° 55' 47"	15' 12.11"	277° 28' 37"	0.61640
20	106° 14' 06"	2° 44' 19"	107° 58' 19"	25° 10' 08"	0° 55' 49"	15' 12.60"	277° 43' 51"	0.62046
21	106° 45' 24"	2° 46' 39"	108° 32' 55"	25° 08' 33"	0° 55' 51"	15' 13.11"	277° 59' 06"	0.62451
22	107° 16' 45"	2° 48' 58"	109° 07' 32"	25° 06' 49"	0° 55' 53"	15' 13.61"	278° 14' 22"	0.62856
23	107° 48' 07"	2° 51' 16"	109° 42' 10"	25° 04' 57"	0° 55' 55"	15' 14.12"	278° 29' 40"	0.63260
24	108° 19' 32"	2° 53' 34"	110° 16' 50"	25° 02' 57"	0° 55' 56"	15' 14.64"	278° 44' 58"	0.63664

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	2° 35' 23"	0.62"	2° 22' 00"	1° 01' 33"	0.9966187	16' 02.89"	23° 26' 14"	-6 m 38 s
1	2° 37' 52"	0.62"	2° 24' 17"	1° 02' 32"	0.9966302	16' 02.87"	23° 26' 14"	-6 m 37 s
2	2° 40' 21"	0.63"	2° 26' 34"	1° 03' 31"	0.9966418	16' 02.86"	23° 26' 14"	-6 m 36 s
3	2° 42' 49"	0.63"	2° 28' 50"	1° 04' 30"	0.9966533	16' 02.85"	23° 26' 14"	-6 m 35 s
4	2° 45' 18"	0.63"	2° 31' 07"	1° 05' 30"	0.9966649	16' 02.84"	23° 26' 14"	-6 m 35 s
5	2° 47' 47"	0.64"	2° 33' 23"	1° 06' 29"	0.9966764	16' 02.83"	23° 26' 14"	-6 m 34 s
6	2° 50' 16"	0.64"	2° 35' 40"	1° 07' 28"	0.9966879	16' 02.82"	23° 26' 14"	-6 m 33 s
7	2° 52' 45"	0.65"	2° 37' 56"	1° 08' 27"	0.9966995	16' 02.81"	23° 26' 14"	-6 m 32 s
8	2° 55' 13"	0.65"	2° 40' 13"	1° 09' 26"	0.9967110	16' 02.80"	23° 26' 14"	-6 m 32 s
9	2° 57' 42"	0.65"	2° 42' 30"	1° 10' 25"	0.9967226	16' 02.79"	23° 26' 14"	-6 m 31 s
10	3° 00' 11"	0.66"	2° 44' 46"	1° 11' 24"	0.9967341	16' 02.77"	23° 26' 14"	-6 m 30 s
11	3° 02' 40"	0.66"	2° 47' 03"	1° 12' 23"	0.9967457	16' 02.76"	23° 26' 14"	-6 m 29 s
12	3° 05' 08"	0.67"	2° 49' 19"	1° 13' 22"	0.9967573	16' 02.75"	23° 26' 14"	-6 m 29 s
13	3° 07' 37"	0.67"	2° 51' 36"	1° 14' 22"	0.9967688	16' 02.74"	23° 26' 14"	-6 m 28 s
14	3° 10' 06"	0.67"	2° 53' 52"	1° 15' 21"	0.9967804	16' 02.73"	23° 26' 14"	-6 m 27 s
15	3° 12' 35"	0.68"	2° 56' 09"	1° 16' 20"	0.9967920	16' 02.72"	23° 26' 14"	-6 m 26 s
16	3° 15' 03"	0.68"	2° 58' 25"	1° 17' 19"	0.9968035	16' 02.71"	23° 26' 14"	-6 m 26 s
17	3° 17' 32"	0.69"	3° 00' 42"	1° 18' 18"	0.9968151	16' 02.70"	23° 26' 14"	-6 m 25 s
18	3° 20' 01"	0.69"	3° 02' 58"	1° 19' 17"	0.9968267	16' 02.68"	23° 26' 14"	-6 m 24 s
19	3° 22' 30"	0.69"	3° 05' 15"	1° 20' 16"	0.9968382	16' 02.67"	23° 26' 15"	-6 m 23 s
20	3° 24' 58"	0.70"	3° 07' 32"	1° 21' 15"	0.9968498	16' 02.66"	23° 26' 15"	-6 m 23 s
21	3° 27' 27"	0.70"	3° 09' 48"	1° 22' 14"	0.9968614	16' 02.65"	23° 26' 15"	-6 m 22 s
22	3° 29' 56"	0.70"	3° 12' 05"	1° 23' 13"	0.9968730	16' 02.64"	23° 26' 15"	-6 m 21 s
23	3° 32' 24"	0.71"	3° 14' 21"	1° 24' 12"	0.9968846	16' 02.63"	23° 26' 15"	-6 m 20 s
24	3° 34' 53"	0.71"	3° 16' 38"	1° 25' 11"	0.9968962	16' 02.62"	23° 26' 15"	-6 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	108° 19' 32"	2° 53' 34"	110° 16' 50"	25° 02' 57"	0° 55' 56"	15' 14.64"	278° 44' 58"	0.63664
1	108° 50' 60"	2° 55' 50"	110° 51' 31"	25° 00' 49"	0° 55' 58"	15' 15.15"	279° 0' 18"	0.64068
2	109° 22' 30"	2° 58' 07"	111° 26' 14"	24° 58' 32"	0° 56' 00"	15' 15.68"	279° 15' 38"	0.64471
3	109° 54' 02"	3° 00' 22"	112° 00' 57"	24° 56' 07"	0° 56' 02"	15' 16.20"	279° 30' 59"	0.64874
4	110° 25' 36"	3° 02' 37"	112° 35' 42"	24° 53' 34"	0° 56' 04"	15' 16.73"	279° 46' 20"	0.65276
5	110° 57' 13"	3° 04' 50"	113° 10' 27"	24° 50' 53"	0° 56' 06"	15' 17.26"	280° 1' 42"	0.65677
6	111° 28' 53"	3° 07' 03"	113° 45' 14"	24° 48' 04"	0° 56' 08"	15' 17.79"	280° 17' 05"	0.66078
7	112° 00' 35"	3° 09' 16"	114° 20' 01"	24° 45' 06"	0° 56' 10"	15' 18.33"	280° 32' 28"	0.66478
8	112° 32' 19"	3° 11' 27"	114° 54' 49"	24° 41' 60"	0° 56' 12"	15' 18.88"	280° 47' 51"	0.66878
9	113° 04' 06"	3° 13' 38"	115° 29' 39"	24° 38' 46"	0° 56' 14"	15' 19.42"	281° 3' 15"	0.67277
10	113° 35' 55"	3° 15' 47"	116° 04' 29"	24° 35' 23"	0° 56' 16"	15' 19.97"	281° 18' 39"	0.67675
11	114° 07' 47"	3° 17' 56"	116° 39' 19"	24° 31' 52"	0° 56' 18"	15' 20.52"	281° 34' 03"	0.68072
12	114° 39' 42"	3° 20' 04"	117° 14' 10"	24° 28' 13"	0° 56' 20"	15' 21.08"	281° 49' 27"	0.68469
13	115° 11' 39"	3° 22' 11"	117° 49' 02"	24° 24' 26"	0° 56' 22"	15' 21.63"	282° 4' 51"	0.68864
14	115° 43' 38"	3° 24' 18"	118° 23' 54"	24° 20' 30"	0° 56' 24"	15' 22.19"	282° 20' 15"	0.69259
15	116° 15' 40"	3° 26' 23"	118° 58' 47"	24° 16' 26"	0° 56' 26"	15' 22.76"	282° 35' 39"	0.69653
16	116° 47' 45"	3° 28' 28"	119° 33' 41"	24° 12' 14"	0° 56' 28"	15' 23.32"	282° 51' 03"	0.70047
17	117° 19' 52"	3° 30' 31"	120° 08' 34"	24° 07' 53"	0° 56' 30"	15' 23.89"	283° 6' 26"	0.70439
18	117° 52' 03"	3° 32' 34"	120° 43' 28"	24° 03' 24"	0° 56' 33"	15' 24.47"	283° 21' 49"	0.70830
19	118° 24' 15"	3° 34' 35"	121° 18' 22"	23° 58' 47"	0° 56' 35"	15' 25.04"	283° 37' 12"	0.71220
20	118° 56' 31"	3° 36' 36"	121° 53' 17"	23° 54' 02"	0° 56' 37"	15' 25.62"	283° 52' 34"	0.71609
21	119° 28' 49"	3° 38' 35"	122° 28' 11"	23° 49' 08"	0° 56' 39"	15' 26.20"	284° 7' 56"	0.71998
22	120° 01' 09"	3° 40' 34"	123° 03' 06"	23° 44' 06"	0° 56' 41"	15' 26.78"	284° 23' 17"	0.72385
23	120° 33' 33"	3° 42' 31"	123° 38' 00"	23° 38' 56"	0° 56' 43"	15' 27.37"	284° 38' 37"	0.72770
24	121° 05' 59"	3° 44' 28"	124° 12' 55"	23° 33' 38"	0° 56' 45"	15' 27.96"	284° 53' 57"	0.73155

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	3° 34' 53"	0.71"	3° 16' 38"	1° 25' 11"	0.9968962	16' 02.62"	23° 26' 15"	-6 m 20 s
1	3° 37' 22"	0.71"	3° 18' 54"	1° 26' 10"	0.9969078	16' 02.61"	23° 26' 15"	-6 m 19 s
2	3° 39' 51"	0.72"	3° 21' 11"	1° 27' 09"	0.9969194	16' 02.60"	23° 26' 15"	-6 m 18 s
3	3° 42' 19"	0.72"	3° 23' 27"	1° 28' 09"	0.9969310	16' 02.58"	23° 26' 15"	-6 m 17 s
4	3° 44' 48"	0.72"	3° 25' 44"	1° 29' 08"	0.9969426	16' 02.57"	23° 26' 15"	-6 m 17 s
5	3° 47' 17"	0.73"	3° 28' 00"	1° 30' 07"	0.9969542	16' 02.56"	23° 26' 15"	-6 m 16 s
6	3° 49' 45"	0.73"	3° 30' 17"	1° 31' 06"	0.9969658	16' 02.55"	23° 26' 15"	-6 m 15 s
7	3° 52' 14"	0.73"	3° 32' 33"	1° 32' 05"	0.9969774	16' 02.54"	23° 26' 15"	-6 m 14 s
8	3° 54' 43"	0.74"	3° 34' 50"	1° 33' 04"	0.9969890	16' 02.53"	23° 26' 15"	-6 m 14 s
9	3° 57' 11"	0.74"	3° 37' 06"	1° 34' 03"	0.9970006	16' 02.52"	23° 26' 15"	-6 m 13 s
10	3° 59' 40"	0.74"	3° 39' 23"	1° 35' 02"	0.9970122	16' 02.51"	23° 26' 15"	-6 m 12 s
11	4° 02' 09"	0.75"	3° 41' 39"	1° 36' 01"	0.9970238	16' 02.49"	23° 26' 15"	-6 m 11 s
12	4° 04' 37"	0.75"	3° 43' 56"	1° 36' 60"	0.9970354	16' 02.48"	23° 26' 15"	-6 m 11 s
13	4° 07' 06"	0.75"	3° 46' 12"	1° 37' 59"	0.9970471	16' 02.47"	23° 26' 15"	-6 m 10 s
14	4° 09' 35"	0.75"	3° 48' 29"	1° 38' 58"	0.9970587	16' 02.46"	23° 26' 15"	-6 m 09 s
15	4° 12' 03"	0.76"	3° 50' 45"	1° 39' 57"	0.9970703	16' 02.45"	23° 26' 15"	-6 m 08 s
16	4° 14' 32"	0.76"	3° 53' 02"	1° 40' 56"	0.9970820	16' 02.44"	23° 26' 15"	-6 m 08 s
17	4° 17' 01"	0.76"	3° 55' 18"	1° 41' 55"	0.9970936	16' 02.43"	23° 26' 15"	-6 m 07 s
18	4° 19' 29"	0.76"	3° 57' 35"	1° 42' 54"	0.9971052	16' 02.42"	23° 26' 15"	-6 m 06 s
19	4° 21' 58"	0.77"	3° 59' 51"	1° 43' 53"	0.9971169	16' 02.40"	23° 26' 15"	-6 m 05 s
20	4° 24' 27"	0.77"	4° 02' 08"	1° 44' 52"	0.9971285	16' 02.39"	23° 26' 15"	-6 m 05 s
21	4° 26' 55"	0.77"	4° 04' 24"	1° 45' 51"	0.9971402	16' 02.38"	23° 26' 15"	-6 m 04 s
22	4° 29' 24"	0.77"	4° 06' 41"	1° 46' 50"	0.9971518	16' 02.37"	23° 26' 15"	-6 m 03 s
23	4° 31' 53"	0.78"	4° 08' 57"	1° 47' 49"	0.9971635	16' 02.36"	23° 26' 15"	-6 m 02 s
24	4° 34' 21"	0.78"	4° 11' 14"	1° 48' 48"	0.9971751	16' 02.35"	23° 26' 15"	-6 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	121° 05' 59"	3° 44' 28"	124° 12' 55"	23° 33' 38"	0° 56' 45"	15' 27.96"	284° 53' 57"	0.73155
1	121° 38' 28"	3° 46' 23"	124° 47' 50"	23° 28' 11"	0° 56' 48"	15' 28.55"	285° 9' 16"	0.73539
2	122° 10' 60"	3° 48' 18"	125° 22' 44"	23° 22' 36"	0° 56' 50"	15' 29.14"	285° 24' 35"	0.73921
3	122° 43' 34"	3° 50' 11"	125° 57' 38"	23° 16' 53"	0° 56' 52"	15' 29.74"	285° 39' 52"	0.74302
4	123° 16' 12"	3° 52' 03"	126° 32' 32"	23° 11' 02"	0° 56' 54"	15' 30.33"	285° 55' 09"	0.74682
5	123° 48' 52"	3° 53' 54"	127° 07' 26"	23° 05' 02"	0° 56' 56"	15' 30.93"	286° 10' 25"	0.75060
6	124° 21' 35"	3° 55' 44"	127° 42' 20"	22° 58' 55"	0° 56' 58"	15' 31.53"	286° 25' 40"	0.75437
7	124° 54' 20"	3° 57' 33"	128° 17' 13"	22° 52' 39"	0° 57' 01"	15' 32.14"	286° 40' 54"	0.75813
8	125° 27' 09"	3° 59' 21"	128° 52' 06"	22° 46' 15"	0° 57' 03"	15' 32.74"	286° 56' 07"	0.76187
9	126° 00' 00"	4° 01' 07"	129° 26' 58"	22° 39' 43"	0° 57' 05"	15' 33.35"	287° 11' 18"	0.76559
10	126° 32' 55"	4° 02' 53"	130° 01' 50"	22° 33' 03"	0° 57' 07"	15' 33.96"	287° 26' 29"	0.76931
11	127° 05' 52"	4° 04' 37"	130° 36' 41"	22° 26' 14"	0° 57' 10"	15' 34.57"	287° 41' 39"	0.77300
12	127° 38' 52"	4° 06' 20"	131° 11' 32"	22° 19' 18"	0° 57' 12"	15' 35.18"	287° 56' 48"	0.77668
13	128° 11' 55"	4° 08' 01"	131° 46' 22"	22° 12' 14"	0° 57' 14"	15' 35.80"	288° 11' 56"	0.78034
14	128° 45' 01"	4° 09' 42"	132° 21' 12"	22° 05' 01"	0° 57' 16"	15' 36.41"	288° 27' 03"	0.78399
15	129° 18' 09"	4° 11' 21"	132° 56' 01"	21° 57' 41"	0° 57' 19"	15' 37.03"	288° 42' 08"	0.78762
16	129° 51' 21"	4° 12' 59"	133° 30' 49"	21° 50' 12"	0° 57' 21"	15' 37.65"	288° 57' 13"	0.79123
17	130° 24' 35"	4° 14' 35"	134° 05' 36"	21° 42' 36"	0° 57' 23"	15' 38.27"	289° 12' 16"	0.79483
18	130° 57' 53"	4° 16' 11"	134° 40' 23"	21° 34' 52"	0° 57' 25"	15' 38.89"	289° 27' 18"	0.79841
19	131° 31' 13"	4° 17' 45"	135° 15' 09"	21° 26' 60"	0° 57' 28"	15' 39.51"	289° 42' 20"	0.80197
20	132° 04' 37"	4° 19' 17"	135° 49' 54"	21° 18' 60"	0° 57' 30"	15' 40.13"	289° 57' 20"	0.80550
21	132° 38' 03"	4° 20' 48"	136° 24' 38"	21° 10' 52"	0° 57' 32"	15' 40.75"	290° 12' 19"	0.80903
22	133° 11' 32"	4° 22' 18"	136° 59' 21"	21° 02' 36"	0° 57' 35"	15' 41.38"	290° 27' 17"	0.81253
23	133° 45' 04"	4° 23' 47"	137° 34' 03"	20° 54' 13"	0° 57' 37"	15' 42.00"	290° 42' 15"	0.81601
24	134° 18' 40"	4° 25' 14"	138° 08' 44"	20° 45' 42"	0° 57' 39"	15' 42.63"	290° 57' 11"	0.81947

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	4° 34' 21"	0.78"	4° 11' 14"	1° 48' 48"	0.9971751	16' 02.35"	23° 26' 15"	-6 m 02 s
1	4° 36' 50"	0.78"	4° 13' 30"	1° 49' 47"	0.9971868	16' 02.34"	23° 26' 15"	-6 m 01 s
2	4° 39' 18"	0.78"	4° 15' 47"	1° 50' 45"	0.9971984	16' 02.33"	23° 26' 15"	-6 m 00 s
3	4° 41' 47"	0.79"	4° 18' 03"	1° 51' 44"	0.9972101	16' 02.31"	23° 26' 15"	-5 m 59 s
4	4° 44' 16"	0.79"	4° 20' 20"	1° 52' 43"	0.9972218	16' 02.30"	23° 26' 15"	-5 m 59 s
5	4° 46' 44"	0.79"	4° 22' 36"	1° 53' 42"	0.9972334	16' 02.29"	23° 26' 15"	-5 m 58 s
6	4° 49' 13"	0.79"	4° 24' 53"	1° 54' 41"	0.9972451	16' 02.28"	23° 26' 15"	-5 m 57 s
7	4° 51' 41"	0.79"	4° 27' 09"	1° 55' 40"	0.9972568	16' 02.27"	23° 26' 15"	-5 m 56 s
8	4° 54' 10"	0.80"	4° 29' 26"	1° 56' 39"	0.9972685	16' 02.26"	23° 26' 15"	-5 m 55 s
9	4° 56' 39"	0.80"	4° 31' 42"	1° 57' 38"	0.9972801	16' 02.25"	23° 26' 15"	-5 m 55 s
10	4° 59' 07"	0.80"	4° 33' 59"	1° 58' 37"	0.9972918	16' 02.24"	23° 26' 15"	-5 m 54 s
11	5° 01' 36"	0.80"	4° 36' 15"	1° 59' 36"	0.9973035	16' 02.22"	23° 26' 15"	-5 m 53 s
12	5° 04' 04"	0.80"	4° 38' 32"	2° 00' 35"	0.9973152	16' 02.21"	23° 26' 15"	-5 m 52 s
13	5° 06' 33"	0.80"	4° 40' 48"	2° 01' 34"	0.9973269	16' 02.20"	23° 26' 15"	-5 m 52 s
14	5° 09' 01"	0.81"	4° 43' 05"	2° 02' 33"	0.9973386	16' 02.19"	23° 26' 15"	-5 m 51 s
15	5° 11' 30"	0.81"	4° 45' 21"	2° 03' 31"	0.9973503	16' 02.18"	23° 26' 15"	-5 m 50 s
16	5° 13' 59"	0.81"	4° 47' 38"	2° 04' 30"	0.9973620	16' 02.17"	23° 26' 15"	-5 m 49 s
17	5° 16' 27"	0.81"	4° 49' 54"	2° 05' 29"	0.9973737	16' 02.16"	23° 26' 15"	-5 m 49 s
18	5° 18' 56"	0.81"	4° 52' 11"	2° 06' 28"	0.9973854	16' 02.15"	23° 26' 15"	-5 m 48 s
19	5° 21' 24"	0.81"	4° 54' 27"	2° 07' 27"	0.9973971	16' 02.13"	23° 26' 15"	-5 m 47 s
20	5° 23' 53"	0.81"	4° 56' 43"	2° 08' 26"	0.9974088	16' 02.12"	23° 26' 15"	-5 m 46 s
21	5° 26' 21"	0.82"	4° 58' 60"	2° 09' 25"	0.9974206	16' 02.11"	23° 26' 15"	-5 m 46 s
22	5° 28' 50"	0.82"	5° 01' 16"	2° 10' 23"	0.9974323	16' 02.10"	23° 26' 15"	-5 m 45 s
23	5° 31' 18"	0.82"	5° 03' 33"	2° 11' 22"	0.9974440	16' 02.09"	23° 26' 15"	-5 m 44 s
24	5° 33' 47"	0.82"	5° 05' 49"	2° 12' 21"	0.9974557	16' 02.08"	23° 26' 15"	-5 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	134° 18' 40"	4° 25' 14"	138° 08' 44"	20° 45' 42"	0° 57' 39"	15' 42.63"	290° 57' 11"	0.81947
1	134° 52' 18"	4° 26' 40"	138° 43' 24"	20° 37' 03"	0° 57' 41"	15' 43.25"	291° 12' 07"	0.82291
2	135° 25' 59"	4° 28' 04"	139° 18' 03"	20° 28' 17"	0° 57' 44"	15' 43.88"	291° 27' 02"	0.82632
3	135° 59' 43"	4° 29' 27"	139° 52' 41"	20° 19' 23"	0° 57' 46"	15' 44.51"	291° 41' 56"	0.82972
4	136° 33' 30"	4° 30' 48"	140° 27' 18"	20° 10' 21"	0° 57' 48"	15' 45.14"	291° 56' 49"	0.83310
5	137° 07' 20"	4° 32' 08"	141° 01' 54"	20° 01' 12"	0° 57' 51"	15' 45.76"	292° 11' 42"	0.83645
6	137° 41' 13"	4° 33' 26"	141° 36' 28"	19° 51' 55"	0° 57' 53"	15' 46.39"	292° 26' 34"	0.83978
7	138° 15' 09"	4° 34' 43"	142° 11' 02"	19° 42' 31"	0° 57' 55"	15' 47.02"	292° 41' 26"	0.84309
8	138° 49' 08"	4° 35' 59"	142° 45' 34"	19° 32' 59"	0° 57' 58"	15' 47.65"	292° 56' 18"	0.84637
9	139° 23' 10"	4° 37' 13"	143° 20' 05"	19° 23' 20"	0° 57' 60"	15' 48.27"	293° 11' 09"	0.84963
10	139° 57' 15"	4° 38' 25"	143° 54' 35"	19° 13' 34"	0° 58' 02"	15' 48.90"	293° 26' 01"	0.85286
11	140° 31' 23"	4° 39' 36"	144° 29' 04"	19° 03' 40"	0° 58' 05"	15' 49.53"	293° 40' 52"	0.85607
12	141° 05' 34"	4° 40' 45"	145° 03' 31"	18° 53' 39"	0° 58' 07"	15' 50.16"	293° 55' 44"	0.85926
13	141° 39' 48"	4° 41' 53"	145° 37' 57"	18° 43' 31"	0° 58' 09"	15' 50.78"	294° 10' 36"	0.86242
14	142° 14' 04"	4° 42' 59"	146° 12' 22"	18° 33' 16"	0° 58' 11"	15' 51.41"	294° 25' 29"	0.86555
15	142° 48' 24"	4° 44' 03"	146° 46' 46"	18° 22' 54"	0° 58' 14"	15' 52.03"	294° 40' 22"	0.86866
16	143° 22' 47"	4° 45' 06"	147° 21' 08"	18° 12' 24"	0° 58' 16"	15' 52.66"	294° 55' 17"	0.87174
17	143° 57' 13"	4° 46' 07"	147° 55' 29"	18° 01' 48"	0° 58' 18"	15' 53.28"	295° 10' 13"	0.87479
18	144° 31' 42"	4° 47' 07"	148° 29' 48"	17° 51' 04"	0° 58' 21"	15' 53.90"	295° 25' 10"	0.87782
19	145° 06' 13"	4° 48' 05"	149° 04' 07"	17° 40' 14"	0° 58' 23"	15' 54.52"	295° 40' 08"	0.88081
20	145° 40' 48"	4° 49' 01"	149° 38' 24"	17° 29' 17"	0° 58' 25"	15' 55.14"	295° 55' 09"	0.88378
21	146° 15' 25"	4° 49' 55"	150° 12' 39"	17° 18' 13"	0° 58' 27"	15' 55.76"	296° 10' 12"	0.88672
22	146° 50' 06"	4° 50' 48"	150° 46' 54"	17° 07' 02"	0° 58' 30"	15' 56.38"	296° 25' 17"	0.88964
23	147° 24' 49"	4° 51' 39"	151° 21' 07"	16° 55' 45"	0° 58' 32"	15' 57.00"	296° 40' 26"	0.89252
24	147° 59' 36"	4° 52' 28"	151° 55' 18"	16° 44' 21"	0° 58' 34"	15' 57.61"	296° 55' 37"	0.89537

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	5° 33' 47"	0.82"	5° 05' 49"	2° 12' 21"	0.9974557	16' 02.08"	23° 26' 15"	-5 m 43 s
1	5° 36' 15"	0.82"	5° 08' 06"	2° 13' 20"	0.9974675	16' 02.07"	23° 26' 15"	-5 m 43 s
2	5° 38' 44"	0.82"	5° 10' 22"	2° 14' 19"	0.9974792	16' 02.06"	23° 26' 15"	-5 m 42 s
3	5° 41' 12"	0.82"	5° 12' 39"	2° 15' 18"	0.9974909	16' 02.04"	23° 26' 15"	-5 m 41 s
4	5° 43' 41"	0.82"	5° 14' 55"	2° 16' 17"	0.9975027	16' 02.03"	23° 26' 15"	-5 m 40 s
5	5° 46' 09"	0.82"	5° 17' 12"	2° 17' 15"	0.9975144	16' 02.02"	23° 26' 15"	-5 m 40 s
6	5° 48' 38"	0.82"	5° 19' 28"	2° 18' 14"	0.9975262	16' 02.01"	23° 26' 15"	-5 m 39 s
7	5° 51' 06"	0.83"	5° 21' 45"	2° 19' 13"	0.9975379	16' 02.00"	23° 26' 15"	-5 m 38 s
8	5° 53' 35"	0.83"	5° 24' 01"	2° 20' 12"	0.9975497	16' 01.99"	23° 26' 15"	-5 m 37 s
9	5° 56' 03"	0.83"	5° 26' 18"	2° 21' 11"	0.9975614	16' 01.98"	23° 26' 15"	-5 m 37 s
10	5° 58' 32"	0.83"	5° 28' 34"	2° 22' 09"	0.9975732	16' 01.96"	23° 26' 15"	-5 m 36 s
11	6° 01' 00"	0.83"	5° 30' 51"	2° 23' 08"	0.9975849	16' 01.95"	23° 26' 15"	-5 m 35 s
12	6° 03' 29"	0.83"	5° 33' 07"	2° 24' 07"	0.9975967	16' 01.94"	23° 26' 15"	-5 m 34 s
13	6° 05' 57"	0.83"	5° 35' 23"	2° 25' 06"	0.9976085	16' 01.93"	23° 26' 15"	-5 m 34 s
14	6° 08' 26"	0.83"	5° 37' 40"	2° 26' 04"	0.9976203	16' 01.92"	23° 26' 15"	-5 m 33 s
15	6° 10' 54"	0.83"	5° 39' 56"	2° 27' 03"	0.9976320	16' 01.91"	23° 26' 15"	-5 m 32 s
16	6° 13' 23"	0.83"	5° 42' 13"	2° 28' 02"	0.9976438	16' 01.90"	23° 26' 15"	-5 m 31 s
17	6° 15' 51"	0.83"	5° 44' 29"	2° 29' 01"	0.9976556	16' 01.89"	23° 26' 15"	-5 m 31 s
18	6° 18' 20"	0.83"	5° 46' 46"	2° 29' 59"	0.9976674	16' 01.87"	23° 26' 15"	-5 m 30 s
19	6° 20' 48"	0.83"	5° 49' 02"	2° 30' 58"	0.9976792	16' 01.86"	23° 26' 15"	-5 m 29 s
20	6° 23' 17"	0.83"	5° 51' 19"	2° 31' 57"	0.9976910	16' 01.85"	23° 26' 15"	-5 m 28 s
21	6° 25' 45"	0.83"	5° 53' 35"	2° 32' 56"	0.9977028	16' 01.84"	23° 26' 15"	-5 m 28 s
22	6° 28' 13"	0.83"	5° 55' 52"	2° 33' 54"	0.9977146	16' 01.83"	23° 26' 15"	-5 m 27 s
23	6° 30' 42"	0.83"	5° 58' 08"	2° 34' 53"	0.9977264	16' 01.82"	23° 26' 15"	-5 m 26 s
24	6° 33' 10"	0.83"	6° 00' 25"	2° 35' 52"	0.9977382	16' 01.81"	23° 26' 15"	-5 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	147° 59' 36"	4° 52' 28"	151° 55' 18"	16° 44' 21"	0° 58' 34"	15' 57.61"	296° 55' 37"	0.89537
1	148° 34' 25"	4° 53' 16"	152° 29' 29"	16° 32' 50"	0° 58' 36"	15' 58.22"	297° 10' 53"	0.89819
2	149° 09' 17"	4° 54' 02"	153° 03' 37"	16° 21' 13"	0° 58' 39"	15' 58.84"	297° 26' 12"	0.90098
3	149° 44' 12"	4° 54' 46"	153° 37' 45"	16° 09' 30"	0° 58' 41"	15' 59.44"	297° 41' 35"	0.90374
4	150° 19' 10"	4° 55' 28"	154° 11' 51"	15° 57' 40"	0° 58' 43"	16' 00.05"	297° 57' 04"	0.90647
5	150° 54' 11"	4° 56' 09"	154° 45' 56"	15° 45' 43"	0° 58' 45"	16' 00.66"	298° 12' 38"	0.90916
6	151° 29' 15"	4° 56' 47"	155° 19' 60"	15° 33' 41"	0° 58' 48"	16' 01.26"	298° 28' 18"	0.91183
7	152° 04' 21"	4° 57' 24"	155° 54' 02"	15° 21' 32"	0° 58' 50"	16' 01.86"	298° 44' 05"	0.91446
8	152° 39' 31"	4° 57' 59"	156° 28' 03"	15° 09' 17"	0° 58' 52"	16' 02.46"	298° 59' 59"	0.91705
9	153° 14' 43"	4° 58' 32"	157° 02' 03"	14° 56' 56"	0° 58' 54"	16' 03.05"	299° 16' 00"	0.91962
10	153° 49' 58"	4° 59' 04"	157° 36' 01"	14° 44' 29"	0° 58' 56"	16' 03.65"	299° 32' 11"	0.92214
11	154° 25' 16"	4° 59' 33"	158° 09' 59"	14° 31' 56"	0° 58' 59"	16' 04.24"	299° 48' 30"	0.92464
12	155° 00' 36"	5° 00' 01"	158° 43' 55"	14° 19' 17"	0° 59' 01"	16' 04.82"	300° 5' 00"	0.92710
13	155° 35' 60"	5° 00' 27"	159° 17' 49"	14° 06' 32"	0° 59' 03"	16' 05.41"	300° 21' 41"	0.92952
14	156° 11' 26"	5° 00' 50"	159° 51' 43"	13° 53' 42"	0° 59' 05"	16' 05.99"	300° 38' 34"	0.93191
15	156° 46' 55"	5° 01' 12"	160° 25' 35"	13° 40' 46"	0° 59' 07"	16' 06.57"	300° 55' 40"	0.93427
16	157° 22' 26"	5° 01' 32"	160° 59' 26"	13° 27' 44"	0° 59' 09"	16' 07.15"	301° 13' 01"	0.93658
17	157° 58' 01"	5° 01' 50"	161° 33' 16"	13° 14' 37"	0° 59' 11"	16' 07.72"	301° 30' 37"	0.93886
18	158° 33' 38"	5° 02' 07"	162° 07' 05"	13° 01' 24"	0° 59' 13"	16' 08.29"	301° 48' 30"	0.94110
19	159° 09' 17"	5° 02' 21"	162° 40' 53"	12° 48' 06"	0° 59' 15"	16' 08.85"	302° 6' 40"	0.94331
20	159° 44' 59"	5° 02' 33"	163° 14' 39"	12° 34' 43"	0° 59' 18"	16' 09.41"	302° 25' 11"	0.94548
21	160° 20' 44"	5° 02' 43"	163° 48' 24"	12° 21' 14"	0° 59' 20"	16' 09.97"	302° 44' 03"	0.94761
22	160° 56' 32"	5° 02' 52"	164° 22' 09"	12° 07' 41"	0° 59' 22"	16' 10.52"	303° 3' 19"	0.94970
23	161° 32' 22"	5° 02' 58"	164° 55' 52"	11° 54' 02"	0° 59' 24"	16' 11.07"	303° 22' 60"	0.95175
24	162° 08' 15"	5° 03' 02"	165° 29' 35"	11° 40' 18"	0° 59' 26"	16' 11.62"	303° 43' 08"	0.95376

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	6° 33' 10"	0.83"	6° 00' 25"	2° 35' 52"	0.9977382	16' 01.81"	23° 26' 15"	-5 m 25 s
1	6° 35' 39"	0.83"	6° 02' 41"	2° 36' 51"	0.9977500	16' 01.79"	23° 26' 15"	-5 m 25 s
2	6° 38' 07"	0.83"	6° 04' 57"	2° 37' 49"	0.9977618	16' 01.78"	23° 26' 15"	-5 m 24 s
3	6° 40' 36"	0.83"	6° 07' 14"	2° 38' 48"	0.9977736	16' 01.77"	23° 26' 15"	-5 m 23 s
4	6° 43' 04"	0.83"	6° 09' 30"	2° 39' 47"	0.9977854	16' 01.76"	23° 26' 15"	-5 m 22 s
5	6° 45' 32"	0.83"	6° 11' 47"	2° 40' 45"	0.9977972	16' 01.75"	23° 26' 15"	-5 m 21 s
6	6° 48' 01"	0.83"	6° 14' 03"	2° 41' 44"	0.9978091	16' 01.74"	23° 26' 15"	-5 m 21 s
7	6° 50' 29"	0.83"	6° 16' 20"	2° 42' 43"	0.9978209	16' 01.73"	23° 26' 15"	-5 m 20 s
8	6° 52' 58"	0.83"	6° 18' 36"	2° 43' 41"	0.9978327	16' 01.71"	23° 26' 15"	-5 m 19 s
9	6° 55' 26"	0.83"	6° 20' 53"	2° 44' 40"	0.9978446	16' 01.70"	23° 26' 15"	-5 m 19 s
10	6° 57' 55"	0.82"	6° 23' 09"	2° 45' 39"	0.9978564	16' 01.69"	23° 26' 15"	-5 m 18 s
11	7° 00' 23"	0.82"	6° 25' 26"	2° 46' 37"	0.9978683	16' 01.68"	23° 26' 15"	-5 m 17 s
12	7° 02' 51"	0.82"	6° 27' 42"	2° 47' 36"	0.9978801	16' 01.67"	23° 26' 15"	-5 m 16 s
13	7° 05' 20"	0.82"	6° 29' 59"	2° 48' 35"	0.9978920	16' 01.66"	23° 26' 15"	-5 m 15 s
14	7° 07' 48"	0.82"	6° 32' 15"	2° 49' 33"	0.9979038	16' 01.65"	23° 26' 15"	-5 m 15 s
15	7° 10' 16"	0.82"	6° 34' 31"	2° 50' 32"	0.9979157	16' 01.63"	23° 26' 15"	-5 m 14 s
16	7° 12' 45"	0.82"	6° 36' 48"	2° 51' 31"	0.9979275	16' 01.62"	23° 26' 15"	-5 m 13 s
17	7° 15' 13"	0.82"	6° 39' 04"	2° 52' 29"	0.9979394	16' 01.61"	23° 26' 15"	-5 m 12 s
18	7° 17' 42"	0.82"	6° 41' 21"	2° 53' 28"	0.9979513	16' 01.60"	23° 26' 15"	-5 m 12 s
19	7° 20' 10"	0.82"	6° 43' 37"	2° 54' 26"	0.9979631	16' 01.59"	23° 26' 15"	-5 m 11 s
20	7° 22' 38"	0.81"	6° 45' 54"	2° 55' 25"	0.9979750	16' 01.58"	23° 26' 15"	-5 m 10 s
21	7° 25' 07"	0.81"	6° 48' 10"	2° 56' 24"	0.9979869	16' 01.57"	23° 26' 15"	-5 m 09 s
22	7° 27' 35"	0.81"	6° 50' 27"	2° 57' 22"	0.9979988	16' 01.55"	23° 26' 15"	-5 m 09 s
23	7° 30' 03"	0.81"	6° 52' 43"	2° 58' 21"	0.9980106	16' 01.54"	23° 26' 15"	-5 m 08 s
24	7° 32' 32"	0.81"	6° 54' 60"	2° 59' 19"	0.9980225	16' 01.53"	23° 26' 15"	-5 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	162° 08' 15"	5° 03' 02"	165° 29' 35"	11° 40' 18"	0° 59' 26"	16' 11.62"	303° 43' 08"	0.95376
1	162° 44' 10"	5° 03' 05"	166° 03' 16"	11° 26' 29"	0° 59' 28"	16' 12.16"	304° 3' 46"	0.95573
2	163° 20' 07"	5° 03' 05"	166° 36' 56"	11° 12' 36"	0° 59' 30"	16' 12.70"	304° 24' 57"	0.95766
3	163° 56' 08"	5° 03' 04"	167° 10' 36"	10° 58' 37"	0° 59' 32"	16' 13.23"	304° 46' 42"	0.95955
4	164° 32' 10"	5° 02' 60"	167° 44' 15"	10° 44' 34"	0° 59' 33"	16' 13.76"	305° 9' 07"	0.96140
5	165° 08' 15"	5° 02' 54"	168° 17' 52"	10° 30' 27"	0° 59' 35"	16' 14.29"	305° 32' 13"	0.96321
6	165° 44' 23"	5° 02' 47"	168° 51' 29"	10° 16' 15"	0° 59' 37"	16' 14.81"	305° 56' 04"	0.96498
7	166° 20' 33"	5° 02' 37"	169° 25' 05"	10° 01' 58"	0° 59' 39"	16' 15.32"	306° 20' 45"	0.96670
8	166° 56' 45"	5° 02' 25"	169° 58' 41"	9° 47' 37"	0° 59' 41"	16' 15.83"	306° 46' 21"	0.96839
9	167° 32' 60"	5° 02' 11"	170° 32' 15"	9° 33' 12"	0° 59' 43"	16' 16.34"	307° 12' 56"	0.97003
10	168° 09' 17"	5° 01' 55"	171° 05' 49"	9° 18' 43"	0° 59' 45"	16' 16.84"	307° 40' 37"	0.97162
11	168° 45' 36"	5° 01' 38"	171° 39' 23"	9° 04' 09"	0° 59' 47"	16' 17.33"	308° 9' 29"	0.97318
12	169° 21' 57"	5° 01' 18"	172° 12' 55"	8° 49' 32"	0° 59' 48"	16' 17.82"	308° 39' 39"	0.97469
13	169° 58' 21"	5° 00' 56"	172° 46' 27"	8° 34' 51"	0° 59' 50"	16' 18.31"	309° 11' 16"	0.97616
14	170° 34' 47"	5° 00' 32"	173° 19' 59"	8° 20' 05"	0° 59' 52"	16' 18.79"	309° 44' 29"	0.97758
15	171° 11' 15"	5° 00' 05"	173° 53' 30"	8° 05' 16"	0° 59' 54"	16' 19.26"	310° 19' 26"	0.97896
16	171° 47' 45"	4° 59' 37"	174° 27' 00"	7° 50' 24"	0° 59' 55"	16' 19.73"	310° 56' 21"	0.98029
17	172° 24' 17"	4° 59' 07"	175° 00' 31"	7° 35' 28"	0° 59' 57"	16' 20.19"	311° 35' 24"	0.98158
18	173° 00' 52"	4° 58' 35"	175° 34' 00"	7° 20' 28"	0° 59' 59"	16' 20.65"	312° 16' 52"	0.98282
19	173° 37' 28"	4° 58' 00"	176° 07' 30"	7° 05' 25"	1° 00' 00"	16' 21.10"	313° 1' 01"	0.98402
20	174° 14' 07"	4° 57' 24"	176° 40' 59"	6° 50' 19"	1° 00' 02"	16' 21.55"	313° 48' 09"	0.98517
21	174° 50' 47"	4° 56' 45"	177° 14' 28"	6° 35' 10"	1° 00' 04"	16' 21.98"	314° 38' 39"	0.98627
22	175° 27' 30"	4° 56' 04"	177° 47' 56"	6° 19' 57"	1° 00' 05"	16' 22.42"	315° 32' 55"	0.98733
23	176° 04' 14"	4° 55' 22"	178° 21' 25"	6° 04' 42"	1° 00' 07"	16' 22.84"	316° 31' 27"	0.98834
24	176° 40' 60"	4° 54' 37"	178° 54' 53"	5° 49' 24"	1° 00' 08"	16' 23.27"	317° 34' 49"	0.98931

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	7° 32' 32"	0.81"	6° 54' 60"	2° 59' 19"	0.9980225	16' 01.53"	23° 26' 15"	-5 m 07 s
1	7° 35' 00"	0.81"	6° 57' 16"	3° 00' 18"	0.9980344	16' 01.52"	23° 26' 15"	-5 m 06 s
2	7° 37' 28"	0.81"	6° 59' 33"	3° 01' 16"	0.9980463	16' 01.51"	23° 26' 15"	-5 m 06 s
3	7° 39' 57"	0.80"	7° 01' 49"	3° 02' 15"	0.9980582	16' 01.50"	23° 26' 15"	-5 m 05 s
4	7° 42' 25"	0.80"	7° 04' 06"	3° 03' 14"	0.9980701	16' 01.49"	23° 26' 15"	-5 m 04 s
5	7° 44' 53"	0.80"	7° 06' 22"	3° 04' 12"	0.9980820	16' 01.47"	23° 26' 15"	-5 m 03 s
6	7° 47' 22"	0.80"	7° 08' 39"	3° 05' 11"	0.9980939	16' 01.46"	23° 26' 15"	-5 m 03 s
7	7° 49' 50"	0.80"	7° 10' 55"	3° 06' 09"	0.9981058	16' 01.45"	23° 26' 15"	-5 m 02 s
8	7° 52' 18"	0.80"	7° 13' 12"	3° 07' 08"	0.9981178	16' 01.44"	23° 26' 15"	-5 m 01 s
9	7° 54' 47"	0.79"	7° 15' 28"	3° 08' 06"	0.9981297	16' 01.43"	23° 26' 15"	-5 m 00 s
10	7° 57' 15"	0.79"	7° 17' 44"	3° 09' 05"	0.9981416	16' 01.42"	23° 26' 15"	-4 m 60 s
11	7° 59' 43"	0.79"	7° 20' 01"	3° 10' 03"	0.9981535	16' 01.41"	23° 26' 15"	-4 m 59 s
12	8° 02' 12"	0.79"	7° 22' 17"	3° 11' 02"	0.9981655	16' 01.39"	23° 26' 15"	-4 m 58 s
13	8° 04' 40"	0.79"	7° 24' 34"	3° 12' 00"	0.9981774	16' 01.38"	23° 26' 15"	-4 m 57 s
14	8° 07' 08"	0.78"	7° 26' 50"	3° 12' 59"	0.9981893	16' 01.37"	23° 26' 15"	-4 m 57 s
15	8° 09' 36"	0.78"	7° 29' 07"	3° 13' 57"	0.9982013	16' 01.36"	23° 26' 15"	-4 m 56 s
16	8° 12' 05"	0.78"	7° 31' 23"	3° 14' 56"	0.9982132	16' 01.35"	23° 26' 15"	-4 m 55 s
17	8° 14' 33"	0.78"	7° 33' 40"	3° 15' 54"	0.9982252	16' 01.34"	23° 26' 15"	-4 m 54 s
18	8° 17' 01"	0.77"	7° 35' 56"	3° 16' 53"	0.9982371	16' 01.32"	23° 26' 15"	-4 m 54 s
19	8° 19' 30"	0.77"	7° 38' 13"	3° 17' 51"	0.9982491	16' 01.31"	23° 26' 15"	-4 m 53 s
20	8° 21' 58"	0.77"	7° 40' 29"	3° 18' 49"	0.9982610	16' 01.30"	23° 26' 15"	-4 m 52 s
21	8° 24' 26"	0.77"	7° 42' 46"	3° 19' 48"	0.9982730	16' 01.29"	23° 26' 15"	-4 m 51 s
22	8° 26' 54"	0.76"	7° 45' 02"	3° 20' 46"	0.9982849	16' 01.28"	23° 26' 15"	-4 m 51 s
23	8° 29' 23"	0.76"	7° 47' 19"	3° 21' 45"	0.9982969	16' 01.27"	23° 26' 15"	-4 m 50 s
24	8° 31' 51"	0.76"	7° 49' 35"	3° 22' 43"	0.9983089	16' 01.26"	23° 26' 15"	-4 m 49 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	176° 40' 60"	4° 54' 37"	178° 54' 53"	5° 49' 24"	1° 00' 08"	16' 23.27"	317° 34' 49"	0.98931
1	177° 17' 48"	4° 53' 50"	179° 28' 22"	5° 34' 02"	1° 00' 10"	16' 23.68"	318° 43' 41"	0.99022
2	177° 54' 38"	4° 53' 01"	180° 01' 50"	5° 18' 39"	1° 00' 11"	16' 24.09"	319° 58' 47"	0.99109
3	178° 31' 29"	4° 52' 10"	180° 35' 18"	5° 03' 12"	1° 00' 13"	16' 24.49"	321° 21' 04"	0.99192
4	179° 08' 23"	4° 51' 17"	181° 08' 46"	4° 47' 43"	1° 00' 14"	16' 24.88"	322° 51' 34"	0.99269
5	179° 45' 18"	4° 50' 21"	181° 42' 15"	4° 32' 12"	1° 00' 16"	16' 25.27"	324° 31' 33"	0.99342
6	180° 22' 15"	4° 49' 24"	182° 15' 43"	4° 16' 38"	1° 00' 17"	16' 25.65"	326° 22' 30"	0.99409
7	180° 59' 13"	4° 48' 25"	182° 49' 12"	4° 01' 02"	1° 00' 18"	16' 26.03"	328° 26' 09"	0.99472
8	181° 36' 13"	4° 47' 23"	183° 22' 41"	3° 45' 24"	1° 00' 20"	16' 26.40"	330° 44' 35"	0.99530
9	182° 13' 15"	4° 46' 20"	183° 56' 11"	3° 29' 44"	1° 00' 21"	16' 26.76"	333° 20' 10"	0.99584
10	182° 50' 18"	4° 45' 14"	184° 29' 40"	3° 14' 02"	1° 00' 22"	16' 27.11"	336° 15' 41"	0.99632
11	183° 27' 22"	4° 44' 07"	185° 03' 10"	2° 58' 18"	1° 00' 24"	16' 27.46"	339° 34' 15"	0.99675
12	184° 04' 28"	4° 42' 57"	185° 36' 41"	2° 42' 33"	1° 00' 25"	16' 27.80"	343° 19' 13"	0.99713
13	184° 41' 36"	4° 41' 45"	186° 10' 12"	2° 26' 46"	1° 00' 26"	16' 28.13"	347° 34' 02"	0.99747
14	185° 18' 44"	4° 40' 32"	186° 43' 44"	2° 10' 57"	1° 00' 27"	16' 28.46"	352° 21' 46"	0.99775
15	185° 55' 55"	4° 39' 16"	187° 17' 16"	1° 55' 07"	1° 00' 29"	16' 28.77"	357° 44' 30"	0.99799
16	186° 33' 06"	4° 37' 58"	187° 50' 49"	1° 39' 16"	1° 00' 30"	16' 29.08"	3° 42' 24"	0.99817
17	187° 10' 19"	4° 36' 38"	188° 24' 22"	1° 23' 24"	1° 00' 31"	16' 29.39"	10° 12' 39"	0.99830
18	187° 47' 33"	4° 35' 17"	188° 57' 57"	1° 07' 30"	1° 00' 32"	16' 29.68"	17° 8' 41"	0.99839
19	188° 24' 48"	4° 33' 53"	189° 31' 32"	0° 51' 36"	1° 00' 33"	16' 29.97"	24° 20' 04"	0.99842
20	189° 02' 04"	4° 32' 27"	190° 05' 08"	0° 35' 40"	1° 00' 34"	16' 30.25"	31° 33' 47"	0.99840
21	189° 39' 21"	4° 30' 59"	190° 38' 45"	0° 19' 44"	1° 00' 35"	16' 30.52"	38° 36' 21"	0.99834
22	190° 16' 40"	4° 29' 29"	191° 12' 23"	0° 03' 47"	1° 00' 36"	16' 30.79"	45° 16' 12"	0.99822
23	190° 53' 59"	4° 27' 58"	191° 46' 02"	0° -12' 10"	1° 00' 37"	16' 31.05"	51° 25' 19"	0.99805
24	191° 31' 19"	4° 26' 24"	192° 19' 42"	0° -28' 08"	1° 00' 38"	16' 31.30"	56° 59' 34"	0.99783

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	8° 31' 51"	0.76"	7° 49' 35"	3° 22' 43"	0.9983089	16' 01.26"	23° 26' 15"	-4 m 49 s
1	8° 34' 19"	0.76"	7° 51' 52"	3° 23' 42"	0.9983208	16' 01.24"	23° 26' 15"	-4 m 48 s
2	8° 36' 47"	0.75"	7° 54' 08"	3° 24' 40"	0.9983328	16' 01.23"	23° 26' 15"	-4 m 48 s
3	8° 39' 16"	0.75"	7° 56' 25"	3° 25' 38"	0.9983448	16' 01.22"	23° 26' 15"	-4 m 47 s
4	8° 41' 44"	0.75"	7° 58' 41"	3° 26' 37"	0.9983568	16' 01.21"	23° 26' 15"	-4 m 46 s
5	8° 44' 12"	0.75"	8° 00' 58"	3° 27' 35"	0.9983688	16' 01.20"	23° 26' 15"	-4 m 45 s
6	8° 46' 40"	0.74"	8° 03' 14"	3° 28' 34"	0.9983808	16' 01.19"	23° 26' 15"	-4 m 45 s
7	8° 49' 09"	0.74"	8° 05' 31"	3° 29' 32"	0.9983928	16' 01.17"	23° 26' 15"	-4 m 44 s
8	8° 51' 37"	0.74"	8° 07' 47"	3° 30' 30"	0.9984048	16' 01.16"	23° 26' 15"	-4 m 43 s
9	8° 54' 05"	0.73"	8° 10' 04"	3° 31' 29"	0.9984168	16' 01.15"	23° 26' 15"	-4 m 42 s
10	8° 56' 33"	0.73"	8° 12' 20"	3° 32' 27"	0.9984288	16' 01.14"	23° 26' 15"	-4 m 42 s
11	8° 59' 02"	0.73"	8° 14' 37"	3° 33' 25"	0.9984408	16' 01.13"	23° 26' 15"	-4 m 41 s
12	9° 01' 30"	0.72"	8° 16' 53"	3° 34' 24"	0.9984528	16' 01.12"	23° 26' 15"	-4 m 40 s
13	9° 03' 58"	0.72"	8° 19' 10"	3° 35' 22"	0.9984648	16' 01.11"	23° 26' 15"	-4 m 39 s
14	9° 06' 26"	0.72"	8° 21' 26"	3° 36' 20"	0.9984768	16' 01.09"	23° 26' 15"	-4 m 39 s
15	9° 08' 54"	0.71"	8° 23' 43"	3° 37' 19"	0.9984888	16' 01.08"	23° 26' 15"	-4 m 38 s
16	9° 11' 23"	0.71"	8° 25' 59"	3° 38' 17"	0.9985008	16' 01.07"	23° 26' 15"	-4 m 37 s
17	9° 13' 51"	0.71"	8° 28' 16"	3° 39' 15"	0.9985129	16' 01.06"	23° 26' 15"	-4 m 36 s
18	9° 16' 19"	0.70"	8° 30' 32"	3° 40' 14"	0.9985249	16' 01.05"	23° 26' 15"	-4 m 36 s
19	9° 18' 47"	0.70"	8° 32' 49"	3° 41' 12"	0.9985369	16' 01.04"	23° 26' 15"	-4 m 35 s
20	9° 21' 15"	0.70"	8° 35' 06"	3° 42' 10"	0.9985490	16' 01.02"	23° 26' 15"	-4 m 34 s
21	9° 23' 44"	0.69"	8° 37' 22"	3° 43' 08"	0.9985610	16' 01.01"	23° 26' 15"	-4 m 33 s
22	9° 26' 12"	0.69"	8° 39' 39"	3° 44' 07"	0.9985731	16' 01.00"	23° 26' 15"	-4 m 33 s
23	9° 28' 40"	0.69"	8° 41' 55"	3° 45' 05"	0.9985851	16' 00.99"	23° 26' 15"	-4 m 32 s
24	9° 31' 08"	0.68"	8° 44' 12"	3° 46' 03"	0.9985971	16' 00.98"	23° 26' 15"	-4 m 31 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	191° 31' 19"	4° 26' 24"	192° 19' 42"	0°-28' 08"	1° 00' 38"	16' 31.30"	56° 59' 34"	0.99783
1	192° 08' 41"	4° 24' 48"	192° 53' 23"	0°-44' 06"	1° 00' 39"	16' 31.54"	61° 58' 11"	0.99756
2	192° 46' 03"	4° 23' 11"	193° 27' 05"	-1° 00' 04"	1° 00' 40"	16' 31.77"	66° 22' 39"	0.99724
3	193° 23' 26"	4° 21' 31"	194° 00' 49"	-1° 16' 02"	1° 00' 40"	16' 32.00"	70° 15' 46"	0.99686
4	194° 00' 50"	4° 19' 50"	194° 34' 34"	-1° 32' 01"	1° 00' 41"	16' 32.22"	73° 40' 56"	0.99644
5	194° 38' 14"	4° 18' 06"	195° 08' 20"	-1° 47' 59"	1° 00' 42"	16' 32.43"	76° 41' 32"	0.99597
6	195° 15' 40"	4° 16' 21"	195° 42' 08"	-2° 03' 57"	1° 00' 43"	16' 32.63"	79° 20' 48"	0.99544
7	195° 53' 06"	4° 14' 34"	196° 15' 57"	-2° 19' 55"	1° 00' 43"	16' 32.82"	81° 41' 39"	0.99486
8	196° 30' 32"	4° 12' 45"	196° 49' 47"	-2° 35' 52"	1° 00' 44"	16' 33.01"	83° 46' 35"	0.99424
9	197° 07' 60"	4° 10' 54"	197° 23' 40"	-2° 51' 49"	1° 00' 45"	16' 33.19"	85° 37' 47"	0.99356
10	197° 45' 27"	4° 09' 01"	197° 57' 33"	-3° 07' 45"	1° 00' 45"	16' 33.36"	87° 17' 07"	0.99283
11	198° 22' 56"	4° 07' 07"	198° 31' 29"	-3° 23' 40"	1° 00' 46"	16' 33.52"	88° 46' 09"	0.99205
12	199° 00' 25"	4° 05' 11"	199° 05' 26"	-3° 39' 35"	1° 00' 47"	16' 33.67"	90° 6' 12"	0.99122
13	199° 37' 54"	4° 03' 12"	199° 39' 25"	-3° 55' 28"	1° 00' 47"	16' 33.82"	91° 18' 26"	0.99033
14	200° 15' 24"	4° 01' 13"	200° 13' 25"	-4° 11' 21"	1° 00' 48"	16' 33.96"	92° 23' 47"	0.98940
15	200° 52' 54"	3° 59' 11"	200° 47' 28"	-4° 27' 12"	1° 00' 48"	16' 34.08"	93° 23' 04"	0.98842
16	201° 30' 24"	3° 57' 07"	201° 21' 32"	-4° 43' 02"	1° 00' 48"	16' 34.21"	94° 16' 60"	0.98738
17	202° 07' 55"	3° 55' 02"	201° 55' 39"	-4° 58' 50"	1° 00' 49"	16' 34.32"	95° 6' 10"	0.98630
18	202° 45' 26"	3° 52' 55"	202° 29' 47"	-5° 14' 37"	1° 00' 49"	16' 34.42"	95° 51' 04"	0.98516
19	203° 22' 57"	3° 50' 47"	203° 03' 58"	-5° 30' 22"	1° 00' 50"	16' 34.52"	96° 32' 10"	0.98398
20	204° 00' 28"	3° 48' 36"	203° 38' 10"	-5° 46' 05"	1° 00' 50"	16' 34.61"	97° 9' 50"	0.98274
21	204° 37' 59"	3° 46' 24"	204° 12' 25"	-6° 01' 47"	1° 00' 50"	16' 34.69"	97° 44' 24"	0.98146
22	205° 15' 31"	3° 44' 11"	204° 46' 42"	-6° 17' 26"	1° 00' 51"	16' 34.76"	98° 16' 11"	0.98012
23	205° 53' 02"	3° 41' 55"	205° 21' 01"	-6° 33' 03"	1° 00' 51"	16' 34.82"	98° 45' 25"	0.97874
24	206° 30' 34"	3° 39' 39"	205° 55' 23"	-6° 48' 39"	1° 00' 51"	16' 34.88"	99° 12' 19"	0.97730

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	9° 31' 08"	0.68"	8° 44' 12"	3° 46' 03"	0.9985971	16' 00.98"	23° 26' 15"	-4 m 31 s
1	9° 33' 36"	0.68"	8° 46' 28"	3° 47' 01"	0.9986092	16' 00.97"	23° 26' 15"	-4 m 30 s
2	9° 36' 04"	0.68"	8° 48' 45"	3° 47' 60"	0.9986213	16' 00.95"	23° 26' 15"	-4 m 30 s
3	9° 38' 33"	0.67"	8° 51' 01"	3° 48' 58"	0.9986333	16' 00.94"	23° 26' 15"	-4 m 29 s
4	9° 41' 01"	0.67"	8° 53' 18"	3° 49' 56"	0.9986454	16' 00.93"	23° 26' 15"	-4 m 28 s
5	9° 43' 29"	0.66"	8° 55' 34"	3° 50' 54"	0.9986574	16' 00.92"	23° 26' 15"	-4 m 27 s
6	9° 45' 57"	0.66"	8° 57' 51"	3° 51' 52"	0.9986695	16' 00.91"	23° 26' 15"	-4 m 27 s
7	9° 48' 25"	0.66"	9° 00' 07"	3° 52' 51"	0.9986816	16' 00.90"	23° 26' 15"	-4 m 26 s
8	9° 50' 53"	0.65"	9° 02' 24"	3° 53' 49"	0.9986936	16' 00.89"	23° 26' 15"	-4 m 25 s
9	9° 53' 22"	0.65"	9° 04' 41"	3° 54' 47"	0.9987057	16' 00.87"	23° 26' 15"	-4 m 24 s
10	9° 55' 50"	0.64"	9° 06' 57"	3° 55' 45"	0.9987178	16' 00.86"	23° 26' 15"	-4 m 24 s
11	9° 58' 18"	0.64"	9° 09' 14"	3° 56' 43"	0.9987299	16' 00.85"	23° 26' 15"	-4 m 23 s
12	10° 00' 46"	0.64"	9° 11' 30"	3° 57' 42"	0.9987420	16' 00.84"	23° 26' 15"	-4 m 22 s
13	10° 03' 14"	0.63"	9° 13' 47"	3° 58' 40"	0.9987541	16' 00.83"	23° 26' 15"	-4 m 21 s
14	10° 05' 42"	0.63"	9° 16' 03"	3° 59' 38"	0.9987662	16' 00.82"	23° 26' 15"	-4 m 21 s
15	10° 08' 10"	0.62"	9° 18' 20"	4° 00' 36"	0.9987782	16' 00.80"	23° 26' 15"	-4 m 20 s
16	10° 10' 38"	0.62"	9° 20' 37"	4° 01' 34"	0.9987903	16' 00.79"	23° 26' 15"	-4 m 19 s
17	10° 13' 07"	0.62"	9° 22' 53"	4° 02' 32"	0.9988024	16' 00.78"	23° 26' 15"	-4 m 18 s
18	10° 15' 35"	0.61"	9° 25' 10"	4° 03' 30"	0.9988145	16' 00.77"	23° 26' 15"	-4 m 18 s
19	10° 18' 03"	0.61"	9° 27' 26"	4° 04' 28"	0.9988267	16' 00.76"	23° 26' 15"	-4 m 17 s
20	10° 20' 31"	0.60"	9° 29' 43"	4° 05' 27"	0.9988388	16' 00.75"	23° 26' 15"	-4 m 16 s
21	10° 22' 59"	0.60"	9° 31' 59"	4° 06' 25"	0.9988509	16' 00.73"	23° 26' 15"	-4 m 15 s
22	10° 25' 27"	0.59"	9° 34' 16"	4° 07' 23"	0.9988630	16' 00.72"	23° 26' 15"	-4 m 15 s
23	10° 27' 55"	0.59"	9° 36' 33"	4° 08' 21"	0.9988751	16' 00.71"	23° 26' 15"	-4 m 14 s
24	10° 30' 23"	0.58"	9° 38' 49"	4° 09' 19"	0.9988872	16' 00.70"	23° 26' 15"	-4 m 13 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	206° 30' 34"	3° 39' 39"	205° 55' 23"	-6° 48' 39"	1° 00' 51"	16' 34.88"	99° 12' 19"	0.97730
1	207° 08' 05"	3° 37' 20"	206° 29' 47"	-7° 04' 11"	1° 00' 51"	16' 34.93"	99° 37' 06"	0.97582
2	207° 45' 36"	3° 35' 00"	207° 04' 13"	-7° 19' 42"	1° 00' 51"	16' 34.96"	99° 59' 56"	0.97428
3	208° 23' 08"	3° 32' 38"	207° 38' 42"	-7° 35' 09"	1° 00' 51"	16' 35.00"	100° 20' 58"	0.97270
4	209° 00' 39"	3° 30' 15"	208° 13' 13"	-7° 50' 34"	1° 00' 51"	16' 35.02"	100° 40' 20"	0.97107
5	209° 38' 09"	3° 27' 51"	208° 47' 47"	-8° 05' 57"	1° 00' 52"	16' 35.03"	100° 58' 11"	0.96939
6	210° 15' 40"	3° 25' 24"	209° 22' 23"	-8° 21' 16"	1° 00' 52"	16' 35.04"	101° 14' 36"	0.96766
7	210° 53' 10"	3° 22' 57"	209° 57' 02"	-8° 36' 32"	1° 00' 52"	16' 35.04"	101° 29' 42"	0.96588
8	211° 30' 40"	3° 20' 28"	210° 31' 44"	-8° 51' 45"	1° 00' 52"	16' 35.03"	101° 43' 33"	0.96406
9	212° 08' 10"	3° 17' 57"	211° 06' 28"	-9° 06' 55"	1° 00' 51"	16' 35.01"	101° 56' 15"	0.96218
10	212° 45' 39"	3° 15' 25"	211° 41' 15"	-9° 22' 02"	1° 00' 51"	16' 34.98"	102° 7' 53"	0.96026
11	213° 23' 08"	3° 12' 52"	212° 16' 05"	-9° 37' 05"	1° 00' 51"	16' 34.95"	102° 18' 29"	0.95829
12	214° 00' 36"	3° 10' 17"	212° 50' 58"	-9° 52' 04"	1° 00' 51"	16' 34.91"	102° 28' 08"	0.95628
13	214° 38' 04"	3° 07' 41"	213° 25' 54"	-10° 07' 00"	1° 00' 51"	16' 34.86"	102° 36' 53"	0.95422
14	215° 15' 31"	3° 05' 03"	214° 00' 52"	-10° 21' 52"	1° 00' 51"	16' 34.80"	102° 44' 47"	0.95211
15	215° 52' 58"	3° 02' 25"	214° 35' 53"	-10° 36' 40"	1° 00' 50"	16' 34.73"	102° 51' 53"	0.94995
16	216° 30' 24"	2° 59' 45"	215° 10' 58"	-10° 51' 24"	1° 00' 50"	16' 34.66"	102° 58' 13"	0.94775
17	217° 07' 49"	2° 57' 03"	215° 46' 05"	-11° 06' 04"	1° 00' 50"	16' 34.58"	103° 3' 49"	0.94550
18	217° 45' 14"	2° 54' 21"	216° 21' 15"	-11° 20' 40"	1° 00' 50"	16' 34.49"	103° 8' 43"	0.94321
19	218° 22' 38"	2° 51' 37"	216° 56' 29"	-11° 35' 11"	1° 00' 49"	16' 34.39"	103° 12' 59"	0.94088
20	219° 00' 01"	2° 48' 52"	217° 31' 45"	-11° 49' 38"	1° 00' 49"	16' 34.29"	103° 16' 36"	0.93849
21	219° 37' 23"	2° 46' 06"	218° 07' 05"	-12° 03' 60"	1° 00' 48"	16' 34.17"	103° 19' 38"	0.93607
22	220° 14' 45"	2° 43' 19"	218° 42' 28"	-12° 18' 17"	1° 00' 48"	16' 34.05"	103° 22' 05"	0.93360
23	220° 52' 05"	2° 40' 30"	219° 17' 54"	-12° 32' 30"	1° 00' 47"	16' 33.93"	103° 23' 59"	0.93108
24	221° 29' 25"	2° 37' 41"	219° 53' 23"	-12° 46' 38"	1° 00' 47"	16' 33.79"	103° 25' 21"	0.92852

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	10° 30' 23"	0.58"	9° 38' 49"	4° 09' 19"	0.9988872	16' 00.70"	23° 26' 15"	-4 m 13 s
1	10° 32' 51"	0.58"	9° 41' 06"	4° 10' 17"	0.9988993	16' 00.69"	23° 26' 15"	-4 m 12 s
2	10° 35' 19"	0.58"	9° 43' 22"	4° 11' 15"	0.9989115	16' 00.68"	23° 26' 15"	-4 m 12 s
3	10° 37' 48"	0.57"	9° 45' 39"	4° 12' 13"	0.9989236	16' 00.66"	23° 26' 15"	-4 m 11 s
4	10° 40' 16"	0.57"	9° 47' 56"	4° 13' 11"	0.9989357	16' 00.65"	23° 26' 15"	-4 m 10 s
5	10° 42' 44"	0.56"	9° 50' 12"	4° 14' 09"	0.9989479	16' 00.64"	23° 26' 15"	-4 m 09 s
6	10° 45' 12"	0.56"	9° 52' 29"	4° 15' 07"	0.9989600	16' 00.63"	23° 26' 15"	-4 m 09 s
7	10° 47' 40"	0.55"	9° 54' 45"	4° 16' 05"	0.9989721	16' 00.62"	23° 26' 15"	-4 m 08 s
8	10° 50' 08"	0.55"	9° 57' 02"	4° 17' 03"	0.9989843	16' 00.61"	23° 26' 15"	-4 m 07 s
9	10° 52' 36"	0.54"	9° 59' 19"	4° 18' 01"	0.9989964	16' 00.59"	23° 26' 15"	-4 m 06 s
10	10° 55' 04"	0.54"	10° 01' 35"	4° 18' 59"	0.9990086	16' 00.58"	23° 26' 15"	-4 m 06 s
11	10° 57' 32"	0.53"	10° 03' 52"	4° 19' 57"	0.9990207	16' 00.57"	23° 26' 15"	-4 m 05 s
12	11° 00' 00"	0.53"	10° 06' 08"	4° 20' 55"	0.9990329	16' 00.56"	23° 26' 15"	-4 m 04 s
13	11° 02' 28"	0.52"	10° 08' 25"	4° 21' 53"	0.9990450	16' 00.55"	23° 26' 15"	-4 m 04 s
14	11° 04' 56"	0.52"	10° 10' 42"	4° 22' 51"	0.9990572	16' 00.54"	23° 26' 15"	-4 m 03 s
15	11° 07' 24"	0.51"	10° 12' 58"	4° 23' 49"	0.9990693	16' 00.52"	23° 26' 15"	-4 m 02 s
16	11° 09' 52"	0.51"	10° 15' 15"	4° 24' 47"	0.9990815	16' 00.51"	23° 26' 15"	-4 m 01 s
17	11° 12' 20"	0.50"	10° 17' 32"	4° 25' 45"	0.9990937	16' 00.50"	23° 26' 15"	-4 m 01 s
18	11° 14' 48"	0.50"	10° 19' 48"	4° 26' 43"	0.9991058	16' 00.49"	23° 26' 15"	-3 m 60 s
19	11° 17' 17"	0.49"	10° 22' 05"	4° 27' 41"	0.9991180	16' 00.48"	23° 26' 15"	-3 m 59 s
20	11° 19' 45"	0.49"	10° 24' 22"	4° 28' 39"	0.9991302	16' 00.47"	23° 26' 15"	-3 m 58 s
21	11° 22' 13"	0.48"	10° 26' 38"	4° 29' 37"	0.9991424	16' 00.45"	23° 26' 15"	-3 m 58 s
22	11° 24' 41"	0.48"	10° 28' 55"	4° 30' 34"	0.9991545	16' 00.44"	23° 26' 15"	-3 m 57 s
23	11° 27' 09"	0.47"	10° 31' 12"	4° 31' 32"	0.9991667	16' 00.43"	23° 26' 15"	-3 m 56 s
24	11° 29' 37"	0.47"	10° 33' 28"	4° 32' 30"	0.9991789	16' 00.42"	23° 26' 15"	-3 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	221° 29' 25"	2° 37' 41"	219° 53' 23"	-12° 46' 38"	1° 00' 47"	16' 33.79"	103° 25' 21"	0.92852
1	222° 06' 44"	2° 34' 50"	220° 28' 55"	-13° 00' 41"	1° 00' 46"	16' 33.65"	103° 26' 13"	0.92592
2	222° 44' 02"	2° 31' 58"	221° 04' 31"	-13° 14' 38"	1° 00' 46"	16' 33.50"	103° 26' 36"	0.92328
3	223° 21' 19"	2° 29' 06"	221° 40' 10"	-13° 28' 31"	1° 00' 45"	16' 33.34"	103° 26' 30"	0.92059
4	223° 58' 34"	2° 26' 12"	222° 15' 52"	-13° 42' 18"	1° 00' 45"	16' 33.18"	103° 25' 57"	0.91787
5	224° 35' 49"	2° 23' 17"	222° 51' 38"	-13° 55' 59"	1° 00' 44"	16' 33.01"	103° 24' 58"	0.91510
6	225° 13' 03"	2° 20' 22"	223° 27' 27"	-14° 09' 36"	1° 00' 43"	16' 32.83"	103° 23' 33"	0.91228
7	225° 50' 15"	2° 17' 25"	224° 03' 19"	-14° 23' 06"	1° 00' 43"	16' 32.64"	103° 21' 44"	0.90943
8	226° 27' 27"	2° 14' 28"	224° 39' 14"	-14° 36' 31"	1° 00' 42"	16' 32.45"	103° 19' 31"	0.90654
9	227° 04' 37"	2° 11' 30"	225° 15' 13"	-14° 49' 50"	1° 00' 41"	16' 32.25"	103° 16' 55"	0.90361
10	227° 41' 46"	2° 08' 30"	225° 51' 16"	-15° 03' 02"	1° 00' 41"	16' 32.04"	103° 13' 57"	0.90064
11	228° 18' 54"	2° 05' 30"	226° 27' 21"	-15° 16' 09"	1° 00' 40"	16' 31.83"	103° 10' 36"	0.89762
12	228° 56' 00"	2° 02' 30"	227° 03' 30"	-15° 29' 10"	1° 00' 39"	16' 31.61"	103° 6' 55"	0.89457
13	229° 33' 05"	1° 59' 28"	227° 39' 43"	-15° 42' 04"	1° 00' 38"	16' 31.38"	103° 2' 53"	0.89149
14	230° 10' 06"	1° 56' 26"	228° 15' 56"	-15° 54' 51"	1° 00' 37"	16' 31.15"	102° 58' 32"	0.88836
15	230° 47' 08"	1° 53' 23"	228° 52' 15"	-16° 07' 33"	1° 00' 36"	16' 30.91"	102° 53' 51"	0.88520
16	231° 24' 10"	1° 50' 19"	229° 28' 38"	-16° 20' 08"	1° 00' 35"	16' 30.66"	102° 48' 51"	0.88200
17	232° 01' 09"	1° 47' 15"	230° 05' 04"	-16° 32' 36"	1° 00' 35"	16' 30.41"	102° 43' 32"	0.87876
18	232° 38' 08"	1° 44' 09"	230° 41' 33"	-16° 44' 58"	1° 00' 34"	16' 30.15"	102° 37' 56"	0.87549
19	233° 15' 04"	1° 41' 04"	231° 18' 06"	-16° 57' 12"	1° 00' 33"	16' 29.88"	102° 32' 02"	0.87218
20	233° 51' 60"	1° 37' 57"	231° 54' 42"	-17° 09' 20"	1° 00' 32"	16' 29.61"	102° 25' 50"	0.86883
21	234° 28' 53"	1° 34' 50"	232° 31' 22"	-17° 21' 21"	1° 00' 31"	16' 29.33"	102° 19' 22"	0.86545
22	235° 05' 46"	1° 31' 43"	233° 08' 05"	-17° 33' 15"	1° 00' 30"	16' 29.05"	102° 12' 38"	0.86203
23	235° 42' 37"	1° 28' 35"	233° 44' 51"	-17° 45' 01"	1° 00' 28"	16' 28.76"	102° 5' 38"	0.85859
24	236° 19' 26"	1° 25' 26"	234° 21' 41"	-17° 56' 40"	1° 00' 27"	16' 28.46"	101° 58' 22"	0.85510

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	11° 29' 37"	0.47"	10° 33' 28"	4° 32' 30"	0.9991789	16' 00.42"	23° 26' 15"	-3 m 55 s
1	11° 32' 05"	0.46"	10° 35' 45"	4° 33' 28"	0.9991911	16' 00.41"	23° 26' 15"	-3 m 55 s
2	11° 34' 33"	0.46"	10° 38' 02"	4° 34' 26"	0.9992033	16' 00.40"	23° 26' 15"	-3 m 54 s
3	11° 37' 01"	0.45"	10° 40' 18"	4° 35' 24"	0.9992154	16' 00.38"	23° 26' 15"	-3 m 53 s
4	11° 39' 29"	0.45"	10° 42' 35"	4° 36' 22"	0.9992276	16' 00.37"	23° 26' 15"	-3 m 52 s
5	11° 41' 57"	0.44"	10° 44' 52"	4° 37' 19"	0.9992398	16' 00.36"	23° 26' 15"	-3 m 52 s
6	11° 44' 25"	0.44"	10° 47' 08"	4° 38' 17"	0.9992520	16' 00.35"	23° 26' 15"	-3 m 51 s
7	11° 46' 53"	0.43"	10° 49' 25"	4° 39' 15"	0.9992642	16' 00.34"	23° 26' 15"	-3 m 50 s
8	11° 49' 21"	0.43"	10° 51' 42"	4° 40' 13"	0.9992764	16' 00.32"	23° 26' 15"	-3 m 49 s
9	11° 51' 49"	0.42"	10° 53' 58"	4° 41' 11"	0.9992886	16' 00.31"	23° 26' 15"	-3 m 49 s
10	11° 54' 17"	0.42"	10° 56' 15"	4° 42' 08"	0.9993008	16' 00.30"	23° 26' 15"	-3 m 48 s
11	11° 56' 45"	0.41"	10° 58' 32"	4° 43' 06"	0.9993130	16' 00.29"	23° 26' 15"	-3 m 47 s
12	11° 59' 13"	0.41"	11° 00' 48"	4° 44' 04"	0.9993252	16' 00.28"	23° 26' 15"	-3 m 46 s
13	12° 01' 41"	0.40"	11° 03' 05"	4° 45' 02"	0.9993374	16' 00.27"	23° 26' 15"	-3 m 46 s
14	12° 04' 09"	0.40"	11° 05' 22"	4° 45' 60"	0.9993497	16' 00.25"	23° 26' 15"	-3 m 45 s
15	12° 06' 37"	0.39"	11° 07' 39"	4° 46' 57"	0.9993619	16' 00.24"	23° 26' 15"	-3 m 44 s
16	12° 09' 05"	0.39"	11° 09' 55"	4° 47' 55"	0.9993741	16' 00.23"	23° 26' 15"	-3 m 44 s
17	12° 11' 32"	0.38"	11° 12' 12"	4° 48' 53"	0.9993863	16' 00.22"	23° 26' 15"	-3 m 43 s
18	12° 14' 00"	0.37"	11° 14' 29"	4° 49' 50"	0.9993985	16' 00.21"	23° 26' 15"	-3 m 42 s
19	12° 16' 28"	0.37"	11° 16' 45"	4° 50' 48"	0.9994107	16' 00.20"	23° 26' 15"	-3 m 41 s
20	12° 18' 56"	0.36"	11° 19' 02"	4° 51' 46"	0.9994229	16' 00.18"	23° 26' 15"	-3 m 41 s
21	12° 21' 24"	0.36"	11° 21' 19"	4° 52' 44"	0.9994352	16' 00.17"	23° 26' 15"	-3 m 40 s
22	12° 23' 52"	0.35"	11° 23' 36"	4° 53' 41"	0.9994474	16' 00.16"	23° 26' 15"	-3 m 39 s
23	12° 26' 20"	0.35"	11° 25' 52"	4° 54' 39"	0.9994596	16' 00.15"	23° 26' 15"	-3 m 38 s
24	12° 28' 48"	0.34"	11° 28' 09"	4° 55' 37"	0.9994718	16' 00.14"	23° 26' 15"	-3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	236° 19' 26"	1° 25' 26"	234° 21' 41"	-17° 56' 40"	1° 00' 27"	16' 28.46"	101° 58' 22"	0.85510
1	236° 56' 13"	1° 22' 17"	234° 58' 34"	-18° 08' 12"	1° 00' 26"	16' 28.16"	101° 50' 51"	0.85159
2	237° 32' 59"	1° 19' 08"	235° 35' 30"	-18° 19' 36"	1° 00' 25"	16' 27.85"	101° 43' 05"	0.84804
3	238° 09' 44"	1° 15' 58"	236° 12' 30"	-18° 30' 53"	1° 00' 24"	16' 27.54"	101° 35' 04"	0.84446
4	238° 46' 26"	1° 12' 48"	236° 49' 33"	-18° 42' 02"	1° 00' 23"	16' 27.22"	101° 26' 49"	0.84085
5	239° 23' 07"	1° 09' 37"	237° 26' 39"	-18° 53' 03"	1° 00' 22"	16' 26.89"	101° 18' 20"	0.83720
6	239° 59' 46"	1° 06' 26"	238° 03' 48"	-19° 03' 56"	1° 00' 20"	16' 26.56"	101° 9' 37"	0.83353
7	240° 36' 24"	1° 03' 15"	238° 41' 01"	-19° 14' 42"	1° 00' 19"	16' 26.23"	101° 0' 41"	0.82983
8	241° 12' 60"	1° 00' 03"	239° 18' 16"	-19° 25' 19"	1° 00' 18"	16' 25.89"	100° 51' 31"	0.82609
9	241° 49' 34"	0° 56' 51"	239° 55' 35"	-19° 35' 49"	1° 00' 17"	16' 25.54"	100° 42' 09"	0.82233
10	242° 26' 06"	0° 53' 39"	240° 32' 57"	-19° 46' 10"	1° 00' 15"	16' 25.19"	100° 32' 34"	0.81854
11	243° 02' 37"	0° 50' 27"	241° 10' 22"	-19° 56' 23"	1° 00' 14"	16' 24.84"	100° 22' 46"	0.81472
12	243° 39' 05"	0° 47' 14"	241° 47' 50"	-20° 06' 27"	1° 00' 13"	16' 24.48"	100° 12' 47"	0.81087
13	244° 15' 32"	0° 44' 02"	242° 25' 21"	-20° 16' 24"	1° 00' 11"	16' 24.11"	100° 2' 35"	0.80700
14	244° 51' 57"	0° 40' 49"	243° 02' 55"	-20° 26' 11"	1° 00' 10"	16' 23.74"	99° 52' 12"	0.80309
15	245° 28' 21"	0° 37' 36"	243° 40' 32"	-20° 35' 51"	1° 00' 09"	16' 23.37"	99° 41' 38"	0.79917
16	246° 04' 42"	0° 34' 22"	244° 18' 11"	-20° 45' 21"	1° 00' 07"	16' 22.99"	99° 30' 52"	0.79521
17	246° 41' 01"	0° 31' 09"	244° 55' 54"	-20° 54' 43"	1° 00' 06"	16' 22.60"	99° 19' 55"	0.79123
18	247° 17' 19"	0° 27' 56"	245° 33' 39"	-21° 03' 57"	1° 00' 04"	16' 22.22"	99° 8' 48"	0.78723
19	247° 53' 34"	0° 24' 43"	246° 11' 27"	-21° 13' 01"	1° 00' 03"	16' 21.82"	98° 57' 30"	0.78320
20	248° 29' 48"	0° 21' 29"	246° 49' 17"	-21° 21' 57"	1° 00' 02"	16' 21.43"	98° 46' 02"	0.77915
21	249° 05' 60"	0° 18' 16"	247° 27' 10"	-21° 30' 43"	1° 00' 00"	16' 21.03"	98° 34' 23"	0.77507
22	249° 42' 10"	0° 15' 03"	248° 05' 06"	-21° 39' 21"	0° 59' 59"	16' 20.62"	98° 22' 35"	0.77097
23	250° 18' 17"	0° 11' 49"	248° 43' 04"	-21° 47' 49"	0° 59' 57"	16' 20.21"	98° 10' 37"	0.76685
24	250° 54' 23"	0° 08' 36"	249° 21' 04"	-21° 56' 09"	0° 59' 56"	16' 19.80"	97° 58' 29"	0.76271

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	12° 28' 48"	0.34"	11° 28' 09"	4° 55' 37"	0.9994718	16' 00.14"	23° 26' 15"	-3 m 38 s
1	12° 31' 16"	0.34"	11° 30' 26"	4° 56' 34"	0.9994841	16' 00.13"	23° 26' 15"	-3 m 37 s
2	12° 33' 44"	0.33"	11° 32' 43"	4° 57' 32"	0.9994963	16' 00.11"	23° 26' 15"	-3 m 36 s
3	12° 36' 12"	0.33"	11° 34' 59"	4° 58' 30"	0.9995085	16' 00.10"	23° 26' 15"	-3 m 35 s
4	12° 38' 40"	0.32"	11° 37' 16"	4° 59' 27"	0.9995208	16' 00.09"	23° 26' 15"	-3 m 35 s
5	12° 41' 08"	0.32"	11° 39' 33"	5° 00' 25"	0.9995330	16' 00.08"	23° 26' 15"	-3 m 34 s
6	12° 43' 36"	0.31"	11° 41' 50"	5° 01' 22"	0.9995452	16' 00.07"	23° 26' 15"	-3 m 33 s
7	12° 46' 04"	0.30"	11° 44' 07"	5° 02' 20"	0.9995575	16' 00.05"	23° 26' 15"	-3 m 32 s
8	12° 48' 32"	0.30"	11° 46' 23"	5° 03' 18"	0.9995697	16' 00.04"	23° 26' 15"	-3 m 32 s
9	12° 50' 60"	0.29"	11° 48' 40"	5° 04' 15"	0.9995820	16' 00.03"	23° 26' 15"	-3 m 31 s
10	12° 53' 27"	0.29"	11° 50' 57"	5° 05' 13"	0.9995942	16' 00.02"	23° 26' 15"	-3 m 30 s
11	12° 55' 55"	0.28"	11° 53' 14"	5° 06' 10"	0.9996065	16' 00.01"	23° 26' 15"	-3 m 30 s
12	12° 58' 23"	0.28"	11° 55' 30"	5° 07' 08"	0.9996187	15' 60.00"	23° 26' 15"	-3 m 29 s
13	13° 00' 51"	0.27"	11° 57' 47"	5° 08' 05"	0.9996309	15' 59.98"	23° 26' 15"	-3 m 28 s
14	13° 03' 19"	0.27"	12° 00' 04"	5° 09' 03"	0.9996432	15' 59.97"	23° 26' 15"	-3 m 27 s
15	13° 05' 47"	0.26"	12° 02' 21"	5° 10' 01"	0.9996554	15' 59.96"	23° 26' 14"	-3 m 27 s
16	13° 08' 15"	0.26"	12° 04' 38"	5° 10' 58"	0.9996677	15' 59.95"	23° 26' 14"	-3 m 26 s
17	13° 10' 43"	0.25"	12° 06' 54"	5° 11' 56"	0.9996799	15' 59.94"	23° 26' 14"	-3 m 25 s
18	13° 13' 11"	0.24"	12° 09' 11"	5° 12' 53"	0.9996922	15' 59.93"	23° 26' 14"	-3 m 24 s
19	13° 15' 39"	0.24"	12° 11' 28"	5° 13' 51"	0.9997044	15' 59.91"	23° 26' 14"	-3 m 24 s
20	13° 18' 06"	0.23"	12° 13' 45"	5° 14' 48"	0.9997167	15' 59.90"	23° 26' 14"	-3 m 23 s
21	13° 20' 34"	0.23"	12° 16' 02"	5° 15' 46"	0.9997290	15' 59.89"	23° 26' 14"	-3 m 22 s
22	13° 23' 02"	0.22"	12° 18' 19"	5° 16' 43"	0.9997412	15' 59.88"	23° 26' 14"	-3 m 21 s
23	13° 25' 30"	0.22"	12° 20' 35"	5° 17' 40"	0.9997535	15' 59.87"	23° 26' 14"	-3 m 21 s
24	13° 27' 58"	0.21"	12° 22' 52"	5° 18' 38"	0.9997657	15' 59.85"	23° 26' 14"	-3 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	250° 54' 23"	0° 08' 36"	249° 21' 04"	-21° 56' 09"	0° 59' 56"	16' 19.80"	97° 58' 29"	0.76271
1	251° 30' 27"	0° 05' 23"	249° 59' 07"	-22° 04' 19"	0° 59' 54"	16' 19.39"	97° 46' 13"	0.75855
2	252° 06' 29"	0° 02' 10"	250° 37' 12"	-22° 12' 20"	0° 59' 53"	16' 18.97"	97° 33' 47"	0.75436
3	252° 42' 29"	0° -1' 02"	251° 15' 19"	-22° 20' 12"	0° 59' 51"	16' 18.54"	97° 21' 12"	0.75016
4	253° 18' 27"	0° -4' 15"	251° 53' 28"	-22° 27' 54"	0° 59' 49"	16' 18.12"	97° 8' 29"	0.74593
5	253° 54' 23"	0° -7' 27"	252° 31' 40"	-22° 35' 27"	0° 59' 48"	16' 17.68"	96° 55' 37"	0.74169
6	254° 30' 17"	0° -10' 39"	253° 09' 53"	-22° 42' 50"	0° 59' 46"	16' 17.25"	96° 42' 37"	0.73743
7	255° 06' 08"	0° -13' 51"	253° 48' 08"	-22° 50' 04"	0° 59' 45"	16' 16.81"	96° 29' 29"	0.73315
8	255° 41' 58"	0° -17' 03"	254° 26' 25"	-22° 57' 09"	0° 59' 43"	16' 16.37"	96° 16' 13"	0.72885
9	256° 17' 46"	0° -20' 14"	255° 04' 44"	-23° 04' 04"	0° 59' 41"	16' 15.93"	96° 2' 49"	0.72453
10	256° 53' 31"	0° -23' 25"	255° 43' 04"	-23° 10' 49"	0° 59' 40"	16' 15.48"	95° 49' 18"	0.72020
11	257° 29' 15"	0° -26' 36"	256° 21' 26"	-23° 17' 25"	0° 59' 38"	16' 15.03"	95° 35' 39"	0.71585
12	258° 04' 56"	0° -29' 47"	256° 59' 50"	-23° 23' 50"	0° 59' 36"	16' 14.58"	95° 21' 53"	0.71149
13	258° 40' 36"	0° -32' 57"	257° 38' 15"	-23° 30' 07"	0° 59' 35"	16' 14.13"	95° 8' 01"	0.70711
14	259° 16' 13"	0° -36' 06"	258° 16' 41"	-23° 36' 13"	0° 59' 33"	16' 13.67"	94° 54' 01"	0.70271
15	259° 51' 48"	0° -39' 15"	258° 55' 08"	-23° 42' 09"	0° 59' 31"	16' 13.21"	94° 39' 55"	0.69830
16	260° 27' 21"	0° -42' 24"	259° 33' 37"	-23° 47' 56"	0° 59' 30"	16' 12.75"	94° 25' 43"	0.69388
17	261° 02' 53"	0° -45' 33"	260° 12' 07"	-23° 53' 33"	0° 59' 28"	16' 12.28"	94° 11' 25"	0.68944
18	261° 38' 21"	0° -48' 40"	260° 50' 37"	-23° 58' 60"	0° 59' 26"	16' 11.82"	93° 57' 00"	0.68499
19	262° 13' 48"	0° -51' 48"	261° 29' 09"	-24° 04' 17"	0° 59' 25"	16' 11.35"	93° 42' 30"	0.68053
20	262° 49' 13"	0° -54' 55"	262° 07' 41"	-24° 09' 24"	0° 59' 23"	16' 10.88"	93° 27' 54"	0.67605
21	263° 24' 36"	0° -58' 01"	262° 46' 14"	-24° 14' 21"	0° 59' 21"	16' 10.40"	93° 13' 12"	0.67157
22	263° 59' 56"	-1° 01' 07"	263° 24' 47"	-24° 19' 08"	0° 59' 19"	16' 09.93"	92° 58' 26"	0.66707
23	264° 35' 15"	-1° 04' 12"	264° 03' 21"	-24° 23' 45"	0° 59' 18"	16' 09.45"	92° 43' 34"	0.66257
24	265° 10' 31"	-1° 07' 17"	264° 41' 56"	-24° 28' 12"	0° 59' 16"	16' 08.97"	92° 28' 37"	0.65805

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	13° 27' 58"	0.21"	12° 22' 52"	5° 18' 38"	0.9997657	15' 59.85"	23° 26' 14"	-3 m 20 s
1	13° 30' 26"	0.21"	12° 25' 09"	5° 19' 35"	0.9997780	15' 59.84"	23° 26' 14"	-3 m 19 s
2	13° 32' 54"	0.20"	12° 27' 26"	5° 20' 33"	0.9997902	15' 59.83"	23° 26' 14"	-3 m 19 s
3	13° 35' 21"	0.20"	12° 29' 43"	5° 21' 30"	0.9998025	15' 59.82"	23° 26' 14"	-3 m 18 s
4	13° 37' 49"	0.19"	12° 31' 60"	5° 22' 28"	0.9998148	15' 59.81"	23° 26' 14"	-3 m 17 s
5	13° 40' 17"	0.19"	12° 34' 17"	5° 23' 25"	0.9998270	15' 59.80"	23° 26' 14"	-3 m 16 s
6	13° 42' 45"	0.18"	12° 36' 33"	5° 24' 22"	0.9998393	15' 59.78"	23° 26' 14"	-3 m 16 s
7	13° 45' 13"	0.17"	12° 38' 50"	5° 25' 20"	0.9998515	15' 59.77"	23° 26' 14"	-3 m 15 s
8	13° 47' 41"	0.17"	12° 41' 07"	5° 26' 17"	0.9998638	15' 59.76"	23° 26' 14"	-3 m 14 s
9	13° 50' 09"	0.16"	12° 43' 24"	5° 27' 15"	0.9998761	15' 59.75"	23° 26' 14"	-3 m 13 s
10	13° 52' 36"	0.16"	12° 45' 41"	5° 28' 12"	0.9998883	15' 59.74"	23° 26' 14"	-3 m 13 s
11	13° 55' 04"	0.15"	12° 47' 58"	5° 29' 09"	0.9999006	15' 59.73"	23° 26' 14"	-3 m 12 s
12	13° 57' 32"	0.15"	12° 50' 15"	5° 30' 07"	0.9999129	15' 59.71"	23° 26' 14"	-3 m 11 s
13	13° 59' 60"	0.14"	12° 52' 32"	5° 31' 04"	0.9999251	15' 59.70"	23° 26' 14"	-3 m 11 s
14	14° 02' 28"	0.14"	12° 54' 49"	5° 32' 01"	0.9999374	15' 59.69"	23° 26' 14"	-3 m 10 s
15	14° 04' 56"	0.13"	12° 57' 06"	5° 32' 58"	0.9999497	15' 59.68"	23° 26' 14"	-3 m 09 s
16	14° 07' 23"	0.13"	12° 59' 22"	5° 33' 56"	0.9999619	15' 59.67"	23° 26' 14"	-3 m 08 s
17	14° 09' 51"	0.12"	13° 01' 39"	5° 34' 53"	0.9999742	15' 59.65"	23° 26' 14"	-3 m 08 s
18	14° 12' 19"	0.12"	13° 03' 56"	5° 35' 50"	0.9999865	15' 59.64"	23° 26' 14"	-3 m 07 s
19	14° 14' 47"	0.11"	13° 06' 13"	5° 36' 48"	0.9999988	15' 59.63"	23° 26' 14"	-3 m 06 s
20	14° 17' 15"	0.11"	13° 08' 30"	5° 37' 45"	1.0000110	15' 59.62"	23° 26' 14"	-3 m 05 s
21	14° 19' 42"	0.10"	13° 10' 47"	5° 38' 42"	1.0000233	15' 59.61"	23° 26' 14"	-3 m 05 s
22	14° 22' 10"	0.10"	13° 13' 04"	5° 39' 39"	1.0000356	15' 59.60"	23° 26' 14"	-3 m 04 s
23	14° 24' 38"	0.09"	13° 15' 21"	5° 40' 37"	1.0000478	15' 59.58"	23° 26' 14"	-3 m 03 s
24	14° 27' 06"	0.09"	13° 17' 38"	5° 41' 34"	1.0000601	15' 59.57"	23° 26' 14"	-3 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	265° 10' 31"	-1° 07' 17"	264° 41' 56"	-24° 28' 12"	0° 59' 16"	16' 08.97"	92° 28' 37"	0.65805
1	265° 45' 45"	-1° 10' 21"	265° 20' 30"	-24° 32' 29"	0° 59' 14"	16' 08.49"	92° 13' 36"	0.65352
2	266° 20' 57"	-1° 13' 24"	265° 59' 05"	-24° 36' 35"	0° 59' 12"	16' 08.00"	91° 58' 30"	0.64899
3	266° 56' 07"	-1° 16' 27"	266° 37' 40"	-24° 40' 32"	0° 59' 11"	16' 07.52"	91° 43' 19"	0.64444
4	267° 31' 15"	-1° 19' 29"	267° 16' 15"	-24° 44' 19"	0° 59' 09"	16' 07.03"	91° 28' 05"	0.63989
5	268° 06' 20"	-1° 22' 30"	267° 54' 50"	-24° 47' 55"	0° 59' 07"	16' 06.55"	91° 12' 46"	0.63533
6	268° 41' 24"	-1° 25' 31"	268° 33' 24"	-24° 51' 22"	0° 59' 05"	16' 06.06"	90° 57' 24"	0.63076
7	269° 16' 25"	-1° 28' 31"	269° 11' 58"	-24° 54' 38"	0° 59' 03"	16' 05.57"	90° 41' 58"	0.62619
8	269° 51' 25"	-1° 31' 30"	269° 50' 32"	-24° 57' 44"	0° 59' 02"	16' 05.07"	90° 26' 28"	0.62161
9	270° 26' 22"	-1° 34' 29"	270° 29' 05"	-25° 00' 40"	0° 58' 60"	16' 04.58"	90° 10' 55"	0.61702
10	271° 01' 17"	-1° 37' 26"	271° 07' 37"	-25° 03' 26"	0° 58' 58"	16' 04.09"	89° 55' 19"	0.61243
11	271° 36' 10"	-1° 40' 23"	271° 46' 09"	-25° 06' 02"	0° 58' 56"	16' 03.59"	89° 39' 40"	0.60783
12	272° 11' 01"	-1° 43' 19"	272° 24' 40"	-25° 08' 28"	0° 58' 54"	16' 03.10"	89° 23' 59"	0.60323
13	272° 45' 50"	-1° 46' 15"	273° 03' 10"	-25° 10' 44"	0° 58' 52"	16' 02.60"	89° 8' 14"	0.59863
14	273° 20' 36"	-1° 49' 09"	273° 41' 39"	-25° 12' 49"	0° 58' 51"	16' 02.10"	88° 52' 28"	0.59402
15	273° 55' 21"	-1° 52' 03"	274° 20' 06"	-25° 14' 45"	0° 58' 49"	16' 01.60"	88° 36' 39"	0.58941
16	274° 30' 03"	-1° 54' 56"	274° 58' 33"	-25° 16' 30"	0° 58' 47"	16' 01.10"	88° 20' 47"	0.58479
17	275° 04' 44"	-1° 57' 48"	275° 36' 58"	-25° 18' 06"	0° 58' 45"	16' 00.61"	88° 4' 54"	0.58017
18	275° 39' 22"	-2° 00' 39"	276° 15' 21"	-25° 19' 31"	0° 58' 43"	16' 00.10"	87° 48' 59"	0.57555
19	276° 13' 58"	-2° 03' 29"	276° 53' 43"	-25° 20' 47"	0° 58' 42"	15' 59.60"	87° 33' 03"	0.57093
20	276° 48' 32"	-2° 06' 18"	277° 32' 03"	-25° 21' 52"	0° 58' 40"	15' 59.10"	87° 17' 05"	0.56631
21	277° 23' 04"	-2° 09' 06"	278° 10' 21"	-25° 22' 47"	0° 58' 38"	15' 58.60"	87° 1' 06"	0.56169
22	277° 57' 34"	-2° 11' 53"	278° 48' 38"	-25° 23' 33"	0° 58' 36"	15' 58.10"	86° 45' 05"	0.55707
23	278° 32' 02"	-2° 14' 40"	279° 26' 52"	-25° 24' 08"	0° 58' 34"	15' 57.60"	86° 29' 04"	0.55244
24	279° 06' 27"	-2° 17' 25"	280° 05' 04"	-25° 24' 34"	0° 58' 32"	15' 57.09"	86° 13' 02"	0.54782

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	14° 27' 06"	0.09"	13° 17' 38"	5° 41' 34"	1.0000601	15' 59.57"	23° 26' 14"	-3 m 03 s
1	14° 29' 34"	0.08"	13° 19' 55"	5° 42' 31"	1.0000724	15' 59.56"	23° 26' 14"	-3 m 02 s
2	14° 32' 01"	0.08"	13° 22' 12"	5° 43' 28"	1.0000846	15' 59.55"	23° 26' 14"	-3 m 01 s
3	14° 34' 29"	0.07"	13° 24' 29"	5° 44' 25"	1.0000969	15' 59.54"	23° 26' 14"	-3 m 00 s
4	14° 36' 57"	0.07"	13° 26' 46"	5° 45' 23"	1.0001092	15' 59.53"	23° 26' 14"	-2 m 60 s
5	14° 39' 25"	0.06"	13° 29' 03"	5° 46' 20"	1.0001215	15' 59.51"	23° 26' 14"	-2 m 59 s
6	14° 41' 53"	0.05"	13° 31' 20"	5° 47' 17"	1.0001337	15' 59.50"	23° 26' 14"	-2 m 58 s
7	14° 44' 20"	0.05"	13° 33' 37"	5° 48' 14"	1.0001460	15' 59.49"	23° 26' 14"	-2 m 58 s
8	14° 46' 48"	0.04"	13° 35' 54"	5° 49' 11"	1.0001583	15' 59.48"	23° 26' 14"	-2 m 57 s
9	14° 49' 16"	0.04"	13° 38' 11"	5° 50' 08"	1.0001705	15' 59.47"	23° 26' 14"	-2 m 56 s
10	14° 51' 44"	0.04"	13° 40' 28"	5° 51' 05"	1.0001828	15' 59.45"	23° 26' 14"	-2 m 55 s
11	14° 54' 11"	0.03"	13° 42' 45"	5° 52' 02"	1.0001951	15' 59.44"	23° 26' 14"	-2 m 55 s
12	14° 56' 39"	0.03"	13° 45' 02"	5° 52' 60"	1.0002073	15' 59.43"	23° 26' 14"	-2 m 54 s
13	14° 59' 07"	0.02"	13° 47' 19"	5° 53' 57"	1.0002196	15' 59.42"	23° 26' 14"	-2 m 53 s
14	15° 01' 35"	0.02"	13° 49' 36"	5° 54' 54"	1.0002319	15' 59.41"	23° 26' 14"	-2 m 52 s
15	15° 04' 03"	0.01"	13° 51' 53"	5° 55' 51"	1.0002442	15' 59.40"	23° 26' 14"	-2 m 52 s
16	15° 06' 30"	0.01"	13° 54' 10"	5° 56' 48"	1.0002564	15' 59.38"	23° 26' 14"	-2 m 51 s
17	15° 08' 58"	0.00"	13° 56' 27"	5° 57' 45"	1.0002687	15' 59.37"	23° 26' 14"	-2 m 50 s
18	15° 11' 26"	-0.00"	13° 58' 44"	5° 58' 42"	1.0002810	15' 59.36"	23° 26' 14"	-2 m 50 s
19	15° 13' 53"	-0.01"	14° 01' 01"	5° 59' 39"	1.0002932	15' 59.35"	23° 26' 14"	-2 m 49 s
20	15° 16' 21"	-0.01"	14° 03' 18"	6° 00' 36"	1.0003055	15' 59.34"	23° 26' 14"	-2 m 48 s
21	15° 18' 49"	-0.02"	14° 05' 35"	6° 01' 33"	1.0003178	15' 59.33"	23° 26' 14"	-2 m 47 s
22	15° 21' 17"	-0.02"	14° 07' 52"	6° 02' 30"	1.0003300	15' 59.31"	23° 26' 14"	-2 m 47 s
23	15° 23' 44"	-0.03"	14° 10' 09"	6° 03' 27"	1.0003423	15' 59.30"	23° 26' 14"	-2 m 46 s
24	15° 26' 12"	-0.03"	14° 12' 26"	6° 04' 24"	1.0003546	15' 59.29"	23° 26' 14"	-2 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	279° 06' 27"	-2° 17' 25"	280° 05' 04"	-25° 24' 34"	0° 58' 32"	15' 57.09"	86° 13' 02"	0.54782
1	279° 40' 51"	-2° 20' 09"	280° 43' 14"	-25° 24' 49"	0° 58' 30"	15' 56.59"	85° 56' 59"	0.54320
2	280° 15' 13"	-2° 22' 53"	281° 21' 22"	-25° 24' 55"	0° 58' 29"	15' 56.09"	85° 40' 56"	0.53858
3	280° 49' 32"	-2° 25' 35"	281° 59' 28"	-25° 24' 51"	0° 58' 27"	15' 55.59"	85° 24' 52"	0.53396
4	281° 23' 50"	-2° 28' 16"	282° 37' 30"	-25° 24' 37"	0° 58' 25"	15' 55.08"	85° 8' 49"	0.52935
5	281° 58' 05"	-2° 30' 56"	283° 15' 30"	-25° 24' 14"	0° 58' 23"	15' 54.58"	84° 52' 45"	0.52474
6	282° 32' 19"	-2° 33' 35"	283° 53' 28"	-25° 23' 41"	0° 58' 21"	15' 54.08"	84° 36' 41"	0.52013
7	283° 06' 30"	-2° 36' 13"	284° 31' 23"	-25° 22' 58"	0° 58' 19"	15' 53.58"	84° 20' 38"	0.51552
8	283° 40' 40"	-2° 38' 50"	285° 09' 14"	-25° 22' 05"	0° 58' 18"	15' 53.08"	84° 4' 34"	0.51092
9	284° 14' 47"	-2° 41' 26"	285° 47' 03"	-25° 21' 03"	0° 58' 16"	15' 52.57"	83° 48' 32"	0.50632
10	284° 48' 52"	-2° 44' 01"	286° 24' 49"	-25° 19' 51"	0° 58' 14"	15' 52.07"	83° 32' 30"	0.50173
11	285° 22' 56"	-2° 46' 34"	287° 02' 31"	-25° 18' 30"	0° 58' 12"	15' 51.57"	83° 16' 29"	0.49714
12	285° 56' 57"	-2° 49' 07"	287° 40' 10"	-25° 16' 59"	0° 58' 10"	15' 51.07"	83° 0' 29"	0.49255
13	286° 30' 56"	-2° 51' 38"	288° 17' 46"	-25° 15' 19"	0° 58' 08"	15' 50.57"	82° 44' 30"	0.48797
14	287° 04' 54"	-2° 54' 08"	288° 55' 19"	-25° 13' 29"	0° 58' 07"	15' 50.07"	82° 28' 32"	0.48340
15	287° 38' 49"	-2° 56' 37"	289° 32' 48"	-25° 11' 30"	0° 58' 05"	15' 49.57"	82° 12' 35"	0.47884
16	288° 12' 43"	-2° 59' 05"	290° 10' 13"	-25° 09' 22"	0° 58' 03"	15' 49.08"	81° 56' 40"	0.47428
17	288° 46' 34"	-3° 01' 32"	290° 47' 34"	-25° 07' 04"	0° 58' 01"	15' 48.58"	81° 40' 47"	0.46973
18	289° 20' 23"	-3° 03' 57"	291° 24' 52"	-25° 04' 37"	0° 57' 59"	15' 48.08"	81° 24' 55"	0.46518
19	289° 54' 11"	-3° 06' 21"	292° 02' 06"	-25° 02' 01"	0° 57' 57"	15' 47.59"	81° 9' 06"	0.46064
20	290° 27' 57"	-3° 08' 44"	292° 39' 16"	-24° 59' 16"	0° 57' 56"	15' 47.09"	80° 53' 18"	0.45612
21	291° 01' 40"	-3° 11' 06"	293° 16' 22"	-24° 56' 22"	0° 57' 54"	15' 46.60"	80° 37' 32"	0.45160
22	291° 35' 22"	-3° 13' 26"	293° 53' 24"	-24° 53' 19"	0° 57' 52"	15' 46.10"	80° 21' 48"	0.44709
23	292° 09' 02"	-3° 15' 46"	294° 30' 22"	-24° 50' 07"	0° 57' 50"	15' 45.61"	80° 6' 07"	0.44258
24	292° 42' 40"	-3° 18' 04"	295° 07' 16"	-24° 46' 46"	0° 57' 48"	15' 45.12"	79° 50' 28"	0.43809

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	15° 26' 12"	-0.03"	14° 12' 26"	6° 04' 24"	1.0003546	15' 59.29"	23° 26' 14"	-2 m 45 s
1	15° 28' 40"	-0.04"	14° 14' 43"	6° 05' 21"	1.0003668	15' 59.28"	23° 26' 14"	-2 m 45 s
2	15° 31' 08"	-0.04"	14° 17' 00"	6° 06' 18"	1.0003791	15' 59.27"	23° 26' 14"	-2 m 44 s
3	15° 33' 35"	-0.05"	14° 19' 18"	6° 07' 15"	1.0003913	15' 59.25"	23° 26' 14"	-2 m 43 s
4	15° 36' 03"	-0.05"	14° 21' 35"	6° 08' 12"	1.0004036	15' 59.24"	23° 26' 14"	-2 m 42 s
5	15° 38' 31"	-0.05"	14° 23' 52"	6° 09' 08"	1.0004159	15' 59.23"	23° 26' 14"	-2 m 42 s
6	15° 40' 58"	-0.06"	14° 26' 09"	6° 10' 05"	1.0004281	15' 59.22"	23° 26' 14"	-2 m 41 s
7	15° 43' 26"	-0.06"	14° 28' 26"	6° 11' 02"	1.0004404	15' 59.21"	23° 26' 15"	-2 m 40 s
8	15° 45' 54"	-0.07"	14° 30' 43"	6° 11' 59"	1.0004526	15' 59.20"	23° 26' 15"	-2 m 40 s
9	15° 48' 22"	-0.07"	14° 33' 00"	6° 12' 56"	1.0004649	15' 59.18"	23° 26' 15"	-2 m 39 s
10	15° 50' 49"	-0.08"	14° 35' 17"	6° 13' 53"	1.0004772	15' 59.17"	23° 26' 15"	-2 m 38 s
11	15° 53' 17"	-0.08"	14° 37' 34"	6° 14' 50"	1.0004894	15' 59.16"	23° 26' 15"	-2 m 37 s
12	15° 55' 45"	-0.08"	14° 39' 52"	6° 15' 46"	1.0005017	15' 59.15"	23° 26' 15"	-2 m 37 s
13	15° 58' 12"	-0.09"	14° 42' 09"	6° 16' 43"	1.0005139	15' 59.14"	23° 26' 15"	-2 m 36 s
14	16° 00' 40"	-0.09"	14° 44' 26"	6° 17' 40"	1.0005262	15' 59.13"	23° 26' 15"	-2 m 35 s
15	16° 03' 08"	-0.10"	14° 46' 43"	6° 18' 37"	1.0005384	15' 59.11"	23° 26' 15"	-2 m 35 s
16	16° 05' 35"	-0.10"	14° 49' 00"	6° 19' 34"	1.0005507	15' 59.10"	23° 26' 15"	-2 m 34 s
17	16° 08' 03"	-0.10"	14° 51' 17"	6° 20' 30"	1.0005629	15' 59.09"	23° 26' 15"	-2 m 33 s
18	16° 10' 31"	-0.11"	14° 53' 34"	6° 21' 27"	1.0005752	15' 59.08"	23° 26' 15"	-2 m 32 s
19	16° 12' 58"	-0.11"	14° 55' 52"	6° 22' 24"	1.0005874	15' 59.07"	23° 26' 15"	-2 m 32 s
20	16° 15' 26"	-0.12"	14° 58' 09"	6° 23' 21"	1.0005997	15' 59.05"	23° 26' 15"	-2 m 31 s
21	16° 17' 54"	-0.12"	15° 00' 26"	6° 24' 17"	1.0006119	15' 59.04"	23° 26' 15"	-2 m 30 s
22	16° 20' 21"	-0.12"	15° 02' 43"	6° 25' 14"	1.0006242	15' 59.03"	23° 26' 15"	-2 m 30 s
23	16° 22' 49"	-0.13"	15° 05' 00"	6° 26' 11"	1.0006364	15' 59.02"	23° 26' 15"	-2 m 29 s
24	16° 25' 17"	-0.13"	15° 07' 18"	6° 27' 08"	1.0006487	15' 59.01"	23° 26' 15"	-2 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	292° 42' 40"	-3° 18' 04"	295° 07' 16"	-24° 46' 46"	0° 57' 48"	15' 45.12"	79° 50' 28"	0.43809
1	293° 16' 16"	-3° 20' 20"	295° 44' 05"	-24° 43' 17"	0° 57' 47"	15' 44.63"	79° 34' 52"	0.43361
2	293° 49' 50"	-3° 22' 36"	296° 20' 50"	-24° 39' 38"	0° 57' 45"	15' 44.14"	79° 19' 18"	0.42914
3	294° 23' 22"	-3° 24' 50"	296° 57' 30"	-24° 35' 51"	0° 57' 43"	15' 43.65"	79° 3' 47"	0.42468
4	294° 56' 53"	-3° 27' 02"	297° 34' 06"	-24° 31' 55"	0° 57' 41"	15' 43.16"	78° 48' 19"	0.42023
5	295° 30' 21"	-3° 29' 14"	298° 10' 38"	-24° 27' 51"	0° 57' 39"	15' 42.68"	78° 32' 54"	0.41579
6	296° 03' 48"	-3° 31' 24"	298° 47' 05"	-24° 23' 38"	0° 57' 38"	15' 42.19"	78° 17' 31"	0.41136
7	296° 37' 13"	-3° 33' 33"	299° 23' 27"	-24° 19' 17"	0° 57' 36"	15' 41.71"	78° 2' 12"	0.40694
8	297° 10' 35"	-3° 35' 40"	299° 59' 45"	-24° 14' 47"	0° 57' 34"	15' 41.23"	77° 46' 56"	0.40254
9	297° 43' 57"	-3° 37' 46"	300° 35' 57"	-24° 10' 09"	0° 57' 32"	15' 40.75"	77° 31' 44"	0.39815
10	298° 17' 16"	-3° 39' 51"	301° 12' 05"	-24° 05' 23"	0° 57' 31"	15' 40.27"	77° 16' 35"	0.39377
11	298° 50' 33"	-3° 41' 55"	301° 48' 09"	-24° 00' 29"	0° 57' 29"	15' 39.79"	77° 1' 29"	0.38940
12	299° 23' 49"	-3° 43' 57"	302° 24' 07"	-23° 55' 26"	0° 57' 27"	15' 39.31"	76° 46' 27"	0.38505
13	299° 57' 03"	-3° 45' 57"	302° 59' 60"	-23° 50' 15"	0° 57' 25"	15' 38.84"	76° 31' 28"	0.38071
14	300° 30' 15"	-3° 47' 56"	303° 35' 48"	-23° 44' 57"	0° 57' 24"	15' 38.36"	76° 16' 33"	0.37639
15	301° 03' 25"	-3° 49' 54"	304° 11' 31"	-23° 39' 30"	0° 57' 22"	15' 37.89"	76° 1' 42"	0.37208
16	301° 36' 34"	-3° 51' 51"	304° 47' 10"	-23° 33' 56"	0° 57' 20"	15' 37.42"	75° 46' 54"	0.36778
17	302° 09' 41"	-3° 53' 46"	305° 22' 43"	-23° 28' 14"	0° 57' 18"	15' 36.95"	75° 32' 11"	0.36350
18	302° 42' 46"	-3° 55' 40"	305° 58' 11"	-23° 22' 24"	0° 57' 17"	15' 36.48"	75° 17' 31"	0.35923
19	303° 15' 49"	-3° 57' 32"	306° 33' 33"	-23° 16' 26"	0° 57' 15"	15' 36.02"	75° 2' 56"	0.35498
20	303° 48' 50"	-3° 59' 23"	307° 08' 51"	-23° 10' 21"	0° 57' 13"	15' 35.55"	74° 48' 25"	0.35075
21	304° 21' 50"	-4° 01' 12"	307° 44' 03"	-23° 04' 09"	0° 57' 12"	15' 35.09"	74° 33' 57"	0.34653
22	304° 54' 48"	-4° 02' 60"	308° 19' 10"	-22° 57' 49"	0° 57' 10"	15' 34.63"	74° 19' 34"	0.34233
23	305° 27' 45"	-4° 04' 46"	308° 54' 12"	-22° 51' 21"	0° 57' 08"	15' 34.17"	74° 5' 15"	0.33814
24	306° 00' 39"	-4° 06' 32"	309° 29' 08"	-22° 44' 46"	0° 57' 06"	15' 33.71"	73° 51' 01"	0.33397

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	16° 25' 17"	-0.13"	15° 07' 18"	6° 27' 08"	1.0006487	15' 59.01"	23° 26' 15"	-2 m 28 s
1	16° 27' 44"	-0.14"	15° 09' 35"	6° 28' 04"	1.0006609	15' 59.00"	23° 26' 15"	-2 m 28 s
2	16° 30' 12"	-0.14"	15° 11' 52"	6° 29' 01"	1.0006731	15' 58.98"	23° 26' 15"	-2 m 27 s
3	16° 32' 40"	-0.14"	15° 14' 09"	6° 29' 58"	1.0006854	15' 58.97"	23° 26' 15"	-2 m 26 s
4	16° 35' 07"	-0.15"	15° 16' 26"	6° 30' 54"	1.0006976	15' 58.96"	23° 26' 15"	-2 m 25 s
5	16° 37' 35"	-0.15"	15° 18' 44"	6° 31' 51"	1.0007098	15' 58.95"	23° 26' 15"	-2 m 25 s
6	16° 40' 03"	-0.15"	15° 21' 01"	6° 32' 48"	1.0007221	15' 58.94"	23° 26' 15"	-2 m 24 s
7	16° 42' 30"	-0.16"	15° 23' 18"	6° 33' 44"	1.0007343	15' 58.93"	23° 26' 15"	-2 m 23 s
8	16° 44' 58"	-0.16"	15° 25' 35"	6° 34' 41"	1.0007465	15' 58.91"	23° 26' 15"	-2 m 23 s
9	16° 47' 25"	-0.16"	15° 27' 53"	6° 35' 37"	1.0007588	15' 58.90"	23° 26' 15"	-2 m 22 s
10	16° 49' 53"	-0.17"	15° 30' 10"	6° 36' 34"	1.0007710	15' 58.89"	23° 26' 15"	-2 m 21 s
11	16° 52' 21"	-0.17"	15° 32' 27"	6° 37' 31"	1.0007832	15' 58.88"	23° 26' 15"	-2 m 20 s
12	16° 54' 48"	-0.17"	15° 34' 45"	6° 38' 27"	1.0007954	15' 58.87"	23° 26' 15"	-2 m 20 s
13	16° 57' 16"	-0.18"	15° 37' 02"	6° 39' 24"	1.0008077	15' 58.86"	23° 26' 15"	-2 m 19 s
14	16° 59' 44"	-0.18"	15° 39' 19"	6° 40' 20"	1.0008199	15' 58.84"	23° 26' 15"	-2 m 18 s
15	17° 02' 11"	-0.18"	15° 41' 36"	6° 41' 17"	1.0008321	15' 58.83"	23° 26' 15"	-2 m 18 s
16	17° 04' 39"	-0.19"	15° 43' 54"	6° 42' 13"	1.0008443	15' 58.82"	23° 26' 15"	-2 m 17 s
17	17° 07' 06"	-0.19"	15° 46' 11"	6° 43' 10"	1.0008565	15' 58.81"	23° 26' 15"	-2 m 16 s
18	17° 09' 34"	-0.19"	15° 48' 28"	6° 44' 06"	1.0008688	15' 58.80"	23° 26' 15"	-2 m 16 s
19	17° 12' 02"	-0.20"	15° 50' 46"	6° 45' 03"	1.0008810	15' 58.79"	23° 26' 15"	-2 m 15 s
20	17° 14' 29"	-0.20"	15° 53' 03"	6° 45' 59"	1.0008932	15' 58.77"	23° 26' 15"	-2 m 14 s
21	17° 16' 57"	-0.20"	15° 55' 20"	6° 46' 56"	1.0009054	15' 58.76"	23° 26' 15"	-2 m 13 s
22	17° 19' 24"	-0.21"	15° 57' 38"	6° 47' 52"	1.0009176	15' 58.75"	23° 26' 15"	-2 m 13 s
23	17° 21' 52"	-0.21"	15° 59' 55"	6° 48' 48"	1.0009298	15' 58.74"	23° 26' 15"	-2 m 12 s
24	17° 24' 19"	-0.21"	16° 02' 12"	6° 49' 45"	1.0009420	15' 58.73"	23° 26' 15"	-2 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	306° 00' 39"	-4° 06' 32"	309° 29' 08"	-22° 44' 46"	0° 57' 06"	15' 33.71"	73° 51' 01"	0.33397
1	306° 33' 32"	-4° 08' 15"	310° 03' 59"	-22° 38' 05"	0° 57' 05"	15' 33.25"	73° 36' 50"	0.32982
2	307° 06' 24"	-4° 09' 57"	310° 38' 45"	-22° 31' 15"	0° 57' 03"	15' 32.80"	73° 22' 44"	0.32568
3	307° 39' 13"	-4° 11' 38"	311° 13' 25"	-22° 24' 19"	0° 57' 01"	15' 32.35"	73° 8' 43"	0.32156
4	308° 12' 01"	-4° 13' 17"	311° 47' 60"	-22° 17' 16"	0° 56' 60"	15' 31.89"	72° 54' 46"	0.31747
5	308° 44' 48"	-4° 14' 55"	312° 22' 30"	-22° 10' 06"	0° 56' 58"	15' 31.45"	72° 40' 53"	0.31338
6	309° 17' 32"	-4° 16' 31"	312° 56' 54"	-22° 02' 49"	0° 56' 57"	15' 31.00"	72° 27' 05"	0.30932
7	309° 50' 15"	-4° 18' 06"	313° 31' 12"	-21° 55' 26"	0° 56' 55"	15' 30.55"	72° 13' 22"	0.30528
8	310° 22' 57"	-4° 19' 39"	314° 05' 26"	-21° 47' 55"	0° 56' 53"	15' 30.11"	71° 59' 43"	0.30125
9	310° 55' 37"	-4° 21' 11"	314° 39' 33"	-21° 40' 18"	0° 56' 52"	15' 29.67"	71° 46' 08"	0.29724
10	311° 28' 15"	-4° 22' 41"	315° 13' 36"	-21° 32' 35"	0° 56' 50"	15' 29.23"	71° 32' 39"	0.29326
11	312° 00' 51"	-4° 24' 10"	315° 47' 33"	-21° 24' 45"	0° 56' 48"	15' 28.79"	71° 19' 13"	0.28929
12	312° 33' 26"	-4° 25' 37"	316° 21' 24"	-21° 16' 48"	0° 56' 47"	15' 28.35"	71° 5' 53"	0.28534
13	313° 05' 60"	-4° 27' 03"	316° 55' 10"	-21° 08' 45"	0° 56' 45"	15' 27.92"	70° 52' 37"	0.28141
14	313° 38' 32"	-4° 28' 27"	317° 28' 51"	-21° 00' 36"	0° 56' 44"	15' 27.49"	70° 39' 26"	0.27750
15	314° 11' 02"	-4° 29' 50"	318° 02' 26"	-20° 52' 21"	0° 56' 42"	15' 27.05"	70° 26' 20"	0.27362
16	314° 43' 31"	-4° 31' 11"	318° 35' 55"	-20° 43' 60"	0° 56' 40"	15' 26.63"	70° 13' 18"	0.26975
17	315° 15' 58"	-4° 32' 31"	319° 09' 20"	-20° 35' 32"	0° 56' 39"	15' 26.20"	70° 0' 21"	0.26591
18	315° 48' 24"	-4° 33' 49"	319° 42' 38"	-20° 26' 59"	0° 56' 37"	15' 25.77"	69° 47' 28"	0.26208
19	316° 20' 48"	-4° 35' 06"	320° 15' 52"	-20° 18' 20"	0° 56' 36"	15' 25.35"	69° 34' 41"	0.25828
20	316° 53' 10"	-4° 36' 21"	320° 48' 60"	-20° 09' 34"	0° 56' 34"	15' 24.93"	69° 21' 57"	0.25450
21	317° 25' 31"	-4° 37' 34"	321° 22' 02"	-20° 00' 44"	0° 56' 33"	15' 24.51"	69° 9' 19"	0.25074
22	317° 57' 51"	-4° 38' 46"	321° 54' 59"	-19° 51' 47"	0° 56' 31"	15' 24.10"	68° 56' 45"	0.24700
23	318° 30' 09"	-4° 39' 57"	322° 27' 51"	-19° 42' 45"	0° 56' 30"	15' 23.68"	68° 44' 16"	0.24328
24	319° 02' 26"	-4° 41' 06"	323° 00' 38"	-19° 33' 37"	0° 56' 28"	15' 23.27"	68° 31' 52"	0.23959

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	17° 24' 19"	-0.21"	16° 02' 12"	6° 49' 45"	1.0009420	15' 58.73"	23° 26' 15"	-2 m 11 s
1	17° 26' 47"	-0.21"	16° 04' 30"	6° 50' 41"	1.0009542	15' 58.72"	23° 26' 15"	-2 m 11 s
2	17° 29' 15"	-0.22"	16° 06' 47"	6° 51' 38"	1.0009664	15' 58.70"	23° 26' 15"	-2 m 10 s
3	17° 31' 42"	-0.22"	16° 09' 04"	6° 52' 34"	1.0009786	15' 58.69"	23° 26' 15"	-2 m 09 s
4	17° 34' 10"	-0.22"	16° 11' 22"	6° 53' 30"	1.0009908	15' 58.68"	23° 26' 15"	-2 m 09 s
5	17° 36' 37"	-0.22"	16° 13' 39"	6° 54' 27"	1.0010030	15' 58.67"	23° 26' 15"	-2 m 08 s
6	17° 39' 05"	-0.23"	16° 15' 56"	6° 55' 23"	1.0010152	15' 58.66"	23° 26' 15"	-2 m 07 s
7	17° 41' 32"	-0.23"	16° 18' 14"	6° 56' 19"	1.0010274	15' 58.65"	23° 26' 15"	-2 m 06 s
8	17° 44' 00"	-0.23"	16° 20' 31"	6° 57' 16"	1.0010396	15' 58.63"	23° 26' 15"	-2 m 06 s
9	17° 46' 28"	-0.23"	16° 22' 49"	6° 58' 12"	1.0010517	15' 58.62"	23° 26' 15"	-2 m 05 s
10	17° 48' 55"	-0.24"	16° 25' 06"	6° 59' 08"	1.0010639	15' 58.61"	23° 26' 15"	-2 m 04 s
11	17° 51' 23"	-0.24"	16° 27' 23"	7° 00' 05"	1.0010761	15' 58.60"	23° 26' 15"	-2 m 04 s
12	17° 53' 50"	-0.24"	16° 29' 41"	7° 01' 01"	1.0010883	15' 58.59"	23° 26' 15"	-2 m 03 s
13	17° 56' 18"	-0.24"	16° 31' 58"	7° 01' 57"	1.0011005	15' 58.58"	23° 26' 15"	-2 m 02 s
14	17° 58' 45"	-0.24"	16° 34' 16"	7° 02' 53"	1.0011126	15' 58.56"	23° 26' 15"	-2 m 02 s
15	18° 01' 13"	-0.25"	16° 36' 33"	7° 03' 50"	1.0011248	15' 58.55"	23° 26' 15"	-2 m 01 s
16	18° 03' 40"	-0.25"	16° 38' 51"	7° 04' 46"	1.0011370	15' 58.54"	23° 26' 15"	-2 m 00 s
17	18° 06' 08"	-0.25"	16° 41' 08"	7° 05' 42"	1.0011492	15' 58.53"	23° 26' 15"	-1 m 59 s
18	18° 08' 35"	-0.25"	16° 43' 25"	7° 06' 38"	1.0011613	15' 58.52"	23° 26' 15"	-1 m 59 s
19	18° 11' 03"	-0.25"	16° 45' 43"	7° 07' 35"	1.0011735	15' 58.51"	23° 26' 15"	-1 m 58 s
20	18° 13' 30"	-0.26"	16° 48' 00"	7° 08' 31"	1.0011856	15' 58.49"	23° 26' 15"	-1 m 57 s
21	18° 15' 58"	-0.26"	16° 50' 18"	7° 09' 27"	1.0011978	15' 58.48"	23° 26' 15"	-1 m 57 s
22	18° 18' 25"	-0.26"	16° 52' 35"	7° 10' 23"	1.0012100	15' 58.47"	23° 26' 15"	-1 m 56 s
23	18° 20' 53"	-0.26"	16° 54' 53"	7° 11' 19"	1.0012221	15' 58.46"	23° 26' 15"	-1 m 55 s
24	18° 23' 20"	-0.26"	16° 57' 10"	7° 12' 15"	1.0012343	15' 58.45"	23° 26' 15"	-1 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	319° 02' 26"	-4° 41' 06"	323° 00' 38"	-19° 33' 37"	0° 56' 28"	15' 23.27"	68° 31' 52"	0.23959
1	319° 34' 41"	-4° 42' 13"	323° 33' 19"	-19° 24' 24"	0° 56' 27"	15' 22.86"	68° 19' 32"	0.23592
2	320° 06' 54"	-4° 43' 19"	324° 05' 55"	-19° 15' 06"	0° 56' 25"	15' 22.45"	68° 7' 17"	0.23227
3	320° 39' 07"	-4° 44' 23"	324° 38' 25"	-19° 05' 42"	0° 56' 24"	15' 22.04"	67° 55' 06"	0.22865
4	321° 11' 17"	-4° 45' 26"	325° 10' 50"	-18° 56' 13"	0° 56' 22"	15' 21.64"	67° 43' 00"	0.22505
5	321° 43' 27"	-4° 46' 27"	325° 43' 10"	-18° 46' 38"	0° 56' 21"	15' 21.24"	67° 30' 59"	0.22147
6	322° 15' 34"	-4° 47' 27"	326° 15' 25"	-18° 36' 59"	0° 56' 19"	15' 20.84"	67° 19' 02"	0.21792
7	322° 47' 41"	-4° 48' 25"	326° 47' 35"	-18° 27' 15"	0° 56' 18"	15' 20.44"	67° 7' 09"	0.21439
8	323° 19' 46"	-4° 49' 21"	327° 19' 39"	-18° 17' 25"	0° 56' 16"	15' 20.04"	66° 55' 21"	0.21088
9	323° 51' 49"	-4° 50' 16"	327° 51' 38"	-18° 07' 31"	0° 56' 15"	15' 19.65"	66° 43' 37"	0.20740
10	324° 23' 51"	-4° 51' 09"	328° 23' 32"	-17° 57' 32"	0° 56' 13"	15' 19.25"	66° 31' 57"	0.20394
11	324° 55' 52"	-4° 52' 01"	328° 55' 21"	-17° 47' 28"	0° 56' 12"	15' 18.86"	66° 20' 22"	0.20051
12	325° 27' 52"	-4° 52' 52"	329° 27' 05"	-17° 37' 20"	0° 56' 11"	15' 18.48"	66° 8' 51"	0.19710
13	325° 59' 50"	-4° 53' 40"	329° 58' 44"	-17° 27' 07"	0° 56' 09"	15' 18.09"	65° 57' 24"	0.19372
14	326° 31' 46"	-4° 54' 27"	330° 30' 18"	-17° 16' 49"	0° 56' 08"	15' 17.71"	65° 46' 01"	0.19036
15	327° 03' 41"	-4° 55' 13"	331° 01' 47"	-17° 06' 27"	0° 56' 06"	15' 17.33"	65° 34' 42"	0.18703
16	327° 35' 35"	-4° 55' 57"	331° 33' 11"	-16° 56' 01"	0° 56' 05"	15' 16.95"	65° 23' 28"	0.18372
17	328° 07' 28"	-4° 56' 39"	332° 04' 30"	-16° 45' 30"	0° 56' 04"	15' 16.57"	65° 12' 17"	0.18044
18	328° 39' 19"	-4° 57' 20"	332° 35' 44"	-16° 34' 55"	0° 56' 02"	15' 16.19"	65° 1' 10"	0.17718
19	329° 11' 09"	-4° 57' 59"	333° 06' 54"	-16° 24' 16"	0° 56' 01"	15' 15.82"	64° 50' 06"	0.17395
20	329° 42' 57"	-4° 58' 37"	333° 37' 59"	-16° 13' 32"	0° 55' 59"	15' 15.45"	64° 39' 07"	0.17075
21	330° 14' 44"	-4° 59' 13"	334° 08' 58"	-16° 02' 45"	0° 55' 58"	15' 15.08"	64° 28' 11"	0.16757
22	330° 46' 30"	-4° 59' 48"	334° 39' 54"	-15° 51' 53"	0° 55' 57"	15' 14.71"	64° 17' 18"	0.16442
23	331° 18' 15"	-5° 00' 21"	335° 10' 44"	-15° 40' 58"	0° 55' 55"	15' 14.35"	64° 6' 29"	0.16130
24	331° 49' 58"	-5° 00' 52"	335° 41' 30"	-15° 29' 59"	0° 55' 54"	15' 13.98"	63° 55' 43"	0.15820

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	18° 23' 20"	-0.26"	16° 57' 10"	7° 12' 15"	1.0012343	15' 58.45"	23° 26' 15"	-1 m 55 s
1	18° 25' 48"	-0.26"	16° 59' 28"	7° 13' 11"	1.0012464	15' 58.44"	23° 26' 15"	-1 m 54 s
2	18° 28' 15"	-0.27"	17° 01' 45"	7° 14' 07"	1.0012586	15' 58.42"	23° 26' 15"	-1 m 53 s
3	18° 30' 43"	-0.27"	17° 04' 03"	7° 15' 04"	1.0012707	15' 58.41"	23° 26' 15"	-1 m 53 s
4	18° 33' 10"	-0.27"	17° 06' 20"	7° 15' 60"	1.0012828	15' 58.40"	23° 26' 15"	-1 m 52 s
5	18° 35' 38"	-0.27"	17° 08' 38"	7° 16' 56"	1.0012950	15' 58.39"	23° 26' 15"	-1 m 51 s
6	18° 38' 05"	-0.27"	17° 10' 55"	7° 17' 52"	1.0013071	15' 58.38"	23° 26' 15"	-1 m 51 s
7	18° 40' 33"	-0.27"	17° 13' 13"	7° 18' 48"	1.0013192	15' 58.37"	23° 26' 15"	-1 m 50 s
8	18° 43' 00"	-0.27"	17° 15' 30"	7° 19' 44"	1.0013314	15' 58.35"	23° 26' 15"	-1 m 49 s
9	18° 45' 28"	-0.28"	17° 17' 48"	7° 20' 40"	1.0013435	15' 58.34"	23° 26' 15"	-1 m 48 s
10	18° 47' 55"	-0.28"	17° 20' 06"	7° 21' 36"	1.0013556	15' 58.33"	23° 26' 15"	-1 m 48 s
11	18° 50' 23"	-0.28"	17° 22' 23"	7° 22' 32"	1.0013678	15' 58.32"	23° 26' 15"	-1 m 47 s
12	18° 52' 50"	-0.28"	17° 24' 41"	7° 23' 28"	1.0013799	15' 58.31"	23° 26' 15"	-1 m 46 s
13	18° 55' 18"	-0.28"	17° 26' 58"	7° 24' 24"	1.0013920	15' 58.30"	23° 26' 15"	-1 m 46 s
14	18° 57' 45"	-0.28"	17° 29' 16"	7° 25' 20"	1.0014041	15' 58.28"	23° 26' 15"	-1 m 45 s
15	19° 00' 13"	-0.28"	17° 31' 33"	7° 26' 16"	1.0014162	15' 58.27"	23° 26' 15"	-1 m 44 s
16	19° 02' 40"	-0.28"	17° 33' 51"	7° 27' 12"	1.0014283	15' 58.26"	23° 26' 15"	-1 m 44 s
17	19° 05' 08"	-0.28"	17° 36' 09"	7° 28' 07"	1.0014404	15' 58.25"	23° 26' 15"	-1 m 43 s
18	19° 07' 35"	-0.28"	17° 38' 26"	7° 29' 03"	1.0014525	15' 58.24"	23° 26' 15"	-1 m 42 s
19	19° 10' 02"	-0.28"	17° 40' 44"	7° 29' 59"	1.0014646	15' 58.23"	23° 26' 15"	-1 m 42 s
20	19° 12' 30"	-0.28"	17° 43' 01"	7° 30' 55"	1.0014767	15' 58.21"	23° 26' 15"	-1 m 41 s
21	19° 14' 57"	-0.29"	17° 45' 19"	7° 31' 51"	1.0014888	15' 58.20"	23° 26' 15"	-1 m 40 s
22	19° 17' 25"	-0.29"	17° 47' 37"	7° 32' 47"	1.0015009	15' 58.19"	23° 26' 15"	-1 m 40 s
23	19° 19' 52"	-0.29"	17° 49' 54"	7° 33' 43"	1.0015130	15' 58.18"	23° 26' 15"	-1 m 39 s
24	19° 22' 20"	-0.29"	17° 52' 12"	7° 34' 38"	1.0015251	15' 58.17"	23° 26' 15"	-1 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	331° 49' 58"	-5° 00' 52"	335° 41' 30"	-15° 29' 59"	0° 55' 54"	15' 13.98"	63° 55' 43"	0.15820
1	332° 21' 40"	-5° 01' 22"	336° 12' 11"	-15° 18' 56"	0° 55' 53"	15' 13.62"	63° 45' 01"	0.15513
2	332° 53' 21"	-5° 01' 51"	336° 42' 48"	-15° 07' 49"	0° 55' 51"	15' 13.26"	63° 34' 21"	0.15209
3	333° 25' 00"	-5° 02' 17"	337° 13' 20"	-14° 56' 39"	0° 55' 50"	15' 12.91"	63° 23' 45"	0.14907
4	333° 56' 38"	-5° 02' 42"	337° 43' 48"	-14° 45' 25"	0° 55' 49"	15' 12.55"	63° 13' 11"	0.14608
5	334° 28' 15"	-5° 03' 06"	338° 14' 12"	-14° 34' 07"	0° 55' 48"	15' 12.20"	63° 2' 40"	0.14312
6	334° 59' 51"	-5° 03' 28"	338° 44' 31"	-14° 22' 46"	0° 55' 46"	15' 11.85"	62° 52' 12"	0.14019
7	335° 31' 25"	-5° 03' 49"	339° 14' 45"	-14° 11' 22"	0° 55' 45"	15' 11.50"	62° 41' 46"	0.13728
8	336° 02' 58"	-5° 04' 08"	339° 44' 56"	-13° 59' 54"	0° 55' 44"	15' 11.16"	62° 31' 23"	0.13440
9	336° 34' 30"	-5° 04' 25"	340° 15' 02"	-13° 48' 23"	0° 55' 42"	15' 10.81"	62° 21' 02"	0.13155
10	337° 06' 00"	-5° 04' 41"	340° 45' 04"	-13° 36' 49"	0° 55' 41"	15' 10.47"	62° 10' 42"	0.12873
11	337° 37' 30"	-5° 04' 55"	341° 15' 02"	-13° 25' 12"	0° 55' 40"	15' 10.13"	62° 0' 25"	0.12594
12	338° 08' 58"	-5° 05' 08"	341° 44' 55"	-13° 13' 32"	0° 55' 39"	15' 09.79"	61° 50' 10"	0.12317
13	338° 40' 25"	-5° 05' 19"	342° 14' 45"	-13° 01' 48"	0° 55' 37"	15' 09.46"	61° 39' 56"	0.12044
14	339° 11' 50"	-5° 05' 29"	342° 44' 31"	-12° 50' 02"	0° 55' 36"	15' 09.12"	61° 29' 43"	0.11773
15	339° 43' 15"	-5° 05' 37"	343° 14' 12"	-12° 38' 12"	0° 55' 35"	15' 08.79"	61° 19' 31"	0.11505
16	340° 14' 38"	-5° 05' 43"	343° 43' 50"	-12° 26' 20"	0° 55' 34"	15' 08.46"	61° 9' 21"	0.11240
17	340° 46' 00"	-5° 05' 48"	344° 13' 24"	-12° 14' 25"	0° 55' 33"	15' 08.14"	60° 59' 11"	0.10978
18	341° 17' 21"	-5° 05' 52"	344° 42' 54"	-12° 02' 28"	0° 55' 31"	15' 07.81"	60° 49' 01"	0.10719
19	341° 48' 41"	-5° 05' 54"	345° 12' 21"	-11° 50' 28"	0° 55' 30"	15' 07.49"	60° 38' 52"	0.10462
20	342° 19' 59"	-5° 05' 54"	345° 41' 43"	-11° 38' 25"	0° 55' 29"	15' 07.17"	60° 28' 43"	0.10209
21	342° 51' 17"	-5° 05' 53"	346° 11' 02"	-11° 26' 19"	0° 55' 28"	15' 06.85"	60° 18' 34"	0.09959
22	343° 22' 33"	-5° 05' 50"	346° 40' 18"	-11° 14' 12"	0° 55' 27"	15' 06.53"	60° 8' 24"	0.09711
23	343° 53' 48"	-5° 05' 46"	347° 09' 30"	-11° 02' 01"	0° 55' 26"	15' 06.21"	59° 58' 14"	0.09467
24	344° 25' 02"	-5° 05' 40"	347° 38' 38"	-10° 49' 49"	0° 55' 24"	15' 05.90"	59° 48' 02"	0.09226

9 April 2021

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	19° 22' 20"	-0.29"	17° 52' 12"	7° 34' 38"	1.0015251	15' 58.17"	23° 26' 15"	-1 m 38 s
1	19° 24' 47"	-0.29"	17° 54' 30"	7° 35' 34"	1.0015372	15' 58.16"	23° 26' 15"	-1 m 38 s
2	19° 27' 15"	-0.29"	17° 56' 47"	7° 36' 30"	1.0015493	15' 58.15"	23° 26' 15"	-1 m 37 s
3	19° 29' 42"	-0.29"	17° 59' 05"	7° 37' 26"	1.0015614	15' 58.13"	23° 26' 15"	-1 m 36 s
4	19° 32' 09"	-0.29"	18° 01' 23"	7° 38' 22"	1.0015734	15' 58.12"	23° 26' 15"	-1 m 36 s
5	19° 34' 37"	-0.29"	18° 03' 40"	7° 39' 17"	1.0015855	15' 58.11"	23° 26' 15"	-1 m 35 s
6	19° 37' 04"	-0.29"	18° 05' 58"	7° 40' 13"	1.0015976	15' 58.10"	23° 26' 15"	-1 m 34 s
7	19° 39' 32"	-0.29"	18° 08' 16"	7° 41' 09"	1.0016096	15' 58.09"	23° 26' 15"	-1 m 33 s
8	19° 41' 59"	-0.29"	18° 10' 33"	7° 42' 04"	1.0016217	15' 58.08"	23° 26' 15"	-1 m 33 s
9	19° 44' 26"	-0.29"	18° 12' 51"	7° 43' 00"	1.0016338	15' 58.06"	23° 26' 15"	-1 m 32 s
10	19° 46' 54"	-0.29"	18° 15' 09"	7° 43' 56"	1.0016458	15' 58.05"	23° 26' 15"	-1 m 31 s
11	19° 49' 21"	-0.29"	18° 17' 27"	7° 44' 51"	1.0016579	15' 58.04"	23° 26' 15"	-1 m 31 s
12	19° 51' 49"	-0.29"	18° 19' 44"	7° 45' 47"	1.0016699	15' 58.03"	23° 26' 15"	-1 m 30 s
13	19° 54' 16"	-0.29"	18° 22' 02"	7° 46' 43"	1.0016820	15' 58.02"	23° 26' 15"	-1 m 29 s
14	19° 56' 43"	-0.29"	18° 24' 20"	7° 47' 38"	1.0016940	15' 58.01"	23° 26' 15"	-1 m 29 s
15	19° 59' 11"	-0.29"	18° 26' 38"	7° 48' 34"	1.0017061	15' 58.00"	23° 26' 15"	-1 m 28 s
16	20° 01' 38"	-0.29"	18° 28' 55"	7° 49' 30"	1.0017181	15' 57.98"	23° 26' 15"	-1 m 27 s
17	20° 04' 05"	-0.28"	18° 31' 13"	7° 50' 25"	1.0017302	15' 57.97"	23° 26' 15"	-1 m 27 s
18	20° 06' 33"	-0.28"	18° 33' 31"	7° 51' 21"	1.0017422	15' 57.96"	23° 26' 15"	-1 m 26 s
19	20° 09' 00"	-0.28"	18° 35' 49"	7° 52' 16"	1.0017542	15' 57.95"	23° 26' 15"	-1 m 25 s
20	20° 11' 28"	-0.28"	18° 38' 06"	7° 53' 12"	1.0017662	15' 57.94"	23° 26' 15"	-1 m 25 s
21	20° 13' 55"	-0.28"	18° 40' 24"	7° 54' 07"	1.0017783	15' 57.93"	23° 26' 15"	-1 m 24 s
22	20° 16' 22"	-0.28"	18° 42' 42"	7° 55' 03"	1.0017903	15' 57.92"	23° 26' 15"	-1 m 23 s
23	20° 18' 50"	-0.28"	18° 44' 60"	7° 55' 58"	1.0018023	15' 57.90"	23° 26' 15"	-1 m 23 s
24	20° 21' 17"	-0.28"	18° 47' 18"	7° 56' 54"	1.0018143	15' 57.89"	23° 26' 15"	-1 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	344° 25' 02"	-5° 05' 40"	347° 38' 38"	-10° 49' 49"	0° 55' 24"	15' 05.90"	59° 48' 02"	0.09226
1	344° 56' 14"	-5° 05' 33"	348° 07' 43"	-10° 37' 34"	0° 55' 23"	15' 05.59"	59° 37' 49"	0.08987
2	345° 27' 26"	-5° 05' 24"	348° 36' 45"	-10° 25' 17"	0° 55' 22"	15' 05.28"	59° 27' 34"	0.08752
3	345° 58' 36"	-5° 05' 14"	349° 05' 43"	-10° 12' 57"	0° 55' 21"	15' 04.97"	59° 17' 17"	0.08519
4	346° 29' 46"	-5° 05' 02"	349° 34' 38"	-10° 00' 36"	0° 55' 20"	15' 04.67"	59° 6' 58"	0.08290
5	347° 00' 54"	-5° 04' 49"	350° 03' 29"	-9° 48' 12"	0° 55' 19"	15' 04.37"	58° 56' 36"	0.08064
6	347° 32' 01"	-5° 04' 34"	350° 32' 18"	-9° 35' 47"	0° 55' 18"	15' 04.07"	58° 46' 10"	0.07840
7	348° 03' 07"	-5° 04' 18"	351° 01' 03"	-9° 23' 19"	0° 55' 17"	15' 03.77"	58° 35' 41"	0.07620
8	348° 34' 11"	-5° 04' 00"	351° 29' 45"	-9° 10' 50"	0° 55' 15"	15' 03.47"	58° 25' 08"	0.07403
9	349° 05' 15"	-5° 03' 41"	351° 58' 25"	-8° 58' 18"	0° 55' 14"	15' 03.18"	58° 14' 30"	0.07189
10	349° 36' 18"	-5° 03' 20"	352° 27' 01"	-8° 45' 45"	0° 55' 13"	15' 02.88"	58° 3' 47"	0.06978
11	350° 07' 19"	-5° 02' 58"	352° 55' 34"	-8° 33' 11"	0° 55' 12"	15' 02.59"	57° 52' 58"	0.06770
12	350° 38' 20"	-5° 02' 34"	353° 24' 05"	-8° 20' 34"	0° 55' 11"	15' 02.30"	57° 42' 03"	0.06565
13	351° 09' 19"	-5° 02' 09"	353° 52' 32"	-8° 07' 56"	0° 55' 10"	15' 02.02"	57° 31' 01"	0.06363
14	351° 40' 17"	-5° 01' 42"	354° 20' 57"	-7° 55' 16"	0° 55' 09"	15' 01.73"	57° 19' 52"	0.06165
15	352° 11' 14"	-5° 01' 14"	354° 49' 19"	-7° 42' 35"	0° 55' 08"	15' 01.45"	57° 8' 34"	0.05969
16	352° 42' 10"	-5° 00' 45"	355° 17' 39"	-7° 29' 53"	0° 55' 07"	15' 01.17"	56° 57' 07"	0.05777
17	353° 13' 05"	-5° 00' 14"	355° 45' 56"	-7° 17' 08"	0° 55' 06"	15' 00.89"	56° 45' 31"	0.05588
18	353° 43' 59"	-4° 59' 41"	356° 14' 10"	-7° 04' 23"	0° 55' 05"	15' 00.61"	56° 33' 44"	0.05402
19	354° 14' 52"	-4° 59' 07"	356° 42' 22"	-6° 51' 36"	0° 55' 04"	15' 00.34"	56° 21' 45"	0.05219
20	354° 45' 44"	-4° 58' 32"	357° 10' 32"	-6° 38' 48"	0° 55' 03"	15' 00.07"	56° 9' 34"	0.05039
21	355° 16' 34"	-4° 57' 55"	357° 38' 39"	-6° 25' 59"	0° 55' 02"	14' 59.80"	55° 57' 10"	0.04862
22	355° 47' 24"	-4° 57' 17"	358° 06' 44"	-6° 13' 09"	0° 55' 01"	14' 59.53"	55° 44' 31"	0.04689
23	356° 18' 13"	-4° 56' 37"	358° 34' 46"	-6° 00' 18"	0° 55' 00"	14' 59.26"	55° 31' 36"	0.04518
24	356° 49' 00"	-4° 55' 56"	359° 02' 46"	-5° 47' 25"	0° 54' 59"	14' 59.00"	55° 18' 24"	0.04351

10 April 2021

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	20° 21' 17"	-0.28"	18° 47' 18"	7° 56' 54"	1.0018143	15' 57.89"	23° 26' 15"	-1 m 22 s
1	20° 23' 44"	-0.28"	18° 49' 36"	7° 57' 49"	1.0018263	15' 57.88"	23° 26' 15"	-1 m 21 s
2	20° 26' 12"	-0.28"	18° 51' 53"	7° 58' 45"	1.0018383	15' 57.87"	23° 26' 15"	-1 m 21 s
3	20° 28' 39"	-0.28"	18° 54' 11"	7° 59' 40"	1.0018504	15' 57.86"	23° 26' 15"	-1 m 20 s
4	20° 31' 06"	-0.28"	18° 56' 29"	8° 00' 36"	1.0018624	15' 57.85"	23° 26' 15"	-1 m 19 s
5	20° 33' 34"	-0.27"	18° 58' 47"	8° 01' 31"	1.0018744	15' 57.83"	23° 26' 15"	-1 m 19 s
6	20° 36' 01"	-0.27"	19° 01' 05"	8° 02' 27"	1.0018864	15' 57.82"	23° 26' 15"	-1 m 18 s
7	20° 38' 28"	-0.27"	19° 03' 23"	8° 03' 22"	1.0018983	15' 57.81"	23° 26' 15"	-1 m 17 s
8	20° 40' 56"	-0.27"	19° 05' 41"	8° 04' 17"	1.0019103	15' 57.80"	23° 26' 15"	-1 m 17 s
9	20° 43' 23"	-0.27"	19° 07' 58"	8° 05' 13"	1.0019223	15' 57.79"	23° 26' 15"	-1 m 16 s
10	20° 45' 50"	-0.27"	19° 10' 16"	8° 06' 08"	1.0019343	15' 57.78"	23° 26' 15"	-1 m 15 s
11	20° 48' 18"	-0.27"	19° 12' 34"	8° 07' 03"	1.0019463	15' 57.77"	23° 26' 15"	-1 m 15 s
12	20° 50' 45"	-0.26"	19° 14' 52"	8° 07' 59"	1.0019583	15' 57.75"	23° 26' 15"	-1 m 14 s
13	20° 53' 12"	-0.26"	19° 17' 10"	8° 08' 54"	1.0019702	15' 57.74"	23° 26' 15"	-1 m 13 s
14	20° 55' 40"	-0.26"	19° 19' 28"	8° 09' 49"	1.0019822	15' 57.73"	23° 26' 15"	-1 m 13 s
15	20° 58' 07"	-0.26"	19° 21' 46"	8° 10' 45"	1.0019942	15' 57.72"	23° 26' 15"	-1 m 12 s
16	21° 00' 34"	-0.26"	19° 24' 04"	8° 11' 40"	1.0020061	15' 57.71"	23° 26' 15"	-1 m 11 s
17	21° 03' 01"	-0.26"	19° 26' 22"	8° 12' 35"	1.0020181	15' 57.70"	23° 26' 15"	-1 m 11 s
18	21° 05' 29"	-0.25"	19° 28' 40"	8° 13' 30"	1.0020301	15' 57.69"	23° 26' 15"	-1 m 10 s
19	21° 07' 56"	-0.25"	19° 30' 58"	8° 14' 26"	1.0020420	15' 57.67"	23° 26' 15"	-1 m 09 s
20	21° 10' 23"	-0.25"	19° 33' 16"	8° 15' 21"	1.0020540	15' 57.66"	23° 26' 15"	-1 m 09 s
21	21° 12' 51"	-0.25"	19° 35' 34"	8° 16' 16"	1.0020659	15' 57.65"	23° 26' 15"	-1 m 08 s
22	21° 15' 18"	-0.25"	19° 37' 52"	8° 17' 11"	1.0020778	15' 57.64"	23° 26' 15"	-1 m 07 s
23	21° 17' 45"	-0.24"	19° 40' 10"	8° 18' 06"	1.0020898	15' 57.63"	23° 26' 15"	-1 m 07 s
24	21° 20' 12"	-0.24"	19° 42' 28"	8° 19' 01"	1.0021017	15' 57.62"	23° 26' 15"	-1 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	356° 49' 00"	-4° 55' 56"	359° 02' 46"	-5° 47' 25"	0° 54' 59"	14' 59.00"	55° 18' 24"	0.04351
1	357° 19' 47"	-4° 55' 14"	359° 30' 44"	-5° 34' 32"	0° 54' 58"	14' 58.73"	55° 4' 54"	0.04187
2	357° 50' 33"	-4° 54' 30"	359° 58' 40"	-5° 21' 38"	0° 54' 57"	14' 58.47"	54° 51' 04"	0.04026
3	358° 21' 17"	-4° 53' 44"	0° 26' 34"	-5° 08' 42"	0° 54' 56"	14' 58.21"	54° 36' 52"	0.03869
4	358° 52' 01"	-4° 52' 58"	0° 54' 26"	-4° 55' 46"	0° 54' 55"	14' 57.96"	54° 22' 18"	0.03715
5	359° 22' 43"	-4° 52' 10"	1° 22' 16"	-4° 42' 50"	0° 54' 54"	14' 57.70"	54° 7' 18"	0.03563
6	359° 53' 25"	-4° 51' 20"	1° 50' 04"	-4° 29' 52"	0° 54' 53"	14' 57.45"	53° 51' 51"	0.03415
7	0° 24' 05"	-4° 50' 29"	2° 17' 51"	-4° 16' 54"	0° 54' 52"	14' 57.20"	53° 35' 55"	0.03271
8	0° 54' 45"	-4° 49' 37"	2° 45' 35"	-4° 03' 55"	0° 54' 52"	14' 56.95"	53° 19' 28"	0.03129
9	1° 25' 23"	-4° 48' 43"	3° 13' 18"	-3° 50' 56"	0° 54' 51"	14' 56.70"	53° 2' 26"	0.02991
10	1° 56' 01"	-4° 47' 48"	3° 40' 59"	-3° 37' 56"	0° 54' 50"	14' 56.46"	52° 44' 48"	0.02856
11	2° 26' 37"	-4° 46' 52"	4° 08' 38"	-3° 24' 55"	0° 54' 49"	14' 56.21"	52° 26' 30"	0.02724
12	2° 57' 13"	-4° 45' 54"	4° 36' 16"	-3° 11' 54"	0° 54' 48"	14' 55.97"	52° 7' 28"	0.02595
13	3° 27' 47"	-4° 44' 55"	5° 03' 53"	-2° 58' 53"	0° 54' 47"	14' 55.73"	51° 47' 39"	0.02470
14	3° 58' 21"	-4° 43' 55"	5° 31' 28"	-2° 45' 51"	0° 54' 46"	14' 55.50"	51° 26' 59"	0.02348
15	4° 28' 53"	-4° 42' 53"	5° 59' 01"	-2° 32' 50"	0° 54' 45"	14' 55.26"	51° 5' 24"	0.02229
16	4° 59' 25"	-4° 41' 50"	6° 26' 33"	-2° 19' 47"	0° 54' 45"	14' 55.03"	50° 42' 48"	0.02113
17	5° 29' 56"	-4° 40' 46"	6° 54' 04"	-2° 06' 45"	0° 54' 44"	14' 54.80"	50° 19' 06"	0.02001
18	6° 00' 25"	-4° 39' 40"	7° 21' 34"	-1° 53' 43"	0° 54' 43"	14' 54.57"	49° 54' 12"	0.01892
19	6° 30' 54"	-4° 38' 33"	7° 49' 02"	-1° 40' 40"	0° 54' 42"	14' 54.34"	49° 27' 60"	0.01786
20	7° 01' 22"	-4° 37' 25"	8° 16' 29"	-1° 27' 38"	0° 54' 41"	14' 54.12"	49° 0' 21"	0.01683
21	7° 31' 49"	-4° 36' 16"	8° 43' 56"	-1° 14' 35"	0° 54' 40"	14' 53.89"	48° 31' 08"	0.01583
22	8° 02' 15"	-4° 35' 05"	9° 11' 21"	-1° 01' 33"	0° 54' 40"	14' 53.67"	48° 0' 11"	0.01487
23	8° 32' 40"	-4° 33' 53"	9° 38' 45"	0° 48' 30"	0° 54' 39"	14' 53.45"	47° 27' 20"	0.01394
24	9° 03' 04"	-4° 32' 39"	10° 06' 08"	0° 35' 28"	0° 54' 38"	14' 53.24"	46° 52' 22"	0.01305

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	21° 20' 12"	-0.24"	19° 42' 28"	8° 19' 01"	1.0021017	15' 57.62"	23° 26' 15"	-1 m 06 s
1	21° 22' 40"	-0.24"	19° 44' 46"	8° 19' 57"	1.0021137	15' 57.61"	23° 26' 15"	-1 m 05 s
2	21° 25' 07"	-0.24"	19° 47' 04"	8° 20' 52"	1.0021256	15' 57.59"	23° 26' 15"	-1 m 05 s
3	21° 27' 34"	-0.24"	19° 49' 22"	8° 21' 47"	1.0021375	15' 57.58"	23° 26' 15"	-1 m 04 s
4	21° 30' 01"	-0.23"	19° 51' 40"	8° 22' 42"	1.0021494	15' 57.57"	23° 26' 15"	-1 m 04 s
5	21° 32' 29"	-0.23"	19° 53' 58"	8° 23' 37"	1.0021614	15' 57.56"	23° 26' 15"	-1 m 03 s
6	21° 34' 56"	-0.23"	19° 56' 16"	8° 24' 32"	1.0021733	15' 57.55"	23° 26' 15"	-1 m 02 s
7	21° 37' 23"	-0.23"	19° 58' 34"	8° 25' 27"	1.0021852	15' 57.54"	23° 26' 15"	-1 m 02 s
8	21° 39' 50"	-0.22"	20° 00' 52"	8° 26' 22"	1.0021971	15' 57.53"	23° 26' 15"	-1 m 01 s
9	21° 42' 18"	-0.22"	20° 03' 10"	8° 27' 17"	1.0022090	15' 57.51"	23° 26' 15"	-1 m 00 s
10	21° 44' 45"	-0.22"	20° 05' 28"	8° 28' 12"	1.0022209	15' 57.50"	23° 26' 15"	0 m-60 s
11	21° 47' 12"	-0.22"	20° 07' 46"	8° 29' 07"	1.0022328	15' 57.49"	23° 26' 15"	0 m-59 s
12	21° 49' 39"	-0.21"	20° 10' 04"	8° 30' 02"	1.0022447	15' 57.48"	23° 26' 15"	0 m-58 s
13	21° 52' 07"	-0.21"	20° 12' 22"	8° 30' 57"	1.0022566	15' 57.47"	23° 26' 15"	0 m-58 s
14	21° 54' 34"	-0.21"	20° 14' 40"	8° 31' 52"	1.0022685	15' 57.46"	23° 26' 15"	0 m-57 s
15	21° 57' 01"	-0.20"	20° 16' 58"	8° 32' 47"	1.0022804	15' 57.45"	23° 26' 15"	0 m-56 s
16	21° 59' 28"	-0.20"	20° 19' 17"	8° 33' 42"	1.0022923	15' 57.44"	23° 26' 15"	0 m-56 s
17	22° 01' 55"	-0.20"	20° 21' 35"	8° 34' 37"	1.0023041	15' 57.42"	23° 26' 15"	0 m-55 s
18	22° 04' 23"	-0.20"	20° 23' 53"	8° 35' 32"	1.0023160	15' 57.41"	23° 26' 15"	0 m-54 s
19	22° 06' 50"	-0.19"	20° 26' 11"	8° 36' 27"	1.0023279	15' 57.40"	23° 26' 15"	0 m-54 s
20	22° 09' 17"	-0.19"	20° 28' 29"	8° 37' 21"	1.0023397	15' 57.39"	23° 26' 15"	0 m-53 s
21	22° 11' 44"	-0.19"	20° 30' 47"	8° 38' 16"	1.0023516	15' 57.38"	23° 26' 15"	0 m-52 s
22	22° 14' 11"	-0.18"	20° 33' 05"	8° 39' 11"	1.0023635	15' 57.37"	23° 26' 15"	0 m-52 s
23	22° 16' 39"	-0.18"	20° 35' 24"	8° 40' 06"	1.0023753	15' 57.36"	23° 26' 15"	0 m-51 s
24	22° 19' 06"	-0.18"	20° 37' 42"	8° 41' 01"	1.0023872	15' 57.34"	23° 26' 15"	0 m-51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	9° 03' 04"	-4° 32' 39"	10° 06' 08"	0°-35' 28"	0° 54' 38"	14' 53.24"	46° 52' 22"	0.01305
1	9° 33' 27"	-4° 31' 25"	10° 33' 30"	0°-22' 26"	0° 54' 37"	14' 53.02"	46° 15' 05"	0.01218
2	10° 03' 50"	-4° 30' 09"	11° 00' 52"	0° -9' 24"	0° 54' 36"	14' 52.81"	45° 35' 13"	0.01135
3	10° 34' 11"	-4° 28' 52"	11° 28' 13"	0° 03' 37"	0° 54' 36"	14' 52.60"	44° 52' 29"	0.01055
4	11° 04' 31"	-4° 27' 33"	11° 55' 33"	0° 16' 39"	0° 54' 35"	14' 52.39"	44° 6' 32"	0.00979
5	11° 34' 51"	-4° 26' 14"	12° 22' 52"	0° 29' 39"	0° 54' 34"	14' 52.18"	43° 17' 01"	0.00905
6	12° 05' 10"	-4° 24' 53"	12° 50' 11"	0° 42' 40"	0° 54' 33"	14' 51.98"	42° 23' 30"	0.00835
7	12° 35' 27"	-4° 23' 31"	13° 17' 29"	0° 55' 40"	0° 54' 33"	14' 51.77"	41° 25' 29"	0.00768
8	13° 05' 44"	-4° 22' 07"	13° 44' 47"	1° 08' 39"	0° 54' 32"	14' 51.57"	40° 22' 22"	0.00705
9	13° 36' 00"	-4° 20' 43"	14° 12' 04"	1° 21' 38"	0° 54' 31"	14' 51.37"	39° 13' 30"	0.00645
10	14° 06' 15"	-4° 19' 17"	14° 39' 21"	1° 34' 36"	0° 54' 30"	14' 51.18"	37° 58' 07"	0.00588
11	14° 36' 30"	-4° 17' 50"	15° 06' 38"	1° 47' 34"	0° 54' 30"	14' 50.98"	36° 35' 18"	0.00534
12	15° 06' 43"	-4° 16' 22"	15° 33' 54"	2° 00' 30"	0° 54' 29"	14' 50.79"	35° 3' 59"	0.00483
13	15° 36' 56"	-4° 14' 53"	16° 01' 10"	2° 13' 26"	0° 54' 28"	14' 50.60"	33° 22' 56"	0.00436
14	16° 07' 07"	-4° 13' 23"	16° 28' 26"	2° 26' 22"	0° 54' 28"	14' 50.41"	31° 30' 44"	0.00392
15	16° 37' 18"	-4° 11' 51"	16° 55' 41"	2° 39' 16"	0° 54' 27"	14' 50.22"	29° 25' 41"	0.00351
16	17° 07' 28"	-4° 10' 19"	17° 22' 57"	2° 52' 10"	0° 54' 26"	14' 50.04"	27° 5' 51"	0.00314
17	17° 37' 37"	-4° 08' 45"	17° 50' 13"	3° 05' 02"	0° 54' 26"	14' 49.85"	24° 29' 02"	0.00279
18	18° 07' 46"	-4° 07' 10"	18° 17' 28"	3° 17' 54"	0° 54' 25"	14' 49.67"	21° 32' 43"	0.00248
19	18° 37' 53"	-4° 05' 34"	18° 44' 44"	3° 30' 45"	0° 54' 24"	14' 49.50"	18° 14' 12"	0.00221
20	19° 07' 60"	-4° 03' 57"	19° 11' 59"	3° 43' 34"	0° 54' 24"	14' 49.32"	14° 30' 41"	0.00196
21	19° 38' 05"	-4° 02' 19"	19° 39' 15"	3° 56' 22"	0° 54' 23"	14' 49.14"	10° 19' 25"	0.00175
22	20° 08' 11"	-4° 00' 39"	20° 06' 31"	4° 09' 10"	0° 54' 22"	14' 48.97"	5° 38' 16"	0.00157
23	20° 38' 15"	-3° 58' 59"	20° 33' 47"	4° 21' 56"	0° 54' 22"	14' 48.80"	0° 26' 06"	0.00142
24	21° 08' 18"	-3° 57' 17"	21° 01' 04"	4° 34' 40"	0° 54' 21"	14' 48.63"	354° 43' 39"	0.00130

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	22° 19' 06"	-0.18"	20° 37' 42"	8° 41' 01"	1.0023872	15' 57.34"	23° 26' 15"	0 m-51 s
1	22° 21' 33"	-0.17"	20° 39' 60"	8° 41' 56"	1.0023990	15' 57.33"	23° 26' 15"	0 m-50 s
2	22° 24' 00"	-0.17"	20° 42' 18"	8° 42' 50"	1.0024109	15' 57.32"	23° 26' 15"	0 m-49 s
3	22° 26' 27"	-0.17"	20° 44' 36"	8° 43' 45"	1.0024227	15' 57.31"	23° 26' 15"	0 m-49 s
4	22° 28' 55"	-0.16"	20° 46' 55"	8° 44' 40"	1.0024346	15' 57.30"	23° 26' 15"	0 m-48 s
5	22° 31' 22"	-0.16"	20° 49' 13"	8° 45' 34"	1.0024464	15' 57.29"	23° 26' 15"	0 m-47 s
6	22° 33' 49"	-0.16"	20° 51' 31"	8° 46' 29"	1.0024582	15' 57.28"	23° 26' 15"	0 m-47 s
7	22° 36' 16"	-0.15"	20° 53' 49"	8° 47' 24"	1.0024701	15' 57.27"	23° 26' 15"	0 m-46 s
8	22° 38' 43"	-0.15"	20° 56' 08"	8° 48' 19"	1.0024819	15' 57.25"	23° 26' 15"	0 m-45 s
9	22° 41' 10"	-0.15"	20° 58' 26"	8° 49' 13"	1.0024937	15' 57.24"	23° 26' 15"	0 m-45 s
10	22° 43' 38"	-0.14"	21° 00' 44"	8° 50' 08"	1.0025055	15' 57.23"	23° 26' 15"	0 m-44 s
11	22° 46' 05"	-0.14"	21° 03' 02"	8° 51' 03"	1.0025173	15' 57.22"	23° 26' 15"	0 m-43 s
12	22° 48' 32"	-0.13"	21° 05' 21"	8° 51' 57"	1.0025292	15' 57.21"	23° 26' 15"	0 m-43 s
13	22° 50' 59"	-0.13"	21° 07' 39"	8° 52' 52"	1.0025410	15' 57.20"	23° 26' 15"	0 m-42 s
14	22° 53' 26"	-0.13"	21° 09' 57"	8° 53' 46"	1.0025528	15' 57.19"	23° 26' 15"	0 m-42 s
15	22° 55' 53"	-0.12"	21° 12' 15"	8° 54' 41"	1.0025646	15' 57.18"	23° 26' 15"	0 m-41 s
16	22° 58' 20"	-0.12"	21° 14' 34"	8° 55' 35"	1.0025764	15' 57.16"	23° 26' 15"	0 m-40 s
17	23° 00' 47"	-0.12"	21° 16' 52"	8° 56' 30"	1.0025882	15' 57.15"	23° 26' 15"	0 m-40 s
18	23° 03' 15"	-0.11"	21° 19' 10"	8° 57' 24"	1.0025999	15' 57.14"	23° 26' 15"	0 m-39 s
19	23° 05' 42"	-0.11"	21° 21' 29"	8° 58' 19"	1.0026117	15' 57.13"	23° 26' 15"	0 m-38 s
20	23° 08' 09"	-0.10"	21° 23' 47"	8° 59' 13"	1.0026235	15' 57.12"	23° 26' 15"	0 m-38 s
21	23° 10' 36"	-0.10"	21° 26' 05"	9° 00' 08"	1.0026353	15' 57.11"	23° 26' 15"	0 m-37 s
22	23° 13' 03"	-0.09"	21° 28' 24"	9° 01' 02"	1.0026471	15' 57.10"	23° 26' 15"	0 m-36 s
23	23° 15' 30"	-0.09"	21° 30' 42"	9° 01' 57"	1.0026588	15' 57.09"	23° 26' 15"	0 m-36 s
24	23° 17' 57"	-0.09"	21° 33' 01"	9° 02' 51"	1.0026706	15' 57.07"	23° 26' 15"	0 m-35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	21° 08' 18"	-3° 57' 17"	21° 01' 04"	4° 34' 40"	0° 54' 21"	14' 48.63"	354° 43' 39"	0.00130
1	21° 38' 21"	-3° 55' 35"	21° 28' 21"	4° 47' 24"	0° 54' 20"	14' 48.47"	348° 34' 10"	0.00122
2	22° 08' 23"	-3° 53' 51"	21° 55' 38"	5° 00' 06"	0° 54' 20"	14' 48.30"	342° 3' 56"	0.00117
3	22° 38' 24"	-3° 52' 07"	22° 22' 56"	5° 12' 47"	0° 54' 19"	14' 48.14"	335° 22' 00"	0.00115
4	23° 08' 24"	-3° 50' 21"	22° 50' 15"	5° 25' 26"	0° 54' 19"	14' 47.98"	328° 39' 09"	0.00116
5	23° 38' 24"	-3° 48' 34"	23° 17' 34"	5° 38' 04"	0° 54' 18"	14' 47.83"	322° 6' 37"	0.00121
6	24° 08' 23"	-3° 46' 46"	23° 44' 53"	5° 50' 40"	0° 54' 18"	14' 47.67"	315° 53' 44"	0.00128
7	24° 38' 21"	-3° 44' 58"	24° 12' 13"	6° 03' 15"	0° 54' 17"	14' 47.52"	310° 7' 17"	0.00139
8	25° 08' 18"	-3° 43' 08"	24° 39' 34"	6° 15' 48"	0° 54' 16"	14' 47.37"	304° 50' 58"	0.00154
9	25° 38' 14"	-3° 41' 17"	25° 06' 56"	6° 28' 20"	0° 54' 16"	14' 47.22"	300° 5' 54"	0.00171
10	26° 08' 10"	-3° 39' 25"	25° 34' 18"	6° 40' 50"	0° 54' 15"	14' 47.07"	295° 51' 12"	0.00191
11	26° 38' 05"	-3° 37' 33"	26° 01' 41"	6° 53' 18"	0° 54' 15"	14' 46.93"	292° 4' 49"	0.00215
12	27° 07' 60"	-3° 35' 39"	26° 29' 05"	7° 05' 44"	0° 54' 14"	14' 46.79"	288° 44' 07"	0.00242
13	27° 37' 53"	-3° 33' 44"	26° 56' 30"	7° 18' 08"	0° 54' 14"	14' 46.65"	285° 46' 17"	0.00272
14	28° 07' 46"	-3° 31' 48"	27° 23' 56"	7° 30' 31"	0° 54' 13"	14' 46.51"	283° 8' 33"	0.00305
15	28° 37' 38"	-3° 29' 52"	27° 51' 23"	7° 42' 51"	0° 54' 13"	14' 46.37"	280° 48' 25"	0.00342
16	29° 07' 30"	-3° 27' 54"	28° 18' 51"	7° 55' 10"	0° 54' 12"	14' 46.24"	278° 43' 36"	0.00381
17	29° 37' 20"	-3° 25' 56"	28° 46' 20"	8° 07' 27"	0° 54' 12"	14' 46.11"	276° 52' 07"	0.00424
18	30° 07' 11"	-3° 23' 57"	29° 13' 50"	8° 19' 41"	0° 54' 11"	14' 45.98"	275° 12' 16"	0.00470
19	30° 36' 60"	-3° 21' 56"	29° 41' 22"	8° 31' 54"	0° 54' 11"	14' 45.86"	273° 42' 33"	0.00519
20	31° 06' 49"	-3° 19' 55"	30° 08' 55"	8° 44' 04"	0° 54' 10"	14' 45.73"	272° 21' 43"	0.00571
21	31° 36' 37"	-3° 17' 53"	30° 36' 29"	8° 56' 12"	0° 54' 10"	14' 45.61"	271° 8' 41"	0.00627
22	32° 06' 24"	-3° 15' 50"	31° 04' 04"	9° 08' 18"	0° 54' 10"	14' 45.49"	270° 2' 31"	0.00685
23	32° 36' 11"	-3° 13' 47"	31° 31' 41"	9° 20' 22"	0° 54' 09"	14' 45.38"	269° 2' 25"	0.00747
24	33° 05' 57"	-3° 11' 42"	31° 59' 19"	9° 32' 23"	0° 54' 09"	14' 45.26"	268° 7' 43"	0.00811

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	23° 17' 57"	-0.09"	21° 33' 01"	9° 02' 51"	1.0026706	15' 57.07"	23° 26' 15"	0 m-35 s
1	23° 20' 24"	-0.08"	21° 35' 19"	9° 03' 46"	1.0026824	15' 57.06"	23° 26' 15"	0 m-35 s
2	23° 22' 51"	-0.08"	21° 37' 37"	9° 04' 40"	1.0026941	15' 57.05"	23° 26' 15"	0 m-34 s
3	23° 25' 19"	-0.07"	21° 39' 56"	9° 05' 34"	1.0027059	15' 57.04"	23° 26' 15"	0 m-33 s
4	23° 27' 46"	-0.07"	21° 42' 14"	9° 06' 29"	1.0027177	15' 57.03"	23° 26' 15"	0 m-33 s
5	23° 30' 13"	-0.06"	21° 44' 33"	9° 07' 23"	1.0027294	15' 57.02"	23° 26' 15"	0 m-32 s
6	23° 32' 40"	-0.06"	21° 46' 51"	9° 08' 18"	1.0027411	15' 57.01"	23° 26' 15"	0 m-31 s
7	23° 35' 07"	-0.06"	21° 49' 09"	9° 09' 12"	1.0027529	15' 57.00"	23° 26' 15"	0 m-31 s
8	23° 37' 34"	-0.05"	21° 51' 28"	9° 10' 06"	1.0027646	15' 56.98"	23° 26' 15"	0 m-30 s
9	23° 40' 01"	-0.05"	21° 53' 46"	9° 11' 00"	1.0027764	15' 56.97"	23° 26' 15"	0 m-30 s
10	23° 42' 28"	-0.04"	21° 56' 05"	9° 11' 55"	1.0027881	15' 56.96"	23° 26' 15"	0 m-29 s
11	23° 44' 55"	-0.04"	21° 58' 23"	9° 12' 49"	1.0027998	15' 56.95"	23° 26' 15"	0 m-28 s
12	23° 47' 22"	-0.03"	22° 00' 42"	9° 13' 43"	1.0028116	15' 56.94"	23° 26' 15"	0 m-28 s
13	23° 49' 49"	-0.03"	22° 03' 00"	9° 14' 37"	1.0028233	15' 56.93"	23° 26' 15"	0 m-27 s
14	23° 52' 16"	-0.02"	22° 05' 19"	9° 15' 32"	1.0028350	15' 56.92"	23° 26' 15"	0 m-26 s
15	23° 54' 43"	-0.02"	22° 07' 37"	9° 16' 26"	1.0028467	15' 56.91"	23° 26' 15"	0 m-26 s
16	23° 57' 10"	-0.01"	22° 09' 56"	9° 17' 20"	1.0028584	15' 56.89"	23° 26' 15"	0 m-25 s
17	23° 59' 37"	-0.01"	22° 12' 14"	9° 18' 14"	1.0028701	15' 56.88"	23° 26' 15"	0 m-25 s
18	24° 02' 05"	-0.01"	22° 14' 33"	9° 19' 08"	1.0028818	15' 56.87"	23° 26' 15"	0 m-24 s
19	24° 04' 32"	-0.00"	22° 16' 51"	9° 20' 02"	1.0028935	15' 56.86"	23° 26' 15"	0 m-24 s
20	24° 06' 59"	0.00"	22° 19' 10"	9° 20' 57"	1.0029052	15' 56.85"	23° 26' 15"	0 m-23 s
21	24° 09' 26"	0.01"	22° 21' 28"	9° 21' 51"	1.0029169	15' 56.84"	23° 26' 15"	0 m-22 s
22	24° 11' 53"	0.01"	22° 23' 47"	9° 22' 45"	1.0029286	15' 56.83"	23° 26' 15"	0 m-21 s
23	24° 14' 20"	0.02"	22° 26' 06"	9° 23' 39"	1.0029403	15' 56.82"	23° 26' 15"	0 m-21 s
24	24° 16' 47"	0.02"	22° 28' 24"	9° 24' 33"	1.0029520	15' 56.81"	23° 26' 15"	0 m-20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	33° 05' 57"	-3° 11' 42"	31° 59' 19"	9° 32' 23"	0° 54' 09"	14' 45.26"	268° 7' 43"	0.00811
1	33° 35' 43"	-3° 09' 36"	32° 26' 59"	9° 44' 22"	0° 54' 08"	14' 45.15"	267° 17' 48"	0.00879
2	34° 05' 28"	-3° 07' 30"	32° 54' 40"	9° 56' 19"	0° 54' 08"	14' 45.04"	266° 32' 10"	0.00950
3	34° 35' 12"	-3° 05' 23"	33° 22' 23"	10° 08' 13"	0° 54' 07"	14' 44.93"	265° 50' 23"	0.01024
4	35° 04' 56"	-3° 03' 15"	33° 50' 07"	10° 20' 04"	0° 54' 07"	14' 44.83"	265° 12' 03"	0.01101
5	35° 34' 39"	-3° 01' 06"	34° 17' 53"	10° 31' 53"	0° 54' 07"	14' 44.73"	264° 36' 51"	0.01181
6	36° 04' 21"	-2° 58' 57"	34° 45' 41"	10° 43' 40"	0° 54' 06"	14' 44.63"	264° 4' 28"	0.01264
7	36° 34' 03"	-2° 56' 46"	35° 13' 30"	10° 55' 24"	0° 54' 06"	14' 44.53"	263° 34' 40"	0.01351
8	37° 03' 45"	-2° 54' 35"	35° 41' 21"	11° 07' 05"	0° 54' 06"	14' 44.44"	263° 7' 12"	0.01440
9	37° 33' 26"	-2° 52' 23"	36° 09' 14"	11° 18' 43"	0° 54' 05"	14' 44.34"	262° 41' 52"	0.01532
10	38° 03' 06"	-2° 50' 11"	36° 37' 09"	11° 30' 19"	0° 54' 05"	14' 44.25"	262° 18' 30"	0.01628
11	38° 32' 45"	-2° 47' 57"	37° 05' 05"	11° 41' 52"	0° 54' 05"	14' 44.17"	261° 56' 55"	0.01726
12	39° 02' 25"	-2° 45' 43"	37° 33' 04"	11° 53' 22"	0° 54' 04"	14' 44.08"	261° 37' 01"	0.01828
13	39° 32' 03"	-2° 43' 28"	38° 01' 04"	12° 04' 49"	0° 54' 04"	14' 44.00"	261° 18' 38"	0.01932
14	40° 01' 41"	-2° 41' 13"	38° 29' 07"	12° 16' 13"	0° 54' 04"	14' 43.92"	261° 1' 41"	0.02040
15	40° 31' 19"	-2° 38' 57"	38° 57' 12"	12° 27' 34"	0° 54' 03"	14' 43.84"	260° 46' 02"	0.02150
16	41° 00' 56"	-2° 36' 40"	39° 25' 18"	12° 38' 53"	0° 54' 03"	14' 43.77"	260° 31' 37"	0.02264
17	41° 30' 33"	-2° 34' 22"	39° 53' 27"	12° 50' 08"	0° 54' 03"	14' 43.70"	260° 18' 20"	0.02380
18	42° 00' 09"	-2° 32' 04"	40° 21' 38"	13° 01' 20"	0° 54' 03"	14' 43.63"	260° 6' 08"	0.02500
19	42° 29' 45"	-2° 29' 45"	40° 49' 51"	13° 12' 28"	0° 54' 02"	14' 43.56"	259° 54' 55"	0.02622
20	42° 59' 20"	-2° 27' 25"	41° 18' 06"	13° 23' 34"	0° 54' 02"	14' 43.50"	259° 44' 38"	0.02747
21	43° 28' 55"	-2° 25' 05"	41° 46' 24"	13° 34' 36"	0° 54' 02"	14' 43.44"	259° 35' 13"	0.02876
22	43° 58' 29"	-2° 22' 44"	42° 14' 44"	13° 45' 35"	0° 54' 02"	14' 43.38"	259° 26' 39"	0.03007
23	44° 28' 03"	-2° 20' 22"	42° 43' 06"	13° 56' 31"	0° 54' 02"	14' 43.32"	259° 18' 51"	0.03141
24	44° 57' 36"	-2° 18' 00"	43° 11' 31"	14° 07' 23"	0° 54' 01"	14' 43.27"	259° 11' 47"	0.03278

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	24° 16' 47"	0.02"	22° 28' 24"	9° 24' 33"	1.0029520	15' 56.81"	23° 26' 15"	0 m-20 s
1	24° 19' 14"	0.03"	22° 30' 43"	9° 25' 27"	1.0029636	15' 56.79"	23° 26' 15"	0 m-20 s
2	24° 21' 41"	0.03"	22° 33' 01"	9° 26' 21"	1.0029753	15' 56.78"	23° 26' 15"	0 m-19 s
3	24° 24' 08"	0.04"	22° 35' 20"	9° 27' 15"	1.0029870	15' 56.77"	23° 26' 15"	0 m-18 s
4	24° 26' 35"	0.04"	22° 37' 39"	9° 28' 09"	1.0029987	15' 56.76"	23° 26' 15"	0 m-18 s
5	24° 29' 02"	0.05"	22° 39' 57"	9° 29' 03"	1.0030103	15' 56.75"	23° 26' 15"	0 m-17 s
6	24° 31' 29"	0.05"	22° 42' 16"	9° 29' 57"	1.0030220	15' 56.74"	23° 26' 15"	0 m-17 s
7	24° 33' 56"	0.06"	22° 44' 34"	9° 30' 51"	1.0030336	15' 56.73"	23° 26' 15"	0 m-16 s
8	24° 36' 23"	0.06"	22° 46' 53"	9° 31' 45"	1.0030453	15' 56.72"	23° 26' 15"	0 m-15 s
9	24° 38' 50"	0.07"	22° 49' 12"	9° 32' 38"	1.0030569	15' 56.71"	23° 26' 15"	0 m-15 s
10	24° 41' 17"	0.07"	22° 51' 30"	9° 33' 32"	1.0030686	15' 56.69"	23° 26' 15"	0 m-14 s
11	24° 43' 44"	0.08"	22° 53' 49"	9° 34' 26"	1.0030802	15' 56.68"	23° 26' 15"	0 m-13 s
12	24° 46' 11"	0.09"	22° 56' 08"	9° 35' 20"	1.0030919	15' 56.67"	23° 26' 15"	0 m-13 s
13	24° 48' 38"	0.09"	22° 58' 27"	9° 36' 14"	1.0031035	15' 56.66"	23° 26' 15"	0 m-12 s
14	24° 51' 05"	0.10"	23° 00' 45"	9° 37' 08"	1.0031151	15' 56.65"	23° 26' 15"	0 m-12 s
15	24° 53' 31"	0.10"	23° 03' 04"	9° 38' 02"	1.0031268	15' 56.64"	23° 26' 15"	0 m-11 s
16	24° 55' 58"	0.11"	23° 05' 23"	9° 38' 55"	1.0031384	15' 56.63"	23° 26' 15"	0 m-10 s
17	24° 58' 25"	0.11"	23° 07' 41"	9° 39' 49"	1.0031500	15' 56.62"	23° 26' 15"	0 m-10 s
18	25° 00' 52"	0.12"	23° 10' 00"	9° 40' 43"	1.0031616	15' 56.61"	23° 26' 15"	0 m -9 s
19	25° 03' 19"	0.12"	23° 12' 19"	9° 41' 37"	1.0031732	15' 56.59"	23° 26' 15"	0 m -9 s
20	25° 05' 46"	0.13"	23° 14' 38"	9° 42' 30"	1.0031848	15' 56.58"	23° 26' 15"	0 m -8 s
21	25° 08' 13"	0.13"	23° 16' 56"	9° 43' 24"	1.0031964	15' 56.57"	23° 26' 15"	0 m -7 s
22	25° 10' 40"	0.14"	23° 19' 15"	9° 44' 18"	1.0032080	15' 56.56"	23° 26' 15"	0 m -7 s
23	25° 13' 07"	0.14"	23° 21' 34"	9° 45' 11"	1.0032196	15' 56.55"	23° 26' 15"	0 m -6 s
24	25° 15' 34"	0.15"	23° 23' 53"	9° 46' 05"	1.0032312	15' 56.54"	23° 26' 15"	0 m -6 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	44° 57' 36"	-2° 18' 00"	43° 11' 31"	14° 07' 23"	0° 54' 01"	14' 43.27"	259° 11' 47"	0.03278
1	45° 27' 09"	-2° 15' 37"	43° 39' 58"	14° 18' 12"	0° 54' 01"	14' 43.22"	259° 5' 24"	0.03418
2	45° 56' 42"	-2° 13' 14"	44° 08' 27"	14° 28' 57"	0° 54' 01"	14' 43.17"	258° 59' 42"	0.03561
3	46° 26' 14"	-2° 10' 50"	44° 36' 59"	14° 39' 39"	0° 54' 01"	14' 43.13"	258° 54' 36"	0.03707
4	46° 55' 46"	-2° 08' 25"	45° 05' 33"	14° 50' 17"	0° 54' 01"	14' 43.09"	258° 50' 06"	0.03855
5	47° 25' 18"	-2° 06' 00"	45° 34' 10"	15° 00' 52"	0° 54' 01"	14' 43.05"	258° 46' 11"	0.04007
6	47° 54' 49"	-2° 03' 35"	46° 02' 50"	15° 11' 23"	0° 54' 00"	14' 43.01"	258° 42' 47"	0.04161
7	48° 24' 20"	-2° 01' 08"	46° 31' 32"	15° 21' 50"	0° 54' 00"	14' 42.98"	258° 39' 54"	0.04318
8	48° 53' 50"	-1° 58' 42"	47° 00' 16"	15° 32' 14"	0° 54' 00"	14' 42.95"	258° 37' 31"	0.04478
9	49° 23' 20"	-1° 56' 14"	47° 29' 04"	15° 42' 34"	0° 54' 00"	14' 42.92"	258° 35' 35"	0.04641
10	49° 52' 50"	-1° 53' 47"	47° 57' 54"	15° 52' 50"	0° 53' 60"	14' 42.89"	258° 34' 07"	0.04807
11	50° 22' 20"	-1° 51' 18"	48° 26' 47"	16° 03' 02"	0° 53' 60"	14' 42.87"	258° 33' 04"	0.04976
12	50° 51' 49"	-1° 48' 49"	48° 55' 42"	16° 13' 10"	0° 53' 60"	14' 42.85"	258° 32' 26"	0.05147
13	51° 21' 18"	-1° 46' 20"	49° 24' 41"	16° 23' 14"	0° 53' 60"	14' 42.84"	258° 32' 12"	0.05321
14	51° 50' 47"	-1° 43' 50"	49° 53' 42"	16° 33' 14"	0° 53' 60"	14' 42.82"	258° 32' 21"	0.05498
15	52° 20' 15"	-1° 41' 20"	50° 22' 46"	16° 43' 10"	0° 53' 60"	14' 42.81"	258° 32' 52"	0.05677
16	52° 49' 43"	-1° 38' 50"	50° 51' 52"	16° 53' 02"	0° 53' 60"	14' 42.81"	258° 33' 44"	0.05860
17	53° 19' 11"	-1° 36' 19"	51° 21' 02"	17° 02' 50"	0° 53' 60"	14' 42.80"	258° 34' 56"	0.06045
18	53° 48' 39"	-1° 33' 47"	51° 50' 15"	17° 12' 34"	0° 53' 60"	14' 42.80"	258° 36' 29"	0.06233
19	54° 18' 07"	-1° 31' 15"	52° 19' 30"	17° 22' 13"	0° 53' 60"	14' 42.80"	258° 38' 20"	0.06423
20	54° 47' 34"	-1° 28' 43"	52° 48' 48"	17° 31' 48"	0° 53' 60"	14' 42.81"	258° 40' 30"	0.06616
21	55° 17' 01"	-1° 26' 10"	53° 18' 10"	17° 41' 19"	0° 53' 60"	14' 42.82"	258° 42' 58"	0.06812
22	55° 46' 29"	-1° 23' 37"	53° 47' 34"	17° 50' 45"	0° 53' 60"	14' 42.83"	258° 45' 43"	0.07011
23	56° 15' 55"	-1° 21' 03"	54° 17' 02"	18° 00' 07"	0° 53' 60"	14' 42.84"	258° 48' 45"	0.07212
24	56° 45' 22"	-1° 18' 30"	54° 46' 32"	18° 09' 25"	0° 53' 60"	14' 42.86"	258° 52' 03"	0.07416

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	25° 15' 34"	0.15"	23° 23' 53"	9° 46' 05"	1.0032312	15' 56.54"	23° 26' 15"	0 m -6 s
1	25° 18' 01"	0.15"	23° 26' 12"	9° 46' 59"	1.0032428	15' 56.53"	23° 26' 15"	0 m -5 s
2	25° 20' 28"	0.16"	23° 28' 30"	9° 47' 52"	1.0032544	15' 56.52"	23° 26' 15"	0 m -4 s
3	25° 22' 55"	0.17"	23° 30' 49"	9° 48' 46"	1.0032660	15' 56.51"	23° 26' 15"	0 m -4 s
4	25° 25' 22"	0.17"	23° 33' 08"	9° 49' 39"	1.0032776	15' 56.50"	23° 26' 15"	0 m -3 s
5	25° 27' 49"	0.18"	23° 35' 27"	9° 50' 33"	1.0032891	15' 56.48"	23° 26' 15"	0 m -3 s
6	25° 30' 15"	0.18"	23° 37' 46"	9° 51' 26"	1.0033007	15' 56.47"	23° 26' 15"	0 m -2 s
7	25° 32' 42"	0.19"	23° 40' 05"	9° 52' 20"	1.0033123	15' 56.46"	23° 26' 15"	0 m -1 s
8	25° 35' 09"	0.19"	23° 42' 23"	9° 53' 14"	1.0033239	15' 56.45"	23° 26' 15"	0 m -1 s
9	25° 37' 36"	0.20"	23° 44' 42"	9° 54' 07"	1.0033354	15' 56.44"	23° 26' 14"	0 m -0 s
10	25° 40' 03"	0.20"	23° 47' 01"	9° 55' 00"	1.0033470	15' 56.43"	23° 26' 14"	0 m 00 s
11	25° 42' 30"	0.21"	23° 49' 20"	9° 55' 54"	1.0033585	15' 56.42"	23° 26' 14"	0 m 01 s
12	25° 44' 57"	0.22"	23° 51' 39"	9° 56' 47"	1.0033701	15' 56.41"	23° 26' 14"	0 m 02 s
13	25° 47' 24"	0.22"	23° 53' 58"	9° 57' 41"	1.0033816	15' 56.40"	23° 26' 14"	0 m 02 s
14	25° 49' 51"	0.23"	23° 56' 17"	9° 58' 34"	1.0033932	15' 56.38"	23° 26' 14"	0 m 03 s
15	25° 52' 17"	0.23"	23° 58' 36"	9° 59' 28"	1.0034047	15' 56.37"	23° 26' 14"	0 m 03 s
16	25° 54' 44"	0.24"	24° 00' 55"	10° 00' 21"	1.0034163	15' 56.36"	23° 26' 14"	0 m 04 s
17	25° 57' 11"	0.24"	24° 03' 14"	10° 01' 14"	1.0034278	15' 56.35"	23° 26' 14"	0 m 05 s
18	25° 59' 38"	0.25"	24° 05' 33"	10° 02' 08"	1.0034393	15' 56.34"	23° 26' 14"	0 m 05 s
19	26° 02' 05"	0.25"	24° 07' 52"	10° 03' 01"	1.0034508	15' 56.33"	23° 26' 14"	0 m 06 s
20	26° 04' 32"	0.26"	24° 10' 11"	10° 03' 54"	1.0034624	15' 56.32"	23° 26' 14"	0 m 06 s
21	26° 06' 59"	0.27"	24° 12' 30"	10° 04' 48"	1.0034739	15' 56.31"	23° 26' 14"	0 m 07 s
22	26° 09' 26"	0.27"	24° 14' 49"	10° 05' 41"	1.0034854	15' 56.30"	23° 26' 14"	0 m 08 s
23	26° 11' 52"	0.28"	24° 17' 08"	10° 06' 34"	1.0034969	15' 56.29"	23° 26' 14"	0 m 08 s
24	26° 14' 19"	0.28"	24° 19' 27"	10° 07' 27"	1.0035084	15' 56.27"	23° 26' 14"	0 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	56° 45' 22"	-1° 18' 30"	54° 46' 32"	18° 09' 25"	0° 53' 60"	14' 42.86"	258° 52' 03"	0.07416
1	57° 14' 49"	-1° 15' 55"	55° 16' 06"	18° 18' 38"	0° 53' 60"	14' 42.88"	258° 55' 37"	0.07623
2	57° 44' 15"	-1° 13' 21"	55° 45' 42"	18° 27' 46"	0° 54' 00"	14' 42.91"	258° 59' 27"	0.07832
3	58° 13' 42"	-1° 10' 46"	56° 15' 22"	18° 36' 50"	0° 54' 00"	14' 42.93"	259° 3' 31"	0.08044
4	58° 43' 08"	-1° 08' 11"	56° 45' 05"	18° 45' 49"	0° 54' 00"	14' 42.97"	259° 7' 50"	0.08259
5	59° 12' 34"	-1° 05' 35"	57° 14' 51"	18° 54' 44"	0° 54' 00"	14' 43.00"	259° 12' 24"	0.08476
6	59° 42' 01"	-1° 02' 59"	57° 44' 40"	19° 03' 33"	0° 54' 00"	14' 43.04"	259° 17' 11"	0.08695
7	60° 11' 27"	-1° 00' 23"	58° 14' 32"	19° 12' 18"	0° 54' 01"	14' 43.08"	259° 22' 11"	0.08918
8	60° 40' 53"	0°-57' 46"	58° 44' 28"	19° 20' 59"	0° 54' 01"	14' 43.12"	259° 27' 25"	0.09142
9	61° 10' 19"	0°-55' 10"	59° 14' 26"	19° 29' 34"	0° 54' 01"	14' 43.17"	259° 32' 52"	0.09370
10	61° 39' 45"	0°-52' 33"	59° 44' 28"	19° 38' 04"	0° 54' 01"	14' 43.22"	259° 38' 31"	0.09600
11	62° 09' 12"	0°-49' 56"	60° 14' 33"	19° 46' 30"	0° 54' 01"	14' 43.27"	259° 44' 22"	0.09832
12	62° 38' 38"	0°-47' 18"	60° 44' 42"	19° 54' 50"	0° 54' 02"	14' 43.33"	259° 50' 25"	0.10067
13	63° 08' 04"	0°-44' 40"	61° 14' 53"	20° 03' 05"	0° 54' 02"	14' 43.39"	259° 56' 40"	0.10305
14	63° 37' 30"	0°-42' 02"	61° 45' 08"	20° 11' 16"	0° 54' 02"	14' 43.45"	260° 3' 07"	0.10545
15	64° 06' 57"	0°-39' 24"	62° 15' 26"	20° 19' 21"	0° 54' 02"	14' 43.52"	260° 9' 44"	0.10787
16	64° 36' 23"	0°-36' 46"	62° 45' 48"	20° 27' 21"	0° 54' 03"	14' 43.59"	260° 16' 33"	0.11032
17	65° 05' 50"	0°-34' 07"	63° 16' 12"	20° 35' 16"	0° 54' 03"	14' 43.67"	260° 23' 32"	0.11279
18	65° 35' 16"	0°-31' 29"	63° 46' 40"	20° 43' 05"	0° 54' 03"	14' 43.75"	260° 30' 42"	0.11529
19	66° 04' 43"	0°-28' 50"	64° 17' 11"	20° 50' 49"	0° 54' 03"	14' 43.83"	260° 38' 02"	0.11781
20	66° 34' 10"	0°-26' 11"	64° 47' 46"	20° 58' 28"	0° 54' 04"	14' 43.91"	260° 45' 33"	0.12036
21	67° 03' 37"	0°-23' 32"	65° 18' 24"	21° 06' 01"	0° 54' 04"	14' 44.00"	260° 53' 13"	0.12293
22	67° 33' 05"	0°-20' 52"	65° 49' 05"	21° 13' 29"	0° 54' 04"	14' 44.09"	261° 1' 02"	0.12552
23	68° 02' 32"	0°-18' 13"	66° 19' 50"	21° 20' 52"	0° 54' 05"	14' 44.19"	261° 9' 02"	0.12814
24	68° 32' 00"	0°-15' 33"	66° 50' 37"	21° 28' 09"	0° 54' 05"	14' 44.29"	261° 17' 10"	0.13078

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	26° 14' 19"	0.28"	24° 19' 27"	10° 07' 27"	1.0035084	15' 56.27"	23° 26' 14"	0 m 09 s
1	26° 16' 46"	0.29"	24° 21' 46"	10° 08' 21"	1.0035199	15' 56.26"	23° 26' 14"	0 m 09 s
2	26° 19' 13"	0.29"	24° 24' 05"	10° 09' 14"	1.0035314	15' 56.25"	23° 26' 14"	0 m 10 s
3	26° 21' 40"	0.30"	24° 26' 24"	10° 10' 07"	1.0035429	15' 56.24"	23° 26' 14"	0 m 10 s
4	26° 24' 07"	0.30"	24° 28' 43"	10° 11' 00"	1.0035544	15' 56.23"	23° 26' 14"	0 m 11 s
5	26° 26' 33"	0.31"	24° 31' 02"	10° 11' 53"	1.0035659	15' 56.22"	23° 26' 14"	0 m 12 s
6	26° 29' 00"	0.32"	24° 33' 21"	10° 12' 46"	1.0035774	15' 56.21"	23° 26' 14"	0 m 12 s
7	26° 31' 27"	0.32"	24° 35' 40"	10° 13' 39"	1.0035889	15' 56.20"	23° 26' 14"	0 m 13 s
8	26° 33' 54"	0.33"	24° 37' 59"	10° 14' 33"	1.0036004	15' 56.19"	23° 26' 14"	0 m 13 s
9	26° 36' 21"	0.33"	24° 40' 18"	10° 15' 26"	1.0036118	15' 56.18"	23° 26' 14"	0 m 14 s
10	26° 38' 47"	0.34"	24° 42' 37"	10° 16' 19"	1.0036233	15' 56.17"	23° 26' 14"	0 m 15 s
11	26° 41' 14"	0.34"	24° 44' 56"	10° 17' 12"	1.0036348	15' 56.15"	23° 26' 14"	0 m 15 s
12	26° 43' 41"	0.35"	24° 47' 15"	10° 18' 05"	1.0036462	15' 56.14"	23° 26' 14"	0 m 16 s
13	26° 46' 08"	0.36"	24° 49' 35"	10° 18' 58"	1.0036577	15' 56.13"	23° 26' 14"	0 m 16 s
14	26° 48' 35"	0.36"	24° 51' 54"	10° 19' 51"	1.0036692	15' 56.12"	23° 26' 14"	0 m 17 s
15	26° 51' 01"	0.37"	24° 54' 13"	10° 20' 44"	1.0036806	15' 56.11"	23° 26' 14"	0 m 17 s
16	26° 53' 28"	0.37"	24° 56' 32"	10° 21' 37"	1.0036921	15' 56.10"	23° 26' 14"	0 m 18 s
17	26° 55' 55"	0.38"	24° 58' 51"	10° 22' 30"	1.0037035	15' 56.09"	23° 26' 14"	0 m 19 s
18	26° 58' 22"	0.38"	25° 01' 10"	10° 23' 23"	1.0037150	15' 56.08"	23° 26' 14"	0 m 19 s
19	27° 00' 48"	0.39"	25° 03' 30"	10° 24' 15"	1.0037264	15' 56.07"	23° 26' 14"	0 m 20 s
20	27° 03' 15"	0.39"	25° 05' 49"	10° 25' 08"	1.0037378	15' 56.06"	23° 26' 14"	0 m 20 s
21	27° 05' 42"	0.40"	25° 08' 08"	10° 26' 01"	1.0037493	15' 56.05"	23° 26' 14"	0 m 21 s
22	27° 08' 09"	0.41"	25° 10' 27"	10° 26' 54"	1.0037607	15' 56.03"	23° 26' 14"	0 m 21 s
23	27° 10' 36"	0.41"	25° 12' 46"	10° 27' 47"	1.0037721	15' 56.02"	23° 26' 14"	0 m 22 s
24	27° 13' 02"	0.42"	25° 15' 06"	10° 28' 40"	1.0037836	15' 56.01"	23° 26' 14"	0 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	68° 32' 00"	0°-15' 33"	66° 50' 37"	21° 28' 09"	0° 54' 05"	14' 44.29"	261° 17' 10"	0.13078
1	69° 01' 28"	0°-12' 54"	67° 21' 29"	21° 35' 20"	0° 54' 05"	14' 44.39"	261° 25' 28"	0.13345
2	69° 30' 56"	0°-10' 14"	67° 52' 23"	21° 42' 26"	0° 54' 06"	14' 44.50"	261° 33' 55"	0.13614
3	70° 00' 25"	0° -7' 34"	68° 23' 21"	21° 49' 26"	0° 54' 06"	14' 44.61"	261° 42' 31"	0.13885
4	70° 29' 54"	0° -4' 57"	68° 54' 22"	21° 56' 18"	0° 54' 07"	14' 44.72"	261° 51' 18"	0.14158
5	70° 59' 23"	0° -2' 17"	69° 25' 27"	22° 03' 07"	0° 54' 07"	14' 44.84"	262° 0' 11"	0.14434
6	71° 28' 52"	0° 00' 23"	69° 56' 34"	22° 09' 50"	0° 54' 08"	14' 44.96"	262° 9' 12"	0.14712
7	71° 58' 22"	0° 03' 04"	70° 27' 45"	22° 16' 27"	0° 54' 08"	14' 45.09"	262° 18' 21"	0.14992
8	72° 27' 52"	0° 05' 44"	70° 58' 60"	22° 22' 58"	0° 54' 08"	14' 45.22"	262° 27' 39"	0.15275
9	72° 57' 23"	0° 08' 24"	71° 30' 17"	22° 29' 23"	0° 54' 09"	14' 45.35"	262° 37' 04"	0.15560
10	73° 26' 54"	0° 11' 04"	72° 01' 38"	22° 35' 42"	0° 54' 09"	14' 45.49"	262° 46' 38"	0.15847
11	73° 56' 25"	0° 13' 44"	72° 33' 02"	22° 41' 56"	0° 54' 10"	14' 45.63"	262° 56' 18"	0.16136
12	74° 25' 57"	0° 16' 24"	73° 04' 30"	22° 48' 03"	0° 54' 11"	14' 45.77"	263° 6' 07"	0.16427
13	74° 55' 29"	0° 19' 04"	73° 36' 00"	22° 54' 04"	0° 54' 11"	14' 45.92"	263° 16' 03"	0.16721
14	75° 25' 01"	0° 21' 44"	74° 07' 34"	22° 59' 59"	0° 54' 12"	14' 46.07"	263° 26' 06"	0.17017
15	75° 54' 34"	0° 24' 25"	74° 39' 11"	23° 05' 48"	0° 54' 12"	14' 46.23"	263° 36' 16"	0.17315
16	76° 24' 08"	0° 27' 05"	75° 10' 52"	23° 11' 31"	0° 54' 13"	14' 46.39"	263° 46' 33"	0.17615
17	76° 53' 42"	0° 29' 44"	75° 42' 35"	23° 17' 07"	0° 54' 13"	14' 46.55"	263° 56' 57"	0.17917
18	77° 23' 17"	0° 32' 24"	76° 14' 22"	23° 22' 37"	0° 54' 14"	14' 46.72"	264° 7' 28"	0.18221
19	77° 52' 52"	0° 35' 04"	76° 46' 12"	23° 28' 01"	0° 54' 15"	14' 46.89"	264° 18' 06"	0.18528
20	78° 22' 28"	0° 37' 44"	77° 18' 05"	23° 33' 19"	0° 54' 15"	14' 47.06"	264° 28' 50"	0.18836
21	78° 52' 04"	0° 40' 23"	77° 50' 01"	23° 38' 30"	0° 54' 16"	14' 47.24"	264° 39' 40"	0.19147
22	79° 21' 41"	0° 43' 03"	78° 22' 01"	23° 43' 34"	0° 54' 17"	14' 47.43"	264° 50' 37"	0.19459
23	79° 51' 18"	0° 45' 42"	78° 54' 03"	23° 48' 33"	0° 54' 17"	14' 47.61"	265° 1' 40"	0.19774
24	80° 20' 56"	0° 48' 21"	79° 26' 09"	23° 53' 24"	0° 54' 18"	14' 47.80"	265° 12' 49"	0.20091

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	27° 13' 02"	0.42"	25° 15' 06"	10° 28' 40"	1.0037836	15' 56.01"	23° 26' 14"	0 m 23 s
1	27° 15' 29"	0.42"	25° 17' 25"	10° 29' 32"	1.0037950	15' 56.00"	23° 26' 14"	0 m 23 s
2	27° 17' 56"	0.43"	25° 19' 44"	10° 30' 25"	1.0038064	15' 55.99"	23° 26' 14"	0 m 24 s
3	27° 20' 22"	0.43"	25° 22' 04"	10° 31' 18"	1.0038178	15' 55.98"	23° 26' 14"	0 m 24 s
4	27° 22' 49"	0.44"	25° 24' 23"	10° 32' 11"	1.0038292	15' 55.97"	23° 26' 14"	0 m 25 s
5	27° 25' 16"	0.44"	25° 26' 42"	10° 33' 03"	1.0038406	15' 55.96"	23° 26' 14"	0 m 25 s
6	27° 27' 43"	0.45"	25° 29' 01"	10° 33' 56"	1.0038520	15' 55.95"	23° 26' 14"	0 m 26 s
7	27° 30' 09"	0.45"	25° 31' 21"	10° 34' 49"	1.0038634	15' 55.94"	23° 26' 14"	0 m 27 s
8	27° 32' 36"	0.46"	25° 33' 40"	10° 35' 41"	1.0038748	15' 55.93"	23° 26' 14"	0 m 27 s
9	27° 35' 03"	0.47"	25° 35' 59"	10° 36' 34"	1.0038862	15' 55.92"	23° 26' 14"	0 m 28 s
10	27° 37' 30"	0.47"	25° 38' 19"	10° 37' 27"	1.0038976	15' 55.90"	23° 26' 14"	0 m 28 s
11	27° 39' 56"	0.48"	25° 40' 38"	10° 38' 19"	1.0039090	15' 55.89"	23° 26' 14"	0 m 29 s
12	27° 42' 23"	0.48"	25° 42' 57"	10° 39' 12"	1.0039204	15' 55.88"	23° 26' 14"	0 m 29 s
13	27° 44' 50"	0.49"	25° 45' 17"	10° 40' 04"	1.0039318	15' 55.87"	23° 26' 14"	0 m 30 s
14	27° 47' 16"	0.49"	25° 47' 36"	10° 40' 57"	1.0039432	15' 55.86"	23° 26' 14"	0 m 31 s
15	27° 49' 43"	0.50"	25° 49' 56"	10° 41' 50"	1.0039545	15' 55.85"	23° 26' 14"	0 m 31 s
16	27° 52' 10"	0.50"	25° 52' 15"	10° 42' 42"	1.0039659	15' 55.84"	23° 26' 14"	0 m 32 s
17	27° 54' 36"	0.51"	25° 54' 34"	10° 43' 35"	1.0039773	15' 55.83"	23° 26' 14"	0 m 32 s
18	27° 57' 03"	0.51"	25° 56' 54"	10° 44' 27"	1.0039886	15' 55.82"	23° 26' 14"	0 m 33 s
19	27° 59' 30"	0.52"	25° 59' 13"	10° 45' 19"	1.0040000	15' 55.81"	23° 26' 14"	0 m 33 s
20	28° 01' 56"	0.52"	26° 01' 33"	10° 46' 12"	1.0040114	15' 55.80"	23° 26' 14"	0 m 34 s
21	28° 04' 23"	0.53"	26° 03' 52"	10° 47' 04"	1.0040227	15' 55.79"	23° 26' 14"	0 m 35 s
22	28° 06' 50"	0.53"	26° 06' 12"	10° 47' 57"	1.0040341	15' 55.77"	23° 26' 14"	0 m 35 s
23	28° 09' 16"	0.54"	26° 08' 31"	10° 48' 49"	1.0040454	15' 55.76"	23° 26' 14"	0 m 36 s
24	28° 11' 43"	0.54"	26° 10' 50"	10° 49' 41"	1.0040568	15' 55.75"	23° 26' 14"	0 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	80° 20' 56"	0° 48' 21"	79° 26' 09"	23° 53' 24"	0° 54' 18"	14' 47.80"	265° 12' 49"	0.20091
1	80° 50' 35"	0° 51' 00"	79° 58' 18"	23° 58' 09"	0° 54' 19"	14' 48.00"	265° 24' 04"	0.20410
2	81° 20' 15"	0° 53' 39"	80° 30' 29"	24° 02' 48"	0° 54' 19"	14' 48.20"	265° 35' 24"	0.20730
3	81° 49' 55"	0° 56' 18"	81° 02' 44"	24° 07' 20"	0° 54' 20"	14' 48.40"	265° 46' 51"	0.21053
4	82° 19' 36"	0° 58' 56"	81° 35' 02"	24° 11' 45"	0° 54' 21"	14' 48.61"	265° 58' 23"	0.21378
5	82° 49' 18"	1° 01' 35"	82° 07' 22"	24° 16' 03"	0° 54' 22"	14' 48.82"	266° 10' 01"	0.21704
6	83° 19' 00"	1° 04' 13"	82° 39' 46"	24° 20' 15"	0° 54' 23"	14' 49.04"	266° 21' 44"	0.22033
7	83° 48' 43"	1° 06' 51"	83° 12' 12"	24° 24' 20"	0° 54' 23"	14' 49.26"	266° 33' 32"	0.22363
8	84° 18' 27"	1° 09' 29"	83° 44' 42"	24° 28' 18"	0° 54' 24"	14' 49.48"	266° 45' 26"	0.22696
9	84° 48' 12"	1° 12' 06"	84° 17' 14"	24° 32' 10"	0° 54' 25"	14' 49.71"	266° 57' 25"	0.23030
10	85° 17' 58"	1° 14' 43"	84° 49' 49"	24° 35' 54"	0° 54' 26"	14' 49.94"	267° 9' 28"	0.23366
11	85° 47' 44"	1° 17' 20"	85° 22' 27"	24° 39' 32"	0° 54' 27"	14' 50.18"	267° 21' 37"	0.23704
12	86° 17' 32"	1° 19' 57"	85° 55' 07"	24° 43' 02"	0° 54' 28"	14' 50.42"	267° 33' 50"	0.24044
13	86° 47' 20"	1° 22' 33"	86° 27' 51"	24° 46' 26"	0° 54' 28"	14' 50.66"	267° 46' 08"	0.24386
14	87° 17' 09"	1° 25' 10"	87° 00' 37"	24° 49' 43"	0° 54' 29"	14' 50.91"	267° 58' 30"	0.24729
15	87° 46' 60"	1° 27' 45"	87° 33' 25"	24° 52' 52"	0° 54' 30"	14' 51.17"	268° 10' 57"	0.25074
16	88° 16' 51"	1° 30' 21"	88° 06' 17"	24° 55' 55"	0° 54' 31"	14' 51.42"	268° 23' 29"	0.25421
17	88° 46' 43"	1° 32' 56"	88° 39' 11"	24° 58' 50"	0° 54' 32"	14' 51.69"	268° 36' 04"	0.25770
18	89° 16' 36"	1° 35' 31"	89° 12' 07"	25° 01' 38"	0° 54' 33"	14' 51.95"	268° 48' 44"	0.26121
19	89° 46' 30"	1° 38' 06"	89° 45' 06"	25° 04' 19"	0° 54' 34"	14' 52.22"	269° 1' 28"	0.26473
20	90° 16' 25"	1° 40' 40"	90° 18' 08"	25° 06' 53"	0° 54' 35"	14' 52.50"	269° 14' 15"	0.26827
21	90° 46' 21"	1° 43' 14"	90° 51' 12"	25° 09' 20"	0° 54' 36"	14' 52.77"	269° 27' 07"	0.27183
22	91° 16' 19"	1° 45' 47"	91° 24' 18"	25° 11' 39"	0° 54' 37"	14' 53.06"	269° 40' 02"	0.27540
23	91° 46' 17"	1° 48' 20"	91° 57' 27"	25° 13' 51"	0° 54' 38"	14' 53.34"	269° 53' 01"	0.27899
24	92° 16' 17"	1° 50' 53"	92° 30' 38"	25° 15' 56"	0° 54' 39"	14' 53.64"	270° 6' 03"	0.28260

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	28° 11' 43"	0.54"	26° 10' 50"	10° 49' 41"	1.0040568	15' 55.75"	23° 26' 14"	0 m 36 s
1	28° 14' 10"	0.55"	26° 13' 10"	10° 50' 34"	1.0040681	15' 55.74"	23° 26' 14"	0 m 37 s
2	28° 16' 36"	0.55"	26° 15' 29"	10° 51' 26"	1.0040794	15' 55.73"	23° 26' 14"	0 m 37 s
3	28° 19' 03"	0.56"	26° 17' 49"	10° 52' 18"	1.0040908	15' 55.72"	23° 26' 14"	0 m 38 s
4	28° 21' 30"	0.56"	26° 20' 08"	10° 53' 11"	1.0041021	15' 55.71"	23° 26' 14"	0 m 38 s
5	28° 23' 56"	0.57"	26° 22' 28"	10° 54' 03"	1.0041134	15' 55.70"	23° 26' 14"	0 m 39 s
6	28° 26' 23"	0.57"	26° 24' 48"	10° 54' 55"	1.0041248	15' 55.69"	23° 26' 14"	0 m 40 s
7	28° 28' 50"	0.58"	26° 27' 07"	10° 55' 47"	1.0041361	15' 55.68"	23° 26' 14"	0 m 40 s
8	28° 31' 16"	0.58"	26° 29' 27"	10° 56' 40"	1.0041474	15' 55.67"	23° 26' 14"	0 m 41 s
9	28° 33' 43"	0.59"	26° 31' 46"	10° 57' 32"	1.0041587	15' 55.66"	23° 26' 14"	0 m 41 s
10	28° 36' 10"	0.59"	26° 34' 06"	10° 58' 24"	1.0041700	15' 55.64"	23° 26' 14"	0 m 42 s
11	28° 38' 36"	0.60"	26° 36' 25"	10° 59' 16"	1.0041814	15' 55.63"	23° 26' 14"	0 m 42 s
12	28° 41' 03"	0.60"	26° 38' 45"	11° 00' 08"	1.0041927	15' 55.62"	23° 26' 14"	0 m 43 s
13	28° 43' 29"	0.61"	26° 41' 05"	11° 01' 00"	1.0042040	15' 55.61"	23° 26' 14"	0 m 43 s
14	28° 45' 56"	0.61"	26° 43' 24"	11° 01' 53"	1.0042153	15' 55.60"	23° 26' 14"	0 m 44 s
15	28° 48' 23"	0.62"	26° 45' 44"	11° 02' 45"	1.0042266	15' 55.59"	23° 26' 14"	0 m 44 s
16	28° 50' 49"	0.62"	26° 48' 03"	11° 03' 37"	1.0042379	15' 55.58"	23° 26' 14"	0 m 45 s
17	28° 53' 16"	0.63"	26° 50' 23"	11° 04' 29"	1.0042492	15' 55.57"	23° 26' 14"	0 m 46 s
18	28° 55' 42"	0.63"	26° 52' 43"	11° 05' 21"	1.0042604	15' 55.56"	23° 26' 14"	0 m 46 s
19	28° 58' 09"	0.64"	26° 55' 02"	11° 06' 13"	1.0042717	15' 55.55"	23° 26' 14"	0 m 47 s
20	29° 00' 36"	0.64"	26° 57' 22"	11° 07' 05"	1.0042830	15' 55.54"	23° 26' 14"	0 m 47 s
21	29° 03' 02"	0.65"	26° 59' 42"	11° 07' 57"	1.0042943	15' 55.53"	23° 26' 14"	0 m 48 s
22	29° 05' 29"	0.65"	27° 02' 01"	11° 08' 49"	1.0043056	15' 55.52"	23° 26' 14"	0 m 48 s
23	29° 07' 55"	0.65"	27° 04' 21"	11° 09' 41"	1.0043169	15' 55.51"	23° 26' 14"	0 m 49 s
24	29° 10' 22"	0.66"	27° 06' 41"	11° 10' 33"	1.0043281	15' 55.49"	23° 26' 14"	0 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	92° 16' 17"	1° 50' 53"	92° 30' 38"	25° 15' 56"	0° 54' 39"	14' 53.64"	270° 6' 03"	0.28260
1	92° 46' 17"	1° 53' 25"	93° 03' 51"	25° 17' 53"	0° 54' 40"	14' 53.93"	270° 19' 09"	0.28623
2	93° 16' 19"	1° 55' 57"	93° 37' 06"	25° 19' 43"	0° 54' 42"	14' 54.23"	270° 32' 18"	0.28987
3	93° 46' 22"	1° 58' 28"	94° 10' 24"	25° 21' 26"	0° 54' 43"	14' 54.54"	270° 45' 30"	0.29352
4	94° 16' 27"	2° 00' 59"	94° 43' 44"	25° 23' 01"	0° 54' 44"	14' 54.84"	270° 58' 46"	0.29720
5	94° 46' 32"	2° 03' 30"	95° 17' 06"	25° 24' 29"	0° 54' 45"	14' 55.16"	271° 12' 04"	0.30088
6	95° 16' 39"	2° 05' 60"	95° 50' 30"	25° 25' 49"	0° 54' 46"	14' 55.47"	271° 25' 25"	0.30459
7	95° 46' 47"	2° 08' 29"	96° 23' 56"	25° 27' 02"	0° 54' 47"	14' 55.80"	271° 38' 50"	0.30830
8	96° 16' 56"	2° 10' 58"	96° 57' 24"	25° 28' 07"	0° 54' 49"	14' 56.12"	271° 52' 16"	0.31204
9	96° 47' 07"	2° 13' 27"	97° 30' 54"	25° 29' 05"	0° 54' 50"	14' 56.45"	272° 5' 46"	0.31579
10	97° 17' 19"	2° 15' 55"	98° 04' 25"	25° 29' 55"	0° 54' 51"	14' 56.79"	272° 19' 17"	0.31955
11	97° 47' 32"	2° 18' 23"	98° 37' 59"	25° 30' 38"	0° 54' 52"	14' 57.12"	272° 32' 52"	0.32333
12	98° 17' 47"	2° 20' 50"	99° 11' 34"	25° 31' 13"	0° 54' 53"	14' 57.47"	272° 46' 28"	0.32712
13	98° 48' 03"	2° 23' 16"	99° 45' 11"	25° 31' 40"	0° 54' 55"	14' 57.81"	273° 0' 07"	0.33093
14	99° 18' 20"	2° 25' 42"	100° 18' 50"	25° 31' 59"	0° 54' 56"	14' 58.17"	273° 13' 48"	0.33475
15	99° 48' 39"	2° 28' 08"	100° 52' 31"	25° 32' 11"	0° 54' 57"	14' 58.52"	273° 27' 30"	0.33859
16	100° 18' 60"	2° 30' 32"	101° 26' 13"	25° 32' 16"	0° 54' 59"	14' 58.88"	273° 41' 15"	0.34244
17	100° 49' 22"	2° 32' 57"	101° 59' 56"	25° 32' 12"	0° 54' 60"	14' 59.25"	273° 55' 01"	0.34630
18	101° 19' 45"	2° 35' 20"	102° 33' 41"	25° 32' 01"	0° 55' 01"	14' 59.62"	274° 8' 49"	0.35017
19	101° 50' 10"	2° 37' 43"	103° 07' 27"	25° 31' 42"	0° 55' 03"	14' 59.99"	274° 22' 39"	0.35406
20	102° 20' 36"	2° 40' 05"	103° 41' 15"	25° 31' 16"	0° 55' 04"	15' 00.37"	274° 36' 30"	0.35796
21	102° 51' 04"	2° 42' 27"	104° 15' 04"	25° 30' 41"	0° 55' 06"	15' 00.75"	274° 50' 22"	0.36188
22	103° 21' 34"	2° 44' 48"	104° 48' 55"	25° 29' 59"	0° 55' 07"	15' 01.13"	275° 4' 16"	0.36581
23	103° 52' 05"	2° 47' 09"	105° 22' 46"	25° 29' 09"	0° 55' 08"	15' 01.53"	275° 18' 10"	0.36975
24	104° 22' 38"	2° 49' 29"	105° 56' 39"	25° 28' 11"	0° 55' 10"	15' 01.92"	275° 32' 06"	0.37370

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	29° 10' 22"	0.66"	27° 06' 41"	11° 10' 33"	1.0043281	15' 55.49"	23° 26' 14"	0 m 49 s
1	29° 12' 48"	0.66"	27° 09' 01"	11° 11' 24"	1.0043394	15' 55.48"	23° 26' 14"	0 m 50 s
2	29° 15' 15"	0.67"	27° 11' 20"	11° 12' 16"	1.0043507	15' 55.47"	23° 26' 14"	0 m 50 s
3	29° 17' 42"	0.67"	27° 13' 40"	11° 13' 08"	1.0043619	15' 55.46"	23° 26' 14"	0 m 51 s
4	29° 20' 08"	0.68"	27° 15' 60"	11° 13' 60"	1.0043732	15' 55.45"	23° 26' 14"	0 m 52 s
5	29° 22' 35"	0.68"	27° 18' 20"	11° 14' 52"	1.0043844	15' 55.44"	23° 26' 14"	0 m 52 s
6	29° 25' 01"	0.69"	27° 20' 39"	11° 15' 44"	1.0043957	15' 55.43"	23° 26' 14"	0 m 53 s
7	29° 27' 28"	0.69"	27° 22' 59"	11° 16' 35"	1.0044069	15' 55.42"	23° 26' 14"	0 m 53 s
8	29° 29' 54"	0.69"	27° 25' 19"	11° 17' 27"	1.0044182	15' 55.41"	23° 26' 14"	0 m 54 s
9	29° 32' 21"	0.70"	27° 27' 39"	11° 18' 19"	1.0044294	15' 55.40"	23° 26' 14"	0 m 54 s
10	29° 34' 47"	0.70"	27° 29' 59"	11° 19' 10"	1.0044407	15' 55.39"	23° 26' 14"	0 m 55 s
11	29° 37' 14"	0.71"	27° 32' 19"	11° 20' 02"	1.0044519	15' 55.38"	23° 26' 14"	0 m 55 s
12	29° 39' 40"	0.71"	27° 34' 38"	11° 20' 54"	1.0044632	15' 55.37"	23° 26' 14"	0 m 56 s
13	29° 42' 07"	0.71"	27° 36' 58"	11° 21' 46"	1.0044744	15' 55.36"	23° 26' 14"	0 m 56 s
14	29° 44' 33"	0.72"	27° 39' 18"	11° 22' 37"	1.0044856	15' 55.34"	23° 26' 14"	0 m 57 s
15	29° 46' 60"	0.72"	27° 41' 38"	11° 23' 29"	1.0044969	15' 55.33"	23° 26' 14"	0 m 57 s
16	29° 49' 26"	0.73"	27° 43' 58"	11° 24' 20"	1.0045081	15' 55.32"	23° 26' 14"	0 m 58 s
17	29° 51' 53"	0.73"	27° 46' 18"	11° 25' 12"	1.0045193	15' 55.31"	23° 26' 14"	0 m 58 s
18	29° 54' 19"	0.73"	27° 48' 38"	11° 26' 03"	1.0045305	15' 55.30"	23° 26' 14"	0 m 59 s
19	29° 56' 46"	0.74"	27° 50' 58"	11° 26' 55"	1.0045417	15' 55.29"	23° 26' 14"	0 m 59 s
20	29° 59' 12"	0.74"	27° 53' 17"	11° 27' 47"	1.0045530	15' 55.28"	23° 26' 14"	1 m 00 s
21	30° 01' 39"	0.74"	27° 55' 37"	11° 28' 38"	1.0045642	15' 55.27"	23° 26' 14"	1 m 01 s
22	30° 04' 05"	0.75"	27° 57' 57"	11° 29' 29"	1.0045754	15' 55.26"	23° 26' 14"	1 m 01 s
23	30° 06' 32"	0.75"	28° 00' 17"	11° 30' 21"	1.0045866	15' 55.25"	23° 26' 14"	1 m 02 s
24	30° 08' 58"	0.76"	28° 02' 37"	11° 31' 12"	1.0045978	15' 55.24"	23° 26' 14"	1 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	104° 22' 38"	2° 49' 29"	105° 56' 39"	25° 28' 11"	0° 55' 10"	15' 01.92"	275° 32' 06"	0.37370
1	104° 53' 13"	2° 51' 48"	106° 30' 33"	25° 27' 05"	0° 55' 11"	15' 02.32"	275° 46' 03"	0.37766
2	105° 23' 49"	2° 54' 06"	107° 04' 28"	25° 25' 52"	0° 55' 13"	15' 02.72"	276° 0' 00"	0.38164
3	105° 54' 27"	2° 56' 24"	107° 38' 24"	25° 24' 30"	0° 55' 14"	15' 03.13"	276° 13' 58"	0.38563
4	106° 25' 07"	2° 58' 41"	108° 12' 21"	25° 23' 01"	0° 55' 16"	15' 03.54"	276° 27' 57"	0.38963
5	106° 55' 48"	3° 00' 57"	108° 46' 19"	25° 21' 24"	0° 55' 17"	15' 03.96"	276° 41' 57"	0.39364
6	107° 26' 31"	3° 03' 12"	109° 20' 18"	25° 19' 39"	0° 55' 19"	15' 04.38"	276° 55' 56"	0.39766
7	107° 57' 16"	3° 05' 27"	109° 54' 18"	25° 17' 46"	0° 55' 20"	15' 04.80"	277° 9' 57"	0.40169
8	108° 28' 03"	3° 07' 41"	110° 28' 18"	25° 15' 45"	0° 55' 22"	15' 05.23"	277° 23' 57"	0.40574
9	108° 58' 52"	3° 09' 54"	111° 02' 19"	25° 13' 37"	0° 55' 24"	15' 05.66"	277° 37' 57"	0.40979
10	109° 29' 42"	3° 12' 07"	111° 36' 21"	25° 11' 20"	0° 55' 25"	15' 06.10"	277° 51' 58"	0.41385
11	110° 00' 35"	3° 14' 18"	112° 10' 23"	25° 08' 56"	0° 55' 27"	15' 06.54"	278° 5' 58"	0.41793
12	110° 31' 29"	3° 16' 29"	112° 44' 26"	25° 06' 23"	0° 55' 28"	15' 06.99"	278° 19' 59"	0.42201
13	111° 02' 25"	3° 18' 39"	113° 18' 30"	25° 03' 43"	0° 55' 30"	15' 07.44"	278° 33' 59"	0.42610
14	111° 33' 23"	3° 20' 48"	113° 52' 34"	25° 00' 55"	0° 55' 32"	15' 07.89"	278° 47' 58"	0.43021
15	112° 04' 23"	3° 22' 57"	114° 26' 38"	24° 57' 58"	0° 55' 33"	15' 08.35"	279° 1' 57"	0.43432
16	112° 35' 25"	3° 25' 04"	115° 00' 43"	24° 54' 54"	0° 55' 35"	15' 08.81"	279° 15' 56"	0.43844
17	113° 06' 29"	3° 27' 11"	115° 34' 48"	24° 51' 42"	0° 55' 37"	15' 09.28"	279° 29' 54"	0.44257
18	113° 37' 35"	3° 29' 16"	116° 08' 53"	24° 48' 22"	0° 55' 39"	15' 09.75"	279° 43' 51"	0.44671
19	114° 08' 43"	3° 31' 21"	116° 42' 58"	24° 44' 54"	0° 55' 40"	15' 10.22"	279° 57' 47"	0.45085
20	114° 39' 53"	3° 33' 25"	117° 17' 04"	24° 41' 18"	0° 55' 42"	15' 10.70"	280° 11' 43"	0.45501
21	115° 11' 06"	3° 35' 28"	117° 51' 10"	24° 37' 35"	0° 55' 44"	15' 11.18"	280° 25' 37"	0.45917
22	115° 42' 20"	3° 37' 30"	118° 25' 15"	24° 33' 43"	0° 55' 46"	15' 11.67"	280° 39' 30"	0.46334
23	116° 13' 37"	3° 39' 31"	118° 59' 21"	24° 29' 43"	0° 55' 47"	15' 12.16"	280° 53' 22"	0.46751
24	116° 44' 55"	3° 41' 31"	119° 33' 27"	24° 25' 36"	0° 55' 49"	15' 12.65"	281° 7' 13"	0.47170

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	30° 08' 58"	0.76"	28° 02' 37"	11° 31' 12"	1.0045978	15' 55.24"	23° 26' 14"	1 m 02 s
1	30° 11' 25"	0.76"	28° 04' 57"	11° 32' 04"	1.0046090	15' 55.23"	23° 26' 14"	1 m 03 s
2	30° 13' 51"	0.76"	28° 07' 17"	11° 32' 55"	1.0046202	15' 55.22"	23° 26' 14"	1 m 03 s
3	30° 16' 18"	0.77"	28° 09' 37"	11° 33' 47"	1.0046314	15' 55.21"	23° 26' 14"	1 m 04 s
4	30° 18' 44"	0.77"	28° 11' 57"	11° 34' 38"	1.0046426	15' 55.20"	23° 26' 14"	1 m 04 s
5	30° 21' 11"	0.77"	28° 14' 17"	11° 35' 29"	1.0046538	15' 55.18"	23° 26' 14"	1 m 05 s
6	30° 23' 37"	0.78"	28° 16' 37"	11° 36' 21"	1.0046650	15' 55.17"	23° 26' 14"	1 m 05 s
7	30° 26' 04"	0.78"	28° 18' 57"	11° 37' 12"	1.0046762	15' 55.16"	23° 26' 14"	1 m 06 s
8	30° 28' 30"	0.78"	28° 21' 17"	11° 38' 03"	1.0046873	15' 55.15"	23° 26' 14"	1 m 06 s
9	30° 30' 56"	0.79"	28° 23' 37"	11° 38' 54"	1.0046985	15' 55.14"	23° 26' 14"	1 m 07 s
10	30° 33' 23"	0.79"	28° 25' 58"	11° 39' 46"	1.0047097	15' 55.13"	23° 26' 14"	1 m 07 s
11	30° 35' 49"	0.79"	28° 28' 18"	11° 40' 37"	1.0047209	15' 55.12"	23° 26' 14"	1 m 08 s
12	30° 38' 16"	0.80"	28° 30' 38"	11° 41' 28"	1.0047321	15' 55.11"	23° 26' 14"	1 m 08 s
13	30° 40' 42"	0.80"	28° 32' 58"	11° 42' 19"	1.0047432	15' 55.10"	23° 26' 14"	1 m 09 s
14	30° 43' 09"	0.80"	28° 35' 18"	11° 43' 10"	1.0047544	15' 55.09"	23° 26' 14"	1 m 09 s
15	30° 45' 35"	0.80"	28° 37' 38"	11° 44' 01"	1.0047656	15' 55.08"	23° 26' 14"	1 m 10 s
16	30° 48' 01"	0.81"	28° 39' 58"	11° 44' 53"	1.0047767	15' 55.07"	23° 26' 14"	1 m 10 s
17	30° 50' 28"	0.81"	28° 42' 18"	11° 45' 44"	1.0047879	15' 55.06"	23° 26' 14"	1 m 11 s
18	30° 52' 54"	0.81"	28° 44' 39"	11° 46' 35"	1.0047990	15' 55.05"	23° 26' 14"	1 m 11 s
19	30° 55' 21"	0.82"	28° 46' 59"	11° 47' 26"	1.0048102	15' 55.04"	23° 26' 14"	1 m 12 s
20	30° 57' 47"	0.82"	28° 49' 19"	11° 48' 17"	1.0048214	15' 55.03"	23° 26' 14"	1 m 12 s
21	31° 00' 13"	0.82"	28° 51' 39"	11° 49' 08"	1.0048325	15' 55.01"	23° 26' 14"	1 m 13 s
22	31° 02' 40"	0.82"	28° 53' 59"	11° 49' 59"	1.0048437	15' 55.00"	23° 26' 14"	1 m 13 s
23	31° 05' 06"	0.83"	28° 56' 19"	11° 50' 50"	1.0048548	15' 54.99"	23° 26' 14"	1 m 14 s
24	31° 07' 33"	0.83"	28° 58' 40"	11° 51' 41"	1.0048660	15' 54.98"	23° 26' 14"	1 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	116° 44' 55"	3° 41' 31"	119° 33' 27"	24° 25' 36"	0° 55' 49"	15' 12.65"	281° 7' 13"	0.47170
1	117° 16' 16"	3° 43' 31"	120° 07' 33"	24° 21' 20"	0° 55' 51"	15' 13.15"	281° 21' 02"	0.47589
2	117° 47' 39"	3° 45' 29"	120° 41' 39"	24° 16' 57"	0° 55' 53"	15' 13.66"	281° 34' 49"	0.48009
3	118° 19' 04"	3° 47' 26"	121° 15' 44"	24° 12' 26"	0° 55' 55"	15' 14.16"	281° 48' 36"	0.48429
4	118° 50' 32"	3° 49' 22"	121° 49' 50"	24° 07' 46"	0° 55' 57"	15' 14.67"	282° 2' 20"	0.48850
5	119° 22' 01"	3° 51' 17"	122° 23' 55"	24° 02' 59"	0° 55' 58"	15' 15.18"	282° 16' 02"	0.49271
6	119° 53' 33"	3° 53' 11"	122° 57' 60"	23° 58' 05"	0° 56' 00"	15' 15.70"	282° 29' 43"	0.49694
7	120° 25' 07"	3° 55' 04"	123° 32' 04"	23° 53' 02"	0° 56' 02"	15' 16.22"	282° 43' 22"	0.50116
8	120° 56' 44"	3° 56' 56"	124° 06' 08"	23° 47' 51"	0° 56' 04"	15' 16.75"	282° 56' 58"	0.50539
9	121° 28' 23"	3° 58' 47"	124° 40' 12"	23° 42' 33"	0° 56' 06"	15' 17.28"	283° 10' 33"	0.50963
10	122° 00' 04"	4° 00' 37"	125° 14' 15"	23° 37' 06"	0° 56' 08"	15' 17.81"	283° 24' 05"	0.51387
11	122° 31' 47"	4° 02' 26"	125° 48' 18"	23° 31' 32"	0° 56' 10"	15' 18.35"	283° 37' 35"	0.51812
12	123° 03' 33"	4° 04' 14"	126° 22' 21"	23° 25' 50"	0° 56' 12"	15' 18.89"	283° 51' 03"	0.52237
13	123° 35' 22"	4° 06' 00"	126° 56' 22"	23° 20' 01"	0° 56' 14"	15' 19.43"	284° 4' 28"	0.52662
14	124° 07' 13"	4° 07' 46"	127° 30' 24"	23° 14' 03"	0° 56' 16"	15' 19.98"	284° 17' 51"	0.53088
15	124° 39' 06"	4° 09' 30"	128° 04' 24"	23° 07' 58"	0° 56' 18"	15' 20.53"	284° 31' 10"	0.53514
16	125° 11' 01"	4° 11' 13"	128° 38' 24"	23° 01' 45"	0° 56' 20"	15' 21.08"	284° 44' 28"	0.53940
17	125° 42' 59"	4° 12' 55"	129° 12' 23"	22° 55' 25"	0° 56' 22"	15' 21.64"	284° 57' 42"	0.54367
18	126° 15' 00"	4° 14' 36"	129° 46' 22"	22° 48' 56"	0° 56' 24"	15' 22.20"	285° 10' 54"	0.54793
19	126° 47' 03"	4° 16' 15"	130° 20' 20"	22° 42' 20"	0° 56' 26"	15' 22.76"	285° 24' 02"	0.55220
20	127° 19' 09"	4° 17' 53"	130° 54' 17"	22° 35' 36"	0° 56' 28"	15' 23.33"	285° 37' 08"	0.55648
21	127° 51' 17"	4° 19' 30"	131° 28' 13"	22° 28' 45"	0° 56' 30"	15' 23.90"	285° 50' 10"	0.56075
22	128° 23' 28"	4° 21' 06"	132° 02' 08"	22° 21' 46"	0° 56' 33"	15' 24.47"	286° 3' 09"	0.56502
23	128° 55' 41"	4° 22' 41"	132° 36' 03"	22° 14' 39"	0° 56' 35"	15' 25.05"	286° 16' 05"	0.56930
24	129° 27' 57"	4° 24' 14"	133° 09' 57"	22° 07' 25"	0° 56' 37"	15' 25.63"	286° 28' 58"	0.57358

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	31° 07' 33"	0.83"	28° 58' 40"	11° 51' 41"	1.0048660	15' 54.98"	23° 26' 14"	1 m 14 s
1	31° 09' 59"	0.83"	29° 00' 60"	11° 52' 32"	1.0048771	15' 54.97"	23° 26' 14"	1 m 15 s
2	31° 12' 25"	0.83"	29° 03' 20"	11° 53' 23"	1.0048882	15' 54.96"	23° 26' 14"	1 m 15 s
3	31° 14' 52"	0.84"	29° 05' 40"	11° 54' 13"	1.0048994	15' 54.95"	23° 26' 14"	1 m 16 s
4	31° 17' 18"	0.84"	29° 08' 01"	11° 55' 04"	1.0049105	15' 54.94"	23° 26' 14"	1 m 16 s
5	31° 19' 44"	0.84"	29° 10' 21"	11° 55' 55"	1.0049217	15' 54.93"	23° 26' 14"	1 m 17 s
6	31° 22' 11"	0.84"	29° 12' 41"	11° 56' 46"	1.0049328	15' 54.92"	23° 26' 14"	1 m 17 s
7	31° 24' 37"	0.84"	29° 15' 02"	11° 57' 37"	1.0049439	15' 54.91"	23° 26' 14"	1 m 18 s
8	31° 27' 04"	0.85"	29° 17' 22"	11° 58' 28"	1.0049551	15' 54.90"	23° 26' 14"	1 m 18 s
9	31° 29' 30"	0.85"	29° 19' 42"	11° 59' 18"	1.0049662	15' 54.89"	23° 26' 14"	1 m 19 s
10	31° 31' 56"	0.85"	29° 22' 03"	12° 00' 09"	1.0049773	15' 54.88"	23° 26' 14"	1 m 19 s
11	31° 34' 23"	0.85"	29° 24' 23"	12° 00' 60"	1.0049884	15' 54.87"	23° 26' 14"	1 m 20 s
12	31° 36' 49"	0.85"	29° 26' 43"	12° 01' 50"	1.0049996	15' 54.86"	23° 26' 14"	1 m 20 s
13	31° 39' 15"	0.86"	29° 29' 04"	12° 02' 41"	1.0050107	15' 54.85"	23° 26' 14"	1 m 21 s
14	31° 41' 42"	0.86"	29° 31' 24"	12° 03' 32"	1.0050218	15' 54.84"	23° 26' 14"	1 m 21 s
15	31° 44' 08"	0.86"	29° 33' 44"	12° 04' 22"	1.0050329	15' 54.82"	23° 26' 14"	1 m 22 s
16	31° 46' 34"	0.86"	29° 36' 05"	12° 05' 13"	1.0050440	15' 54.81"	23° 26' 14"	1 m 22 s
17	31° 49' 01"	0.86"	29° 38' 25"	12° 06' 04"	1.0050551	15' 54.80"	23° 26' 14"	1 m 23 s
18	31° 51' 27"	0.86"	29° 40' 46"	12° 06' 54"	1.0050662	15' 54.79"	23° 26' 14"	1 m 23 s
19	31° 53' 53"	0.87"	29° 43' 06"	12° 07' 45"	1.0050773	15' 54.78"	23° 26' 14"	1 m 24 s
20	31° 56' 20"	0.87"	29° 45' 26"	12° 08' 35"	1.0050884	15' 54.77"	23° 26' 14"	1 m 24 s
21	31° 58' 46"	0.87"	29° 47' 47"	12° 09' 26"	1.0050995	15' 54.76"	23° 26' 14"	1 m 25 s
22	32° 01' 12"	0.87"	29° 50' 07"	12° 10' 16"	1.0051107	15' 54.75"	23° 26' 14"	1 m 25 s
23	32° 03' 38"	0.87"	29° 52' 28"	12° 11' 07"	1.0051217	15' 54.74"	23° 26' 14"	1 m 26 s
24	32° 06' 05"	0.87"	29° 54' 48"	12° 11' 57"	1.0051328	15' 54.73"	23° 26' 15"	1 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	129° 27' 57"	4° 24' 14"	133° 09' 57"	22° 07' 25"	0° 56' 37"	15' 25.63"	286° 28' 58"	0.57358
1	130° 00' 16"	4° 25' 46"	133° 43' 49"	22° 00' 04"	0° 56' 39"	15' 26.21"	286° 41' 47"	0.57785
2	130° 32' 37"	4° 27' 17"	134° 17' 41"	21° 52' 34"	0° 56' 41"	15' 26.80"	286° 54' 33"	0.58213
3	131° 05' 01"	4° 28' 47"	134° 51' 32"	21° 44' 58"	0° 56' 43"	15' 27.39"	287° 7' 15"	0.58641
4	131° 37' 27"	4° 30' 15"	135° 25' 22"	21° 37' 13"	0° 56' 45"	15' 27.98"	287° 19' 54"	0.59068
5	132° 09' 57"	4° 31' 42"	135° 59' 11"	21° 29' 22"	0° 56' 48"	15' 28.58"	287° 32' 29"	0.59496
6	132° 42' 28"	4° 33' 07"	136° 32' 59"	21° 21' 22"	0° 56' 50"	15' 29.18"	287° 45' 00"	0.59923
7	133° 15' 03"	4° 34' 31"	137° 06' 46"	21° 13' 16"	0° 56' 52"	15' 29.78"	287° 57' 28"	0.60350
8	133° 47' 40"	4° 35' 54"	137° 40' 31"	21° 05' 02"	0° 56' 54"	15' 30.38"	288° 9' 51"	0.60777
9	134° 20' 20"	4° 37' 15"	138° 14' 16"	20° 56' 41"	0° 56' 56"	15' 30.99"	288° 22' 11"	0.61204
10	134° 53' 03"	4° 38' 35"	138° 47' 60"	20° 48' 12"	0° 56' 59"	15' 31.60"	288° 34' 27"	0.61631
11	135° 25' 49"	4° 39' 54"	139° 21' 42"	20° 39' 36"	0° 57' 01"	15' 32.21"	288° 46' 38"	0.62057
12	135° 58' 37"	4° 41' 11"	139° 55' 24"	20° 30' 53"	0° 57' 03"	15' 32.82"	288° 58' 46"	0.62483
13	136° 31' 28"	4° 42' 27"	140° 29' 04"	20° 22' 03"	0° 57' 05"	15' 33.44"	289° 10' 49"	0.62909
14	137° 04' 22"	4° 43' 41"	141° 02' 43"	20° 13' 06"	0° 57' 08"	15' 34.06"	289° 22' 48"	0.63334
15	137° 37' 19"	4° 44' 54"	141° 36' 21"	20° 04' 01"	0° 57' 10"	15' 34.68"	289° 34' 43"	0.63759
16	138° 10' 19"	4° 46' 05"	142° 09' 58"	19° 54' 49"	0° 57' 12"	15' 35.30"	289° 46' 34"	0.64183
17	138° 43' 21"	4° 47' 15"	142° 43' 34"	19° 45' 30"	0° 57' 15"	15' 35.93"	289° 58' 20"	0.64607
18	139° 16' 26"	4° 48' 23"	143° 17' 09"	19° 36' 04"	0° 57' 17"	15' 36.56"	290° 10' 02"	0.65031
19	139° 49' 35"	4° 49' 30"	143° 50' 42"	19° 26' 32"	0° 57' 19"	15' 37.19"	290° 21' 39"	0.65454
20	140° 22' 46"	4° 50' 36"	144° 24' 14"	19° 16' 52"	0° 57' 22"	15' 37.82"	290° 33' 12"	0.65876
21	140° 55' 60"	4° 51' 39"	144° 57' 46"	19° 07' 05"	0° 57' 24"	15' 38.46"	290° 44' 40"	0.66297
22	141° 29' 16"	4° 52' 42"	145° 31' 16"	18° 57' 11"	0° 57' 26"	15' 39.09"	290° 56' 04"	0.66718
23	142° 02' 36"	4° 53' 42"	146° 04' 44"	18° 47' 11"	0° 57' 29"	15' 39.73"	291° 7' 23"	0.67139
24	142° 35' 59"	4° 54' 41"	146° 38' 12"	18° 37' 03"	0° 57' 31"	15' 40.37"	291° 18' 37"	0.67558

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	32° 06' 05"	0.87"	29° 54' 48"	12° 11' 57"	1.0051328	15' 54.73"	23° 26' 15"	1 m 26 s
1	32° 08' 31"	0.87"	29° 57' 09"	12° 12' 48"	1.0051439	15' 54.72"	23° 26' 15"	1 m 27 s
2	32° 10' 57"	0.88"	29° 59' 29"	12° 13' 38"	1.0051550	15' 54.71"	23° 26' 15"	1 m 27 s
3	32° 13' 24"	0.88"	30° 01' 50"	12° 14' 28"	1.0051661	15' 54.70"	23° 26' 15"	1 m 28 s
4	32° 15' 50"	0.88"	30° 04' 10"	12° 15' 19"	1.0051772	15' 54.69"	23° 26' 15"	1 m 28 s
5	32° 18' 16"	0.88"	30° 06' 31"	12° 16' 09"	1.0051883	15' 54.68"	23° 26' 15"	1 m 29 s
6	32° 20' 42"	0.88"	30° 08' 51"	12° 16' 59"	1.0051994	15' 54.67"	23° 26' 15"	1 m 29 s
7	32° 23' 09"	0.88"	30° 11' 12"	12° 17' 50"	1.0052105	15' 54.66"	23° 26' 15"	1 m 30 s
8	32° 25' 35"	0.88"	30° 13' 33"	12° 18' 40"	1.0052216	15' 54.65"	23° 26' 15"	1 m 30 s
9	32° 28' 01"	0.88"	30° 15' 53"	12° 19' 30"	1.0052326	15' 54.63"	23° 26' 15"	1 m 31 s
10	32° 30' 27"	0.88"	30° 18' 14"	12° 20' 21"	1.0052437	15' 54.62"	23° 26' 15"	1 m 31 s
11	32° 32' 54"	0.88"	30° 20' 34"	12° 21' 11"	1.0052548	15' 54.61"	23° 26' 15"	1 m 32 s
12	32° 35' 20"	0.88"	30° 22' 55"	12° 22' 01"	1.0052659	15' 54.60"	23° 26' 15"	1 m 32 s
13	32° 37' 46"	0.89"	30° 25' 16"	12° 22' 51"	1.0052770	15' 54.59"	23° 26' 15"	1 m 33 s
14	32° 40' 12"	0.89"	30° 27' 36"	12° 23' 41"	1.0052880	15' 54.58"	23° 26' 15"	1 m 33 s
15	32° 42' 39"	0.89"	30° 29' 57"	12° 24' 31"	1.0052991	15' 54.57"	23° 26' 15"	1 m 34 s
16	32° 45' 05"	0.89"	30° 32' 18"	12° 25' 22"	1.0053102	15' 54.56"	23° 26' 15"	1 m 34 s
17	32° 47' 31"	0.89"	30° 34' 38"	12° 26' 12"	1.0053212	15' 54.55"	23° 26' 15"	1 m 34 s
18	32° 49' 57"	0.89"	30° 36' 59"	12° 27' 02"	1.0053323	15' 54.54"	23° 26' 15"	1 m 35 s
19	32° 52' 24"	0.89"	30° 39' 20"	12° 27' 52"	1.0053434	15' 54.53"	23° 26' 15"	1 m 35 s
20	32° 54' 50"	0.89"	30° 41' 40"	12° 28' 42"	1.0053544	15' 54.52"	23° 26' 15"	1 m 36 s
21	32° 57' 16"	0.89"	30° 44' 01"	12° 29' 32"	1.0053655	15' 54.51"	23° 26' 15"	1 m 36 s
22	32° 59' 42"	0.89"	30° 46' 22"	12° 30' 22"	1.0053766	15' 54.50"	23° 26' 15"	1 m 37 s
23	33° 02' 08"	0.89"	30° 48' 43"	12° 31' 12"	1.0053876	15' 54.49"	23° 26' 15"	1 m 37 s
24	33° 04' 35"	0.89"	30° 51' 03"	12° 32' 02"	1.0053987	15' 54.48"	23° 26' 15"	1 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	142° 35' 59"	4° 54' 41"	146° 38' 12"	18° 37' 03"	0° 57' 31"	15' 40.37"	291° 18' 37"	0.67558
1	143° 09' 24"	4° 55' 39"	147° 11' 38"	18° 26' 49"	0° 57' 33"	15' 41.01"	291° 29' 47"	0.67977
2	143° 42' 53"	4° 56' 35"	147° 45' 04"	18° 16' 28"	0° 57' 36"	15' 41.66"	291° 40' 52"	0.68395
3	144° 16' 25"	4° 57' 29"	148° 18' 28"	18° 06' 01"	0° 57' 38"	15' 42.30"	291° 51' 52"	0.68812
4	144° 49' 59"	4° 58' 22"	148° 51' 51"	17° 55' 26"	0° 57' 40"	15' 42.95"	292° 2' 47"	0.69228
5	145° 23' 36"	4° 59' 13"	149° 25' 12"	17° 44' 45"	0° 57' 43"	15' 43.60"	292° 13' 38"	0.69643
6	145° 57' 17"	5° 00' 02"	149° 58' 33"	17° 33' 58"	0° 57' 45"	15' 44.24"	292° 24' 23"	0.70057
7	146° 31' 00"	5° 00' 50"	150° 31' 53"	17° 23' 04"	0° 57' 48"	15' 44.90"	292° 35' 03"	0.70471
8	147° 04' 47"	5° 01' 36"	151° 05' 11"	17° 12' 04"	0° 57' 50"	15' 45.55"	292° 45' 39"	0.70883
9	147° 38' 36"	5° 02' 21"	151° 38' 28"	17° 00' 57"	0° 57' 52"	15' 46.20"	292° 56' 10"	0.71294
10	148° 12' 28"	5° 03' 03"	152° 11' 45"	16° 49' 44"	0° 57' 55"	15' 46.85"	293° 6' 35"	0.71704
11	148° 46' 24"	5° 03' 44"	152° 44' 60"	16° 38' 24"	0° 57' 57"	15' 47.51"	293° 16' 56"	0.72113
12	149° 20' 22"	5° 04' 24"	153° 18' 14"	16° 26' 58"	0° 57' 60"	15' 48.16"	293° 27' 11"	0.72520
13	149° 54' 24"	5° 05' 01"	153° 51' 27"	16° 15' 26"	0° 58' 02"	15' 48.82"	293° 37' 22"	0.72927
14	150° 28' 28"	5° 05' 37"	154° 24' 39"	16° 03' 48"	0° 58' 04"	15' 49.48"	293° 47' 27"	0.73332
15	151° 02' 35"	5° 06' 11"	154° 57' 50"	15° 52' 03"	0° 58' 07"	15' 50.13"	293° 57' 27"	0.73736
16	151° 36' 46"	5° 06' 44"	155° 30' 60"	15° 40' 13"	0° 58' 09"	15' 50.79"	294° 7' 23"	0.74138
17	152° 10' 59"	5° 07' 14"	156° 04' 09"	15° 28' 16"	0° 58' 12"	15' 51.45"	294° 17' 13"	0.74539
18	152° 45' 16"	5° 07' 43"	156° 37' 17"	15° 16' 14"	0° 58' 14"	15' 52.11"	294° 26' 57"	0.74938
19	153° 19' 36"	5° 08' 10"	157° 10' 24"	15° 04' 05"	0° 58' 16"	15' 52.77"	294° 36' 37"	0.75336
20	153° 53' 58"	5° 08' 35"	157° 43' 30"	14° 51' 51"	0° 58' 19"	15' 53.43"	294° 46' 12"	0.75733
21	154° 28' 24"	5° 08' 58"	158° 16' 35"	14° 39' 31"	0° 58' 21"	15' 54.09"	294° 55' 41"	0.76128
22	155° 02' 53"	5° 09' 20"	158° 49' 39"	14° 27' 05"	0° 58' 24"	15' 54.75"	295° 5' 06"	0.76521
23	155° 37' 24"	5° 09' 39"	159° 22' 43"	14° 14' 34"	0° 58' 26"	15' 55.41"	295° 14' 25"	0.76912
24	156° 11' 59"	5° 09' 57"	159° 55' 46"	14° 01' 56"	0° 58' 29"	15' 56.07"	295° 23' 39"	0.77302

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	33° 04' 35"	0.89"	30° 51' 03"	12° 32' 02"	1.0053987	15' 54.48"	23° 26' 15"	1 m 38 s
1	33° 07' 01"	0.89"	30° 53' 24"	12° 32' 51"	1.0054097	15' 54.47"	23° 26' 15"	1 m 38 s
2	33° 09' 27"	0.89"	30° 55' 45"	12° 33' 41"	1.0054208	15' 54.46"	23° 26' 15"	1 m 39 s
3	33° 11' 53"	0.89"	30° 58' 06"	12° 34' 31"	1.0054318	15' 54.45"	23° 26' 15"	1 m 39 s
4	33° 14' 19"	0.89"	31° 00' 27"	12° 35' 21"	1.0054429	15' 54.44"	23° 26' 15"	1 m 40 s
5	33° 16' 46"	0.89"	31° 02' 47"	12° 36' 11"	1.0054539	15' 54.42"	23° 26' 15"	1 m 40 s
6	33° 19' 12"	0.89"	31° 05' 08"	12° 37' 01"	1.0054650	15' 54.41"	23° 26' 15"	1 m 41 s
7	33° 21' 38"	0.89"	31° 07' 29"	12° 37' 51"	1.0054760	15' 54.40"	23° 26' 15"	1 m 41 s
8	33° 24' 04"	0.89"	31° 09' 50"	12° 38' 40"	1.0054871	15' 54.39"	23° 26' 15"	1 m 41 s
9	33° 26' 30"	0.89"	31° 12' 11"	12° 39' 30"	1.0054981	15' 54.38"	23° 26' 15"	1 m 42 s
10	33° 28' 56"	0.89"	31° 14' 32"	12° 40' 20"	1.0055092	15' 54.37"	23° 26' 15"	1 m 42 s
11	33° 31' 23"	0.89"	31° 16' 53"	12° 41' 09"	1.0055202	15' 54.36"	23° 26' 15"	1 m 43 s
12	33° 33' 49"	0.88"	31° 19' 13"	12° 41' 59"	1.0055313	15' 54.35"	23° 26' 15"	1 m 43 s
13	33° 36' 15"	0.88"	31° 21' 34"	12° 42' 49"	1.0055423	15' 54.34"	23° 26' 15"	1 m 44 s
14	33° 38' 41"	0.88"	31° 23' 55"	12° 43' 38"	1.0055533	15' 54.33"	23° 26' 15"	1 m 44 s
15	33° 41' 07"	0.88"	31° 26' 16"	12° 44' 28"	1.0055644	15' 54.32"	23° 26' 15"	1 m 45 s
16	33° 43' 33"	0.88"	31° 28' 37"	12° 45' 18"	1.0055754	15' 54.31"	23° 26' 15"	1 m 45 s
17	33° 45' 59"	0.88"	31° 30' 58"	12° 46' 07"	1.0055865	15' 54.30"	23° 26' 15"	1 m 46 s
18	33° 48' 26"	0.88"	31° 33' 19"	12° 46' 57"	1.0055975	15' 54.29"	23° 26' 15"	1 m 46 s
19	33° 50' 52"	0.88"	31° 35' 40"	12° 47' 46"	1.0056085	15' 54.28"	23° 26' 15"	1 m 46 s
20	33° 53' 18"	0.88"	31° 38' 01"	12° 48' 36"	1.0056196	15' 54.27"	23° 26' 15"	1 m 47 s
21	33° 55' 44"	0.88"	31° 40' 22"	12° 49' 25"	1.0056306	15' 54.26"	23° 26' 15"	1 m 47 s
22	33° 58' 10"	0.88"	31° 42' 43"	12° 50' 15"	1.0056416	15' 54.25"	23° 26' 15"	1 m 48 s
23	34° 00' 36"	0.87"	31° 45' 04"	12° 51' 04"	1.0056527	15' 54.24"	23° 26' 15"	1 m 48 s
24	34° 03' 02"	0.87"	31° 47' 25"	12° 51' 53"	1.0056637	15' 54.23"	23° 26' 15"	1 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	156° 11' 59"	5° 09' 57"	159° 55' 46"	14° 01' 56"	0° 58' 29"	15' 56.07"	295° 23' 39"	0.77302
1	156° 46' 37"	5° 10' 13"	160° 28' 48"	13° 49' 14"	0° 58' 31"	15' 56.72"	295° 32' 48"	0.77690
2	157° 21' 18"	5° 10' 27"	161° 01' 49"	13° 36' 25"	0° 58' 33"	15' 57.38"	295° 41' 52"	0.78077
3	157° 56' 02"	5° 10' 39"	161° 34' 49"	13° 23' 31"	0° 58' 36"	15' 58.04"	295° 50' 51"	0.78461
4	158° 30' 48"	5° 10' 50"	162° 07' 49"	13° 10' 32"	0° 58' 38"	15' 58.70"	295° 59' 45"	0.78844
5	159° 05' 38"	5° 10' 58"	162° 40' 48"	12° 57' 28"	0° 58' 41"	15' 59.35"	296° 8' 34"	0.79224
6	159° 40' 31"	5° 11' 05"	163° 13' 47"	12° 44' 18"	0° 58' 43"	16' 00.01"	296° 17' 17"	0.79603
7	160° 15' 27"	5° 11' 09"	163° 46' 45"	12° 31' 03"	0° 58' 45"	16' 00.66"	296° 25' 56"	0.79979
8	160° 50' 26"	5° 11' 12"	164° 19' 42"	12° 17' 42"	0° 58' 48"	16' 01.32"	296° 34' 30"	0.80354
9	161° 25' 28"	5° 11' 13"	164° 52' 39"	12° 04' 17"	0° 58' 50"	16' 01.97"	296° 42' 59"	0.80726
10	162° 00' 33"	5° 11' 11"	165° 25' 35"	11° 50' 47"	0° 58' 53"	16' 02.62"	296° 51' 23"	0.81096
11	162° 35' 41"	5° 11' 08"	165° 58' 31"	11° 37' 11"	0° 58' 55"	16' 03.27"	296° 59' 42"	0.81464
12	163° 10' 52"	5° 11' 03"	166° 31' 26"	11° 23' 31"	0° 58' 57"	16' 03.92"	297° 7' 56"	0.81830
13	163° 46' 06"	5° 10' 56"	167° 04' 21"	11° 09' 46"	0° 58' 60"	16' 04.57"	297° 16' 06"	0.82193
14	164° 21' 23"	5° 10' 47"	167° 37' 16"	10° 55' 56"	0° 59' 02"	16' 05.21"	297° 24' 11"	0.82555
15	164° 56' 43"	5° 10' 36"	168° 10' 10"	10° 42' 01"	0° 59' 04"	16' 05.86"	297° 32' 12"	0.82913
16	165° 32' 06"	5° 10' 23"	168° 43' 04"	10° 28' 02"	0° 59' 07"	16' 06.50"	297° 40' 07"	0.83269
17	166° 07' 32"	5° 10' 08"	169° 15' 58"	10° 13' 58"	0° 59' 09"	16' 07.14"	297° 47' 59"	0.83623
18	166° 43' 00"	5° 09' 51"	169° 48' 52"	9° 59' 50"	0° 59' 11"	16' 07.77"	297° 55' 46"	0.83974
19	167° 18' 32"	5° 09' 32"	170° 21' 46"	9° 45' 37"	0° 59' 14"	16' 08.41"	298° 3' 29"	0.84323
20	167° 54' 07"	5° 09' 11"	170° 54' 39"	9° 31' 20"	0° 59' 16"	16' 09.04"	298° 11' 07"	0.84669
21	168° 29' 44"	5° 08' 48"	171° 27' 33"	9° 16' 59"	0° 59' 18"	16' 09.67"	298° 18' 42"	0.85012
22	169° 05' 24"	5° 08' 23"	172° 00' 26"	9° 02' 33"	0° 59' 21"	16' 10.30"	298° 26' 12"	0.85353
23	169° 41' 08"	5° 07' 55"	172° 33' 20"	8° 48' 04"	0° 59' 23"	16' 10.93"	298° 33' 39"	0.85690
24	170° 16' 54"	5° 07' 26"	173° 06' 13"	8° 33' 30"	0° 59' 25"	16' 11.55"	298° 41' 02"	0.86025

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	34° 03' 02"	0.87"	31° 47' 25"	12° 51' 53"	1.0056637	15' 54.23"	23° 26' 15"	1 m 49 s
1	34° 05' 28"	0.87"	31° 49' 46"	12° 52' 43"	1.0056747	15' 54.22"	23° 26' 15"	1 m 49 s
2	34° 07' 55"	0.87"	31° 52' 07"	12° 53' 32"	1.0056857	15' 54.20"	23° 26' 15"	1 m 50 s
3	34° 10' 21"	0.87"	31° 54' 28"	12° 54' 22"	1.0056968	15' 54.19"	23° 26' 15"	1 m 50 s
4	34° 12' 47"	0.87"	31° 56' 49"	12° 55' 11"	1.0057078	15' 54.18"	23° 26' 15"	1 m 51 s
5	34° 15' 13"	0.87"	31° 59' 11"	12° 56' 00"	1.0057188	15' 54.17"	23° 26' 15"	1 m 51 s
6	34° 17' 39"	0.86"	32° 01' 32"	12° 56' 49"	1.0057298	15' 54.16"	23° 26' 15"	1 m 51 s
7	34° 20' 05"	0.86"	32° 03' 53"	12° 57' 39"	1.0057408	15' 54.15"	23° 26' 15"	1 m 52 s
8	34° 22' 31"	0.86"	32° 06' 14"	12° 58' 28"	1.0057519	15' 54.14"	23° 26' 15"	1 m 52 s
9	34° 24' 57"	0.86"	32° 08' 35"	12° 59' 17"	1.0057629	15' 54.13"	23° 26' 15"	1 m 53 s
10	34° 27' 23"	0.86"	32° 10' 56"	13° 00' 06"	1.0057739	15' 54.12"	23° 26' 15"	1 m 53 s
11	34° 29' 49"	0.86"	32° 13' 17"	13° 00' 55"	1.0057849	15' 54.11"	23° 26' 15"	1 m 54 s
12	34° 32' 15"	0.85"	32° 15' 39"	13° 01' 45"	1.0057959	15' 54.10"	23° 26' 15"	1 m 54 s
13	34° 34' 42"	0.85"	32° 17' 60"	13° 02' 34"	1.0058069	15' 54.09"	23° 26' 15"	1 m 55 s
14	34° 37' 08"	0.85"	32° 20' 21"	13° 03' 23"	1.0058180	15' 54.08"	23° 26' 15"	1 m 55 s
15	34° 39' 34"	0.85"	32° 22' 42"	13° 04' 12"	1.0058290	15' 54.07"	23° 26' 15"	1 m 55 s
16	34° 41' 60"	0.85"	32° 25' 03"	13° 05' 01"	1.0058400	15' 54.06"	23° 26' 15"	1 m 56 s
17	34° 44' 26"	0.84"	32° 27' 25"	13° 05' 50"	1.0058510	15' 54.05"	23° 26' 15"	1 m 56 s
18	34° 46' 52"	0.84"	32° 29' 46"	13° 06' 39"	1.0058620	15' 54.04"	23° 26' 15"	1 m 57 s
19	34° 49' 18"	0.84"	32° 32' 07"	13° 07' 28"	1.0058730	15' 54.03"	23° 26' 15"	1 m 57 s
20	34° 51' 44"	0.84"	32° 34' 28"	13° 08' 17"	1.0058840	15' 54.02"	23° 26' 15"	1 m 58 s
21	34° 54' 10"	0.83"	32° 36' 50"	13° 09' 06"	1.0058950	15' 54.01"	23° 26' 15"	1 m 58 s
22	34° 56' 36"	0.83"	32° 39' 11"	13° 09' 55"	1.0059060	15' 54.00"	23° 26' 15"	1 m 58 s
23	34° 59' 02"	0.83"	32° 41' 32"	13° 10' 44"	1.0059170	15' 53.99"	23° 26' 15"	1 m 59 s
24	35° 01' 28"	0.83"	32° 43' 54"	13° 11' 32"	1.0059280	15' 53.97"	23° 26' 15"	1 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	170° 16' 54"	5° 07' 26"	173° 06' 13"	8° 33' 30"	0° 59' 25"	16' 11.55"	298° 41' 02"	0.86025
1	170° 52' 43"	5° 06' 55"	173° 39' 07"	8° 18' 52"	0° 59' 28"	16' 12.17"	298° 48' 22"	0.86357
2	171° 28' 35"	5° 06' 22"	174° 12' 01"	8° 04' 11"	0° 59' 30"	16' 12.79"	298° 55' 38"	0.86687
3	172° 04' 29"	5° 05' 46"	174° 44' 55"	7° 49' 25"	0° 59' 32"	16' 13.40"	299° 2' 50"	0.87013
4	172° 40' 26"	5° 05' 09"	175° 17' 49"	7° 34' 36"	0° 59' 34"	16' 14.01"	299° 9' 60"	0.87336
5	173° 16' 27"	5° 04' 30"	175° 50' 44"	7° 19' 43"	0° 59' 37"	16' 14.62"	299° 17' 06"	0.87656
6	173° 52' 30"	5° 03' 48"	176° 23' 39"	7° 04' 47"	0° 59' 39"	16' 15.22"	299° 24' 10"	0.87973
7	174° 28' 35"	5° 03' 05"	176° 56' 35"	6° 49' 47"	0° 59' 41"	16' 15.82"	299° 31' 11"	0.88287
8	175° 04' 44"	5° 02' 19"	177° 29' 31"	6° 34' 44"	0° 59' 43"	16' 16.42"	299° 38' 10"	0.88598
9	175° 40' 55"	5° 01' 31"	178° 02' 28"	6° 19' 37"	0° 59' 45"	16' 17.01"	299° 45' 07"	0.88905
10	176° 17' 09"	5° 00' 42"	178° 35' 25"	6° 04' 27"	0° 59' 48"	16' 17.60"	299° 52' 02"	0.89209
11	176° 53' 25"	4° 59' 50"	179° 08' 23"	5° 49' 14"	0° 59' 50"	16' 18.19"	299° 58' 56"	0.89510
12	177° 29' 44"	4° 58' 56"	179° 41' 22"	5° 33' 58"	0° 59' 52"	16' 18.77"	300° 5' 48"	0.89807
13	178° 06' 06"	4° 57' 60"	180° 14' 21"	5° 18' 39"	0° 59' 54"	16' 19.34"	300° 12' 39"	0.90101
14	178° 42' 30"	4° 57' 02"	180° 47' 21"	5° 03' 17"	0° 59' 56"	16' 19.92"	300° 19' 29"	0.90392
15	179° 18' 57"	4° 56' 02"	181° 20' 22"	4° 47' 52"	0° 59' 58"	16' 20.48"	300° 26' 19"	0.90679
16	179° 55' 27"	4° 54' 59"	181° 53' 24"	4° 32' 25"	1° 00' 00"	16' 21.05"	300° 33' 10"	0.90962
17	180° 31' 59"	4° 53' 55"	182° 26' 27"	4° 16' 54"	1° 00' 02"	16' 21.61"	300° 40' 00"	0.91242
18	181° 08' 33"	4° 52' 49"	182° 59' 31"	4° 01' 22"	1° 00' 04"	16' 22.16"	300° 46' 52"	0.91518
19	181° 45' 10"	4° 51' 40"	183° 32' 36"	3° 45' 46"	1° 00' 06"	16' 22.71"	300° 53' 45"	0.91790
20	182° 21' 50"	4° 50' 30"	184° 05' 42"	3° 30' 09"	1° 00' 08"	16' 23.25"	301° 0' 40"	0.92059
21	182° 58' 32"	4° 49' 17"	184° 38' 50"	3° 14' 29"	1° 00' 10"	16' 23.79"	301° 7' 38"	0.92324
22	183° 35' 16"	4° 48' 02"	185° 11' 58"	2° 58' 47"	1° 00' 12"	16' 24.32"	301° 14' 38"	0.92585
23	184° 12' 03"	4° 46' 46"	185° 45' 08"	2° 43' 03"	1° 00' 14"	16' 24.85"	301° 21' 42"	0.92842
24	184° 48' 52"	4° 45' 27"	186° 18' 20"	2° 27' 17"	1° 00' 16"	16' 25.37"	301° 28' 51"	0.93095

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	35° 01' 28"	0.83"	32° 43' 54"	13° 11' 32"	1.0059280	15' 53.97"	23° 26' 15"	1 m 59 s
1	35° 03' 54"	0.83"	32° 46' 15"	13° 12' 21"	1.0059390	15' 53.96"	23° 26' 15"	1 m 60 s
2	35° 06' 20"	0.82"	32° 48' 36"	13° 13' 10"	1.0059501	15' 53.95"	23° 26' 15"	2 m 00 s
3	35° 08' 46"	0.82"	32° 50' 58"	13° 13' 59"	1.0059611	15' 53.94"	23° 26' 15"	2 m 01 s
4	35° 11' 12"	0.82"	32° 53' 19"	13° 14' 48"	1.0059721	15' 53.93"	23° 26' 15"	2 m 01 s
5	35° 13' 38"	0.81"	32° 55' 41"	13° 15' 36"	1.0059831	15' 53.92"	23° 26' 15"	2 m 01 s
6	35° 16' 04"	0.81"	32° 58' 02"	13° 16' 25"	1.0059941	15' 53.91"	23° 26' 15"	2 m 02 s
7	35° 18' 30"	0.81"	33° 00' 23"	13° 17' 14"	1.0060051	15' 53.90"	23° 26' 15"	2 m 02 s
8	35° 20' 56"	0.81"	33° 02' 45"	13° 18' 03"	1.0060161	15' 53.89"	23° 26' 15"	2 m 03 s
9	35° 23' 22"	0.80"	33° 05' 06"	13° 18' 51"	1.0060270	15' 53.88"	23° 26' 15"	2 m 03 s
10	35° 25' 48"	0.80"	33° 07' 28"	13° 19' 40"	1.0060380	15' 53.87"	23° 26' 15"	2 m 04 s
11	35° 28' 14"	0.80"	33° 09' 49"	13° 20' 28"	1.0060490	15' 53.86"	23° 26' 15"	2 m 04 s
12	35° 30' 40"	0.79"	33° 12' 11"	13° 21' 17"	1.0060600	15' 53.85"	23° 26' 15"	2 m 04 s
13	35° 33' 06"	0.79"	33° 14' 32"	13° 22' 06"	1.0060710	15' 53.84"	23° 26' 15"	2 m 05 s
14	35° 35' 32"	0.79"	33° 16' 54"	13° 22' 54"	1.0060820	15' 53.83"	23° 26' 15"	2 m 05 s
15	35° 37' 58"	0.79"	33° 19' 15"	13° 23' 43"	1.0060930	15' 53.82"	23° 26' 15"	2 m 06 s
16	35° 40' 24"	0.78"	33° 21' 37"	13° 24' 31"	1.0061040	15' 53.81"	23° 26' 15"	2 m 06 s
17	35° 42' 50"	0.78"	33° 23' 58"	13° 25' 20"	1.0061150	15' 53.80"	23° 26' 15"	2 m 06 s
18	35° 45' 16"	0.78"	33° 26' 20"	13° 26' 08"	1.0061260	15' 53.79"	23° 26' 15"	2 m 07 s
19	35° 47' 42"	0.77"	33° 28' 41"	13° 26' 57"	1.0061370	15' 53.78"	23° 26' 15"	2 m 07 s
20	35° 50' 08"	0.77"	33° 31' 03"	13° 27' 45"	1.0061480	15' 53.77"	23° 26' 15"	2 m 08 s
21	35° 52' 34"	0.77"	33° 33' 25"	13° 28' 33"	1.0061590	15' 53.76"	23° 26' 15"	2 m 08 s
22	35° 54' 60"	0.76"	33° 35' 46"	13° 29' 22"	1.0061699	15' 53.75"	23° 26' 15"	2 m 08 s
23	35° 57' 26"	0.76"	33° 38' 08"	13° 30' 10"	1.0061809	15' 53.74"	23° 26' 15"	2 m 09 s
24	35° 59' 52"	0.76"	33° 40' 29"	13° 30' 58"	1.0061919	15' 53.72"	23° 26' 15"	2 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	184° 48' 52"	4° 45' 27"	186° 18' 20"	2° 27' 17"	1° 00' 16"	16' 25.37"	301° 28' 51"	0.93095
1	185° 25' 43"	4° 44' 06"	186° 51' 32"	2° 11' 29"	1° 00' 18"	16' 25.89"	301° 36' 04"	0.93344
2	186° 02' 37"	4° 42' 43"	187° 24' 47"	1° 55' 39"	1° 00' 20"	16' 26.40"	301° 43' 24"	0.93589
3	186° 39' 33"	4° 41' 18"	187° 58' 02"	1° 39' 47"	1° 00' 22"	16' 26.91"	301° 50' 50"	0.93830
4	187° 16' 31"	4° 39' 51"	188° 31' 20"	1° 23' 54"	1° 00' 24"	16' 27.41"	301° 58' 25"	0.94067
5	187° 53' 32"	4° 38' 22"	189° 04' 39"	1° 07' 60"	1° 00' 25"	16' 27.90"	302° 6' 07"	0.94300
6	188° 30' 34"	4° 36' 51"	189° 37' 60"	0° 52' 04"	1° 00' 27"	16' 28.39"	302° 14' 00"	0.94529
7	189° 07' 39"	4° 35' 18"	190° 11' 22"	0° 36' 06"	1° 00' 29"	16' 28.87"	302° 22' 04"	0.94753
8	189° 44' 46"	4° 33' 43"	190° 44' 47"	0° 20' 08"	1° 00' 31"	16' 29.34"	302° 30' 20"	0.94974
9	190° 21' 55"	4° 32' 06"	191° 18' 13"	0° 04' 08"	1° 00' 32"	16' 29.81"	302° 38' 50"	0.95189
10	190° 59' 06"	4° 30' 26"	191° 51' 41"	0° -11' 52"	1° 00' 34"	16' 30.27"	302° 47' 36"	0.95401
11	191° 36' 19"	4° 28' 45"	192° 25' 12"	0° -27' 54"	1° 00' 36"	16' 30.73"	302° 56' 39"	0.95608
12	192° 13' 33"	4° 27' 02"	192° 58' 44"	0° -43' 56"	1° 00' 37"	16' 31.18"	303° 6' 01"	0.95811
13	192° 50' 50"	4° 25' 17"	193° 32' 19"	0° -59' 59"	1° 00' 39"	16' 31.62"	303° 15' 45"	0.96009
14	193° 28' 09"	4° 23' 30"	194° 05' 56"	-1° 16' 02"	1° 00' 41"	16' 32.05"	303° 25' 52"	0.96203
15	194° 05' 30"	4° 21' 41"	194° 39' 35"	-1° 32' 06"	1° 00' 42"	16' 32.48"	303° 36' 25"	0.96392
16	194° 42' 52"	4° 19' 49"	195° 13' 16"	-1° 48' 11"	1° 00' 44"	16' 32.90"	303° 47' 27"	0.96577
17	195° 20' 17"	4° 17' 56"	195° 46' 60"	-2° 04' 15"	1° 00' 45"	16' 33.31"	303° 59' 02"	0.96757
18	195° 57' 43"	4° 16' 01"	196° 20' 46"	-2° 20' 20"	1° 00' 47"	16' 33.72"	304° 11' 12"	0.96932
19	196° 35' 10"	4° 14' 05"	196° 54' 34"	-2° 36' 25"	1° 00' 48"	16' 34.12"	304° 24' 03"	0.97103
20	197° 12' 40"	4° 12' 06"	197° 28' 26"	-2° 52' 29"	1° 00' 50"	16' 34.51"	304° 37' 38"	0.97269
21	197° 50' 11"	4° 10' 05"	198° 02' 20"	-3° 08' 34"	1° 00' 51"	16' 34.89"	304° 52' 02"	0.97430
22	198° 27' 44"	4° 08' 02"	198° 36' 16"	-3° 24' 38"	1° 00' 52"	16' 35.27"	305° 7' 21"	0.97587
23	199° 05' 18"	4° 05' 58"	199° 10' 15"	-3° 40' 41"	1° 00' 54"	16' 35.63"	305° 23' 42"	0.97739
24	199° 42' 54"	4° 03' 51"	199° 44' 17"	-3° 56' 44"	1° 00' 55"	16' 35.99"	305° 41' 11"	0.97885

26 April 2021

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	35° 59' 52"	0.76"	33° 40' 29"	13° 30' 58"	1.0061919	15' 53.72"	23° 26' 15"	2 m 09 s
1	36° 02' 18"	0.75"	33° 42' 51"	13° 31' 47"	1.0062029	15' 53.71"	23° 26' 15"	2 m 10 s
2	36° 04' 44"	0.75"	33° 45' 13"	13° 32' 35"	1.0062139	15' 53.70"	23° 26' 15"	2 m 10 s
3	36° 07' 10"	0.74"	33° 47' 34"	13° 33' 23"	1.0062249	15' 53.69"	23° 26' 15"	2 m 11 s
4	36° 09' 35"	0.74"	33° 49' 56"	13° 34' 11"	1.0062359	15' 53.68"	23° 26' 15"	2 m 11 s
5	36° 12' 01"	0.74"	33° 52' 18"	13° 34' 60"	1.0062468	15' 53.67"	23° 26' 15"	2 m 11 s
6	36° 14' 27"	0.73"	33° 54' 39"	13° 35' 48"	1.0062578	15' 53.66"	23° 26' 15"	2 m 12 s
7	36° 16' 53"	0.73"	33° 57' 01"	13° 36' 36"	1.0062688	15' 53.65"	23° 26' 15"	2 m 12 s
8	36° 19' 19"	0.73"	33° 59' 23"	13° 37' 24"	1.0062798	15' 53.64"	23° 26' 15"	2 m 13 s
9	36° 21' 45"	0.72"	34° 01' 45"	13° 38' 12"	1.0062908	15' 53.63"	23° 26' 15"	2 m 13 s
10	36° 24' 11"	0.72"	34° 04' 06"	13° 39' 00"	1.0063017	15' 53.62"	23° 26' 15"	2 m 13 s
11	36° 26' 37"	0.71"	34° 06' 28"	13° 39' 48"	1.0063127	15' 53.61"	23° 26' 15"	2 m 14 s
12	36° 29' 03"	0.71"	34° 08' 50"	13° 40' 36"	1.0063237	15' 53.60"	23° 26' 15"	2 m 14 s
13	36° 31' 29"	0.71"	34° 11' 12"	13° 41' 24"	1.0063347	15' 53.59"	23° 26' 14"	2 m 15 s
14	36° 33' 55"	0.70"	34° 13' 34"	13° 42' 12"	1.0063457	15' 53.58"	23° 26' 14"	2 m 15 s
15	36° 36' 20"	0.70"	34° 15' 55"	13° 43' 00"	1.0063566	15' 53.57"	23° 26' 14"	2 m 15 s
16	36° 38' 46"	0.69"	34° 18' 17"	13° 43' 48"	1.0063676	15' 53.56"	23° 26' 14"	2 m 16 s
17	36° 41' 12"	0.69"	34° 20' 39"	13° 44' 36"	1.0063786	15' 53.55"	23° 26' 14"	2 m 16 s
18	36° 43' 38"	0.69"	34° 23' 01"	13° 45' 24"	1.0063896	15' 53.54"	23° 26' 14"	2 m 16 s
19	36° 46' 04"	0.68"	34° 25' 23"	13° 46' 12"	1.0064005	15' 53.53"	23° 26' 14"	2 m 17 s
20	36° 48' 30"	0.68"	34° 27' 45"	13° 46' 60"	1.0064115	15' 53.52"	23° 26' 14"	2 m 17 s
21	36° 50' 56"	0.67"	34° 30' 07"	13° 47' 48"	1.0064225	15' 53.51"	23° 26' 14"	2 m 18 s
22	36° 53' 22"	0.67"	34° 32' 29"	13° 48' 35"	1.0064334	15' 53.50"	23° 26' 14"	2 m 18 s
23	36° 55' 48"	0.66"	34° 34' 51"	13° 49' 23"	1.0064444	15' 53.49"	23° 26' 14"	2 m 18 s
24	36° 58' 13"	0.66"	34° 37' 12"	13° 50' 11"	1.0064554	15' 53.47"	23° 26' 14"	2 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	199° 42' 54"	4° 03' 51"	199° 44' 17"	-3° 56' 44"	1° 00' 55"	16' 35.99"	305° 41' 11"	0.97885
1	200° 20' 31"	4° 01' 43"	200° 18' 22"	-4° 12' 47"	1° 00' 56"	16' 36.34"	305° 59' 58"	0.98027
2	200° 58' 10"	3° 59' 33"	200° 52' 30"	-4° 28' 49"	1° 00' 58"	16' 36.69"	306° 20' 11"	0.98165
3	201° 35' 50"	3° 57' 21"	201° 26' 41"	-4° 44' 50"	1° 00' 59"	16' 37.02"	306° 42' 03"	0.98297
4	202° 13' 32"	3° 55' 07"	202° 00' 54"	-5° 00' 49"	1° 01' 00"	16' 37.35"	307° 5' 44"	0.98424
5	202° 51' 15"	3° 52' 52"	202° 35' 11"	-5° 16' 48"	1° 01' 01"	16' 37.67"	307° 31' 31"	0.98546
6	203° 28' 59"	3° 50' 35"	203° 09' 31"	-5° 32' 46"	1° 01' 02"	16' 37.98"	307° 59' 41"	0.98664
7	204° 06' 45"	3° 48' 16"	203° 43' 54"	-5° 48' 42"	1° 01' 03"	16' 38.28"	308° 30' 34"	0.98776
8	204° 44' 31"	3° 45' 55"	204° 18' 21"	-6° 04' 36"	1° 01' 05"	16' 38.58"	309° 4' 35"	0.98883
9	205° 22' 19"	3° 43' 32"	204° 52' 50"	-6° 20' 29"	1° 01' 06"	16' 38.86"	309° 42' 11"	0.98985
10	206° 00' 08"	3° 41' 08"	205° 27' 23"	-6° 36' 21"	1° 01' 07"	16' 39.14"	310° 23' 58"	0.99082
11	206° 37' 58"	3° 38' 42"	206° 01' 60"	-6° 52' 10"	1° 01' 08"	16' 39.41"	311° 10' 37"	0.99174
12	207° 15' 49"	3° 36' 14"	206° 36' 39"	-7° 07' 58"	1° 01' 09"	16' 39.67"	312° 2' 59"	0.99261
13	207° 53' 42"	3° 33' 45"	207° 11' 23"	-7° 23' 44"	1° 01' 09"	16' 39.92"	313° 2' 07"	0.99342
14	208° 31' 35"	3° 31' 14"	207° 46' 10"	-7° 39' 27"	1° 01' 10"	16' 40.16"	314° 9' 17"	0.99419
15	209° 09' 29"	3° 28' 41"	208° 21' 00"	-7° 55' 08"	1° 01' 11"	16' 40.39"	315° 26' 07"	0.99490
16	209° 47' 24"	3° 26' 07"	208° 55' 54"	-8° 10' 46"	1° 01' 12"	16' 40.61"	316° 54' 39"	0.99556
17	210° 25' 19"	3° 23' 31"	209° 30' 52"	-8° 26' 22"	1° 01' 13"	16' 40.83"	318° 37' 30"	0.99617
18	211° 03' 16"	3° 20' 54"	210° 05' 53"	-8° 41' 56"	1° 01' 14"	16' 41.03"	320° 37' 60"	0.99672
19	211° 41' 13"	3° 18' 15"	210° 40' 59"	-8° 57' 26"	1° 01' 14"	16' 41.23"	323° 0' 31"	0.99723
20	212° 19' 11"	3° 15' 35"	211° 16' 08"	-9° 12' 54"	1° 01' 15"	16' 41.42"	325° 50' 46"	0.99768
21	212° 57' 10"	3° 12' 53"	211° 51' 21"	-9° 28' 18"	1° 01' 16"	16' 41.60"	329° 16' 09"	0.99807
22	213° 35' 09"	3° 10' 09"	212° 26' 38"	-9° 43' 40"	1° 01' 16"	16' 41.76"	333° 26' 18"	0.99842
23	214° 13' 09"	3° 07' 24"	213° 01' 58"	-9° 58' 58"	1° 01' 17"	16' 41.92"	338° 33' 14"	0.99871
24	214° 51' 09"	3° 04' 38"	213° 37' 23"	-10° 14' 13"	1° 01' 17"	16' 42.08"	344° 50' 60"	0.99894

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	36° 58' 13"	0.66"	34° 37' 12"	13° 50' 11"	1.0064554	15' 53.47"	23° 26' 14"	2 m 19 s
1	37° 00' 39"	0.65"	34° 39' 34"	13° 50' 59"	1.0064664	15' 53.46"	23° 26' 14"	2 m 19 s
2	37° 03' 05"	0.65"	34° 41' 56"	13° 51' 46"	1.0064773	15' 53.45"	23° 26' 14"	2 m 20 s
3	37° 05' 31"	0.65"	34° 44' 18"	13° 52' 34"	1.0064883	15' 53.44"	23° 26' 14"	2 m 20 s
4	37° 07' 57"	0.64"	34° 46' 40"	13° 53' 22"	1.0064993	15' 53.43"	23° 26' 14"	2 m 20 s
5	37° 10' 23"	0.64"	34° 49' 02"	13° 54' 09"	1.0065102	15' 53.42"	23° 26' 14"	2 m 21 s
6	37° 12' 49"	0.63"	34° 51' 24"	13° 54' 57"	1.0065212	15' 53.41"	23° 26' 14"	2 m 21 s
7	37° 15' 14"	0.63"	34° 53' 46"	13° 55' 44"	1.0065322	15' 53.40"	23° 26' 14"	2 m 22 s
8	37° 17' 40"	0.62"	34° 56' 08"	13° 56' 32"	1.0065431	15' 53.39"	23° 26' 14"	2 m 22 s
9	37° 20' 06"	0.62"	34° 58' 31"	13° 57' 20"	1.0065541	15' 53.38"	23° 26' 14"	2 m 22 s
10	37° 22' 32"	0.61"	35° 00' 53"	13° 58' 07"	1.0065650	15' 53.37"	23° 26' 14"	2 m 23 s
11	37° 24' 58"	0.61"	35° 03' 15"	13° 58' 55"	1.0065760	15' 53.36"	23° 26' 14"	2 m 23 s
12	37° 27' 24"	0.60"	35° 05' 37"	13° 59' 42"	1.0065870	15' 53.35"	23° 26' 14"	2 m 23 s
13	37° 29' 49"	0.60"	35° 07' 59"	14° 00' 29"	1.0065979	15' 53.34"	23° 26' 14"	2 m 24 s
14	37° 32' 15"	0.59"	35° 10' 21"	14° 01' 17"	1.0066089	15' 53.33"	23° 26' 14"	2 m 24 s
15	37° 34' 41"	0.59"	35° 12' 43"	14° 02' 04"	1.0066198	15' 53.32"	23° 26' 14"	2 m 25 s
16	37° 37' 07"	0.58"	35° 15' 05"	14° 02' 52"	1.0066308	15' 53.31"	23° 26' 14"	2 m 25 s
17	37° 39' 33"	0.58"	35° 17' 28"	14° 03' 39"	1.0066418	15' 53.30"	23° 26' 14"	2 m 25 s
18	37° 41' 58"	0.58"	35° 19' 50"	14° 04' 26"	1.0066527	15' 53.29"	23° 26' 14"	2 m 26 s
19	37° 44' 24"	0.57"	35° 22' 12"	14° 05' 14"	1.0066637	15' 53.28"	23° 26' 14"	2 m 26 s
20	37° 46' 50"	0.57"	35° 24' 34"	14° 06' 01"	1.0066746	15' 53.27"	23° 26' 14"	2 m 26 s
21	37° 49' 16"	0.56"	35° 26' 56"	14° 06' 48"	1.0066856	15' 53.26"	23° 26' 14"	2 m 27 s
22	37° 51' 42"	0.56"	35° 29' 19"	14° 07' 35"	1.0066965	15' 53.25"	23° 26' 14"	2 m 27 s
23	37° 54' 08"	0.55"	35° 31' 41"	14° 08' 23"	1.0067075	15' 53.24"	23° 26' 14"	2 m 28 s
24	37° 56' 33"	0.55"	35° 34' 03"	14° 09' 10"	1.0067184	15' 53.23"	23° 26' 14"	2 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	214° 51' 09"	3° 04' 38"	213° 37' 23"	-10° 14' 13"	1° 01' 17"	16' 42.08"	344° 50' 60"	0.99894
1	215° 29' 10"	3° 01' 50"	214° 12' 52"	-10° 29' 24"	1° 01' 18"	16' 42.22"	352° 33' 17"	0.99913
2	216° 07' 11"	2° 59' 01"	214° 48' 25"	-10° 44' 31"	1° 01' 18"	16' 42.35"	1° 47' 40"	0.99926
3	216° 45' 12"	2° 56' 11"	215° 24' 02"	-10° 59' 35"	1° 01' 19"	16' 42.47"	12° 25' 40"	0.99934
4	217° 23' 14"	2° 53' 19"	215° 59' 43"	-11° 14' 34"	1° 01' 19"	16' 42.58"	23° 54' 19"	0.99936
5	218° 01' 17"	2° 50' 26"	216° 35' 28"	-11° 29' 30"	1° 01' 20"	16' 42.69"	35° 20' 36"	0.99933
6	218° 39' 19"	2° 47' 31"	217° 11' 18"	-11° 44' 22"	1° 01' 20"	16' 42.78"	45° 52' 30"	0.99925
7	219° 17' 22"	2° 44' 35"	217° 47' 11"	-11° 59' 09"	1° 01' 20"	16' 42.86"	54° 58' 57"	0.99912
8	219° 55' 25"	2° 41' 38"	218° 23' 09"	-12° 13' 52"	1° 01' 21"	16' 42.94"	62° 33' 09"	0.99893
9	220° 33' 28"	2° 38' 40"	218° 59' 11"	-12° 28' 30"	1° 01' 21"	16' 43.01"	68° 43' 26"	0.99868
10	221° 11' 31"	2° 35' 41"	219° 35' 18"	-12° 43' 03"	1° 01' 21"	16' 43.06"	73° 43' 41"	0.99839
11	221° 49' 34"	2° 32' 40"	220° 11' 29"	-12° 57' 32"	1° 01' 21"	16' 43.11"	77° 47' 49"	0.99804
12	222° 27' 37"	2° 29' 38"	220° 47' 44"	-13° 11' 56"	1° 01' 21"	16' 43.14"	81° 7' 41"	0.99763
13	223° 05' 40"	2° 26' 36"	221° 24' 04"	-13° 26' 14"	1° 01' 21"	16' 43.17"	83° 52' 44"	0.99717
14	223° 43' 43"	2° 23' 32"	222° 00' 28"	-13° 40' 28"	1° 01' 21"	16' 43.19"	86° 10' 13"	0.99666
15	224° 21' 46"	2° 20' 26"	222° 36' 56"	-13° 54' 36"	1° 01' 21"	16' 43.20"	88° 5' 45"	0.99610
16	224° 59' 48"	2° 17' 20"	223° 13' 29"	-14° 08' 39"	1° 01' 21"	16' 43.20"	89° 43' 34"	0.99548
17	225° 37' 50"	2° 14' 13"	223° 50' 06"	-14° 22' 37"	1° 01' 21"	16' 43.19"	91° 6' 59"	0.99481
18	226° 15' 53"	2° 11' 05"	224° 26' 48"	-14° 36' 28"	1° 01' 21"	16' 43.17"	92° 18' 33"	0.99409
19	226° 53' 54"	2° 07' 56"	225° 03' 34"	-14° 50' 14"	1° 01' 21"	16' 43.14"	93° 20' 16"	0.99331
20	227° 31' 56"	2° 04' 46"	225° 40' 25"	-15° 03' 54"	1° 01' 21"	16' 43.10"	94° 13' 43"	0.99248
21	228° 09' 57"	2° 01' 35"	226° 17' 20"	-15° 17' 28"	1° 01' 21"	16' 43.05"	95° 0' 11"	0.99160
22	228° 47' 57"	1° 58' 23"	226° 54' 19"	-15° 30' 56"	1° 01' 21"	16' 42.99"	95° 40' 40"	0.99067
23	229° 25' 57"	1° 55' 11"	227° 31' 23"	-15° 44' 17"	1° 01' 20"	16' 42.92"	96° 16' 02"	0.98968
24	230° 03' 57"	1° 51' 57"	228° 08' 32"	-15° 57' 32"	1° 01' 20"	16' 42.85"	96° 46' 56"	0.98864

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	37° 56' 33"	0.55"	35° 34' 03"	14° 09' 10"	1.0067184	15' 53.23"	23° 26' 14"	2 m 28 s
1	37° 58' 59"	0.54"	35° 36' 25"	14° 09' 57"	1.0067294	15' 53.22"	23° 26' 14"	2 m 28 s
2	38° 01' 25"	0.54"	35° 38' 48"	14° 10' 44"	1.0067403	15' 53.21"	23° 26' 14"	2 m 29 s
3	38° 03' 51"	0.53"	35° 41' 10"	14° 11' 31"	1.0067513	15' 53.19"	23° 26' 14"	2 m 29 s
4	38° 06' 16"	0.52"	35° 43' 32"	14° 12' 18"	1.0067622	15' 53.18"	23° 26' 14"	2 m 29 s
5	38° 08' 42"	0.52"	35° 45' 55"	14° 13' 05"	1.0067732	15' 53.17"	23° 26' 14"	2 m 30 s
6	38° 11' 08"	0.51"	35° 48' 17"	14° 13' 52"	1.0067841	15' 53.16"	23° 26' 14"	2 m 30 s
7	38° 13' 34"	0.51"	35° 50' 39"	14° 14' 39"	1.0067951	15' 53.15"	23° 26' 14"	2 m 30 s
8	38° 15' 60"	0.50"	35° 53' 02"	14° 15' 26"	1.0068060	15' 53.14"	23° 26' 14"	2 m 31 s
9	38° 18' 25"	0.50"	35° 55' 24"	14° 16' 13"	1.0068169	15' 53.13"	23° 26' 14"	2 m 31 s
10	38° 20' 51"	0.49"	35° 57' 46"	14° 17' 00"	1.0068279	15' 53.12"	23° 26' 14"	2 m 31 s
11	38° 23' 17"	0.49"	36° 00' 09"	14° 17' 47"	1.0068388	15' 53.11"	23° 26' 14"	2 m 32 s
12	38° 25' 43"	0.48"	36° 02' 31"	14° 18' 34"	1.0068498	15' 53.10"	23° 26' 14"	2 m 32 s
13	38° 28' 08"	0.48"	36° 04' 54"	14° 19' 21"	1.0068607	15' 53.09"	23° 26' 14"	2 m 33 s
14	38° 30' 34"	0.47"	36° 07' 16"	14° 20' 08"	1.0068716	15' 53.08"	23° 26' 14"	2 m 33 s
15	38° 32' 60"	0.47"	36° 09' 39"	14° 20' 54"	1.0068826	15' 53.07"	23° 26' 14"	2 m 33 s
16	38° 35' 26"	0.46"	36° 12' 01"	14° 21' 41"	1.0068935	15' 53.06"	23° 26' 14"	2 m 34 s
17	38° 37' 51"	0.46"	36° 14' 24"	14° 22' 28"	1.0069044	15' 53.05"	23° 26' 14"	2 m 34 s
18	38° 40' 17"	0.45"	36° 16' 46"	14° 23' 15"	1.0069154	15' 53.04"	23° 26' 14"	2 m 34 s
19	38° 42' 43"	0.45"	36° 19' 09"	14° 24' 01"	1.0069263	15' 53.03"	23° 26' 14"	2 m 35 s
20	38° 45' 09"	0.44"	36° 21' 31"	14° 24' 48"	1.0069372	15' 53.02"	23° 26' 14"	2 m 35 s
21	38° 47' 34"	0.44"	36° 23' 54"	14° 25' 35"	1.0069482	15' 53.01"	23° 26' 14"	2 m 35 s
22	38° 49' 60"	0.43"	36° 26' 16"	14° 26' 21"	1.0069591	15' 53.00"	23° 26' 14"	2 m 36 s
23	38° 52' 26"	0.42"	36° 28' 39"	14° 27' 08"	1.0069700	15' 52.99"	23° 26' 14"	2 m 36 s
24	38° 54' 51"	0.42"	36° 31' 02"	14° 27' 55"	1.0069809	15' 52.98"	23° 26' 14"	2 m 36 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	230° 03' 57"	1° 51' 57"	228° 08' 32"	-15° 57' 32"	1° 01' 20"	16' 42.85"	96° 46' 56"	0.98864
1	230° 41' 56"	1° 48' 43"	228° 45' 45"	-16° 10' 41"	1° 01' 20"	16' 42.76"	97° 13' 58"	0.98755
2	231° 19' 54"	1° 45' 28"	229° 23' 02"	-16° 23' 43"	1° 01' 20"	16' 42.67"	97° 37' 35"	0.98640
3	231° 57' 49"	1° 42' 12"	230° 00' 22"	-16° 36' 37"	1° 01' 19"	16' 42.56"	97° 58' 10"	0.98521
4	232° 35' 46"	1° 38' 56"	230° 37' 48"	-16° 49' 25"	1° 01' 19"	16' 42.45"	98° 16' 07"	0.98396
5	233° 13' 43"	1° 35' 39"	231° 15' 19"	-17° 02' 07"	1° 01' 18"	16' 42.32"	98° 31' 40"	0.98267
6	233° 51' 38"	1° 32' 21"	231° 52' 54"	-17° 14' 41"	1° 01' 18"	16' 42.19"	98° 45' 05"	0.98132
7	234° 29' 33"	1° 29' 03"	232° 30' 33"	-17° 27' 08"	1° 01' 17"	16' 42.05"	98° 56' 34"	0.97992
8	235° 07' 26"	1° 25' 43"	233° 08' 17"	-17° 39' 28"	1° 01' 17"	16' 41.90"	99° 6' 19"	0.97846
9	235° 45' 19"	1° 22' 24"	233° 46' 06"	-17° 51' 40"	1° 01' 16"	16' 41.74"	99° 14' 28"	0.97696
10	236° 23' 11"	1° 19' 04"	234° 23' 58"	-18° 03' 45"	1° 01' 16"	16' 41.57"	99° 21' 11"	0.97541
11	237° 01' 02"	1° 15' 43"	235° 01' 55"	-18° 15' 42"	1° 01' 15"	16' 41.39"	99° 26' 34"	0.97381
12	237° 38' 52"	1° 12' 22"	235° 39' 57"	-18° 27' 31"	1° 01' 14"	16' 41.21"	99° 30' 44"	0.97216
13	238° 16' 41"	1° 09' 00"	236° 18' 02"	-18° 39' 12"	1° 01' 13"	16' 41.01"	99° 33' 47"	0.97045
14	238° 54' 29"	1° 05' 38"	236° 56' 12"	-18° 50' 46"	1° 01' 13"	16' 40.81"	99° 35' 47"	0.96870
15	239° 32' 16"	1° 02' 16"	237° 34' 26"	-19° 02' 11"	1° 01' 12"	16' 40.59"	99° 36' 50"	0.96690
16	240° 10' 01"	0° 58' 53"	238° 12' 44"	-19° 13' 28"	1° 01' 11"	16' 40.37"	99° 36' 60"	0.96506
17	240° 47' 46"	0° 55' 30"	238° 51' 06"	-19° 24' 37"	1° 01' 10"	16' 40.14"	99° 36' 19"	0.96316
18	241° 25' 29"	0° 52' 06"	239° 29' 32"	-19° 35' 38"	1° 01' 09"	16' 39.90"	99° 34' 52"	0.96122
19	242° 03' 10"	0° 48' 43"	240° 08' 02"	-19° 46' 30"	1° 01' 09"	16' 39.66"	99° 32' 41"	0.95922
20	242° 40' 51"	0° 45' 19"	240° 46' 36"	-19° 57' 13"	1° 01' 08"	16' 39.40"	99° 29' 49"	0.95718
21	243° 18' 30"	0° 41' 54"	241° 25' 14"	-20° 07' 48"	1° 01' 07"	16' 39.14"	99° 26' 19"	0.95510
22	243° 56' 08"	0° 38' 30"	242° 03' 56"	-20° 18' 14"	1° 01' 06"	16' 38.87"	99° 22' 12"	0.95297
23	244° 33' 44"	0° 35' 05"	242° 42' 41"	-20° 28' 31"	1° 01' 05"	16' 38.59"	99° 17' 31"	0.95079
24	245° 11' 19"	0° 31' 41"	243° 21' 30"	-20° 38' 39"	1° 01' 04"	16' 38.30"	99° 12' 18"	0.94856

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	38° 54' 51"	0.42"	36° 31' 02"	14° 27' 55"	1.0069809	15' 52.98"	23° 26' 14"	2 m 36 s
1	38° 57' 17"	0.41"	36° 33' 24"	14° 28' 41"	1.0069919	15' 52.97"	23° 26' 14"	2 m 37 s
2	38° 59' 43"	0.41"	36° 35' 47"	14° 29' 28"	1.0070028	15' 52.96"	23° 26' 14"	2 m 37 s
3	39° 02' 09"	0.40"	36° 38' 09"	14° 30' 14"	1.0070137	15' 52.95"	23° 26' 14"	2 m 37 s
4	39° 04' 34"	0.40"	36° 40' 32"	14° 31' 01"	1.0070246	15' 52.94"	23° 26' 14"	2 m 38 s
5	39° 06' 60"	0.39"	36° 42' 55"	14° 31' 47"	1.0070356	15' 52.93"	23° 26' 14"	2 m 38 s
6	39° 09' 26"	0.39"	36° 45' 17"	14° 32' 34"	1.0070465	15' 52.92"	23° 26' 14"	2 m 38 s
7	39° 11' 51"	0.38"	36° 47' 40"	14° 33' 20"	1.0070574	15' 52.90"	23° 26' 14"	2 m 39 s
8	39° 14' 17"	0.38"	36° 50' 03"	14° 34' 06"	1.0070683	15' 52.89"	23° 26' 14"	2 m 39 s
9	39° 16' 43"	0.37"	36° 52' 25"	14° 34' 53"	1.0070792	15' 52.88"	23° 26' 14"	2 m 39 s
10	39° 19' 08"	0.36"	36° 54' 48"	14° 35' 39"	1.0070901	15' 52.87"	23° 26' 14"	2 m 40 s
11	39° 21' 34"	0.36"	36° 57' 11"	14° 36' 25"	1.0071010	15' 52.86"	23° 26' 14"	2 m 40 s
12	39° 23' 60"	0.35"	36° 59' 34"	14° 37' 12"	1.0071120	15' 52.85"	23° 26' 14"	2 m 40 s
13	39° 26' 26"	0.35"	37° 01' 56"	14° 37' 58"	1.0071229	15' 52.84"	23° 26' 14"	2 m 41 s
14	39° 28' 51"	0.34"	37° 04' 19"	14° 38' 44"	1.0071338	15' 52.83"	23° 26' 14"	2 m 41 s
15	39° 31' 17"	0.34"	37° 06' 42"	14° 39' 30"	1.0071447	15' 52.82"	23° 26' 14"	2 m 41 s
16	39° 33' 43"	0.33"	37° 09' 05"	14° 40' 17"	1.0071556	15' 52.81"	23° 26' 14"	2 m 42 s
17	39° 36' 08"	0.33"	37° 11' 28"	14° 41' 03"	1.0071665	15' 52.80"	23° 26' 14"	2 m 42 s
18	39° 38' 34"	0.32"	37° 13' 51"	14° 41' 49"	1.0071774	15' 52.79"	23° 26' 14"	2 m 42 s
19	39° 40' 60"	0.32"	37° 16' 13"	14° 42' 35"	1.0071883	15' 52.78"	23° 26' 14"	2 m 43 s
20	39° 43' 25"	0.31"	37° 18' 36"	14° 43' 21"	1.0071992	15' 52.77"	23° 26' 14"	2 m 43 s
21	39° 45' 51"	0.30"	37° 20' 59"	14° 44' 07"	1.0072101	15' 52.76"	23° 26' 14"	2 m 43 s
22	39° 48' 17"	0.30"	37° 23' 22"	14° 44' 53"	1.0072210	15' 52.75"	23° 26' 14"	2 m 44 s
23	39° 50' 42"	0.29"	37° 25' 45"	14° 45' 39"	1.0072319	15' 52.74"	23° 26' 14"	2 m 44 s
24	39° 53' 08"	0.29"	37° 28' 08"	14° 46' 25"	1.0072428	15' 52.73"	23° 26' 14"	2 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	245° 11' 19"	0° 31' 41"	243° 21' 30"	-20° 38' 39"	1° 01' 04"	16' 38.30"	99° 12' 18"	0.94856
1	245° 48' 52"	0° 28' 16"	244° 00' 23"	-20° 48' 38"	1° 01' 02"	16' 38.00"	99° 6' 34"	0.94629
2	246° 26' 24"	0° 24' 51"	244° 39' 20"	-20° 58' 28"	1° 01' 01"	16' 37.70"	99° 0' 21"	0.94398
3	247° 03' 55"	0° 21' 26"	245° 18' 20"	-21° 08' 08"	1° 01' 00"	16' 37.38"	98° 53' 40"	0.94161
4	247° 41' 23"	0° 18' 01"	245° 57' 23"	-21° 17' 39"	1° 00' 59"	16' 37.06"	98° 46' 33"	0.93921
5	248° 18' 51"	0° 14' 36"	246° 36' 30"	-21° 27' 01"	1° 00' 58"	16' 36.74"	98° 39' 01"	0.93676
6	248° 56' 16"	0° 11' 11"	247° 15' 40"	-21° 36' 14"	1° 00' 57"	16' 36.40"	98° 31' 05"	0.93427
7	249° 33' 40"	0° 07' 46"	247° 54' 53"	-21° 45' 16"	1° 00' 55"	16' 36.06"	98° 22' 47"	0.93173
8	250° 11' 02"	0° 04' 21"	248° 34' 09"	-21° 54' 09"	1° 00' 54"	16' 35.71"	98° 14' 06"	0.92915
9	250° 48' 22"	0° 00' 57"	249° 13' 29"	-22° 02' 53"	1° 00' 53"	16' 35.35"	98° 5' 05"	0.92653
10	251° 25' 41"	0° -2' 28"	249° 52' 51"	-22° 11' 27"	1° 00' 51"	16' 34.99"	97° 55' 44"	0.92387
11	252° 02' 58"	0° -5' 52"	250° 32' 16"	-22° 19' 50"	1° 00' 50"	16' 34.61"	97° 46' 04"	0.92116
12	252° 40' 13"	0° -9' 16"	251° 11' 44"	-22° 28' 04"	1° 00' 49"	16' 34.24"	97° 36' 06"	0.91842
13	253° 17' 26"	0° -12' 40"	251° 51' 15"	-22° 36' 08"	1° 00' 47"	16' 33.85"	97° 25' 50"	0.91563
14	253° 54' 37"	0° -16' 04"	252° 30' 48"	-22° 44' 02"	1° 00' 46"	16' 33.46"	97° 15' 18"	0.91281
15	254° 31' 47"	0° -19' 28"	253° 10' 24"	-22° 51' 45"	1° 00' 44"	16' 33.06"	97° 4' 29"	0.90994
16	255° 08' 54"	0° -22' 51"	253° 50' 02"	-22° 59' 19"	1° 00' 43"	16' 32.65"	96° 53' 25"	0.90703
17	255° 45' 59"	0° -26' 14"	254° 29' 42"	-23° 06' 42"	1° 00' 41"	16' 32.24"	96° 42' 06"	0.90409
18	256° 23' 03"	0° -29' 36"	255° 09' 25"	-23° 13' 55"	1° 00' 40"	16' 31.82"	96° 30' 33"	0.90110
19	257° 00' 04"	0° -32' 58"	255° 49' 09"	-23° 20' 57"	1° 00' 38"	16' 31.39"	96° 18' 46"	0.89808
20	257° 37' 04"	0° -36' 20"	256° 28' 56"	-23° 27' 49"	1° 00' 37"	16' 30.96"	96° 6' 46"	0.89503
21	258° 14' 01"	0° -39' 41"	257° 08' 44"	-23° 34' 31"	1° 00' 35"	16' 30.52"	95° 54' 33"	0.89193
22	258° 50' 57"	0° -43' 02"	257° 48' 34"	-23° 41' 02"	1° 00' 33"	16' 30.08"	95° 42' 08"	0.88880
23	259° 27' 50"	0° -46' 22"	258° 28' 25"	-23° 47' 22"	1° 00' 32"	16' 29.63"	95° 29' 32"	0.88563
24	260° 04' 41"	0° -49' 42"	259° 08' 18"	-23° 53' 32"	1° 00' 30"	16' 29.17"	95° 16' 44"	0.88243

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	39° 53' 08"	0.29"	37° 28' 08"	14° 46' 25"	1.0072428	15' 52.73"	23° 26' 14"	2 m 44 s
1	39° 55' 34"	0.28"	37° 30' 31"	14° 47' 11"	1.0072536	15' 52.72"	23° 26' 14"	2 m 45 s
2	39° 57' 59"	0.28"	37° 32' 54"	14° 47' 57"	1.0072645	15' 52.71"	23° 26' 14"	2 m 45 s
3	40° 00' 25"	0.27"	37° 35' 17"	14° 48' 43"	1.0072754	15' 52.70"	23° 26' 14"	2 m 45 s
4	40° 02' 50"	0.27"	37° 37' 40"	14° 49' 29"	1.0072863	15' 52.69"	23° 26' 14"	2 m 46 s
5	40° 05' 16"	0.26"	37° 40' 03"	14° 50' 15"	1.0072972	15' 52.68"	23° 26' 14"	2 m 46 s
6	40° 07' 42"	0.25"	37° 42' 26"	14° 51' 01"	1.0073081	15' 52.67"	23° 26' 14"	2 m 46 s
7	40° 10' 07"	0.25"	37° 44' 49"	14° 51' 46"	1.0073189	15' 52.66"	23° 26' 14"	2 m 47 s
8	40° 12' 33"	0.24"	37° 47' 12"	14° 52' 32"	1.0073298	15' 52.65"	23° 26' 14"	2 m 47 s
9	40° 14' 59"	0.24"	37° 49' 35"	14° 53' 18"	1.0073407	15' 52.64"	23° 26' 14"	2 m 47 s
10	40° 17' 24"	0.23"	37° 51' 58"	14° 54' 04"	1.0073516	15' 52.63"	23° 26' 14"	2 m 48 s
11	40° 19' 50"	0.23"	37° 54' 21"	14° 54' 49"	1.0073624	15' 52.62"	23° 26' 14"	2 m 48 s
12	40° 22' 16"	0.22"	37° 56' 44"	14° 55' 35"	1.0073733	15' 52.61"	23° 26' 14"	2 m 48 s
13	40° 24' 41"	0.22"	37° 59' 07"	14° 56' 21"	1.0073842	15' 52.60"	23° 26' 14"	2 m 49 s
14	40° 27' 07"	0.21"	38° 01' 30"	14° 57' 06"	1.0073950	15' 52.59"	23° 26' 14"	2 m 49 s
15	40° 29' 32"	0.21"	38° 03' 54"	14° 57' 52"	1.0074059	15' 52.58"	23° 26' 14"	2 m 49 s
16	40° 31' 58"	0.20"	38° 06' 17"	14° 58' 38"	1.0074168	15' 52.57"	23° 26' 14"	2 m 49 s
17	40° 34' 24"	0.20"	38° 08' 40"	14° 59' 23"	1.0074276	15' 52.55"	23° 26' 14"	2 m 50 s
18	40° 36' 49"	0.19"	38° 11' 03"	15° 00' 09"	1.0074385	15' 52.54"	23° 26' 14"	2 m 50 s
19	40° 39' 15"	0.18"	38° 13' 26"	15° 00' 54"	1.0074493	15' 52.53"	23° 26' 14"	2 m 50 s
20	40° 41' 40"	0.18"	38° 15' 50"	15° 01' 40"	1.0074602	15' 52.52"	23° 26' 14"	2 m 51 s
21	40° 44' 06"	0.17"	38° 18' 13"	15° 02' 25"	1.0074710	15' 52.51"	23° 26' 14"	2 m 51 s
22	40° 46' 32"	0.17"	38° 20' 36"	15° 03' 11"	1.0074819	15' 52.50"	23° 26' 14"	2 m 51 s
23	40° 48' 57"	0.16"	38° 22' 59"	15° 03' 56"	1.0074927	15' 52.49"	23° 26' 14"	2 m 52 s
24	40° 51' 23"	0.16"	38° 25' 23"	15° 04' 41"	1.0075036	15' 52.48"	23° 26' 14"	2 m 52 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	260° 04' 41"	0°-49' 42"	259° 08' 18"	-23° 53' 32"	1° 00' 30"	16' 29.17"	95° 16' 44"	0.88243
1	260° 41' 30"	0°-53' 01"	259° 48' 13"	-23° 59' 32"	1° 00' 28"	16' 28.71"	95° 3' 46"	0.87919
2	261° 18' 17"	0°-56' 20"	260° 28' 09"	-24° 05' 20"	1° 00' 27"	16' 28.24"	94° 50' 37"	0.87591
3	261° 55' 01"	0°-59' 38"	261° 08' 05"	-24° 10' 58"	1° 00' 25"	16' 27.77"	94° 37' 18"	0.87261
4	262° 31' 44"	-1° 02' 55"	261° 48' 03"	-24° 16' 25"	1° 00' 23"	16' 27.29"	94° 23' 50"	0.86926
5	263° 08' 24"	-1° 06' 12"	262° 28' 02"	-24° 21' 42"	1° 00' 21"	16' 26.80"	94° 10' 13"	0.86589
6	263° 45' 02"	-1° 09' 29"	263° 08' 01"	-24° 26' 47"	1° 00' 20"	16' 26.31"	93° 56' 27"	0.86248
7	264° 21' 37"	-1° 12' 44"	263° 48' 01"	-24° 31' 42"	1° 00' 18"	16' 25.82"	93° 42' 32"	0.85904
8	264° 58' 11"	-1° 15' 59"	264° 28' 02"	-24° 36' 26"	1° 00' 16"	16' 25.32"	93° 28' 30"	0.85557
9	265° 34' 42"	-1° 19' 13"	265° 08' 02"	-24° 40' 59"	1° 00' 14"	16' 24.82"	93° 14' 20"	0.85207
10	266° 11' 11"	-1° 22' 27"	265° 48' 03"	-24° 45' 21"	1° 00' 12"	16' 24.31"	93° 0' 02"	0.84854
11	266° 47' 37"	-1° 25' 39"	266° 28' 04"	-24° 49' 32"	1° 00' 10"	16' 23.79"	92° 45' 38"	0.84497
12	267° 24' 01"	-1° 28' 51"	267° 08' 06"	-24° 53' 32"	1° 00' 08"	16' 23.27"	92° 31' 07"	0.84138
13	268° 00' 23"	-1° 32' 02"	267° 48' 06"	-24° 57' 22"	1° 00' 06"	16' 22.75"	92° 16' 30"	0.83776
14	268° 36' 42"	-1° 35' 13"	268° 28' 07"	-25° 01' 00"	1° 00' 05"	16' 22.22"	92° 1' 46"	0.83411
15	269° 12' 59"	-1° 38' 22"	269° 08' 07"	-25° 04' 28"	1° 00' 03"	16' 21.69"	91° 46' 57"	0.83043
16	269° 49' 14"	-1° 41' 31"	269° 48' 07"	-25° 07' 44"	1° 00' 01"	16' 21.16"	91° 32' 03"	0.82672
17	270° 25' 26"	-1° 44' 38"	270° 28' 06"	-25° 10' 50"	0° 59' 59"	16' 20.62"	91° 17' 03"	0.82299
18	271° 01' 36"	-1° 47' 45"	271° 08' 04"	-25° 13' 45"	0° 59' 57"	16' 20.07"	91° 1' 58"	0.81923
19	271° 37' 43"	-1° 50' 51"	271° 48' 01"	-25° 16' 28"	0° 59' 55"	16' 19.53"	90° 46' 49"	0.81544
20	272° 13' 48"	-1° 53' 56"	272° 27' 57"	-25° 19' 01"	0° 59' 53"	16' 18.97"	90° 31' 36"	0.81163
21	272° 49' 50"	-1° 56' 60"	273° 07' 51"	-25° 21' 23"	0° 59' 51"	16' 18.42"	90° 16' 19"	0.80780
22	273° 25' 50"	-2° 00' 03"	273° 47' 44"	-25° 23' 34"	0° 59' 49"	16' 17.86"	90° 0' 58"	0.80393
23	274° 01' 48"	-2° 03' 05"	274° 27' 36"	-25° 25' 34"	0° 59' 46"	16' 17.30"	89° 45' 34"	0.80005
24	274° 37' 42"	-2° 06' 05"	275° 07' 26"	-25° 27' 24"	0° 59' 44"	16' 16.73"	89° 30' 06"	0.79614

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	40° 51' 23"	0.16"	38° 25' 23"	15° 04' 41"	1.0075036	15' 52.48"	23° 26' 14"	2 m 52 s
1	40° 53' 48"	0.15"	38° 27' 46"	15° 05' 27"	1.0075144	15' 52.47"	23° 26' 14"	2 m 52 s
2	40° 56' 14"	0.15"	38° 30' 09"	15° 06' 12"	1.0075253	15' 52.46"	23° 26' 14"	2 m 53 s
3	40° 58' 40"	0.14"	38° 32' 32"	15° 06' 57"	1.0075361	15' 52.45"	23° 26' 14"	2 m 53 s
4	41° 01' 05"	0.14"	38° 34' 56"	15° 07' 43"	1.0075469	15' 52.44"	23° 26' 14"	2 m 53 s
5	41° 03' 31"	0.13"	38° 37' 19"	15° 08' 28"	1.0075578	15' 52.43"	23° 26' 14"	2 m 53 s
6	41° 05' 56"	0.13"	38° 39' 42"	15° 09' 13"	1.0075686	15' 52.42"	23° 26' 14"	2 m 54 s
7	41° 08' 22"	0.12"	38° 42' 06"	15° 09' 58"	1.0075794	15' 52.41"	23° 26' 14"	2 m 54 s
8	41° 10' 47"	0.12"	38° 44' 29"	15° 10' 43"	1.0075902	15' 52.40"	23° 26' 14"	2 m 54 s
9	41° 13' 13"	0.11"	38° 46' 53"	15° 11' 29"	1.0076011	15' 52.39"	23° 26' 14"	2 m 55 s
10	41° 15' 39"	0.11"	38° 49' 16"	15° 12' 14"	1.0076119	15' 52.38"	23° 26' 14"	2 m 55 s
11	41° 18' 04"	0.10"	38° 51' 39"	15° 12' 59"	1.0076227	15' 52.37"	23° 26' 14"	2 m 55 s
12	41° 20' 30"	0.10"	38° 54' 03"	15° 13' 44"	1.0076335	15' 52.36"	23° 26' 14"	2 m 55 s
13	41° 22' 55"	0.09"	38° 56' 26"	15° 14' 29"	1.0076443	15' 52.35"	23° 26' 14"	2 m 56 s
14	41° 25' 21"	0.09"	38° 58' 50"	15° 15' 14"	1.0076551	15' 52.34"	23° 26' 14"	2 m 56 s
15	41° 27' 46"	0.08"	39° 01' 13"	15° 15' 59"	1.0076659	15' 52.33"	23° 26' 14"	2 m 56 s
16	41° 30' 12"	0.08"	39° 03' 37"	15° 16' 44"	1.0076767	15' 52.32"	23° 26' 14"	2 m 57 s
17	41° 32' 37"	0.07"	39° 06' 00"	15° 17' 29"	1.0076875	15' 52.31"	23° 26' 14"	2 m 57 s
18	41° 35' 03"	0.07"	39° 08' 24"	15° 18' 14"	1.0076983	15' 52.30"	23° 26' 14"	2 m 57 s
19	41° 37' 28"	0.06"	39° 10' 47"	15° 18' 59"	1.0077091	15' 52.29"	23° 26' 14"	2 m 57 s
20	41° 39' 54"	0.06"	39° 13' 11"	15° 19' 43"	1.0077199	15' 52.28"	23° 26' 14"	2 m 58 s
21	41° 42' 20"	0.05"	39° 15' 35"	15° 20' 28"	1.0077307	15' 52.27"	23° 26' 14"	2 m 58 s
22	41° 44' 45"	0.05"	39° 17' 58"	15° 21' 13"	1.0077415	15' 52.26"	23° 26' 14"	2 m 58 s
23	41° 47' 11"	0.04"	39° 20' 22"	15° 21' 58"	1.0077523	15' 52.25"	23° 26' 14"	2 m 59 s
24	41° 49' 36"	0.04"	39° 22' 45"	15° 22' 43"	1.0077631	15' 52.24"	23° 26' 14"	2 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	274° 37' 42"	-2° 06' 05"	275° 07' 26"	-25° 27' 24"	0° 59' 44"	16' 16.73"	89° 30' 06"	0.79614
1	275° 13' 35"	-2° 09' 05"	275° 47' 15"	-25° 29' 02"	0° 59' 42"	16' 16.17"	89° 14' 36"	0.79221
2	275° 49' 25"	-2° 12' 04"	276° 27' 01"	-25° 30' 29"	0° 59' 40"	16' 15.59"	88° 59' 03"	0.78825
3	276° 25' 12"	-2° 15' 02"	277° 06' 45"	-25° 31' 46"	0° 59' 38"	16' 15.02"	88° 43' 27"	0.78428
4	277° 00' 57"	-2° 17' 59"	277° 46' 27"	-25° 32' 52"	0° 59' 36"	16' 14.44"	88° 27' 49"	0.78028
5	277° 36' 39"	-2° 20' 54"	278° 26' 07"	-25° 33' 47"	0° 59' 34"	16' 13.86"	88° 12' 10"	0.77626
6	278° 12' 19"	-2° 23' 49"	279° 05' 45"	-25° 34' 32"	0° 59' 32"	16' 13.28"	87° 56' 28"	0.77222
7	278° 47' 56"	-2° 26' 42"	279° 45' 19"	-25° 35' 05"	0° 59' 30"	16' 12.70"	87° 40' 45"	0.76816
8	279° 23' 31"	-2° 29' 34"	280° 24' 51"	-25° 35' 28"	0° 59' 27"	16' 12.11"	87° 25' 01"	0.76408
9	279° 59' 03"	-2° 32' 25"	281° 04' 21"	-25° 35' 41"	0° 59' 25"	16' 11.52"	87° 9' 16"	0.75998
10	280° 34' 32"	-2° 35' 15"	281° 43' 47"	-25° 35' 43"	0° 59' 23"	16' 10.93"	86° 53' 30"	0.75586
11	281° 09' 59"	-2° 38' 03"	282° 23' 10"	-25° 35' 34"	0° 59' 21"	16' 10.33"	86° 37' 44"	0.75173
12	281° 45' 23"	-2° 40' 51"	283° 02' 30"	-25° 35' 15"	0° 59' 19"	16' 09.74"	86° 21' 57"	0.74757
13	282° 20' 45"	-2° 43' 37"	283° 41' 47"	-25° 34' 45"	0° 59' 16"	16' 09.14"	86° 6' 10"	0.74340
14	282° 56' 04"	-2° 46' 22"	284° 21' 00"	-25° 34' 05"	0° 59' 14"	16' 08.54"	85° 50' 23"	0.73922
15	283° 31' 21"	-2° 49' 05"	285° 00' 10"	-25° 33' 14"	0° 59' 12"	16' 07.94"	85° 34' 36"	0.73501
16	284° 06' 35"	-2° 51' 48"	285° 39' 16"	-25° 32' 14"	0° 59' 10"	16' 07.33"	85° 18' 50"	0.73079
17	284° 41' 46"	-2° 54' 29"	286° 18' 18"	-25° 31' 03"	0° 59' 08"	16' 06.73"	85° 3' 04"	0.72656
18	285° 16' 55"	-2° 57' 09"	286° 57' 16"	-25° 29' 41"	0° 59' 05"	16' 06.12"	84° 47' 20"	0.72231
19	285° 52' 01"	-2° 59' 47"	287° 36' 11"	-25° 28' 10"	0° 59' 03"	16' 05.52"	84° 31' 36"	0.71805
20	286° 27' 04"	-3° 02' 24"	288° 15' 01"	-25° 26' 28"	0° 59' 01"	16' 04.91"	84° 15' 53"	0.71377
21	287° 02' 05"	-3° 05' 00"	288° 53' 47"	-25° 24' 37"	0° 58' 59"	16' 04.30"	84° 0' 12"	0.70948
22	287° 37' 03"	-3° 07' 35"	289° 32' 29"	-25° 22' 35"	0° 58' 56"	16' 03.69"	83° 44' 33"	0.70518
23	288° 11' 59"	-3° 10' 08"	290° 11' 06"	-25° 20' 24"	0° 58' 54"	16' 03.07"	83° 28' 55"	0.70086
24	288° 46' 52"	-3° 12' 39"	290° 49' 39"	-25° 18' 02"	0° 58' 52"	16' 02.46"	83° 13' 19"	0.69654

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	41° 49' 36"	0.04"	39° 22' 45"	15° 22' 43"	1.0077631	15' 52.24"	23° 26' 14"	2 m 59 s
1	41° 52' 02"	0.03"	39° 25' 09"	15° 23' 27"	1.0077739	15' 52.23"	23° 26' 14"	2 m 59 s
2	41° 54' 27"	0.03"	39° 27' 33"	15° 24' 12"	1.0077846	15' 52.22"	23° 26' 14"	2 m 59 s
3	41° 56' 53"	0.02"	39° 29' 56"	15° 24' 57"	1.0077954	15' 52.21"	23° 26' 14"	2 m 60 s
4	41° 59' 18"	0.02"	39° 32' 20"	15° 25' 41"	1.0078062	15' 52.20"	23° 26' 14"	2 m 60 s
5	42° 01' 44"	0.01"	39° 34' 44"	15° 26' 26"	1.0078169	15' 52.19"	23° 26' 14"	3 m 00 s
6	42° 04' 09"	0.01"	39° 37' 07"	15° 27' 11"	1.0078277	15' 52.18"	23° 26' 14"	3 m 01 s
7	42° 06' 35"	0.00"	39° 39' 31"	15° 27' 55"	1.0078385	15' 52.17"	23° 26' 14"	3 m 01 s
8	42° 09' 00"	-0.00"	39° 41' 55"	15° 28' 40"	1.0078492	15' 52.16"	23° 26' 14"	3 m 01 s
9	42° 11' 26"	-0.01"	39° 44' 19"	15° 29' 24"	1.0078600	15' 52.15"	23° 26' 14"	3 m 01 s
10	42° 13' 51"	-0.01"	39° 46' 42"	15° 30' 09"	1.0078707	15' 52.14"	23° 26' 14"	3 m 02 s
11	42° 16' 17"	-0.01"	39° 49' 06"	15° 30' 53"	1.0078815	15' 52.13"	23° 26' 14"	3 m 02 s
12	42° 18' 42"	-0.02"	39° 51' 30"	15° 31' 38"	1.0078922	15' 52.12"	23° 26' 14"	3 m 02 s
13	42° 21' 08"	-0.02"	39° 53' 54"	15° 32' 22"	1.0079029	15' 52.11"	23° 26' 14"	3 m 02 s
14	42° 23' 33"	-0.03"	39° 56' 18"	15° 33' 06"	1.0079137	15' 52.10"	23° 26' 14"	3 m 03 s
15	42° 25' 59"	-0.03"	39° 58' 41"	15° 33' 51"	1.0079244	15' 52.09"	23° 26' 14"	3 m 03 s
16	42° 28' 24"	-0.04"	40° 01' 05"	15° 34' 35"	1.0079351	15' 52.08"	23° 26' 14"	3 m 03 s
17	42° 30' 50"	-0.04"	40° 03' 29"	15° 35' 19"	1.0079459	15' 52.07"	23° 26' 14"	3 m 03 s
18	42° 33' 15"	-0.04"	40° 05' 53"	15° 36' 04"	1.0079566	15' 52.05"	23° 26' 14"	3 m 04 s
19	42° 35' 41"	-0.05"	40° 08' 17"	15° 36' 48"	1.0079673	15' 52.04"	23° 26' 14"	3 m 04 s
20	42° 38' 06"	-0.05"	40° 10' 41"	15° 37' 32"	1.0079780	15' 52.03"	23° 26' 14"	3 m 04 s
21	42° 40' 32"	-0.06"	40° 13' 05"	15° 38' 16"	1.0079887	15' 52.02"	23° 26' 14"	3 m 04 s
22	42° 42' 57"	-0.06"	40° 15' 29"	15° 39' 00"	1.0079995	15' 52.01"	23° 26' 14"	3 m 05 s
23	42° 45' 23"	-0.07"	40° 17' 53"	15° 39' 45"	1.0080102	15' 52.00"	23° 26' 14"	3 m 05 s
24	42° 47' 48"	-0.07"	40° 20' 17"	15° 40' 29"	1.0080209	15' 51.99"	23° 26' 14"	3 m 05 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	288° 46' 52"	-3° 12' 39"	290° 49' 39"	-25° 18' 02"	0° 58' 52"	16' 02.46"	83° 13' 19"	0.69654
1	289° 21' 43"	-3° 15' 10"	291° 28' 07"	-25° 15' 31"	0° 58' 50"	16' 01.85"	82° 57' 45"	0.69220
2	289° 56' 31"	-3° 17' 39"	292° 06' 30"	-25° 12' 50"	0° 58' 47"	16' 01.23"	82° 42' 14"	0.68785
3	290° 31' 16"	-3° 20' 06"	292° 44' 49"	-25° 09' 59"	0° 58' 45"	16' 00.62"	82° 26' 45"	0.68349
4	291° 05' 59"	-3° 22' 32"	293° 23' 03"	-25° 06' 59"	0° 58' 43"	16' 00.00"	82° 11' 18"	0.67912
5	291° 40' 39"	-3° 24' 57"	294° 01' 12"	-25° 03' 50"	0° 58' 41"	15' 59.39"	81° 55' 55"	0.67474
6	292° 15' 16"	-3° 27' 21"	294° 39' 15"	-25° 00' 30"	0° 58' 38"	15' 58.77"	81° 40' 34"	0.67035
7	292° 49' 51"	-3° 29' 42"	295° 17' 14"	-24° 57' 02"	0° 58' 36"	15' 58.15"	81° 25' 16"	0.66595
8	293° 24' 23"	-3° 32' 03"	295° 55' 07"	-24° 53' 24"	0° 58' 34"	15' 57.54"	81° 10' 01"	0.66154
9	293° 58' 53"	-3° 34' 22"	296° 32' 55"	-24° 49' 37"	0° 58' 32"	15' 56.92"	80° 54' 50"	0.65713
10	294° 33' 20"	-3° 36' 39"	297° 10' 38"	-24° 45' 41"	0° 58' 29"	15' 56.30"	80° 39' 42"	0.65271
11	295° 07' 45"	-3° 38' 55"	297° 48' 15"	-24° 41' 35"	0° 58' 27"	15' 55.69"	80° 24' 38"	0.64828
12	295° 42' 07"	-3° 41' 10"	298° 25' 47"	-24° 37' 21"	0° 58' 25"	15' 55.07"	80° 9' 37"	0.64384
13	296° 16' 26"	-3° 43' 23"	299° 03' 13"	-24° 32' 57"	0° 58' 23"	15' 54.46"	79° 54' 40"	0.63940
14	296° 50' 43"	-3° 45' 34"	299° 40' 33"	-24° 28' 25"	0° 58' 20"	15' 53.84"	79° 39' 47"	0.63496
15	297° 24' 57"	-3° 47' 44"	300° 17' 48"	-24° 23' 44"	0° 58' 18"	15' 53.22"	79° 24' 59"	0.63050
16	297° 59' 09"	-3° 49' 53"	300° 54' 57"	-24° 18' 55"	0° 58' 16"	15' 52.61"	79° 10' 14"	0.62605
17	298° 33' 18"	-3° 51' 60"	301° 32' 00"	-24° 13' 56"	0° 58' 14"	15' 52.00"	78° 55' 34"	0.62158
18	299° 07' 25"	-3° 54' 05"	302° 08' 58"	-24° 08' 49"	0° 58' 11"	15' 51.38"	78° 40' 58"	0.61712
19	299° 41' 29"	-3° 56' 09"	302° 45' 49"	-24° 03' 34"	0° 58' 09"	15' 50.77"	78° 26' 27"	0.61265
20	300° 15' 30"	-3° 58' 11"	303° 22' 35"	-23° 58' 10"	0° 58' 07"	15' 50.16"	78° 11' 60"	0.60818
21	300° 49' 29"	-4° 00' 12"	303° 59' 14"	-23° 52' 38"	0° 58' 05"	15' 49.55"	77° 57' 38"	0.60370
22	301° 23' 26"	-4° 02' 11"	304° 35' 47"	-23° 46' 58"	0° 58' 02"	15' 48.93"	77° 43' 21"	0.59922
23	301° 57' 20"	-4° 04' 09"	305° 12' 15"	-23° 41' 10"	0° 58' 00"	15' 48.33"	77° 29' 09"	0.59474
24	302° 31' 11"	-4° 06' 05"	305° 48' 36"	-23° 35' 14"	0° 57' 58"	15' 47.72"	77° 15' 01"	0.59026

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	42° 47' 48"	-0.07"	40° 20' 17"	15° 40' 29"	1.0080209	15' 51.99"	23° 26' 14"	3 m 05 s
1	42° 50' 13"	-0.07"	40° 22' 41"	15° 41' 13"	1.0080316	15' 51.98"	23° 26' 14"	3 m 06 s
2	42° 52' 39"	-0.08"	40° 25' 05"	15° 41' 57"	1.0080423	15' 51.97"	23° 26' 14"	3 m 06 s
3	42° 55' 04"	-0.08"	40° 27' 29"	15° 42' 41"	1.0080529	15' 51.96"	23° 26' 14"	3 m 06 s
4	42° 57' 30"	-0.09"	40° 29' 53"	15° 43' 25"	1.0080636	15' 51.95"	23° 26' 14"	3 m 06 s
5	42° 59' 55"	-0.09"	40° 32' 17"	15° 44' 09"	1.0080743	15' 51.94"	23° 26' 14"	3 m 07 s
6	43° 02' 21"	-0.09"	40° 34' 41"	15° 44' 53"	1.0080850	15' 51.93"	23° 26' 14"	3 m 07 s
7	43° 04' 46"	-0.10"	40° 37' 05"	15° 45' 37"	1.0080957	15' 51.92"	23° 26' 14"	3 m 07 s
8	43° 07' 12"	-0.10"	40° 39' 29"	15° 46' 21"	1.0081063	15' 51.91"	23° 26' 14"	3 m 07 s
9	43° 09' 37"	-0.10"	40° 41' 53"	15° 47' 04"	1.0081170	15' 51.90"	23° 26' 14"	3 m 08 s
10	43° 12' 03"	-0.11"	40° 44' 17"	15° 47' 48"	1.0081277	15' 51.89"	23° 26' 14"	3 m 08 s
11	43° 14' 28"	-0.11"	40° 46' 41"	15° 48' 32"	1.0081383	15' 51.88"	23° 26' 14"	3 m 08 s
12	43° 16' 53"	-0.11"	40° 49' 05"	15° 49' 16"	1.0081490	15' 51.87"	23° 26' 14"	3 m 08 s
13	43° 19' 19"	-0.12"	40° 51' 30"	15° 49' 60"	1.0081596	15' 51.86"	23° 26' 14"	3 m 09 s
14	43° 21' 44"	-0.12"	40° 53' 54"	15° 50' 43"	1.0081703	15' 51.85"	23° 26' 14"	3 m 09 s
15	43° 24' 10"	-0.13"	40° 56' 18"	15° 51' 27"	1.0081809	15' 51.84"	23° 26' 14"	3 m 09 s
16	43° 26' 35"	-0.13"	40° 58' 42"	15° 52' 11"	1.0081916	15' 51.83"	23° 26' 14"	3 m 09 s
17	43° 29' 01"	-0.13"	41° 01' 06"	15° 52' 54"	1.0082022	15' 51.82"	23° 26' 14"	3 m 09 s
18	43° 31' 26"	-0.14"	41° 03' 31"	15° 53' 38"	1.0082128	15' 51.81"	23° 26' 14"	3 m 10 s
19	43° 33' 51"	-0.14"	41° 05' 55"	15° 54' 22"	1.0082235	15' 51.80"	23° 26' 14"	3 m 10 s
20	43° 36' 17"	-0.14"	41° 08' 19"	15° 55' 05"	1.0082341	15' 51.79"	23° 26' 14"	3 m 10 s
21	43° 38' 42"	-0.15"	41° 10' 43"	15° 55' 49"	1.0082447	15' 51.78"	23° 26' 14"	3 m 10 s
22	43° 41' 08"	-0.15"	41° 13' 08"	15° 56' 32"	1.0082553	15' 51.77"	23° 26' 14"	3 m 11 s
23	43° 43' 33"	-0.15"	41° 15' 32"	15° 57' 16"	1.0082659	15' 51.76"	23° 26' 14"	3 m 11 s
24	43° 45' 58"	-0.15"	41° 17' 56"	15° 57' 59"	1.0082765	15' 51.75"	23° 26' 14"	3 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	302° 31' 11"	-4° 06' 05"	305° 48' 36"	-23° 35' 14"	0° 57' 58"	15' 47.72"	77° 15' 01"	0.59026
1	303° 05' 00"	-4° 07' 59"	306° 24' 51"	-23° 29' 09"	0° 57' 56"	15' 47.11"	77° 0' 59"	0.58578
2	303° 38' 47"	-4° 09' 52"	307° 00' 59"	-23° 22' 57"	0° 57' 53"	15' 46.50"	76° 47' 02"	0.58129
3	304° 12' 31"	-4° 11' 44"	307° 37' 02"	-23° 16' 37"	0° 57' 51"	15' 45.90"	76° 33' 11"	0.57681
4	304° 46' 12"	-4° 13' 34"	308° 12' 58"	-23° 10' 09"	0° 57' 49"	15' 45.29"	76° 19' 24"	0.57232
5	305° 19' 51"	-4° 15' 22"	308° 48' 48"	-23° 03' 34"	0° 57' 47"	15' 44.69"	76° 5' 44"	0.56784
6	305° 53' 28"	-4° 17' 08"	309° 24' 31"	-22° 56' 51"	0° 57' 45"	15' 44.09"	75° 52' 08"	0.56335
7	306° 27' 02"	-4° 18' 53"	310° 00' 09"	-22° 50' 01"	0° 57' 42"	15' 43.49"	75° 38' 38"	0.55887
8	307° 00' 34"	-4° 20' 37"	310° 35' 40"	-22° 43' 03"	0° 57' 40"	15' 42.89"	75° 25' 14"	0.55439
9	307° 34' 03"	-4° 22' 18"	311° 11' 04"	-22° 35' 58"	0° 57' 38"	15' 42.30"	75° 11' 56"	0.54991
10	308° 07' 30"	-4° 23' 59"	311° 46' 22"	-22° 28' 46"	0° 57' 36"	15' 41.70"	74° 58' 43"	0.54543
11	308° 40' 55"	-4° 25' 37"	312° 21' 34"	-22° 21' 27"	0° 57' 34"	15' 41.11"	74° 45' 36"	0.54095
12	309° 14' 17"	-4° 27' 14"	312° 56' 40"	-22° 14' 01"	0° 57' 31"	15' 40.52"	74° 32' 35"	0.53648
13	309° 47' 36"	-4° 28' 49"	313° 31' 38"	-22° 06' 28"	0° 57' 29"	15' 39.93"	74° 19' 40"	0.53201
14	310° 20' 54"	-4° 30' 23"	314° 06' 31"	-21° 58' 48"	0° 57' 27"	15' 39.34"	74° 6' 51"	0.52754
15	310° 54' 09"	-4° 31' 55"	314° 41' 17"	-21° 51' 01"	0° 57' 25"	15' 38.76"	73° 54' 08"	0.52308
16	311° 27' 21"	-4° 33' 25"	315° 15' 57"	-21° 43' 07"	0° 57' 23"	15' 38.17"	73° 41' 31"	0.51862
17	312° 00' 32"	-4° 34' 54"	315° 50' 30"	-21° 35' 07"	0° 57' 21"	15' 37.59"	73° 28' 60"	0.51416
18	312° 33' 40"	-4° 36' 21"	316° 24' 57"	-21° 27' 01"	0° 57' 19"	15' 37.01"	73° 16' 35"	0.50971
19	313° 06' 45"	-4° 37' 47"	316° 59' 18"	-21° 18' 48"	0° 57' 16"	15' 36.44"	73° 4' 17"	0.50527
20	313° 39' 48"	-4° 39' 10"	317° 33' 32"	-21° 10' 28"	0° 57' 14"	15' 35.86"	72° 52' 04"	0.50083
21	314° 12' 49"	-4° 40' 33"	318° 07' 39"	-21° 02' 03"	0° 57' 12"	15' 35.29"	72° 39' 58"	0.49639
22	314° 45' 48"	-4° 41' 53"	318° 41' 41"	-20° 53' 31"	0° 57' 10"	15' 34.72"	72° 27' 59"	0.49196
23	315° 18' 44"	-4° 43' 12"	319° 15' 36"	-20° 44' 53"	0° 57' 08"	15' 34.15"	72° 16' 06"	0.48754
24	315° 51' 39"	-4° 44' 29"	319° 49' 24"	-20° 36' 09"	0° 57' 06"	15' 33.58"	72° 4' 19"	0.48313

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	43° 45' 58"	-0.15"	41° 17' 56"	15° 57' 59"	1.0082765	15' 51.75"	23° 26' 14"	3 m 11 s
1	43° 48' 24"	-0.16"	41° 20' 21"	15° 58' 43"	1.0082871	15' 51.74"	23° 26' 14"	3 m 11 s
2	43° 50' 49"	-0.16"	41° 22' 45"	15° 59' 26"	1.0082977	15' 51.73"	23° 26' 14"	3 m 12 s
3	43° 53' 15"	-0.16"	41° 25' 09"	16° 00' 09"	1.0083083	15' 51.72"	23° 26' 14"	3 m 12 s
4	43° 55' 40"	-0.17"	41° 27' 34"	16° 00' 53"	1.0083189	15' 51.71"	23° 26' 14"	3 m 12 s
5	43° 58' 05"	-0.17"	41° 29' 58"	16° 01' 36"	1.0083295	15' 51.70"	23° 26' 14"	3 m 12 s
6	44° 00' 31"	-0.17"	41° 32' 23"	16° 02' 19"	1.0083401	15' 51.69"	23° 26' 14"	3 m 13 s
7	44° 02' 56"	-0.17"	41° 34' 47"	16° 03' 03"	1.0083507	15' 51.68"	23° 26' 14"	3 m 13 s
8	44° 05' 22"	-0.18"	41° 37' 11"	16° 03' 46"	1.0083612	15' 51.67"	23° 26' 14"	3 m 13 s
9	44° 07' 47"	-0.18"	41° 39' 36"	16° 04' 29"	1.0083718	15' 51.66"	23° 26' 14"	3 m 13 s
10	44° 10' 12"	-0.18"	41° 42' 00"	16° 05' 12"	1.0083824	15' 51.65"	23° 26' 14"	3 m 13 s
11	44° 12' 38"	-0.19"	41° 44' 25"	16° 05' 56"	1.0083929	15' 51.64"	23° 26' 14"	3 m 14 s
12	44° 15' 03"	-0.19"	41° 46' 49"	16° 06' 39"	1.0084035	15' 51.63"	23° 26' 14"	3 m 14 s
13	44° 17' 29"	-0.19"	41° 49' 14"	16° 07' 22"	1.0084140	15' 51.62"	23° 26' 14"	3 m 14 s
14	44° 19' 54"	-0.19"	41° 51' 38"	16° 08' 05"	1.0084246	15' 51.61"	23° 26' 14"	3 m 14 s
15	44° 22' 19"	-0.20"	41° 54' 03"	16° 08' 48"	1.0084351	15' 51.60"	23° 26' 14"	3 m 15 s
16	44° 24' 45"	-0.20"	41° 56' 27"	16° 09' 31"	1.0084456	15' 51.59"	23° 26' 14"	3 m 15 s
17	44° 27' 10"	-0.20"	41° 58' 52"	16° 10' 14"	1.0084562	15' 51.58"	23° 26' 14"	3 m 15 s
18	44° 29' 35"	-0.20"	42° 01' 17"	16° 10' 57"	1.0084667	15' 51.57"	23° 26' 14"	3 m 15 s
19	44° 32' 01"	-0.20"	42° 03' 41"	16° 11' 40"	1.0084772	15' 51.56"	23° 26' 14"	3 m 15 s
20	44° 34' 26"	-0.21"	42° 06' 06"	16° 12' 23"	1.0084877	15' 51.55"	23° 26' 14"	3 m 16 s
21	44° 36' 51"	-0.21"	42° 08' 31"	16° 13' 06"	1.0084982	15' 51.54"	23° 26' 14"	3 m 16 s
22	44° 39' 17"	-0.21"	42° 10' 55"	16° 13' 48"	1.0085087	15' 51.53"	23° 26' 14"	3 m 16 s
23	44° 41' 42"	-0.21"	42° 13' 20"	16° 14' 31"	1.0085192	15' 51.52"	23° 26' 14"	3 m 16 s
24	44° 44' 07"	-0.21"	42° 15' 45"	16° 15' 14"	1.0085297	15' 51.51"	23° 26' 14"	3 m 16 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	315° 51' 39"	-4° 44' 29"	319° 49' 24"	-20° 36' 09"	0° 57' 06"	15' 33.58"	72° 4' 19"	0.48313
1	316° 24' 30"	-4° 45' 45"	320° 23' 07"	-20° 27' 20"	0° 57' 04"	15' 33.02"	71° 52' 38"	0.47872
2	316° 57' 20"	-4° 46' 59"	320° 56' 43"	-20° 18' 24"	0° 57' 02"	15' 32.46"	71° 41' 04"	0.47432
3	317° 30' 08"	-4° 48' 11"	321° 30' 12"	-20° 09' 23"	0° 56' 60"	15' 31.90"	71° 29' 37"	0.46992
4	318° 02' 53"	-4° 49' 22"	322° 03' 36"	-20° 00' 16"	0° 56' 58"	15' 31.34"	71° 18' 15"	0.46554
5	318° 35' 36"	-4° 50' 31"	322° 36' 53"	-19° 51' 03"	0° 56' 56"	15' 30.79"	71° 7' 01"	0.46116
6	319° 08' 17"	-4° 51' 38"	323° 10' 04"	-19° 41' 45"	0° 56' 54"	15' 30.24"	70° 55' 53"	0.45679
7	319° 40' 55"	-4° 52' 44"	323° 43' 09"	-19° 32' 22"	0° 56' 52"	15' 29.69"	70° 44' 51"	0.45243
8	320° 13' 32"	-4° 53' 48"	324° 16' 07"	-19° 22' 53"	0° 56' 50"	15' 29.14"	70° 33' 56"	0.44808
9	320° 46' 06"	-4° 54' 51"	324° 48' 60"	-19° 13' 19"	0° 56' 48"	15' 28.60"	70° 23' 08"	0.44373
10	321° 18' 38"	-4° 55' 51"	325° 21' 46"	-19° 03' 39"	0° 56' 46"	15' 28.06"	70° 12' 26"	0.43940
11	321° 51' 08"	-4° 56' 50"	325° 54' 26"	-18° 53' 55"	0° 56' 44"	15' 27.52"	70° 1' 51"	0.43508
12	322° 23' 36"	-4° 57' 48"	326° 27' 01"	-18° 44' 05"	0° 56' 42"	15' 26.99"	69° 51' 22"	0.43077
13	322° 56' 02"	-4° 58' 44"	326° 59' 29"	-18° 34' 11"	0° 56' 40"	15' 26.46"	69° 40' 60"	0.42646
14	323° 28' 25"	-4° 59' 38"	327° 31' 51"	-18° 24' 12"	0° 56' 38"	15' 25.93"	69° 30' 44"	0.42217
15	324° 00' 47"	-5° 00' 30"	328° 04' 08"	-18° 14' 08"	0° 56' 36"	15' 25.40"	69° 20' 35"	0.41789
16	324° 33' 07"	-5° 01' 21"	328° 36' 18"	-18° 03' 59"	0° 56' 34"	15' 24.88"	69° 10' 33"	0.41362
17	325° 05' 24"	-5° 02' 11"	329° 08' 23"	-17° 53' 46"	0° 56' 32"	15' 24.36"	69° 0' 38"	0.40936
18	325° 37' 39"	-5° 02' 58"	329° 40' 22"	-17° 43' 28"	0° 56' 30"	15' 23.84"	68° 50' 49"	0.40511
19	326° 09' 53"	-5° 03' 44"	330° 12' 15"	-17° 33' 05"	0° 56' 28"	15' 23.32"	68° 41' 06"	0.40088
20	326° 42' 04"	-5° 04' 28"	330° 44' 02"	-17° 22' 38"	0° 56' 26"	15' 22.81"	68° 31' 30"	0.39666
21	327° 14' 14"	-5° 05' 11"	331° 15' 44"	-17° 12' 07"	0° 56' 25"	15' 22.30"	68° 22' 01"	0.39245
22	327° 46' 21"	-5° 05' 52"	331° 47' 20"	-17° 01' 32"	0° 56' 23"	15' 21.80"	68° 12' 39"	0.38825
23	328° 18' 27"	-5° 06' 31"	332° 18' 50"	-16° 50' 52"	0° 56' 21"	15' 21.30"	68° 3' 23"	0.38406
24	328° 50' 30"	-5° 07' 09"	332° 50' 15"	-16° 40' 08"	0° 56' 19"	15' 20.80"	67° 54' 13"	0.37989

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	44° 44' 07"	-0.21"	42° 15' 45"	16° 15' 14"	1.0085297	15' 51.51"	23° 26' 14"	3 m 16 s
1	44° 46' 33"	-0.22"	42° 18' 09"	16° 15' 57"	1.0085402	15' 51.50"	23° 26' 14"	3 m 17 s
2	44° 48' 58"	-0.22"	42° 20' 34"	16° 16' 40"	1.0085507	15' 51.49"	23° 26' 14"	3 m 17 s
3	44° 51' 24"	-0.22"	42° 22' 59"	16° 17' 22"	1.0085612	15' 51.48"	23° 26' 14"	3 m 17 s
4	44° 53' 49"	-0.22"	42° 25' 23"	16° 18' 05"	1.0085717	15' 51.47"	23° 26' 14"	3 m 17 s
5	44° 56' 14"	-0.22"	42° 27' 48"	16° 18' 48"	1.0085821	15' 51.46"	23° 26' 14"	3 m 17 s
6	44° 58' 40"	-0.22"	42° 30' 13"	16° 19' 30"	1.0085926	15' 51.45"	23° 26' 14"	3 m 18 s
7	45° 01' 05"	-0.23"	42° 32' 38"	16° 20' 13"	1.0086030	15' 51.44"	23° 26' 14"	3 m 18 s
8	45° 03' 30"	-0.23"	42° 35' 03"	16° 20' 55"	1.0086135	15' 51.43"	23° 26' 14"	3 m 18 s
9	45° 05' 56"	-0.23"	42° 37' 27"	16° 21' 38"	1.0086239	15' 51.42"	23° 26' 14"	3 m 18 s
10	45° 08' 21"	-0.23"	42° 39' 52"	16° 22' 20"	1.0086344	15' 51.42"	23° 26' 14"	3 m 18 s
11	45° 10' 46"	-0.23"	42° 42' 17"	16° 23' 03"	1.0086448	15' 51.41"	23° 26' 14"	3 m 19 s
12	45° 13' 11"	-0.23"	42° 44' 42"	16° 23' 45"	1.0086553	15' 51.40"	23° 26' 14"	3 m 19 s
13	45° 15' 37"	-0.23"	42° 47' 07"	16° 24' 28"	1.0086657	15' 51.39"	23° 26' 14"	3 m 19 s
14	45° 18' 02"	-0.24"	42° 49' 32"	16° 25' 10"	1.0086761	15' 51.38"	23° 26' 14"	3 m 19 s
15	45° 20' 27"	-0.24"	42° 51' 57"	16° 25' 53"	1.0086865	15' 51.37"	23° 26' 14"	3 m 19 s
16	45° 22' 53"	-0.24"	42° 54' 21"	16° 26' 35"	1.0086969	15' 51.36"	23° 26' 14"	3 m 20 s
17	45° 25' 18"	-0.24"	42° 56' 46"	16° 27' 17"	1.0087073	15' 51.35"	23° 26' 14"	3 m 20 s
18	45° 27' 43"	-0.24"	42° 59' 11"	16° 27' 60"	1.0087177	15' 51.34"	23° 26' 14"	3 m 20 s
19	45° 30' 09"	-0.24"	43° 01' 36"	16° 28' 42"	1.0087281	15' 51.33"	23° 26' 14"	3 m 20 s
20	45° 32' 34"	-0.24"	43° 04' 01"	16° 29' 24"	1.0087385	15' 51.32"	23° 26' 14"	3 m 20 s
21	45° 34' 59"	-0.24"	43° 06' 26"	16° 30' 06"	1.0087489	15' 51.31"	23° 26' 14"	3 m 21 s
22	45° 37' 25"	-0.24"	43° 08' 51"	16° 30' 48"	1.0087593	15' 51.30"	23° 26' 14"	3 m 21 s
23	45° 39' 50"	-0.24"	43° 11' 16"	16° 31' 31"	1.0087697	15' 51.29"	23° 26' 14"	3 m 21 s
24	45° 42' 15"	-0.25"	43° 13' 41"	16° 32' 13"	1.0087800	15' 51.28"	23° 26' 14"	3 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	328° 50' 30"	-5° 07' 09"	332° 50' 15"	-16° 40' 08"	0° 56' 19"	15' 20.80"	67° 54' 13"	0.37989
1	329° 22' 32"	-5° 07' 45"	333° 21' 34"	-16° 29' 20"	0° 56' 17"	15' 20.30"	67° 45' 10"	0.37573
2	329° 54' 31"	-5° 08' 20"	333° 52' 48"	-16° 18' 28"	0° 56' 15"	15' 19.81"	67° 36' 14"	0.37159
3	330° 26' 29"	-5° 08' 53"	334° 23' 57"	-16° 07' 33"	0° 56' 14"	15' 19.32"	67° 27' 25"	0.36746
4	330° 58' 25"	-5° 09' 24"	334° 55' 00"	-15° 56' 33"	0° 56' 12"	15' 18.83"	67° 18' 42"	0.36334
5	331° 30' 19"	-5° 09' 53"	335° 25' 58"	-15° 45' 30"	0° 56' 10"	15' 18.35"	67° 10' 05"	0.35924
6	332° 02' 11"	-5° 10' 21"	335° 56' 51"	-15° 34' 23"	0° 56' 08"	15' 17.87"	67° 1' 35"	0.35515
7	332° 34' 01"	-5° 10' 48"	336° 27' 38"	-15° 23' 12"	0° 56' 07"	15' 17.39"	66° 53' 12"	0.35108
8	333° 05' 49"	-5° 11' 12"	336° 58' 20"	-15° 11' 58"	0° 56' 05"	15' 16.91"	66° 44' 55"	0.34702
9	333° 37' 36"	-5° 11' 36"	337° 28' 58"	-15° 00' 40"	0° 56' 03"	15' 16.44"	66° 36' 44"	0.34298
10	334° 09' 21"	-5° 11' 57"	337° 59' 30"	-14° 49' 19"	0° 56' 01"	15' 15.98"	66° 28' 40"	0.33895
11	334° 41' 03"	-5° 12' 17"	338° 29' 57"	-14° 37' 55"	0° 55' 60"	15' 15.51"	66° 20' 43"	0.33494
12	335° 12' 45"	-5° 12' 35"	339° 00' 20"	-14° 26' 27"	0° 55' 58"	15' 15.05"	66° 12' 51"	0.33095
13	335° 44' 24"	-5° 12' 52"	339° 30' 37"	-14° 14' 56"	0° 55' 56"	15' 14.59"	66° 5' 07"	0.32697
14	336° 16' 01"	-5° 13' 07"	340° 00' 50"	-14° 03' 22"	0° 55' 55"	15' 14.14"	65° 57' 29"	0.32301
15	336° 47' 37"	-5° 13' 20"	340° 30' 58"	-13° 51' 44"	0° 55' 53"	15' 13.69"	65° 49' 57"	0.31906
16	337° 19' 11"	-5° 13' 32"	341° 01' 01"	-13° 40' 04"	0° 55' 51"	15' 13.24"	65° 42' 31"	0.31513
17	337° 50' 44"	-5° 13' 43"	341° 30' 59"	-13° 28' 21"	0° 55' 50"	15' 12.80"	65° 35' 12"	0.31122
18	338° 22' 14"	-5° 13' 51"	342° 00' 53"	-13° 16' 35"	0° 55' 48"	15' 12.36"	65° 27' 59"	0.30732
19	338° 53' 43"	-5° 13' 59"	342° 30' 43"	-13° 04' 46"	0° 55' 46"	15' 11.92"	65° 20' 53"	0.30345
20	339° 25' 10"	-5° 14' 04"	343° 00' 28"	-12° 52' 54"	0° 55' 45"	15' 11.48"	65° 13' 52"	0.29959
21	339° 56' 36"	-5° 14' 08"	343° 30' 08"	-12° 40' 59"	0° 55' 43"	15' 11.05"	65° 6' 58"	0.29574
22	340° 27' 60"	-5° 14' 10"	343° 59' 45"	-12° 29' 02"	0° 55' 42"	15' 10.62"	65° 0' 11"	0.29192
23	340° 59' 22"	-5° 14' 11"	344° 29' 17"	-12° 17' 02"	0° 55' 40"	15' 10.20"	64° 53' 29"	0.28811
24	341° 30' 43"	-5° 14' 11"	344° 58' 44"	-12° 05' 00"	0° 55' 39"	15' 09.78"	64° 46' 54"	0.28433

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	45° 42' 15"	-0.25"	43° 13' 41"	16° 32' 13"	1.0087800	15' 51.28"	23° 26' 14"	3 m 21 s
1	45° 44' 40"	-0.25"	43° 16' 06"	16° 32' 55"	1.0087904	15' 51.27"	23° 26' 14"	3 m 21 s
2	45° 47' 06"	-0.25"	43° 18' 32"	16° 33' 37"	1.0088008	15' 51.26"	23° 26' 14"	3 m 22 s
3	45° 49' 31"	-0.25"	43° 20' 57"	16° 34' 19"	1.0088111	15' 51.25"	23° 26' 14"	3 m 22 s
4	45° 51' 56"	-0.25"	43° 23' 22"	16° 35' 01"	1.0088215	15' 51.24"	23° 26' 14"	3 m 22 s
5	45° 54' 22"	-0.25"	43° 25' 47"	16° 35' 43"	1.0088318	15' 51.23"	23° 26' 14"	3 m 22 s
6	45° 56' 47"	-0.25"	43° 28' 12"	16° 36' 25"	1.0088421	15' 51.22"	23° 26' 14"	3 m 22 s
7	45° 59' 12"	-0.25"	43° 30' 37"	16° 37' 07"	1.0088525	15' 51.21"	23° 26' 14"	3 m 22 s
8	46° 01' 37"	-0.25"	43° 33' 02"	16° 37' 49"	1.0088628	15' 51.20"	23° 26' 14"	3 m 23 s
9	46° 04' 03"	-0.25"	43° 35' 27"	16° 38' 31"	1.0088731	15' 51.19"	23° 26' 14"	3 m 23 s
10	46° 06' 28"	-0.25"	43° 37' 53"	16° 39' 12"	1.0088834	15' 51.18"	23° 26' 14"	3 m 23 s
11	46° 08' 53"	-0.25"	43° 40' 18"	16° 39' 54"	1.0088937	15' 51.17"	23° 26' 14"	3 m 23 s
12	46° 11' 18"	-0.25"	43° 42' 43"	16° 40' 36"	1.0089040	15' 51.16"	23° 26' 14"	3 m 23 s
13	46° 13' 44"	-0.25"	43° 45' 08"	16° 41' 18"	1.0089143	15' 51.15"	23° 26' 14"	3 m 24 s
14	46° 16' 09"	-0.25"	43° 47' 34"	16° 41' 59"	1.0089246	15' 51.14"	23° 26' 14"	3 m 24 s
15	46° 18' 34"	-0.25"	43° 49' 59"	16° 42' 41"	1.0089349	15' 51.13"	23° 26' 14"	3 m 24 s
16	46° 20' 59"	-0.25"	43° 52' 24"	16° 43' 23"	1.0089451	15' 51.12"	23° 26' 14"	3 m 24 s
17	46° 23' 25"	-0.25"	43° 54' 49"	16° 44' 04"	1.0089554	15' 51.11"	23° 26' 14"	3 m 24 s
18	46° 25' 50"	-0.25"	43° 57' 15"	16° 44' 46"	1.0089657	15' 51.10"	23° 26' 14"	3 m 24 s
19	46° 28' 15"	-0.25"	43° 59' 40"	16° 45' 28"	1.0089759	15' 51.09"	23° 26' 14"	3 m 25 s
20	46° 30' 40"	-0.25"	44° 02' 05"	16° 46' 09"	1.0089862	15' 51.08"	23° 26' 14"	3 m 25 s
21	46° 33' 06"	-0.25"	44° 04' 31"	16° 46' 51"	1.0089964	15' 51.07"	23° 26' 14"	3 m 25 s
22	46° 35' 31"	-0.25"	44° 06' 56"	16° 47' 32"	1.0090067	15' 51.06"	23° 26' 14"	3 m 25 s
23	46° 37' 56"	-0.25"	44° 09' 22"	16° 48' 14"	1.0090169	15' 51.05"	23° 26' 14"	3 m 25 s
24	46° 40' 21"	-0.25"	44° 11' 47"	16° 48' 55"	1.0090271	15' 51.04"	23° 26' 14"	3 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	341° 30' 43"	-5° 14' 11"	344° 58' 44"	-12° 05' 00"	0° 55' 39"	15' 09.78"	64° 46' 54"	0.28433
1	342° 02' 02"	-5° 14' 08"	345° 28' 08"	-11° 52' 55"	0° 55' 37"	15' 09.36"	64° 40' 25"	0.28056
2	342° 33' 19"	-5° 14' 04"	345° 57' 27"	-11° 40' 48"	0° 55' 36"	15' 08.95"	64° 34' 02"	0.27681
3	343° 04' 35"	-5° 13' 59"	346° 26' 43"	-11° 28' 39"	0° 55' 34"	15' 08.54"	64° 27' 45"	0.27308
4	343° 35' 49"	-5° 13' 52"	346° 55' 54"	-11° 16' 27"	0° 55' 33"	15' 08.13"	64° 21' 34"	0.26936
5	344° 07' 02"	-5° 13' 43"	347° 25' 02"	-11° 04' 13"	0° 55' 31"	15' 07.73"	64° 15' 29"	0.26567
6	344° 38' 13"	-5° 13' 33"	347° 54' 05"	-10° 51' 56"	0° 55' 30"	15' 07.33"	64° 9' 30"	0.26200
7	345° 09' 23"	-5° 13' 22"	348° 23' 05"	-10° 39' 38"	0° 55' 28"	15' 06.93"	64° 3' 37"	0.25834
8	345° 40' 31"	-5° 13' 09"	348° 52' 01"	-10° 27' 17"	0° 55' 27"	15' 06.54"	63° 57' 51"	0.25471
9	346° 11' 38"	-5° 12' 54"	349° 20' 54"	-10° 14' 55"	0° 55' 25"	15' 06.15"	63° 52' 10"	0.25109
10	346° 42' 43"	-5° 12' 38"	349° 49' 42"	-10° 02' 30"	0° 55' 24"	15' 05.76"	63° 46' 35"	0.24750
11	347° 13' 47"	-5° 12' 20"	350° 18' 28"	-9° 50' 04"	0° 55' 22"	15' 05.37"	63° 41' 06"	0.24393
12	347° 44' 49"	-5° 12' 01"	350° 47' 09"	-9° 37' 36"	0° 55' 21"	15' 05.00"	63° 35' 42"	0.24037
13	348° 15' 50"	-5° 11' 40"	351° 15' 48"	-9° 25' 06"	0° 55' 20"	15' 04.62"	63° 30' 25"	0.23684
14	348° 46' 49"	-5° 11' 18"	351° 44' 23"	-9° 12' 34"	0° 55' 18"	15' 04.25"	63° 25' 13"	0.23333
15	349° 17' 47"	-5° 10' 55"	352° 12' 54"	-9° 00' 00"	0° 55' 17"	15' 03.88"	63° 20' 07"	0.22984
16	349° 48' 43"	-5° 10' 29"	352° 41' 23"	-8° 47' 25"	0° 55' 16"	15' 03.51"	63° 15' 07"	0.22637
17	350° 19' 38"	-5° 10' 03"	353° 09' 48"	-8° 34' 49"	0° 55' 14"	15' 03.15"	63° 10' 13"	0.22292
18	350° 50' 32"	-5° 09' 35"	353° 38' 10"	-8° 22' 10"	0° 55' 13"	15' 02.79"	63° 5' 24"	0.21950
19	351° 21' 24"	-5° 09' 05"	354° 06' 29"	-8° 09' 31"	0° 55' 12"	15' 02.43"	63° 0' 41"	0.21609
20	351° 52' 15"	-5° 08' 34"	354° 34' 45"	-7° 56' 49"	0° 55' 10"	15' 02.08"	62° 56' 03"	0.21271
21	352° 23' 05"	-5° 08' 01"	355° 02' 58"	-7° 44' 07"	0° 55' 09"	15' 01.73"	62° 51' 31"	0.20935
22	352° 53' 53"	-5° 07' 27"	355° 31' 09"	-7° 31' 23"	0° 55' 08"	15' 01.38"	62° 47' 04"	0.20601
23	353° 24' 40"	-5° 06' 52"	355° 59' 16"	-7° 18' 38"	0° 55' 07"	15' 01.04"	62° 42' 43"	0.20269
24	353° 55' 26"	-5° 06' 15"	356° 27' 21"	-7° 05' 51"	0° 55' 05"	15' 00.70"	62° 38' 27"	0.19940

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	46° 40' 21"	-0.25"	44° 11' 47"	16° 48' 55"	1.0090271	15' 51.04"	23° 26' 14"	3 m 25 s
1	46° 42' 47"	-0.25"	44° 14' 12"	16° 49' 36"	1.0090374	15' 51.04"	23° 26' 14"	3 m 26 s
2	46° 45' 12"	-0.25"	44° 16' 38"	16° 50' 18"	1.0090476	15' 51.03"	23° 26' 14"	3 m 26 s
3	46° 47' 37"	-0.24"	44° 19' 03"	16° 50' 59"	1.0090578	15' 51.02"	23° 26' 14"	3 m 26 s
4	46° 50' 02"	-0.24"	44° 21' 29"	16° 51' 40"	1.0090680	15' 51.01"	23° 26' 14"	3 m 26 s
5	46° 52' 27"	-0.24"	44° 23' 54"	16° 52' 22"	1.0090782	15' 51.00"	23° 26' 14"	3 m 26 s
6	46° 54' 53"	-0.24"	44° 26' 20"	16° 53' 03"	1.0090884	15' 50.99"	23° 26' 14"	3 m 26 s
7	46° 57' 18"	-0.24"	44° 28' 45"	16° 53' 44"	1.0090986	15' 50.98"	23° 26' 14"	3 m 26 s
8	46° 59' 43"	-0.24"	44° 31' 11"	16° 54' 25"	1.0091087	15' 50.97"	23° 26' 14"	3 m 27 s
9	47° 02' 08"	-0.24"	44° 33' 36"	16° 55' 07"	1.0091189	15' 50.96"	23° 26' 14"	3 m 27 s
10	47° 04' 33"	-0.24"	44° 36' 02"	16° 55' 48"	1.0091291	15' 50.95"	23° 26' 14"	3 m 27 s
11	47° 06' 59"	-0.24"	44° 38' 27"	16° 56' 29"	1.0091392	15' 50.94"	23° 26' 14"	3 m 27 s
12	47° 09' 24"	-0.24"	44° 40' 53"	16° 57' 10"	1.0091494	15' 50.93"	23° 26' 14"	3 m 27 s
13	47° 11' 49"	-0.23"	44° 43' 19"	16° 57' 51"	1.0091596	15' 50.92"	23° 26' 14"	3 m 27 s
14	47° 14' 14"	-0.23"	44° 45' 44"	16° 58' 32"	1.0091697	15' 50.91"	23° 26' 14"	3 m 28 s
15	47° 16' 39"	-0.23"	44° 48' 10"	16° 59' 13"	1.0091798	15' 50.90"	23° 26' 14"	3 m 28 s
16	47° 19' 05"	-0.23"	44° 50' 35"	16° 59' 54"	1.0091900	15' 50.89"	23° 26' 14"	3 m 28 s
17	47° 21' 30"	-0.23"	44° 53' 01"	17° 00' 35"	1.0092001	15' 50.88"	23° 26' 14"	3 m 28 s
18	47° 23' 55"	-0.23"	44° 55' 27"	17° 01' 16"	1.0092102	15' 50.87"	23° 26' 14"	3 m 28 s
19	47° 26' 20"	-0.23"	44° 57' 53"	17° 01' 57"	1.0092203	15' 50.86"	23° 26' 14"	3 m 28 s
20	47° 28' 45"	-0.22"	45° 00' 18"	17° 02' 37"	1.0092304	15' 50.85"	23° 26' 14"	3 m 28 s
21	47° 31' 11"	-0.22"	45° 02' 44"	17° 03' 18"	1.0092405	15' 50.84"	23° 26' 14"	3 m 29 s
22	47° 33' 36"	-0.22"	45° 05' 10"	17° 03' 59"	1.0092506	15' 50.83"	23° 26' 14"	3 m 29 s
23	47° 36' 01"	-0.22"	45° 07' 35"	17° 04' 40"	1.0092607	15' 50.82"	23° 26' 14"	3 m 29 s
24	47° 38' 26"	-0.22"	45° 10' 01"	17° 05' 20"	1.0092708	15' 50.82"	23° 26' 14"	3 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	353° 55' 26"	-5° 06' 15"	356° 27' 21"	-7° 05' 51"	0° 55' 05"	15' 00.70"	62° 38' 27"	0.19940
1	354° 26' 10"	-5° 05' 36"	356° 55' 23"	-6° 53' 04"	0° 55' 04"	15' 00.37"	62° 34' 17"	0.19613
2	354° 56' 53"	-5° 04' 57"	357° 23' 22"	-6° 40' 15"	0° 55' 03"	15' 00.03"	62° 30' 12"	0.19288
3	355° 27' 35"	-5° 04' 15"	357° 51' 19"	-6° 27' 25"	0° 55' 02"	14' 59.70"	62° 26' 12"	0.18965
4	355° 58' 16"	-5° 03' 33"	358° 19' 13"	-6° 14' 35"	0° 55' 00"	14' 59.38"	62° 22' 18"	0.18645
5	356° 28' 55"	-5° 02' 49"	358° 47' 05"	-6° 01' 43"	0° 54' 59"	14' 59.06"	62° 18' 28"	0.18327
6	356° 59' 33"	-5° 02' 03"	359° 14' 54"	-5° 48' 50"	0° 54' 58"	14' 58.74"	62° 14' 44"	0.18012
7	357° 30' 10"	-5° 01' 16"	359° 42' 42"	-5° 35' 56"	0° 54' 57"	14' 58.42"	62° 11' 05"	0.17698
8	358° 00' 46"	-5° 00' 28"	0° 10' 27"	-5° 23' 02"	0° 54' 56"	14' 58.11"	62° 7' 31"	0.17388
9	358° 31' 20"	-4° 59' 38"	0° 38' 09"	-5° 10' 07"	0° 54' 55"	14' 57.80"	62° 4' 03"	0.17079
10	359° 01' 54"	-4° 58' 47"	1° 05' 50"	-4° 57' 11"	0° 54' 54"	14' 57.49"	62° 0' 39"	0.16773
11	359° 32' 26"	-4° 57' 54"	1° 33' 28"	-4° 44' 14"	0° 54' 52"	14' 57.19"	61° 57' 20"	0.16469
12	0° 02' 57"	-4° 57' 01"	2° 01' 05"	-4° 31' 17"	0° 54' 51"	14' 56.89"	61° 54' 06"	0.16168
13	0° 33' 27"	-4° 56' 05"	2° 28' 39"	-4° 18' 19"	0° 54' 50"	14' 56.60"	61° 50' 57"	0.15869
14	1° 03' 55"	-4° 55' 09"	2° 56' 12"	-4° 05' 20"	0° 54' 49"	14' 56.30"	61° 47' 52"	0.15573
15	1° 34' 23"	-4° 54' 11"	3° 23' 43"	-3° 52' 21"	0° 54' 48"	14' 56.02"	61° 44' 53"	0.15279
16	2° 04' 49"	-4° 53' 11"	3° 51' 12"	-3° 39' 22"	0° 54' 47"	14' 55.73"	61° 41' 58"	0.14987
17	2° 35' 15"	-4° 52' 11"	4° 18' 39"	-3° 26' 22"	0° 54' 46"	14' 55.45"	61° 39' 07"	0.14698
18	3° 05' 39"	-4° 51' 09"	4° 46' 05"	-3° 13' 22"	0° 54' 45"	14' 55.17"	61° 36' 21"	0.14412
19	3° 36' 02"	-4° 50' 05"	5° 13' 29"	-3° 00' 21"	0° 54' 44"	14' 54.89"	61° 33' 40"	0.14128
20	4° 06' 24"	-4° 49' 01"	5° 40' 52"	-2° 47' 21"	0° 54' 43"	14' 54.62"	61° 31' 03"	0.13847
21	4° 36' 45"	-4° 47' 55"	6° 08' 13"	-2° 34' 20"	0° 54' 42"	14' 54.35"	61° 28' 31"	0.13568
22	5° 07' 06"	-4° 46' 47"	6° 35' 33"	-2° 21' 18"	0° 54' 41"	14' 54.08"	61° 26' 02"	0.13291
23	5° 37' 25"	-4° 45' 39"	7° 02' 51"	-2° 08' 17"	0° 54' 40"	14' 53.82"	61° 23' 38"	0.13017
24	6° 07' 43"	-4° 44' 29"	7° 30' 08"	-1° 55' 15"	0° 54' 39"	14' 53.56"	61° 21' 18"	0.12746

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	47° 38' 26"	-0.22"	45° 10' 01"	17° 05' 20"	1.0092708	15' 50.82"	23° 26' 14"	3 m 29 s
1	47° 40' 51"	-0.22"	45° 12' 27"	17° 06' 01"	1.0092808	15' 50.81"	23° 26' 14"	3 m 29 s
2	47° 43' 16"	-0.21"	45° 14' 53"	17° 06' 42"	1.0092909	15' 50.80"	23° 26' 14"	3 m 29 s
3	47° 45' 42"	-0.21"	45° 17' 19"	17° 07' 22"	1.0093010	15' 50.79"	23° 26' 14"	3 m 29 s
4	47° 48' 07"	-0.21"	45° 19' 44"	17° 08' 03"	1.0093110	15' 50.78"	23° 26' 14"	3 m 30 s
5	47° 50' 32"	-0.21"	45° 22' 10"	17° 08' 44"	1.0093211	15' 50.77"	23° 26' 14"	3 m 30 s
6	47° 52' 57"	-0.21"	45° 24' 36"	17° 09' 24"	1.0093311	15' 50.76"	23° 26' 14"	3 m 30 s
7	47° 55' 22"	-0.20"	45° 27' 02"	17° 10' 05"	1.0093411	15' 50.75"	23° 26' 14"	3 m 30 s
8	47° 57' 47"	-0.20"	45° 29' 28"	17° 10' 45"	1.0093511	15' 50.74"	23° 26' 14"	3 m 30 s
9	48° 00' 12"	-0.20"	45° 31' 54"	17° 11' 26"	1.0093612	15' 50.73"	23° 26' 14"	3 m 30 s
10	48° 02' 38"	-0.20"	45° 34' 20"	17° 12' 06"	1.0093712	15' 50.72"	23° 26' 14"	3 m 30 s
11	48° 05' 03"	-0.19"	45° 36' 46"	17° 12' 46"	1.0093812	15' 50.71"	23° 26' 14"	3 m 30 s
12	48° 07' 28"	-0.19"	45° 39' 12"	17° 13' 27"	1.0093912	15' 50.70"	23° 26' 14"	3 m 31 s
13	48° 09' 53"	-0.19"	45° 41' 38"	17° 14' 07"	1.0094012	15' 50.69"	23° 26' 14"	3 m 31 s
14	48° 12' 18"	-0.19"	45° 44' 04"	17° 14' 48"	1.0094112	15' 50.68"	23° 26' 14"	3 m 31 s
15	48° 14' 43"	-0.18"	45° 46' 30"	17° 15' 28"	1.0094211	15' 50.67"	23° 26' 14"	3 m 31 s
16	48° 17' 08"	-0.18"	45° 48' 56"	17° 16' 08"	1.0094311	15' 50.66"	23° 26' 14"	3 m 31 s
17	48° 19' 34"	-0.18"	45° 51' 22"	17° 16' 48"	1.0094411	15' 50.65"	23° 26' 14"	3 m 31 s
18	48° 21' 59"	-0.18"	45° 53' 48"	17° 17' 28"	1.0094510	15' 50.65"	23° 26' 14"	3 m 31 s
19	48° 24' 24"	-0.17"	45° 56' 14"	17° 18' 09"	1.0094610	15' 50.64"	23° 26' 14"	3 m 31 s
20	48° 26' 49"	-0.17"	45° 58' 40"	17° 18' 49"	1.0094709	15' 50.63"	23° 26' 14"	3 m 32 s
21	48° 29' 14"	-0.17"	46° 01' 06"	17° 19' 29"	1.0094809	15' 50.62"	23° 26' 14"	3 m 32 s
22	48° 31' 39"	-0.16"	46° 03' 32"	17° 20' 09"	1.0094908	15' 50.61"	23° 26' 14"	3 m 32 s
23	48° 34' 04"	-0.16"	46° 05' 58"	17° 20' 49"	1.0095007	15' 50.60"	23° 26' 14"	3 m 32 s
24	48° 36' 29"	-0.16"	46° 08' 24"	17° 21' 29"	1.0095107	15' 50.59"	23° 26' 14"	3 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	6° 07' 43"	-4° 44' 29"	7° 30' 08"	-1° 55' 15"	0° 54' 39"	14' 53.56"	61° 21' 18"	0.12746
1	6° 37' 60"	-4° 43' 18"	7° 57' 24"	-1° 42' 14"	0° 54' 38"	14' 53.30"	61° 19' 03"	0.12478
2	7° 08' 16"	-4° 42' 05"	8° 24' 39"	-1° 29' 12"	0° 54' 37"	14' 53.05"	61° 16' 51"	0.12212
3	7° 38' 31"	-4° 40' 51"	8° 51' 52"	-1° 16' 11"	0° 54' 36"	14' 52.80"	61° 14' 43"	0.11948
4	8° 08' 45"	-4° 39' 36"	9° 19' 05"	-1° 03' 09"	0° 54' 35"	14' 52.55"	61° 12' 39"	0.11687
5	8° 38' 58"	-4° 38' 20"	9° 46' 16"	0° -50' 08"	0° 54' 35"	14' 52.31"	61° 10' 39"	0.11429
6	9° 09' 10"	-4° 37' 02"	10° 13' 27"	0° -37' 07"	0° 54' 34"	14' 52.06"	61° 8' 42"	0.11174
7	9° 39' 22"	-4° 35' 44"	10° 40' 37"	0° -24' 06"	0° 54' 33"	14' 51.83"	61° 6' 49"	0.10921
8	10° 09' 32"	-4° 34' 24"	11° 07' 46"	0° -11' 05"	0° 54' 32"	14' 51.59"	61° 4' 59"	0.10671
9	10° 39' 41"	-4° 33' 02"	11° 34' 54"	0° 01' 55"	0° 54' 31"	14' 51.36"	61° 3' 13"	0.10423
10	11° 09' 50"	-4° 31' 40"	12° 02' 01"	0° 14' 55"	0° 54' 30"	14' 51.13"	61° 1' 30"	0.10178
11	11° 39' 57"	-4° 30' 16"	12° 29' 08"	0° 27' 55"	0° 54' 29"	14' 50.90"	60° 59' 50"	0.09936
12	12° 10' 04"	-4° 28' 51"	12° 56' 14"	0° 40' 54"	0° 54' 29"	14' 50.68"	60° 58' 13"	0.09697
13	12° 40' 10"	-4° 27' 25"	13° 23' 20"	0° 53' 53"	0° 54' 28"	14' 50.46"	60° 56' 39"	0.09460
14	13° 10' 15"	-4° 25' 57"	13° 50' 25"	1° 06' 52"	0° 54' 27"	14' 50.25"	60° 55' 08"	0.09226
15	13° 40' 19"	-4° 24' 29"	14° 17' 30"	1° 19' 49"	0° 54' 26"	14' 50.03"	60° 53' 39"	0.08995
16	14° 10' 23"	-4° 22' 59"	14° 44' 34"	1° 32' 46"	0° 54' 25"	14' 49.82"	60° 52' 13"	0.08766
17	14° 40' 25"	-4° 21' 28"	15° 11' 39"	1° 45' 43"	0° 54' 25"	14' 49.61"	60° 50' 49"	0.08540
18	15° 10' 27"	-4° 19' 56"	15° 38' 42"	1° 58' 39"	0° 54' 24"	14' 49.41"	60° 49' 28"	0.08318
19	15° 40' 28"	-4° 18' 23"	16° 05' 46"	2° 11' 34"	0° 54' 23"	14' 49.21"	60° 48' 08"	0.08097
20	16° 10' 28"	-4° 16' 49"	16° 32' 50"	2° 24' 28"	0° 54' 22"	14' 49.01"	60° 46' 50"	0.07880
21	16° 40' 27"	-4° 15' 13"	16° 59' 53"	2° 37' 22"	0° 54' 22"	14' 48.81"	60° 45' 34"	0.07665
22	17° 10' 26"	-4° 13' 36"	17° 26' 57"	2° 50' 14"	0° 54' 21"	14' 48.62"	60° 44' 20"	0.07454
23	17° 40' 24"	-4° 11' 59"	17° 53' 60"	3° 03' 06"	0° 54' 20"	14' 48.43"	60° 43' 07"	0.07245
24	18° 10' 21"	-4° 10' 20"	18° 21' 03"	3° 15' 57"	0° 54' 20"	14' 48.25"	60° 41' 55"	0.07038

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	48° 36' 29"	-0.16"	46° 08' 24"	17° 21' 29"	1.0095107	15' 50.59"	23° 26' 14"	3 m 32 s
1	48° 38' 54"	-0.16"	46° 10' 50"	17° 22' 09"	1.0095206	15' 50.58"	23° 26' 14"	3 m 32 s
2	48° 41' 20"	-0.15"	46° 13' 16"	17° 22' 49"	1.0095305	15' 50.57"	23° 26' 14"	3 m 32 s
3	48° 43' 45"	-0.15"	46° 15' 43"	17° 23' 29"	1.0095404	15' 50.56"	23° 26' 14"	3 m 32 s
4	48° 46' 10"	-0.15"	46° 18' 09"	17° 24' 09"	1.0095503	15' 50.55"	23° 26' 14"	3 m 33 s
5	48° 48' 35"	-0.14"	46° 20' 35"	17° 24' 49"	1.0095601	15' 50.54"	23° 26' 14"	3 m 33 s
6	48° 50' 60"	-0.14"	46° 23' 01"	17° 25' 28"	1.0095700	15' 50.53"	23° 26' 14"	3 m 33 s
7	48° 53' 25"	-0.14"	46° 25' 27"	17° 26' 08"	1.0095799	15' 50.52"	23° 26' 14"	3 m 33 s
8	48° 55' 50"	-0.13"	46° 27' 54"	17° 26' 48"	1.0095898	15' 50.51"	23° 26' 14"	3 m 33 s
9	48° 58' 15"	-0.13"	46° 30' 20"	17° 27' 28"	1.0095996	15' 50.51"	23° 26' 14"	3 m 33 s
10	49° 00' 40"	-0.13"	46° 32' 46"	17° 28' 07"	1.0096095	15' 50.50"	23° 26' 14"	3 m 33 s
11	49° 03' 05"	-0.12"	46° 35' 13"	17° 28' 47"	1.0096193	15' 50.49"	23° 26' 14"	3 m 33 s
12	49° 05' 30"	-0.12"	46° 37' 39"	17° 29' 27"	1.0096291	15' 50.48"	23° 26' 14"	3 m 33 s
13	49° 07' 56"	-0.12"	46° 40' 05"	17° 30' 06"	1.0096390	15' 50.47"	23° 26' 14"	3 m 33 s
14	49° 10' 21"	-0.11"	46° 42' 32"	17° 30' 46"	1.0096488	15' 50.46"	23° 26' 14"	3 m 34 s
15	49° 12' 46"	-0.11"	46° 44' 58"	17° 31' 25"	1.0096586	15' 50.45"	23° 26' 14"	3 m 34 s
16	49° 15' 11"	-0.11"	46° 47' 24"	17° 32' 05"	1.0096684	15' 50.44"	23° 26' 14"	3 m 34 s
17	49° 17' 36"	-0.10"	46° 49' 51"	17° 32' 44"	1.0096782	15' 50.43"	23° 26' 14"	3 m 34 s
18	49° 20' 01"	-0.10"	46° 52' 17"	17° 33' 24"	1.0096880	15' 50.42"	23° 26' 14"	3 m 34 s
19	49° 22' 26"	-0.09"	46° 54' 44"	17° 34' 03"	1.0096978	15' 50.41"	23° 26' 14"	3 m 34 s
20	49° 24' 51"	-0.09"	46° 57' 10"	17° 34' 43"	1.0097076	15' 50.40"	23° 26' 14"	3 m 34 s
21	49° 27' 16"	-0.09"	46° 59' 36"	17° 35' 22"	1.0097174	15' 50.39"	23° 26' 14"	3 m 34 s
22	49° 29' 41"	-0.08"	47° 02' 03"	17° 36' 01"	1.0097271	15' 50.39"	23° 26' 14"	3 m 34 s
23	49° 32' 06"	-0.08"	47° 04' 29"	17° 36' 41"	1.0097369	15' 50.38"	23° 26' 14"	3 m 34 s
24	49° 34' 31"	-0.07"	47° 06' 56"	17° 37' 20"	1.0097466	15' 50.37"	23° 26' 14"	3 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	18° 10' 21"	-4° 10' 20"	18° 21' 03"	3° 15' 57"	0° 54' 20"	14' 48.25"	60° 41' 55"	0.07038
1	18° 40' 17"	-4° 08' 40"	18° 48' 07"	3° 28' 47"	0° 54' 19"	14' 48.06"	60° 40' 43"	0.06835
2	19° 10' 13"	-4° 06' 59"	19° 15' 11"	3° 41' 36"	0° 54' 18"	14' 47.88"	60° 39' 32"	0.06635
3	19° 40' 07"	-4° 05' 16"	19° 42' 15"	3° 54' 23"	0° 54' 18"	14' 47.70"	60° 38' 22"	0.06437
4	20° 10' 02"	-4° 03' 33"	20° 09' 19"	4° 07' 10"	0° 54' 17"	14' 47.53"	60° 37' 12"	0.06242
5	20° 39' 55"	-4° 01' 49"	20° 36' 24"	4° 19' 56"	0° 54' 16"	14' 47.36"	60° 36' 01"	0.06050
6	21° 09' 48"	-4° 00' 03"	21° 03' 29"	4° 32' 40"	0° 54' 16"	14' 47.19"	60° 34' 50"	0.05861
7	21° 39' 40"	-3° 58' 17"	21° 30' 35"	4° 45' 23"	0° 54' 15"	14' 47.02"	60° 33' 38"	0.05675
8	22° 09' 31"	-3° 56' 29"	21° 57' 41"	4° 58' 05"	0° 54' 15"	14' 46.86"	60° 32' 25"	0.05492
9	22° 39' 22"	-3° 54' 40"	22° 24' 48"	5° 10' 45"	0° 54' 14"	14' 46.70"	60° 31' 11"	0.05312
10	23° 09' 12"	-3° 52' 51"	22° 51' 55"	5° 23' 24"	0° 54' 13"	14' 46.54"	60° 29' 54"	0.05134
11	23° 39' 02"	-3° 51' 00"	23° 19' 03"	5° 36' 02"	0° 54' 13"	14' 46.38"	60° 28' 35"	0.04960
12	24° 08' 50"	-3° 49' 08"	23° 46' 11"	5° 48' 38"	0° 54' 12"	14' 46.23"	60° 27' 14"	0.04788
13	24° 38' 39"	-3° 47' 16"	24° 13' 21"	6° 01' 13"	0° 54' 12"	14' 46.08"	60° 25' 49"	0.04620
14	25° 08' 26"	-3° 45' 22"	24° 40' 31"	6° 13' 46"	0° 54' 11"	14' 45.94"	60° 24' 20"	0.04454
15	25° 38' 13"	-3° 43' 27"	25° 07' 42"	6° 26' 18"	0° 54' 11"	14' 45.79"	60° 22' 47"	0.04291
16	26° 07' 60"	-3° 41' 32"	25° 34' 54"	6° 38' 48"	0° 54' 10"	14' 45.65"	60° 21' 09"	0.04131
17	26° 37' 46"	-3° 39' 35"	26° 02' 07"	6° 51' 16"	0° 54' 10"	14' 45.51"	60° 19' 25"	0.03975
18	27° 07' 31"	-3° 37' 37"	26° 29' 21"	7° 03' 43"	0° 54' 09"	14' 45.38"	60° 17' 35"	0.03821
19	27° 37' 15"	-3° 35' 39"	26° 56' 36"	7° 16' 08"	0° 54' 09"	14' 45.24"	60° 15' 38"	0.03670
20	28° 06' 60"	-3° 33' 39"	27° 23' 52"	7° 28' 31"	0° 54' 08"	14' 45.11"	60° 13' 33"	0.03522
21	28° 36' 43"	-3° 31' 39"	27° 51' 09"	7° 40' 52"	0° 54' 08"	14' 44.99"	60° 11' 19"	0.03377
22	29° 06' 26"	-3° 29' 38"	28° 18' 28"	7° 53' 11"	0° 54' 07"	14' 44.86"	60° 8' 55"	0.03235
23	29° 36' 09"	-3° 27' 35"	28° 45' 48"	8° 05' 29"	0° 54' 07"	14' 44.74"	60° 6' 21"	0.03096
24	30° 05' 51"	-3° 25' 32"	29° 13' 09"	8° 17' 44"	0° 54' 06"	14' 44.62"	60° 3' 35"	0.02960

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	49° 34' 31"	-0.07"	47° 06' 56"	17° 37' 20"	1.0097466	15' 50.37"	23° 26' 14"	3 m 35 s
1	49° 36' 56"	-0.07"	47° 09' 22"	17° 37' 59"	1.0097564	15' 50.36"	23° 26' 14"	3 m 35 s
2	49° 39' 21"	-0.07"	47° 11' 49"	17° 38' 38"	1.0097661	15' 50.35"	23° 26' 14"	3 m 35 s
3	49° 41' 46"	-0.06"	47° 14' 15"	17° 39' 18"	1.0097759	15' 50.34"	23° 26' 14"	3 m 35 s
4	49° 44' 11"	-0.06"	47° 16' 42"	17° 39' 57"	1.0097856	15' 50.33"	23° 26' 14"	3 m 35 s
5	49° 46' 36"	-0.05"	47° 19' 09"	17° 40' 36"	1.0097953	15' 50.32"	23° 26' 14"	3 m 35 s
6	49° 49' 01"	-0.05"	47° 21' 35"	17° 41' 15"	1.0098050	15' 50.31"	23° 26' 14"	3 m 35 s
7	49° 51' 26"	-0.05"	47° 24' 02"	17° 41' 54"	1.0098147	15' 50.30"	23° 26' 14"	3 m 35 s
8	49° 53' 51"	-0.04"	47° 26' 28"	17° 42' 33"	1.0098244	15' 50.29"	23° 26' 14"	3 m 35 s
9	49° 56' 16"	-0.04"	47° 28' 55"	17° 43' 12"	1.0098341	15' 50.28"	23° 26' 14"	3 m 35 s
10	49° 58' 41"	-0.03"	47° 31' 22"	17° 43' 51"	1.0098438	15' 50.28"	23° 26' 14"	3 m 35 s
11	50° 01' 06"	-0.03"	47° 33' 48"	17° 44' 30"	1.0098535	15' 50.27"	23° 26' 14"	3 m 35 s
12	50° 03' 32"	-0.02"	47° 36' 15"	17° 45' 09"	1.0098631	15' 50.26"	23° 26' 14"	3 m 36 s
13	50° 05' 57"	-0.02"	47° 38' 42"	17° 45' 48"	1.0098728	15' 50.25"	23° 26' 14"	3 m 36 s
14	50° 08' 22"	-0.02"	47° 41' 08"	17° 46' 27"	1.0098824	15' 50.24"	23° 26' 14"	3 m 36 s
15	50° 10' 47"	-0.01"	47° 43' 35"	17° 47' 05"	1.0098921	15' 50.23"	23° 26' 14"	3 m 36 s
16	50° 13' 12"	-0.01"	47° 46' 02"	17° 47' 44"	1.0099017	15' 50.22"	23° 26' 14"	3 m 36 s
17	50° 15' 37"	-0.00"	47° 48' 29"	17° 48' 23"	1.0099113	15' 50.21"	23° 26' 14"	3 m 36 s
18	50° 18' 02"	0.00"	47° 50' 55"	17° 49' 02"	1.0099210	15' 50.20"	23° 26' 14"	3 m 36 s
19	50° 20' 27"	0.01"	47° 53' 22"	17° 49' 40"	1.0099306	15' 50.19"	23° 26' 14"	3 m 36 s
20	50° 22' 52"	0.01"	47° 55' 49"	17° 50' 19"	1.0099402	15' 50.18"	23° 26' 14"	3 m 36 s
21	50° 25' 17"	0.02"	47° 58' 16"	17° 50' 58"	1.0099498	15' 50.18"	23° 26' 14"	3 m 36 s
22	50° 27' 41"	0.02"	48° 00' 43"	17° 51' 36"	1.0099594	15' 50.17"	23° 26' 14"	3 m 36 s
23	50° 30' 06"	0.03"	48° 03' 09"	17° 52' 15"	1.0099690	15' 50.16"	23° 26' 14"	3 m 36 s
24	50° 32' 31"	0.03"	48° 05' 36"	17° 52' 53"	1.0099786	15' 50.15"	23° 26' 14"	3 m 36 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	30° 05' 51"	-3° 25' 32"	29° 13' 09"	8° 17' 44"	0° 54' 06"	14' 44.62"	60° 3' 35"	0.02960
1	30° 35' 32"	-3° 23' 28"	29° 40' 31"	8° 29' 58"	0° 54' 06"	14' 44.50"	60° 0' 35"	0.02827
2	31° 05' 13"	-3° 21' 23"	30° 07' 55"	8° 42' 09"	0° 54' 05"	14' 44.39"	59° 57' 21"	0.02697
3	31° 34' 54"	-3° 19' 17"	30° 35' 20"	8° 54' 18"	0° 54' 05"	14' 44.28"	59° 53' 51"	0.02570
4	32° 04' 34"	-3° 17' 10"	31° 02' 47"	9° 06' 25"	0° 54' 05"	14' 44.17"	59° 50' 03"	0.02447
5	32° 34' 14"	-3° 15' 03"	31° 30' 15"	9° 18' 30"	0° 54' 04"	14' 44.06"	59° 45' 56"	0.02326
6	33° 03' 53"	-3° 12' 54"	31° 57' 45"	9° 30' 33"	0° 54' 04"	14' 43.96"	59° 41' 27"	0.02208
7	33° 33' 31"	-3° 10' 45"	32° 25' 17"	9° 42' 34"	0° 54' 04"	14' 43.86"	59° 36' 34"	0.02093
8	34° 03' 10"	-3° 08' 35"	32° 52' 50"	9° 54' 32"	0° 54' 03"	14' 43.76"	59° 31' 15"	0.01982
9	34° 32' 47"	-3° 06' 24"	33° 20' 25"	10° 06' 28"	0° 54' 03"	14' 43.67"	59° 25' 27"	0.01873
10	35° 02' 25"	-3° 04' 12"	33° 48' 02"	10° 18' 21"	0° 54' 02"	14' 43.58"	59° 19' 07"	0.01768
11	35° 32' 02"	-3° 01' 59"	34° 15' 40"	10° 30' 12"	0° 54' 02"	14' 43.49"	59° 12' 11"	0.01665
12	36° 01' 38"	-2° 59' 46"	34° 43' 20"	10° 42' 00"	0° 54' 02"	14' 43.40"	59° 4' 36"	0.01566
13	36° 31' 15"	-2° 57' 32"	35° 11' 03"	10° 53' 46"	0° 54' 02"	14' 43.31"	58° 56' 16"	0.01469
14	37° 00' 50"	-2° 55' 17"	35° 38' 47"	11° 05' 29"	0° 54' 01"	14' 43.23"	58° 47' 08"	0.01376
15	37° 30' 26"	-2° 53' 01"	36° 06' 33"	11° 17' 10"	0° 54' 01"	14' 43.15"	58° 37' 06"	0.01286
16	38° 00' 01"	-2° 50' 44"	36° 34' 21"	11° 28' 48"	0° 54' 01"	14' 43.07"	58° 26' 02"	0.01199
17	38° 29' 36"	-2° 48' 27"	37° 02' 11"	11° 40' 23"	0° 54' 00"	14' 43.00"	58° 13' 50"	0.01115
18	38° 59' 10"	-2° 46' 09"	37° 30' 04"	11° 51' 56"	0° 54' 00"	14' 42.93"	58° 0' 21"	0.01034
19	39° 28' 44"	-2° 43' 50"	37° 57' 58"	12° 03' 26"	0° 53' 60"	14' 42.86"	57° 45' 26"	0.00956
20	39° 58' 18"	-2° 41' 31"	38° 25' 55"	12° 14' 53"	0° 53' 60"	14' 42.79"	57° 28' 52"	0.00881
21	40° 27' 51"	-2° 39' 11"	38° 53' 54"	12° 26' 16"	0° 53' 59"	14' 42.73"	57° 10' 26"	0.00810
22	40° 57' 24"	-2° 36' 50"	39° 21' 55"	12° 37' 37"	0° 53' 59"	14' 42.67"	56° 49' 53"	0.00741
23	41° 26' 57"	-2° 34' 28"	39° 49' 58"	12° 48' 56"	0° 53' 59"	14' 42.61"	56° 26' 54"	0.00676
24	41° 56' 30"	-2° 32' 06"	40° 18' 04"	13° 00' 10"	0° 53' 59"	14' 42.55"	56° 1' 06"	0.00613

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	50° 32' 31"	0.03"	48° 05' 36"	17° 52' 53"	1.0099786	15' 50.15"	23° 26' 14"	3 m 36 s
1	50° 34' 56"	0.04"	48° 08' 03"	17° 53' 32"	1.0099881	15' 50.14"	23° 26' 14"	3 m 37 s
2	50° 37' 21"	0.04"	48° 10' 30"	17° 54' 10"	1.0099977	15' 50.13"	23° 26' 14"	3 m 37 s
3	50° 39' 46"	0.04"	48° 12' 57"	17° 54' 49"	1.0100073	15' 50.12"	23° 26' 14"	3 m 37 s
4	50° 42' 11"	0.05"	48° 15' 24"	17° 55' 27"	1.0100168	15' 50.11"	23° 26' 14"	3 m 37 s
5	50° 44' 36"	0.05"	48° 17' 51"	17° 56' 06"	1.0100264	15' 50.10"	23° 26' 14"	3 m 37 s
6	50° 47' 01"	0.06"	48° 20' 18"	17° 56' 44"	1.0100359	15' 50.09"	23° 26' 14"	3 m 37 s
7	50° 49' 26"	0.06"	48° 22' 45"	17° 57' 22"	1.0100454	15' 50.09"	23° 26' 14"	3 m 37 s
8	50° 51' 51"	0.07"	48° 25' 12"	17° 58' 01"	1.0100550	15' 50.08"	23° 26' 14"	3 m 37 s
9	50° 54' 16"	0.07"	48° 27' 39"	17° 58' 39"	1.0100645	15' 50.07"	23° 26' 14"	3 m 37 s
10	50° 56' 41"	0.08"	48° 30' 06"	17° 59' 17"	1.0100740	15' 50.06"	23° 26' 14"	3 m 37 s
11	50° 59' 06"	0.08"	48° 32' 33"	17° 59' 55"	1.0100835	15' 50.05"	23° 26' 14"	3 m 37 s
12	51° 01' 31"	0.09"	48° 34' 60"	18° 00' 33"	1.0100930	15' 50.04"	23° 26' 14"	3 m 37 s
13	51° 03' 56"	0.09"	48° 37' 27"	18° 01' 11"	1.0101025	15' 50.03"	23° 26' 14"	3 m 37 s
14	51° 06' 21"	0.10"	48° 39' 54"	18° 01' 50"	1.0101119	15' 50.02"	23° 26' 14"	3 m 37 s
15	51° 08' 46"	0.10"	48° 42' 21"	18° 02' 28"	1.0101214	15' 50.01"	23° 26' 14"	3 m 37 s
16	51° 11' 11"	0.11"	48° 44' 48"	18° 03' 06"	1.0101309	15' 50.01"	23° 26' 14"	3 m 37 s
17	51° 13' 36"	0.11"	48° 47' 15"	18° 03' 44"	1.0101403	15' 50.00"	23° 26' 14"	3 m 37 s
18	51° 16' 01"	0.12"	48° 49' 42"	18° 04' 22"	1.0101498	15' 49.99"	23° 26' 14"	3 m 38 s
19	51° 18' 26"	0.13"	48° 52' 09"	18° 04' 60"	1.0101592	15' 49.98"	23° 26' 14"	3 m 38 s
20	51° 20' 51"	0.13"	48° 54' 36"	18° 05' 37"	1.0101687	15' 49.97"	23° 26' 14"	3 m 38 s
21	51° 23' 15"	0.14"	48° 57' 04"	18° 06' 15"	1.0101781	15' 49.96"	23° 26' 14"	3 m 38 s
22	51° 25' 40"	0.14"	48° 59' 31"	18° 06' 53"	1.0101875	15' 49.95"	23° 26' 14"	3 m 38 s
23	51° 28' 05"	0.15"	49° 01' 58"	18° 07' 31"	1.0101969	15' 49.94"	23° 26' 14"	3 m 38 s
24	51° 30' 30"	0.15"	49° 04' 25"	18° 08' 09"	1.0102063	15' 49.93"	23° 26' 14"	3 m 38 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	41° 56' 30"	-2° 32' 06"	40° 18' 04"	13° 00' 10"	0° 53' 59"	14' 42.55"	56° 1' 06"	0.00613
1	42° 26' 02"	-2° 29' 43"	40° 46' 12"	13° 11' 22"	0° 53' 59"	14' 42.50"	55° 32' 02"	0.00554
2	42° 55' 34"	-2° 27' 20"	41° 14' 23"	13° 22' 31"	0° 53' 58"	14' 42.45"	54° 59' 10"	0.00498
3	43° 25' 05"	-2° 24' 55"	41° 42' 36"	13° 33' 37"	0° 53' 58"	14' 42.40"	54° 21' 49"	0.00445
4	43° 54' 37"	-2° 22' 31"	42° 10' 52"	13° 44' 39"	0° 53' 58"	14' 42.35"	53° 39' 10"	0.00395
5	44° 24' 08"	-2° 20' 05"	42° 39' 10"	13° 55' 38"	0° 53' 58"	14' 42.31"	52° 50' 12"	0.00349
6	44° 53' 39"	-2° 17' 39"	43° 07' 30"	14° 06' 34"	0° 53' 58"	14' 42.27"	51° 53' 34"	0.00305
7	45° 23' 09"	-2° 15' 12"	43° 35' 53"	14° 17' 26"	0° 53' 58"	14' 42.23"	50° 47' 38"	0.00265
8	45° 52' 40"	-2° 12' 45"	44° 04' 19"	14° 28' 16"	0° 53' 57"	14' 42.19"	49° 30' 13"	0.00227
9	46° 22' 10"	-2° 10' 17"	44° 32' 48"	14° 39' 01"	0° 53' 57"	14' 42.16"	47° 58' 26"	0.00193
10	46° 51' 40"	-2° 07' 49"	45° 01' 19"	14° 49' 43"	0° 53' 57"	14' 42.13"	46° 8' 29"	0.00162
11	47° 21' 10"	-2° 05' 20"	45° 29' 53"	15° 00' 22"	0° 53' 57"	14' 42.10"	43° 55' 10"	0.00134
12	47° 50' 40"	-2° 02' 50"	45° 58' 29"	15° 10' 57"	0° 53' 57"	14' 42.07"	41° 11' 16"	0.00109
13	48° 20' 09"	-2° 00' 20"	46° 27' 09"	15° 21' 28"	0° 53' 57"	14' 42.05"	37° 46' 47"	0.00088
14	48° 49' 39"	-1° 57' 50"	46° 55' 51"	15° 31' 56"	0° 53' 57"	14' 42.03"	33° 27' 38"	0.00069
15	49° 19' 08"	-1° 55' 18"	47° 24' 36"	15° 42' 20"	0° 53' 57"	14' 42.01"	27° 54' 20"	0.00054
16	49° 48' 37"	-1° 52' 47"	47° 53' 24"	15° 52' 40"	0° 53' 57"	14' 41.99"	20° 41' 21"	0.00041
17	50° 18' 06"	-1° 50' 15"	48° 22' 15"	16° 02' 56"	0° 53' 57"	14' 41.98"	11° 19' 45"	0.00032
18	50° 47' 35"	-1° 47' 42"	48° 51' 09"	16° 13' 09"	0° 53' 57"	14' 41.97"	359° 31' 45"	0.00026
19	51° 17' 04"	-1° 45' 09"	49° 20' 06"	16° 23' 17"	0° 53' 57"	14' 41.96"	345° 37' 37"	0.00024
20	51° 46' 32"	-1° 42' 35"	49° 49' 05"	16° 33' 22"	0° 53' 57"	14' 41.95"	330° 58' 23"	0.00024
21	52° 16' 01"	-1° 40' 01"	50° 18' 08"	16° 43' 22"	0° 53' 57"	14' 41.95"	317° 23' 17"	0.00027
22	52° 45' 29"	-1° 37' 26"	50° 47' 14"	16° 53' 19"	0° 53' 57"	14' 41.95"	306° 2' 37"	0.00034
23	53° 14' 58"	-1° 34' 52"	51° 16' 22"	17° 03' 11"	0° 53' 57"	14' 41.95"	297° 7' 20"	0.00044
24	53° 44' 26"	-1° 32' 16"	51° 45' 34"	17° 12' 59"	0° 53' 57"	14' 41.95"	290° 15' 30"	0.00056

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	51° 30' 30"	0.15"	49° 04' 25"	18° 08' 09"	1.0102063	15' 49.93"	23° 26' 14"	3 m 38 s
1	51° 32' 55"	0.16"	49° 06' 52"	18° 08' 47"	1.0102157	15' 49.93"	23° 26' 14"	3 m 38 s
2	51° 35' 20"	0.16"	49° 09' 20"	18° 09' 24"	1.0102251	15' 49.92"	23° 26' 14"	3 m 38 s
3	51° 37' 45"	0.17"	49° 11' 47"	18° 10' 02"	1.0102345	15' 49.91"	23° 26' 14"	3 m 38 s
4	51° 40' 10"	0.17"	49° 14' 14"	18° 10' 40"	1.0102439	15' 49.90"	23° 26' 14"	3 m 38 s
5	51° 42' 35"	0.18"	49° 16' 42"	18° 11' 17"	1.0102533	15' 49.89"	23° 26' 14"	3 m 38 s
6	51° 44' 60"	0.18"	49° 19' 09"	18° 11' 55"	1.0102626	15' 49.88"	23° 26' 14"	3 m 38 s
7	51° 47' 25"	0.19"	49° 21' 36"	18° 12' 32"	1.0102720	15' 49.87"	23° 26' 14"	3 m 38 s
8	51° 49' 49"	0.19"	49° 24' 04"	18° 13' 10"	1.0102813	15' 49.86"	23° 26' 14"	3 m 38 s
9	51° 52' 14"	0.20"	49° 26' 31"	18° 13' 47"	1.0102907	15' 49.86"	23° 26' 14"	3 m 38 s
10	51° 54' 39"	0.21"	49° 28' 58"	18° 14' 25"	1.0103000	15' 49.85"	23° 26' 14"	3 m 38 s
11	51° 57' 04"	0.21"	49° 31' 26"	18° 15' 02"	1.0103093	15' 49.84"	23° 26' 14"	3 m 38 s
12	51° 59' 29"	0.22"	49° 33' 53"	18° 15' 40"	1.0103186	15' 49.83"	23° 26' 14"	3 m 38 s
13	52° 01' 54"	0.22"	49° 36' 20"	18° 16' 17"	1.0103279	15' 49.82"	23° 26' 14"	3 m 38 s
14	52° 04' 19"	0.23"	49° 38' 48"	18° 16' 54"	1.0103372	15' 49.81"	23° 26' 14"	3 m 38 s
15	52° 06' 44"	0.23"	49° 41' 15"	18° 17' 32"	1.0103465	15' 49.80"	23° 26' 14"	3 m 38 s
16	52° 09' 09"	0.24"	49° 43' 43"	18° 18' 09"	1.0103558	15' 49.79"	23° 26' 14"	3 m 38 s
17	52° 11' 33"	0.24"	49° 46' 10"	18° 18' 46"	1.0103651	15' 49.79"	23° 26' 14"	3 m 38 s
18	52° 13' 58"	0.25"	49° 48' 38"	18° 19' 23"	1.0103744	15' 49.78"	23° 26' 14"	3 m 38 s
19	52° 16' 23"	0.25"	49° 51' 05"	18° 20' 01"	1.0103836	15' 49.77"	23° 26' 14"	3 m 38 s
20	52° 18' 48"	0.26"	49° 53' 33"	18° 20' 38"	1.0103929	15' 49.76"	23° 26' 14"	3 m 38 s
21	52° 21' 13"	0.27"	49° 56' 00"	18° 21' 15"	1.0104022	15' 49.75"	23° 26' 14"	3 m 38 s
22	52° 23' 38"	0.27"	49° 58' 28"	18° 21' 52"	1.0104114	15' 49.74"	23° 26' 14"	3 m 39 s
23	52° 26' 03"	0.28"	50° 00' 55"	18° 22' 29"	1.0104206	15' 49.73"	23° 26' 14"	3 m 39 s
24	52° 28' 27"	0.28"	50° 03' 23"	18° 23' 06"	1.0104299	15' 49.72"	23° 26' 14"	3 m 39 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	53° 44' 26"	-1° 32' 16"	51° 45' 34"	17° 12' 59"	0° 53' 57"	14' 41.95"	290° 15' 30"	0.00056
1	54° 13' 54"	-1° 29' 40"	52° 14' 49"	17° 22' 43"	0° 53' 57"	14' 41.96"	284° 58' 28"	0.00072
2	54° 43' 22"	-1° 27' 04"	52° 44' 07"	17° 32' 23"	0° 53' 57"	14' 41.97"	280° 51' 46"	0.00091
3	55° 12' 50"	-1° 24' 27"	53° 13' 28"	17° 41' 58"	0° 53' 57"	14' 41.98"	277° 36' 58"	0.00114
4	55° 42' 18"	-1° 21' 50"	53° 42' 53"	17° 51' 30"	0° 53' 57"	14' 42.00"	275° 0' 51"	0.00139
5	56° 11' 46"	-1° 19' 13"	54° 12' 20"	18° 00' 56"	0° 53' 57"	14' 42.01"	272° 53' 59"	0.00168
6	56° 41' 14"	-1° 16' 35"	54° 41' 51"	18° 10' 19"	0° 53' 57"	14' 42.03"	271° 9' 37"	0.00199
7	57° 10' 42"	-1° 13' 57"	55° 11' 25"	18° 19' 36"	0° 53' 57"	14' 42.05"	269° 42' 50"	0.00234
8	57° 40' 10"	-1° 11' 19"	55° 41' 02"	18° 28' 50"	0° 53' 57"	14' 42.08"	268° 29' 60"	0.00272
9	58° 09' 38"	-1° 08' 40"	56° 10' 42"	18° 37' 58"	0° 53' 57"	14' 42.10"	267° 28' 23"	0.00313
10	58° 39' 06"	-1° 06' 01"	56° 40' 26"	18° 47' 03"	0° 53' 57"	14' 42.13"	266° 35' 57"	0.00357
11	59° 08' 34"	-1° 03' 22"	57° 10' 13"	18° 56' 02"	0° 53' 57"	14' 42.17"	265° 51' 05"	0.00404
12	59° 38' 02"	-1° 00' 42"	57° 40' 03"	19° 04' 57"	0° 53' 57"	14' 42.20"	265° 12' 31"	0.00455
13	60° 07' 31"	0°-58' 02"	58° 09' 56"	19° 13' 47"	0° 53' 58"	14' 42.24"	264° 39' 17"	0.00508
14	60° 36' 59"	0°-55' 22"	58° 39' 53"	19° 22' 32"	0° 53' 58"	14' 42.28"	264° 10' 35"	0.00565
15	61° 06' 27"	0°-52' 41"	59° 09' 53"	19° 31' 12"	0° 53' 58"	14' 42.32"	263° 45' 46"	0.00625
16	61° 35' 56"	0°-50' 00"	59° 39' 57"	19° 39' 47"	0° 53' 58"	14' 42.36"	263° 24' 19"	0.00687
17	62° 05' 24"	0°-47' 19"	60° 10' 04"	19° 48' 18"	0° 53' 58"	14' 42.41"	263° 5' 47"	0.00753
18	62° 34' 53"	0°-44' 38"	60° 40' 14"	19° 56' 43"	0° 53' 58"	14' 42.46"	262° 49' 49"	0.00822
19	63° 04' 21"	0°-41' 57"	61° 10' 27"	20° 05' 03"	0° 53' 59"	14' 42.51"	262° 36' 06"	0.00895
20	63° 33' 50"	0°-39' 15"	61° 40' 44"	20° 13' 18"	0° 53' 59"	14' 42.57"	262° 24' 24"	0.00970
21	64° 03' 19"	0°-36' 33"	62° 11' 04"	20° 21' 28"	0° 53' 59"	14' 42.62"	262° 14' 29"	0.01048
22	64° 32' 48"	0°-33' 51"	62° 41' 28"	20° 29' 33"	0° 53' 59"	14' 42.68"	262° 6' 10"	0.01130
23	65° 02' 17"	0°-31' 09"	63° 11' 55"	20° 37' 33"	0° 53' 59"	14' 42.75"	261° 59' 17"	0.01214
24	65° 31' 47"	0°-28' 27"	63° 42' 25"	20° 45' 27"	0° 53' 60"	14' 42.81"	261° 53' 41"	0.01302

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	52° 28' 27"	0.28"	50° 03' 23"	18° 23' 06"	1.0104299	15' 49.72"	23° 26' 14"	3 m 39 s
1	52° 30' 52"	0.29"	50° 05' 50"	18° 23' 43"	1.0104391	15' 49.72"	23° 26' 14"	3 m 39 s
2	52° 33' 17"	0.29"	50° 08' 18"	18° 24' 20"	1.0104483	15' 49.71"	23° 26' 14"	3 m 39 s
3	52° 35' 42"	0.30"	50° 10' 46"	18° 24' 57"	1.0104575	15' 49.70"	23° 26' 14"	3 m 39 s
4	52° 38' 07"	0.30"	50° 13' 13"	18° 25' 34"	1.0104667	15' 49.69"	23° 26' 14"	3 m 39 s
5	52° 40' 32"	0.31"	50° 15' 41"	18° 26' 10"	1.0104759	15' 49.68"	23° 26' 14"	3 m 39 s
6	52° 42' 56"	0.32"	50° 18' 09"	18° 26' 47"	1.0104851	15' 49.67"	23° 26' 14"	3 m 39 s
7	52° 45' 21"	0.32"	50° 20' 36"	18° 27' 24"	1.0104942	15' 49.66"	23° 26' 14"	3 m 39 s
8	52° 47' 46"	0.33"	50° 23' 04"	18° 28' 01"	1.0105034	15' 49.66"	23° 26' 14"	3 m 39 s
9	52° 50' 11"	0.33"	50° 25' 32"	18° 28' 38"	1.0105126	15' 49.65"	23° 26' 14"	3 m 39 s
10	52° 52' 36"	0.34"	50° 27' 59"	18° 29' 14"	1.0105217	15' 49.64"	23° 26' 14"	3 m 39 s
11	52° 55' 01"	0.34"	50° 30' 27"	18° 29' 51"	1.0105309	15' 49.63"	23° 26' 14"	3 m 39 s
12	52° 57' 25"	0.35"	50° 32' 55"	18° 30' 27"	1.0105400	15' 49.62"	23° 26' 14"	3 m 39 s
13	52° 59' 50"	0.35"	50° 35' 23"	18° 31' 04"	1.0105492	15' 49.61"	23° 26' 14"	3 m 39 s
14	53° 02' 15"	0.36"	50° 37' 50"	18° 31' 41"	1.0105583	15' 49.60"	23° 26' 14"	3 m 39 s
15	53° 04' 40"	0.37"	50° 40' 18"	18° 32' 17"	1.0105674	15' 49.60"	23° 26' 14"	3 m 39 s
16	53° 07' 05"	0.37"	50° 42' 46"	18° 32' 54"	1.0105765	15' 49.59"	23° 26' 14"	3 m 39 s
17	53° 09' 29"	0.38"	50° 45' 14"	18° 33' 30"	1.0105856	15' 49.58"	23° 26' 14"	3 m 39 s
18	53° 11' 54"	0.38"	50° 47' 42"	18° 34' 07"	1.0105947	15' 49.57"	23° 26' 14"	3 m 39 s
19	53° 14' 19"	0.39"	50° 50' 10"	18° 34' 43"	1.0106038	15' 49.56"	23° 26' 14"	3 m 39 s
20	53° 16' 44"	0.39"	50° 52' 37"	18° 35' 19"	1.0106129	15' 49.55"	23° 26' 14"	3 m 39 s
21	53° 19' 09"	0.40"	50° 55' 05"	18° 35' 56"	1.0106219	15' 49.54"	23° 26' 14"	3 m 39 s
22	53° 21' 33"	0.40"	50° 57' 33"	18° 36' 32"	1.0106310	15' 49.54"	23° 26' 14"	3 m 39 s
23	53° 23' 58"	0.41"	51° 00' 01"	18° 37' 08"	1.0106401	15' 49.53"	23° 26' 14"	3 m 39 s
24	53° 26' 23"	0.41"	51° 02' 29"	18° 37' 44"	1.0106491	15' 49.52"	23° 26' 14"	3 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	65° 31' 47"	0°-28' 27"	63° 42' 25"	20° 45' 27"	0° 53' 60"	14' 42.81"	261° 53' 41"	0.01302
1	66° 01' 16"	0°-25' 44"	64° 12' 59"	20° 53' 16"	0° 53' 60"	14' 42.88"	261° 49' 17"	0.01392
2	66° 30' 46"	0°-23' 01"	64° 43' 36"	21° 00' 60"	0° 54' 00"	14' 42.95"	261° 45' 57"	0.01486
3	67° 00' 16"	0°-20' 18"	65° 14' 17"	21° 08' 38"	0° 54' 00"	14' 43.02"	261° 43' 36"	0.01583
4	67° 29' 46"	0°-17' 36"	65° 45' 01"	21° 16' 11"	0° 54' 01"	14' 43.10"	261° 42' 09"	0.01683
5	67° 59' 17"	0°-14' 53"	66° 15' 48"	21° 23' 38"	0° 54' 01"	14' 43.18"	261° 41' 31"	0.01786
6	68° 28' 47"	0°-12' 09"	66° 46' 39"	21° 30' 60"	0° 54' 01"	14' 43.26"	261° 41' 40"	0.01892
7	68° 58' 18"	0° -9' 26"	67° 17' 33"	21° 38' 16"	0° 54' 02"	14' 43.34"	261° 42' 30"	0.02001
8	69° 27' 49"	0° -6' 43"	67° 48' 30"	21° 45' 26"	0° 54' 02"	14' 43.43"	261° 44' 00"	0.02113
9	69° 57' 21"	0° -4' 02"	68° 19' 31"	21° 52' 29"	0° 54' 02"	14' 43.52"	261° 46' 15"	0.02228
10	70° 26' 53"	0° -1' 19"	68° 50' 35"	21° 59' 28"	0° 54' 03"	14' 43.61"	261° 48' 55"	0.02346
11	70° 56' 25"	0° 01' 25"	69° 21' 43"	22° 06' 21"	0° 54' 03"	14' 43.70"	261° 52' 07"	0.02467
12	71° 25' 57"	0° 04' 08"	69° 52' 53"	22° 13' 08"	0° 54' 03"	14' 43.80"	261° 55' 49"	0.02591
13	71° 55' 29"	0° 06' 52"	70° 24' 07"	22° 19' 50"	0° 54' 04"	14' 43.90"	261° 59' 59"	0.02719
14	72° 25' 02"	0° 09' 35"	70° 55' 25"	22° 26' 25"	0° 54' 04"	14' 44.00"	262° 4' 35"	0.02849
15	72° 54' 35"	0° 12' 19"	71° 26' 45"	22° 32' 55"	0° 54' 04"	14' 44.11"	262° 9' 36"	0.02982
16	73° 24' 09"	0° 15' 02"	71° 58' 09"	22° 39' 18"	0° 54' 05"	14' 44.21"	262° 15' 00"	0.03118
17	73° 53' 43"	0° 17' 46"	72° 29' 36"	22° 45' 36"	0° 54' 05"	14' 44.33"	262° 20' 47"	0.03257
18	74° 23' 17"	0° 20' 29"	73° 01' 07"	22° 51' 47"	0° 54' 06"	14' 44.44"	262° 26' 54"	0.03400
19	74° 52' 51"	0° 23' 13"	73° 32' 40"	22° 57' 53"	0° 54' 06"	14' 44.55"	262° 33' 22"	0.03545
20	75° 22' 26"	0° 25' 56"	74° 04' 17"	23° 03' 52"	0° 54' 07"	14' 44.67"	262° 40' 08"	0.03693
21	75° 52' 02"	0° 28' 39"	74° 35' 57"	23° 09' 45"	0° 54' 07"	14' 44.80"	262° 47' 12"	0.03844
22	76° 21' 38"	0° 31' 22"	75° 07' 40"	23° 15' 32"	0° 54' 07"	14' 44.92"	262° 54' 33"	0.03998
23	76° 51' 14"	0° 34' 05"	75° 39' 27"	23° 21' 12"	0° 54' 08"	14' 45.05"	263° 2' 10"	0.04155
24	77° 20' 50"	0° 36' 48"	76° 11' 16"	23° 26' 46"	0° 54' 08"	14' 45.18"	263° 10' 03"	0.04315

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	53° 26' 23"	0.41"	51° 02' 29"	18° 37' 44"	1.0106491	15' 49.52"	23° 26' 14"	3 m 39 s
1	53° 28' 48"	0.42"	51° 04' 57"	18° 38' 21"	1.0106581	15' 49.51"	23° 26' 14"	3 m 39 s
2	53° 31' 13"	0.43"	51° 07' 25"	18° 38' 57"	1.0106672	15' 49.50"	23° 26' 14"	3 m 39 s
3	53° 33' 37"	0.43"	51° 09' 53"	18° 39' 33"	1.0106762	15' 49.49"	23° 26' 14"	3 m 39 s
4	53° 36' 02"	0.44"	51° 12' 21"	18° 40' 09"	1.0106852	15' 49.48"	23° 26' 14"	3 m 39 s
5	53° 38' 27"	0.44"	51° 14' 49"	18° 40' 45"	1.0106942	15' 49.48"	23° 26' 14"	3 m 39 s
6	53° 40' 52"	0.45"	51° 17' 17"	18° 41' 21"	1.0107032	15' 49.47"	23° 26' 14"	3 m 39 s
7	53° 43' 16"	0.45"	51° 19' 45"	18° 41' 57"	1.0107122	15' 49.46"	23° 26' 14"	3 m 39 s
8	53° 45' 41"	0.46"	51° 22' 13"	18° 42' 33"	1.0107212	15' 49.45"	23° 26' 14"	3 m 39 s
9	53° 48' 06"	0.46"	51° 24' 41"	18° 43' 09"	1.0107302	15' 49.44"	23° 26' 14"	3 m 39 s
10	53° 50' 31"	0.47"	51° 27' 09"	18° 43' 45"	1.0107392	15' 49.43"	23° 26' 14"	3 m 39 s
11	53° 52' 55"	0.47"	51° 29' 37"	18° 44' 21"	1.0107482	15' 49.43"	23° 26' 14"	3 m 39 s
12	53° 55' 20"	0.48"	51° 32' 05"	18° 44' 57"	1.0107571	15' 49.42"	23° 26' 14"	3 m 39 s
13	53° 57' 45"	0.49"	51° 34' 33"	18° 45' 32"	1.0107661	15' 49.41"	23° 26' 14"	3 m 39 s
14	54° 00' 10"	0.49"	51° 37' 02"	18° 46' 08"	1.0107750	15' 49.40"	23° 26' 14"	3 m 39 s
15	54° 02' 34"	0.50"	51° 39' 30"	18° 46' 44"	1.0107840	15' 49.39"	23° 26' 14"	3 m 39 s
16	54° 04' 59"	0.50"	51° 41' 58"	18° 47' 20"	1.0107929	15' 49.38"	23° 26' 14"	3 m 39 s
17	54° 07' 24"	0.51"	51° 44' 26"	18° 47' 55"	1.0108018	15' 49.38"	23° 26' 14"	3 m 39 s
18	54° 09' 49"	0.51"	51° 46' 54"	18° 48' 31"	1.0108107	15' 49.37"	23° 26' 14"	3 m 39 s
19	54° 12' 13"	0.52"	51° 49' 23"	18° 49' 07"	1.0108196	15' 49.36"	23° 26' 14"	3 m 39 s
20	54° 14' 38"	0.52"	51° 51' 51"	18° 49' 42"	1.0108285	15' 49.35"	23° 26' 14"	3 m 38 s
21	54° 17' 03"	0.53"	51° 54' 19"	18° 50' 18"	1.0108374	15' 49.34"	23° 26' 14"	3 m 38 s
22	54° 19' 28"	0.53"	51° 56' 47"	18° 50' 53"	1.0108463	15' 49.33"	23° 26' 14"	3 m 38 s
23	54° 21' 52"	0.54"	51° 59' 15"	18° 51' 29"	1.0108552	15' 49.32"	23° 26' 14"	3 m 38 s
24	54° 24' 17"	0.54"	52° 01' 44"	18° 52' 04"	1.0108641	15' 49.32"	23° 26' 14"	3 m 38 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	77° 20' 50"	0° 36' 48"	76° 11' 16"	23° 26' 46"	0° 54' 08"	14' 45.18"	263° 10' 03"	0.04315
1	77° 50' 27"	0° 39' 31"	76° 43' 09"	23° 32' 14"	0° 54' 09"	14' 45.31"	263° 18' 11"	0.04478
2	78° 20' 05"	0° 42' 14"	77° 15' 04"	23° 37' 35"	0° 54' 09"	14' 45.44"	263° 26' 33"	0.04644
3	78° 49' 43"	0° 44' 56"	77° 47' 03"	23° 42' 50"	0° 54' 10"	14' 45.58"	263° 35' 09"	0.04813
4	79° 19' 21"	0° 47' 39"	78° 19' 05"	23° 47' 58"	0° 54' 10"	14' 45.72"	263° 43' 57"	0.04985
5	79° 49' 00"	0° 50' 21"	78° 51' 10"	23° 52' 60"	0° 54' 11"	14' 45.87"	263° 52' 58"	0.05159
6	80° 18' 40"	0° 53' 03"	79° 23' 17"	23° 57' 55"	0° 54' 11"	14' 46.02"	264° 2' 12"	0.05337
7	80° 48' 20"	0° 55' 45"	79° 55' 28"	24° 02' 44"	0° 54' 12"	14' 46.17"	264° 11' 36"	0.05517
8	81° 18' 00"	0° 58' 27"	80° 27' 41"	24° 07' 25"	0° 54' 13"	14' 46.32"	264° 21' 12"	0.05701
9	81° 47' 41"	1° 01' 08"	80° 59' 58"	24° 12' 01"	0° 54' 13"	14' 46.47"	264° 30' 58"	0.05887
10	82° 17' 23"	1° 03' 49"	81° 32' 17"	24° 16' 29"	0° 54' 14"	14' 46.63"	264° 40' 55"	0.06076
11	82° 47' 05"	1° 06' 30"	82° 04' 39"	24° 20' 51"	0° 54' 14"	14' 46.79"	264° 51' 01"	0.06268
12	83° 16' 48"	1° 09' 11"	82° 37' 04"	24° 25' 06"	0° 54' 15"	14' 46.96"	265° 1' 17"	0.06463
13	83° 46' 31"	1° 11' 52"	83° 09' 31"	24° 29' 14"	0° 54' 16"	14' 47.13"	265° 11' 42"	0.06660
14	84° 16' 15"	1° 14' 32"	83° 42' 02"	24° 33' 15"	0° 54' 16"	14' 47.30"	265° 22' 16"	0.06861
15	84° 45' 59"	1° 17' 12"	84° 14' 35"	24° 37' 10"	0° 54' 17"	14' 47.47"	265° 32' 58"	0.07064
16	85° 15' 45"	1° 19' 52"	84° 47' 10"	24° 40' 57"	0° 54' 17"	14' 47.64"	265° 43' 48"	0.07270
17	85° 45' 30"	1° 22' 31"	85° 19' 48"	24° 44' 38"	0° 54' 18"	14' 47.82"	265° 54' 47"	0.07479
18	86° 15' 17"	1° 25' 10"	85° 52' 29"	24° 48' 11"	0° 54' 19"	14' 48.01"	266° 5' 53"	0.07691
19	86° 45' 04"	1° 27' 49"	86° 25' 12"	24° 51' 38"	0° 54' 19"	14' 48.19"	266° 17' 06"	0.07906
20	87° 14' 52"	1° 30' 27"	86° 57' 58"	24° 54' 57"	0° 54' 20"	14' 48.38"	266° 28' 27"	0.08123
21	87° 44' 40"	1° 33' 05"	87° 30' 46"	24° 58' 09"	0° 54' 21"	14' 48.57"	266° 39' 54"	0.08343
22	88° 14' 29"	1° 35' 43"	88° 03' 36"	25° 01' 14"	0° 54' 22"	14' 48.76"	266° 51' 28"	0.08566
23	88° 44' 19"	1° 38' 20"	88° 36' 29"	25° 04' 12"	0° 54' 22"	14' 48.96"	267° 3' 08"	0.08792
24	89° 14' 10"	1° 40' 57"	89° 09' 24"	25° 07' 03"	0° 54' 23"	14' 49.16"	267° 14' 54"	0.09020

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	54° 24' 17"	0.54"	52° 01' 44"	18° 52' 04"	1.0108641	15' 49.32"	23° 26' 14"	3 m 38 s
1	54° 26' 42"	0.55"	52° 04' 12"	18° 52' 39"	1.0108729	15' 49.31"	23° 26' 14"	3 m 38 s
2	54° 29' 06"	0.55"	52° 06' 40"	18° 53' 15"	1.0108818	15' 49.30"	23° 26' 14"	3 m 38 s
3	54° 31' 31"	0.56"	52° 09' 09"	18° 53' 50"	1.0108906	15' 49.29"	23° 26' 14"	3 m 38 s
4	54° 33' 56"	0.56"	52° 11' 37"	18° 54' 25"	1.0108995	15' 49.28"	23° 26' 14"	3 m 38 s
5	54° 36' 21"	0.57"	52° 14' 05"	18° 55' 01"	1.0109083	15' 49.28"	23° 26' 14"	3 m 38 s
6	54° 38' 45"	0.57"	52° 16' 34"	18° 55' 36"	1.0109171	15' 49.27"	23° 26' 14"	3 m 38 s
7	54° 41' 10"	0.58"	52° 19' 02"	18° 56' 11"	1.0109260	15' 49.26"	23° 26' 14"	3 m 38 s
8	54° 43' 35"	0.58"	52° 21' 31"	18° 56' 46"	1.0109348	15' 49.25"	23° 26' 14"	3 m 38 s
9	54° 45' 59"	0.59"	52° 23' 59"	18° 57' 21"	1.0109436	15' 49.24"	23° 26' 14"	3 m 38 s
10	54° 48' 24"	0.59"	52° 26' 27"	18° 57' 57"	1.0109524	15' 49.23"	23° 26' 14"	3 m 38 s
11	54° 50' 49"	0.60"	52° 28' 56"	18° 58' 32"	1.0109612	15' 49.23"	23° 26' 14"	3 m 38 s
12	54° 53' 13"	0.60"	52° 31' 24"	18° 59' 07"	1.0109699	15' 49.22"	23° 26' 14"	3 m 38 s
13	54° 55' 38"	0.61"	52° 33' 53"	18° 59' 42"	1.0109787	15' 49.21"	23° 26' 14"	3 m 38 s
14	54° 58' 03"	0.61"	52° 36' 21"	19° 00' 17"	1.0109875	15' 49.20"	23° 26' 14"	3 m 38 s
15	55° 00' 27"	0.62"	52° 38' 50"	19° 00' 52"	1.0109963	15' 49.19"	23° 26' 14"	3 m 38 s
16	55° 02' 52"	0.62"	52° 41' 18"	19° 01' 26"	1.0110050	15' 49.18"	23° 26' 14"	3 m 38 s
17	55° 05' 17"	0.63"	52° 43' 47"	19° 02' 01"	1.0110138	15' 49.18"	23° 26' 14"	3 m 38 s
18	55° 07' 41"	0.63"	52° 46' 15"	19° 02' 36"	1.0110225	15' 49.17"	23° 26' 14"	3 m 38 s
19	55° 10' 06"	0.64"	52° 48' 44"	19° 03' 11"	1.0110312	15' 49.16"	23° 26' 14"	3 m 38 s
20	55° 12' 31"	0.64"	52° 51' 12"	19° 03' 46"	1.0110399	15' 49.15"	23° 26' 14"	3 m 38 s
21	55° 14' 55"	0.65"	52° 53' 41"	19° 04' 20"	1.0110487	15' 49.14"	23° 26' 14"	3 m 38 s
22	55° 17' 20"	0.65"	52° 56' 10"	19° 04' 55"	1.0110574	15' 49.14"	23° 26' 14"	3 m 38 s
23	55° 19' 45"	0.66"	52° 58' 38"	19° 05' 30"	1.0110661	15' 49.13"	23° 26' 14"	3 m 38 s
24	55° 22' 09"	0.66"	53° 01' 07"	19° 06' 04"	1.0110748	15' 49.12"	23° 26' 14"	3 m 37 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	89° 14' 10"	1° 40' 57"	89° 09' 24"	25° 07' 03"	0° 54' 23"	14' 49.16"	267° 14' 54"	0.09020
1	89° 44' 01"	1° 43' 34"	89° 42' 21"	25° 09' 47"	0° 54' 24"	14' 49.37"	267° 26' 47"	0.09251
2	90° 13' 53"	1° 46' 10"	90° 15' 21"	25° 12' 23"	0° 54' 24"	14' 49.57"	267° 38' 45"	0.09485
3	90° 43' 46"	1° 48' 46"	90° 48' 22"	25° 14' 53"	0° 54' 25"	14' 49.78"	267° 50' 48"	0.09721
4	91° 13' 40"	1° 51' 21"	91° 21' 26"	25° 17' 14"	0° 54' 26"	14' 49.99"	268° 2' 57"	0.09961
5	91° 43' 35"	1° 53' 56"	91° 54' 32"	25° 19' 29"	0° 54' 27"	14' 50.21"	268° 15' 11"	0.10202
6	92° 13' 30"	1° 56' 30"	92° 27' 40"	25° 21' 36"	0° 54' 28"	14' 50.43"	268° 27' 30"	0.10447
7	92° 43' 26"	1° 59' 04"	93° 00' 49"	25° 23' 36"	0° 54' 28"	14' 50.65"	268° 39' 53"	0.10694
8	93° 13' 23"	2° 01' 38"	93° 34' 01"	25° 25' 28"	0° 54' 29"	14' 50.88"	268° 52' 21"	0.10944
9	93° 43' 21"	2° 04' 11"	94° 07' 14"	25° 27' 13"	0° 54' 30"	14' 51.10"	269° 4' 54"	0.11197
10	94° 13' 20"	2° 06' 44"	94° 40' 30"	25° 28' 51"	0° 54' 31"	14' 51.34"	269° 17' 30"	0.11452
11	94° 43' 19"	2° 09' 16"	95° 13' 47"	25° 30' 21"	0° 54' 32"	14' 51.57"	269° 30' 11"	0.11710
12	95° 13' 20"	2° 11' 47"	95° 47' 05"	25° 31' 44"	0° 54' 33"	14' 51.81"	269° 42' 55"	0.11970
13	95° 43' 21"	2° 14' 18"	96° 20' 26"	25° 32' 59"	0° 54' 34"	14' 52.05"	269° 55' 43"	0.12233
14	96° 13' 24"	2° 16' 48"	96° 53' 47"	25° 34' 07"	0° 54' 34"	14' 52.29"	270° 8' 35"	0.12499
15	96° 43' 27"	2° 19' 18"	97° 27' 11"	25° 35' 07"	0° 54' 35"	14' 52.54"	270° 21' 30"	0.12767
16	97° 13' 31"	2° 21' 48"	98° 00' 36"	25° 35' 59"	0° 54' 36"	14' 52.79"	270° 34' 28"	0.13038
17	97° 43' 37"	2° 24' 16"	98° 34' 02"	25° 36' 44"	0° 54' 37"	14' 53.05"	270° 47' 29"	0.13311
18	98° 13' 43"	2° 26' 45"	99° 07' 30"	25° 37' 22"	0° 54' 38"	14' 53.30"	271° 0' 33"	0.13587
19	98° 43' 50"	2° 29' 12"	99° 40' 59"	25° 37' 52"	0° 54' 39"	14' 53.57"	271° 13' 40"	0.13866
20	99° 13' 58"	2° 31' 39"	100° 14' 29"	25° 38' 14"	0° 54' 40"	14' 53.83"	271° 26' 49"	0.14147
21	99° 44' 08"	2° 34' 06"	100° 48' 00"	25° 38' 28"	0° 54' 41"	14' 54.10"	271° 40' 01"	0.14430
22	100° 14' 18"	2° 36' 31"	101° 21' 33"	25° 38' 35"	0° 54' 42"	14' 54.37"	271° 53' 15"	0.14716
23	100° 44' 30"	2° 38' 56"	101° 55' 07"	25° 38' 35"	0° 54' 43"	14' 54.64"	272° 6' 31"	0.15005
24	101° 14' 42"	2° 41' 21"	102° 28' 41"	25° 38' 26"	0° 54' 44"	14' 54.92"	272° 19' 50"	0.15296

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	55° 22' 09"	0.66"	53° 01' 07"	19° 06' 04"	1.0110748	15' 49.12"	23° 26' 14"	3 m 37 s
1	55° 24' 34"	0.66"	53° 03' 35"	19° 06' 39"	1.0110835	15' 49.11"	23° 26' 14"	3 m 37 s
2	55° 26' 59"	0.67"	53° 06' 04"	19° 07' 14"	1.0110921	15' 49.10"	23° 26' 14"	3 m 37 s
3	55° 29' 23"	0.67"	53° 08' 33"	19° 07' 48"	1.0111008	15' 49.09"	23° 26' 14"	3 m 37 s
4	55° 31' 48"	0.68"	53° 11' 01"	19° 08' 23"	1.0111095	15' 49.09"	23° 26' 14"	3 m 37 s
5	55° 34' 13"	0.68"	53° 13' 30"	19° 08' 57"	1.0111181	15' 49.08"	23° 26' 14"	3 m 37 s
6	55° 36' 37"	0.69"	53° 15' 59"	19° 09' 32"	1.0111268	15' 49.07"	23° 26' 14"	3 m 37 s
7	55° 39' 02"	0.69"	53° 18' 28"	19° 10' 06"	1.0111354	15' 49.06"	23° 26' 14"	3 m 37 s
8	55° 41' 26"	0.70"	53° 20' 56"	19° 10' 40"	1.0111441	15' 49.05"	23° 26' 14"	3 m 37 s
9	55° 43' 51"	0.70"	53° 23' 25"	19° 11' 15"	1.0111527	15' 49.05"	23° 26' 14"	3 m 37 s
10	55° 46' 16"	0.70"	53° 25' 54"	19° 11' 49"	1.0111613	15' 49.04"	23° 26' 14"	3 m 37 s
11	55° 48' 40"	0.71"	53° 28' 23"	19° 12' 23"	1.0111699	15' 49.03"	23° 26' 14"	3 m 37 s
12	55° 51' 05"	0.71"	53° 30' 51"	19° 12' 57"	1.0111786	15' 49.02"	23° 26' 14"	3 m 37 s
13	55° 53' 30"	0.72"	53° 33' 20"	19° 13' 32"	1.0111872	15' 49.01"	23° 26' 14"	3 m 37 s
14	55° 55' 54"	0.72"	53° 35' 49"	19° 14' 06"	1.0111958	15' 49.01"	23° 26' 14"	3 m 37 s
15	55° 58' 19"	0.72"	53° 38' 18"	19° 14' 40"	1.0112043	15' 49.00"	23° 26' 14"	3 m 37 s
16	56° 00' 43"	0.73"	53° 40' 47"	19° 15' 14"	1.0112129	15' 48.99"	23° 26' 14"	3 m 37 s
17	56° 03' 08"	0.73"	53° 43' 16"	19° 15' 48"	1.0112215	15' 48.98"	23° 26' 14"	3 m 36 s
18	56° 05' 33"	0.74"	53° 45' 44"	19° 16' 22"	1.0112301	15' 48.97"	23° 26' 14"	3 m 36 s
19	56° 07' 57"	0.74"	53° 48' 13"	19° 16' 56"	1.0112386	15' 48.96"	23° 26' 14"	3 m 36 s
20	56° 10' 22"	0.74"	53° 50' 42"	19° 17' 30"	1.0112472	15' 48.96"	23° 26' 14"	3 m 36 s
21	56° 12' 46"	0.75"	53° 53' 11"	19° 18' 04"	1.0112557	15' 48.95"	23° 26' 14"	3 m 36 s
22	56° 15' 11"	0.75"	53° 55' 40"	19° 18' 38"	1.0112643	15' 48.94"	23° 26' 14"	3 m 36 s
23	56° 17' 35"	0.76"	53° 58' 09"	19° 19' 12"	1.0112728	15' 48.93"	23° 26' 14"	3 m 36 s
24	56° 20' 00"	0.76"	54° 00' 38"	19° 19' 45"	1.0112813	15' 48.92"	23° 26' 14"	3 m 36 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	101° 14' 42"	2° 41' 21"	102° 28' 41"	25° 38' 26"	0° 54' 44"	14' 54.92"	272° 19' 50"	0.15296
1	101° 44' 56"	2° 43' 45"	103° 02' 17"	25° 38' 10"	0° 54' 45"	14' 55.20"	272° 33' 10"	0.15589
2	102° 15' 10"	2° 46' 08"	103° 35' 54"	25° 37' 46"	0° 54' 46"	14' 55.48"	272° 46' 32"	0.15885
3	102° 45' 26"	2° 48' 30"	104° 09' 31"	25° 37' 15"	0° 54' 47"	14' 55.77"	272° 59' 55"	0.16183
4	103° 15' 43"	2° 50' 52"	104° 43' 09"	25° 36' 36"	0° 54' 48"	14' 56.06"	273° 13' 20"	0.16484
5	103° 46' 01"	2° 53' 13"	105° 16' 48"	25° 35' 49"	0° 54' 49"	14' 56.35"	273° 26' 46"	0.16787
6	104° 16' 21"	2° 55' 33"	105° 50' 28"	25° 34' 54"	0° 54' 50"	14' 56.65"	273° 40' 14"	0.17092
7	104° 46' 41"	2° 57' 53"	106° 24' 08"	25° 33' 52"	0° 54' 52"	14' 56.95"	273° 53' 42"	0.17400
8	105° 17' 03"	3° 00' 11"	106° 57' 49"	25° 32' 42"	0° 54' 53"	14' 57.26"	274° 7' 12"	0.17710
9	105° 47' 26"	3° 02' 29"	107° 31' 30"	25° 31' 24"	0° 54' 54"	14' 57.56"	274° 20' 42"	0.18023
10	106° 17' 50"	3° 04' 47"	108° 05' 12"	25° 29' 58"	0° 54' 55"	14' 57.88"	274° 34' 13"	0.18338
11	106° 48' 15"	3° 07' 03"	108° 38' 54"	25° 28' 25"	0° 54' 56"	14' 58.19"	274° 47' 45"	0.18655
12	107° 18' 42"	3° 09' 19"	109° 12' 37"	25° 26' 44"	0° 54' 57"	14' 58.51"	275° 1' 17"	0.18975
13	107° 49' 10"	3° 11' 34"	109° 46' 20"	25° 24' 55"	0° 54' 58"	14' 58.83"	275° 14' 49"	0.19296
14	108° 19' 39"	3° 13' 48"	110° 20' 03"	25° 22' 58"	0° 54' 60"	14' 59.15"	275° 28' 22"	0.19620
15	108° 50' 10"	3° 16' 01"	110° 53' 46"	25° 20' 54"	0° 55' 01"	14' 59.48"	275° 41' 54"	0.19947
16	109° 20' 41"	3° 18' 14"	111° 27' 30"	25° 18' 42"	0° 55' 02"	14' 59.81"	275° 55' 27"	0.20275
17	109° 51' 15"	3° 20' 25"	112° 01' 13"	25° 16' 22"	0° 55' 03"	15' 00.15"	276° 8' 59"	0.20606
18	110° 21' 49"	3° 22' 36"	112° 34' 57"	25° 13' 54"	0° 55' 05"	15' 00.49"	276° 22' 31"	0.20939
19	110° 52' 25"	3° 24' 46"	113° 08' 40"	25° 11' 19"	0° 55' 06"	15' 00.83"	276° 36' 03"	0.21275
20	111° 23' 03"	3° 26' 55"	113° 42' 24"	25° 08' 35"	0° 55' 07"	15' 01.17"	276° 49' 34"	0.21612
21	111° 53' 41"	3° 29' 03"	114° 16' 07"	25° 05' 45"	0° 55' 08"	15' 01.52"	277° 3' 05"	0.21952
22	112° 24' 22"	3° 31' 10"	114° 49' 50"	25° 02' 46"	0° 55' 10"	15' 01.87"	277° 16' 34"	0.22293
23	112° 55' 03"	3° 33' 16"	115° 23' 33"	24° 59' 40"	0° 55' 11"	15' 02.23"	277° 30' 03"	0.22637
24	113° 25' 46"	3° 35' 22"	115° 57' 15"	24° 56' 25"	0° 55' 12"	15' 02.59"	277° 43' 31"	0.22983

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	56° 20' 00"	0.76"	54° 00' 38"	19° 19' 45"	1.0112813	15' 48.92"	23° 26' 14"	3 m 36 s
1	56° 22' 25"	0.76"	54° 03' 07"	19° 20' 19"	1.0112898	15' 48.92"	23° 26' 14"	3 m 36 s
2	56° 24' 49"	0.77"	54° 05' 36"	19° 20' 53"	1.0112983	15' 48.91"	23° 26' 14"	3 m 36 s
3	56° 27' 14"	0.77"	54° 08' 05"	19° 21' 27"	1.0113068	15' 48.90"	23° 26' 14"	3 m 36 s
4	56° 29' 38"	0.77"	54° 10' 34"	19° 22' 00"	1.0113153	15' 48.89"	23° 26' 14"	3 m 36 s
5	56° 32' 03"	0.78"	54° 13' 03"	19° 22' 34"	1.0113238	15' 48.88"	23° 26' 14"	3 m 36 s
6	56° 34' 27"	0.78"	54° 15' 32"	19° 23' 08"	1.0113323	15' 48.88"	23° 26' 14"	3 m 36 s
7	56° 36' 52"	0.78"	54° 18' 01"	19° 23' 41"	1.0113408	15' 48.87"	23° 26' 14"	3 m 35 s
8	56° 39' 17"	0.79"	54° 20' 30"	19° 24' 15"	1.0113492	15' 48.86"	23° 26' 14"	3 m 35 s
9	56° 41' 41"	0.79"	54° 22' 59"	19° 24' 48"	1.0113577	15' 48.85"	23° 26' 14"	3 m 35 s
10	56° 44' 06"	0.79"	54° 25' 28"	19° 25' 22"	1.0113662	15' 48.85"	23° 26' 14"	3 m 35 s
11	56° 46' 30"	0.80"	54° 27' 58"	19° 25' 55"	1.0113746	15' 48.84"	23° 26' 14"	3 m 35 s
12	56° 48' 55"	0.80"	54° 30' 27"	19° 26' 29"	1.0113830	15' 48.83"	23° 26' 14"	3 m 35 s
13	56° 51' 19"	0.80"	54° 32' 56"	19° 27' 02"	1.0113915	15' 48.82"	23° 26' 14"	3 m 35 s
14	56° 53' 44"	0.81"	54° 35' 25"	19° 27' 35"	1.0113999	15' 48.81"	23° 26' 14"	3 m 35 s
15	56° 56' 08"	0.81"	54° 37' 54"	19° 28' 09"	1.0114083	15' 48.81"	23° 26' 14"	3 m 35 s
16	56° 58' 33"	0.81"	54° 40' 23"	19° 28' 42"	1.0114167	15' 48.80"	23° 26' 14"	3 m 35 s
17	57° 00' 57"	0.82"	54° 42' 53"	19° 29' 15"	1.0114251	15' 48.79"	23° 26' 14"	3 m 35 s
18	57° 03' 22"	0.82"	54° 45' 22"	19° 29' 48"	1.0114335	15' 48.78"	23° 26' 14"	3 m 34 s
19	57° 05' 46"	0.82"	54° 47' 51"	19° 30' 21"	1.0114419	15' 48.77"	23° 26' 14"	3 m 34 s
20	57° 08' 11"	0.83"	54° 50' 20"	19° 30' 54"	1.0114503	15' 48.77"	23° 26' 14"	3 m 34 s
21	57° 10' 36"	0.83"	54° 52' 50"	19° 31' 28"	1.0114587	15' 48.76"	23° 26' 14"	3 m 34 s
22	57° 13' 00"	0.83"	54° 55' 19"	19° 32' 01"	1.0114671	15' 48.75"	23° 26' 14"	3 m 34 s
23	57° 15' 25"	0.83"	54° 57' 48"	19° 32' 34"	1.0114754	15' 48.74"	23° 26' 14"	3 m 34 s
24	57° 17' 49"	0.84"	55° 00' 17"	19° 33' 07"	1.0114838	15' 48.73"	23° 26' 14"	3 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	113° 25' 46"	3° 35' 22"	115° 57' 15"	24° 56' 25"	0° 55' 12"	15' 02.59"	277° 43' 31"	0.22983
1	113° 56' 31"	3° 37' 26"	116° 30' 58"	24° 53' 04"	0° 55' 14"	15' 02.95"	277° 56' 58"	0.23332
2	114° 27' 17"	3° 39' 30"	117° 04' 39"	24° 49' 34"	0° 55' 15"	15' 03.32"	278° 10' 24"	0.23682
3	114° 58' 05"	3° 41' 32"	117° 38' 21"	24° 45' 57"	0° 55' 16"	15' 03.69"	278° 23' 49"	0.24034
4	115° 28' 54"	3° 43' 34"	118° 12' 02"	24° 42' 12"	0° 55' 18"	15' 04.06"	278° 37' 12"	0.24389
5	115° 59' 44"	3° 45' 34"	118° 45' 42"	24° 38' 19"	0° 55' 19"	15' 04.44"	278° 50' 33"	0.24745
6	116° 30' 36"	3° 47' 34"	119° 19' 22"	24° 34' 19"	0° 55' 20"	15' 04.82"	279° 3' 53"	0.25103
7	117° 01' 30"	3° 49' 33"	119° 53' 01"	24° 30' 11"	0° 55' 22"	15' 05.20"	279° 17' 12"	0.25464
8	117° 32' 26"	3° 51' 30"	120° 26' 39"	24° 25' 55"	0° 55' 23"	15' 05.59"	279° 30' 28"	0.25826
9	118° 03' 23"	3° 53' 27"	121° 00' 17"	24° 21' 32"	0° 55' 25"	15' 05.98"	279° 43' 43"	0.26191
10	118° 34' 21"	3° 55' 22"	121° 33' 54"	24° 17' 01"	0° 55' 26"	15' 06.37"	279° 56' 55"	0.26557
11	119° 05' 21"	3° 57' 17"	122° 07' 30"	24° 12' 23"	0° 55' 28"	15' 06.77"	280° 10' 06"	0.26926
12	119° 36' 23"	3° 59' 10"	122° 41' 06"	24° 07' 37"	0° 55' 29"	15' 07.17"	280° 23' 14"	0.27296
13	120° 07' 27"	4° 01' 02"	123° 14' 40"	24° 02' 43"	0° 55' 31"	15' 07.58"	280° 36' 20"	0.27668
14	120° 38' 32"	4° 02' 54"	123° 48' 14"	23° 57' 42"	0° 55' 32"	15' 07.98"	280° 49' 24"	0.28042
15	121° 09' 39"	4° 04' 44"	124° 21' 46"	23° 52' 33"	0° 55' 34"	15' 08.40"	281° 2' 25"	0.28418
16	121° 40' 48"	4° 06' 33"	124° 55' 18"	23° 47' 17"	0° 55' 35"	15' 08.81"	281° 15' 23"	0.28796
17	122° 11' 58"	4° 08' 21"	125° 28' 49"	23° 41' 53"	0° 55' 37"	15' 09.23"	281° 28' 19"	0.29175
18	122° 43' 10"	4° 10' 07"	126° 02' 18"	23° 36' 21"	0° 55' 38"	15' 09.65"	281° 41' 12"	0.29557
19	123° 14' 24"	4° 11' 53"	126° 35' 47"	23° 30' 43"	0° 55' 40"	15' 10.08"	281° 54' 02"	0.29940
20	123° 45' 40"	4° 13' 38"	127° 09' 14"	23° 24' 56"	0° 55' 41"	15' 10.51"	282° 6' 50"	0.30325
21	124° 16' 57"	4° 15' 21"	127° 42' 40"	23° 19' 03"	0° 55' 43"	15' 10.94"	282° 19' 34"	0.30711
22	124° 48' 17"	4° 17' 03"	128° 16' 05"	23° 13' 02"	0° 55' 44"	15' 11.37"	282° 32' 15"	0.31100
23	125° 19' 38"	4° 18' 44"	128° 49' 28"	23° 06' 53"	0° 55' 46"	15' 11.81"	282° 44' 53"	0.31490
24	125° 51' 01"	4° 20' 24"	129° 22' 51"	23° 00' 38"	0° 55' 48"	15' 12.26"	282° 57' 27"	0.31882

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	57° 17' 49"	0.84"	55° 00' 17"	19° 33' 07"	1.0114838	15' 48.73"	23° 26' 14"	3 m 34 s
1	57° 20' 14"	0.84"	55° 02' 47"	19° 33' 40"	1.0114921	15' 48.73"	23° 26' 14"	3 m 34 s
2	57° 22' 38"	0.84"	55° 05' 16"	19° 34' 12"	1.0115005	15' 48.72"	23° 26' 14"	3 m 34 s
3	57° 25' 03"	0.84"	55° 07' 45"	19° 34' 45"	1.0115088	15' 48.71"	23° 26' 14"	3 m 34 s
4	57° 27' 27"	0.85"	55° 10' 15"	19° 35' 18"	1.0115172	15' 48.70"	23° 26' 14"	3 m 34 s
5	57° 29' 52"	0.85"	55° 12' 44"	19° 35' 51"	1.0115255	15' 48.70"	23° 26' 14"	3 m 33 s
6	57° 32' 16"	0.85"	55° 15' 14"	19° 36' 24"	1.0115338	15' 48.69"	23° 26' 14"	3 m 33 s
7	57° 34' 41"	0.85"	55° 17' 43"	19° 36' 57"	1.0115421	15' 48.68"	23° 26' 14"	3 m 33 s
8	57° 37' 05"	0.86"	55° 20' 12"	19° 37' 29"	1.0115504	15' 48.67"	23° 26' 14"	3 m 33 s
9	57° 39' 30"	0.86"	55° 22' 42"	19° 38' 02"	1.0115587	15' 48.66"	23° 26' 14"	3 m 33 s
10	57° 41' 54"	0.86"	55° 25' 11"	19° 38' 35"	1.0115670	15' 48.66"	23° 26' 14"	3 m 33 s
11	57° 44' 18"	0.86"	55° 27' 41"	19° 39' 07"	1.0115753	15' 48.65"	23° 26' 14"	3 m 33 s
12	57° 46' 43"	0.86"	55° 30' 10"	19° 39' 40"	1.0115836	15' 48.64"	23° 26' 14"	3 m 33 s
13	57° 49' 07"	0.87"	55° 32' 40"	19° 40' 12"	1.0115919	15' 48.63"	23° 26' 14"	3 m 33 s
14	57° 51' 32"	0.87"	55° 35' 09"	19° 40' 45"	1.0116001	15' 48.63"	23° 26' 14"	3 m 32 s
15	57° 53' 56"	0.87"	55° 37' 39"	19° 41' 17"	1.0116084	15' 48.62"	23° 26' 14"	3 m 32 s
16	57° 56' 21"	0.87"	55° 40' 08"	19° 41' 50"	1.0116166	15' 48.61"	23° 26' 14"	3 m 32 s
17	57° 58' 45"	0.87"	55° 42' 38"	19° 42' 22"	1.0116249	15' 48.60"	23° 26' 14"	3 m 32 s
18	58° 01' 10"	0.88"	55° 45' 07"	19° 42' 54"	1.0116331	15' 48.59"	23° 26' 14"	3 m 32 s
19	58° 03' 34"	0.88"	55° 47' 37"	19° 43' 27"	1.0116414	15' 48.59"	23° 26' 14"	3 m 32 s
20	58° 05' 59"	0.88"	55° 50' 06"	19° 43' 59"	1.0116496	15' 48.58"	23° 26' 14"	3 m 32 s
21	58° 08' 23"	0.88"	55° 52' 36"	19° 44' 31"	1.0116578	15' 48.57"	23° 26' 14"	3 m 32 s
22	58° 10' 48"	0.88"	55° 55' 06"	19° 45' 03"	1.0116660	15' 48.56"	23° 26' 14"	3 m 32 s
23	58° 13' 12"	0.88"	55° 57' 35"	19° 45' 36"	1.0116742	15' 48.56"	23° 26' 14"	3 m 31 s
24	58° 15' 36"	0.89"	56° 00' 05"	19° 46' 08"	1.0116824	15' 48.55"	23° 26' 14"	3 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	125° 51' 01"	4° 20' 24"	129° 22' 51"	23° 00' 38"	0° 55' 48"	15' 12.26"	282° 57' 27"	0.31882
1	126° 22' 26"	4° 22' 03"	129° 56' 12"	22° 54' 14"	0° 55' 49"	15' 12.70"	283° 9' 59"	0.32275
2	126° 53' 52"	4° 23' 40"	130° 29' 32"	22° 47' 44"	0° 55' 51"	15' 13.15"	283° 22' 26"	0.32671
3	127° 25' 21"	4° 25' 16"	131° 02' 50"	22° 41' 06"	0° 55' 53"	15' 13.60"	283° 34' 51"	0.33067
4	127° 56' 52"	4° 26' 51"	131° 36' 07"	22° 34' 21"	0° 55' 54"	15' 14.06"	283° 47' 11"	0.33466
5	128° 28' 24"	4° 28' 25"	132° 09' 23"	22° 27' 29"	0° 55' 56"	15' 14.52"	283° 59' 28"	0.33866
6	128° 59' 59"	4° 29' 57"	132° 42' 37"	22° 20' 30"	0° 55' 58"	15' 14.98"	284° 11' 41"	0.34267
7	129° 31' 35"	4° 31' 28"	133° 15' 50"	22° 13' 23"	0° 55' 59"	15' 15.45"	284° 23' 50"	0.34671
8	130° 03' 14"	4° 32' 58"	133° 49' 02"	22° 06' 09"	0° 56' 01"	15' 15.92"	284° 35' 56"	0.35075
9	130° 34' 54"	4° 34' 27"	134° 22' 12"	21° 58' 48"	0° 56' 03"	15' 16.39"	284° 47' 57"	0.35481
10	131° 06' 36"	4° 35' 54"	134° 55' 20"	21° 51' 20"	0° 56' 05"	15' 16.87"	284° 59' 54"	0.35889
11	131° 38' 21"	4° 37' 20"	135° 28' 27"	21° 43' 45"	0° 56' 06"	15' 17.35"	285° 11' 47"	0.36298
12	132° 10' 07"	4° 38' 44"	136° 01' 32"	21° 36' 03"	0° 56' 08"	15' 17.83"	285° 23' 36"	0.36709
13	132° 41' 56"	4° 40' 08"	136° 34' 36"	21° 28' 14"	0° 56' 10"	15' 18.32"	285° 35' 20"	0.37121
14	133° 13' 47"	4° 41' 30"	137° 07' 39"	21° 20' 18"	0° 56' 12"	15' 18.81"	285° 47' 00"	0.37534
15	133° 45' 39"	4° 42' 50"	137° 40' 39"	21° 12' 15"	0° 56' 14"	15' 19.30"	285° 58' 36"	0.37949
16	134° 17' 34"	4° 44' 09"	138° 13' 39"	21° 04' 05"	0° 56' 15"	15' 19.80"	286° 10' 07"	0.38365
17	134° 49' 31"	4° 45' 27"	138° 46' 36"	20° 55' 48"	0° 56' 17"	15' 20.29"	286° 21' 34"	0.38782
18	135° 21' 30"	4° 46' 44"	139° 19' 32"	20° 47' 25"	0° 56' 19"	15' 20.80"	286° 32' 56"	0.39201
19	135° 53' 31"	4° 47' 59"	139° 52' 27"	20° 38' 54"	0° 56' 21"	15' 21.30"	286° 44' 13"	0.39620
20	136° 25' 35"	4° 49' 12"	140° 25' 20"	20° 30' 17"	0° 56' 23"	15' 21.81"	286° 55' 25"	0.40042
21	136° 57' 40"	4° 50' 24"	140° 58' 11"	20° 21' 33"	0° 56' 25"	15' 22.32"	287° 6' 33"	0.40464
22	137° 29' 48"	4° 51' 35"	141° 31' 01"	20° 12' 42"	0° 56' 27"	15' 22.84"	287° 17' 35"	0.40888
23	138° 01' 58"	4° 52' 44"	142° 03' 49"	20° 03' 45"	0° 56' 28"	15' 23.35"	287° 28' 33"	0.41312
24	138° 34' 11"	4° 53' 52"	142° 36' 35"	19° 54' 41"	0° 56' 30"	15' 23.87"	287° 39' 26"	0.41738

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	58° 15' 36"	0.89"	56° 00' 05"	19° 46' 08"	1.0116824	15' 48.55"	23° 26' 14"	3 m 31 s
1	58° 18' 01"	0.89"	56° 02' 34"	19° 46' 40"	1.0116906	15' 48.54"	23° 26' 14"	3 m 31 s
2	58° 20' 25"	0.89"	56° 05' 04"	19° 47' 12"	1.0116988	15' 48.53"	23° 26' 14"	3 m 31 s
3	58° 22' 50"	0.89"	56° 07' 34"	19° 47' 44"	1.0117070	15' 48.53"	23° 26' 14"	3 m 31 s
4	58° 25' 14"	0.89"	56° 10' 03"	19° 48' 16"	1.0117152	15' 48.52"	23° 26' 14"	3 m 31 s
5	58° 27' 39"	0.89"	56° 12' 33"	19° 48' 48"	1.0117233	15' 48.51"	23° 26' 14"	3 m 31 s
6	58° 30' 03"	0.89"	56° 15' 03"	19° 49' 20"	1.0117315	15' 48.50"	23° 26' 14"	3 m 31 s
7	58° 32' 27"	0.89"	56° 17' 33"	19° 49' 52"	1.0117397	15' 48.49"	23° 26' 14"	3 m 30 s
8	58° 34' 52"	0.90"	56° 20' 02"	19° 50' 24"	1.0117478	15' 48.49"	23° 26' 14"	3 m 30 s
9	58° 37' 16"	0.90"	56° 22' 32"	19° 50' 55"	1.0117560	15' 48.48"	23° 26' 14"	3 m 30 s
10	58° 39' 41"	0.90"	56° 25' 02"	19° 51' 27"	1.0117641	15' 48.47"	23° 26' 14"	3 m 30 s
11	58° 42' 05"	0.90"	56° 27' 32"	19° 51' 59"	1.0117722	15' 48.46"	23° 26' 14"	3 m 30 s
12	58° 44' 29"	0.90"	56° 30' 01"	19° 52' 31"	1.0117804	15' 48.46"	23° 26' 14"	3 m 30 s
13	58° 46' 54"	0.90"	56° 32' 31"	19° 53' 02"	1.0117885	15' 48.45"	23° 26' 14"	3 m 30 s
14	58° 49' 18"	0.90"	56° 35' 01"	19° 53' 34"	1.0117966	15' 48.44"	23° 26' 14"	3 m 30 s
15	58° 51' 43"	0.90"	56° 37' 31"	19° 54' 06"	1.0118047	15' 48.43"	23° 26' 14"	3 m 29 s
16	58° 54' 07"	0.90"	56° 40' 01"	19° 54' 37"	1.0118128	15' 48.43"	23° 26' 14"	3 m 29 s
17	58° 56' 31"	0.90"	56° 42' 31"	19° 55' 09"	1.0118209	15' 48.42"	23° 26' 14"	3 m 29 s
18	58° 58' 56"	0.90"	56° 45' 01"	19° 55' 40"	1.0118290	15' 48.41"	23° 26' 14"	3 m 29 s
19	59° 01' 20"	0.90"	56° 47' 30"	19° 56' 12"	1.0118371	15' 48.40"	23° 26' 14"	3 m 29 s
20	59° 03' 45"	0.90"	56° 50' 00"	19° 56' 43"	1.0118452	15' 48.40"	23° 26' 14"	3 m 29 s
21	59° 06' 09"	0.91"	56° 52' 30"	19° 57' 15"	1.0118532	15' 48.39"	23° 26' 14"	3 m 29 s
22	59° 08' 33"	0.91"	56° 55' 00"	19° 57' 46"	1.0118613	15' 48.38"	23° 26' 14"	3 m 28 s
23	59° 10' 58"	0.91"	56° 57' 30"	19° 58' 17"	1.0118694	15' 48.37"	23° 26' 14"	3 m 28 s
24	59° 13' 22"	0.91"	57° 00' 00"	19° 58' 49"	1.0118774	15' 48.37"	23° 26' 14"	3 m 28 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	138° 34' 11"	4° 53' 52"	142° 36' 35"	19° 54' 41"	0° 56' 30"	15' 23.87"	287° 39' 26"	0.41738
1	139° 06' 25"	4° 54' 59"	143° 09' 20"	19° 45' 30"	0° 56' 32"	15' 24.40"	287° 50' 13"	0.42165
2	139° 38' 42"	4° 56' 04"	143° 42' 03"	19° 36' 13"	0° 56' 34"	15' 24.93"	288° 0' 56"	0.42593
3	140° 11' 01"	4° 57' 07"	144° 14' 45"	19° 26' 49"	0° 56' 36"	15' 25.46"	288° 11' 33"	0.43023
4	140° 43' 22"	4° 58' 09"	144° 47' 25"	19° 17' 19"	0° 56' 38"	15' 25.99"	288° 22' 05"	0.43453
5	141° 15' 46"	4° 59' 09"	145° 20' 03"	19° 07' 43"	0° 56' 40"	15' 26.52"	288° 32' 31"	0.43884
6	141° 48' 12"	5° 00' 08"	145° 52' 40"	18° 57' 60"	0° 56' 42"	15' 27.06"	288° 42' 53"	0.44316
7	142° 20' 40"	5° 01' 06"	146° 25' 15"	18° 48' 10"	0° 56' 44"	15' 27.60"	288° 53' 08"	0.44750
8	142° 53' 10"	5° 02' 01"	146° 57' 49"	18° 38' 14"	0° 56' 46"	15' 28.15"	289° 3' 19"	0.45184
9	143° 25' 43"	5° 02' 56"	147° 30' 21"	18° 28' 12"	0° 56' 48"	15' 28.69"	289° 13' 23"	0.45619
10	143° 58' 19"	5° 03' 48"	148° 02' 52"	18° 18' 04"	0° 56' 50"	15' 29.24"	289° 23' 23"	0.46055
11	144° 30' 56"	5° 04' 40"	148° 35' 21"	18° 07' 49"	0° 56' 52"	15' 29.79"	289° 33' 16"	0.46491
12	145° 03' 36"	5° 05' 29"	149° 07' 48"	17° 57' 29"	0° 56' 54"	15' 30.35"	289° 43' 04"	0.46929
13	145° 36' 19"	5° 06' 17"	149° 40' 14"	17° 47' 02"	0° 56' 56"	15' 30.91"	289° 52' 46"	0.47367
14	146° 09' 04"	5° 07' 03"	150° 12' 39"	17° 36' 29"	0° 56' 58"	15' 31.47"	290° 2' 22"	0.47806
15	146° 41' 51"	5° 07' 48"	150° 45' 02"	17° 25' 50"	0° 57' 00"	15' 32.03"	290° 11' 53"	0.48246
16	147° 14' 41"	5° 08' 31"	151° 17' 24"	17° 15' 05"	0° 57' 02"	15' 32.59"	290° 21' 17"	0.48687
17	147° 47' 33"	5° 09' 13"	151° 49' 44"	17° 04' 14"	0° 57' 04"	15' 33.16"	290° 30' 36"	0.49128
18	148° 20' 28"	5° 09' 53"	152° 22' 03"	16° 53' 17"	0° 57' 07"	15' 33.73"	290° 39' 48"	0.49570
19	148° 53' 25"	5° 10' 31"	152° 54' 20"	16° 42' 15"	0° 57' 09"	15' 34.30"	290° 48' 55"	0.50012
20	149° 26' 25"	5° 11' 08"	153° 26' 36"	16° 31' 06"	0° 57' 11"	15' 34.88"	290° 57' 56"	0.50455
21	149° 59' 27"	5° 11' 42"	153° 58' 51"	16° 19' 52"	0° 57' 13"	15' 35.46"	291° 6' 50"	0.50899
22	150° 32' 32"	5° 12' 16"	154° 31' 04"	16° 08' 32"	0° 57' 15"	15' 36.03"	291° 15' 38"	0.51343
23	151° 05' 39"	5° 12' 47"	155° 03' 16"	15° 57' 06"	0° 57' 17"	15' 36.62"	291° 24' 20"	0.51788
24	151° 38' 49"	5° 13' 17"	155° 35' 27"	15° 45' 35"	0° 57' 19"	15' 37.20"	291° 32' 56"	0.52233

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	59° 13' 22"	0.91"	57° 00' 00"	19° 58' 49"	1.0118774	15' 48.37"	23° 26' 14"	3 m 28 s
1	59° 15' 46"	0.91"	57° 02' 30"	19° 59' 20"	1.0118855	15' 48.36"	23° 26' 14"	3 m 28 s
2	59° 18' 11"	0.91"	57° 05' 00"	19° 59' 51"	1.0118935	15' 48.35"	23° 26' 14"	3 m 28 s
3	59° 20' 35"	0.91"	57° 07' 30"	20° 00' 22"	1.0119015	15' 48.34"	23° 26' 14"	3 m 28 s
4	59° 22' 59"	0.91"	57° 10' 00"	20° 00' 53"	1.0119096	15' 48.34"	23° 26' 14"	3 m 28 s
5	59° 25' 24"	0.91"	57° 12' 30"	20° 01' 25"	1.0119176	15' 48.33"	23° 26' 14"	3 m 27 s
6	59° 27' 48"	0.91"	57° 15' 00"	20° 01' 56"	1.0119256	15' 48.32"	23° 26' 14"	3 m 27 s
7	59° 30' 13"	0.91"	57° 17' 30"	20° 02' 27"	1.0119336	15' 48.31"	23° 26' 14"	3 m 27 s
8	59° 32' 37"	0.91"	57° 20' 00"	20° 02' 58"	1.0119416	15' 48.31"	23° 26' 14"	3 m 27 s
9	59° 35' 01"	0.91"	57° 22' 30"	20° 03' 29"	1.0119496	15' 48.30"	23° 26' 14"	3 m 27 s
10	59° 37' 26"	0.91"	57° 25' 00"	20° 03' 60"	1.0119576	15' 48.29"	23° 26' 14"	3 m 27 s
11	59° 39' 50"	0.90"	57° 27' 30"	20° 04' 30"	1.0119656	15' 48.28"	23° 26' 14"	3 m 27 s
12	59° 42' 14"	0.90"	57° 30' 01"	20° 05' 01"	1.0119736	15' 48.28"	23° 26' 14"	3 m 26 s
13	59° 44' 39"	0.90"	57° 32' 31"	20° 05' 32"	1.0119816	15' 48.27"	23° 26' 14"	3 m 26 s
14	59° 47' 03"	0.90"	57° 35' 01"	20° 06' 03"	1.0119896	15' 48.26"	23° 26' 14"	3 m 26 s
15	59° 49' 27"	0.90"	57° 37' 31"	20° 06' 34"	1.0119975	15' 48.25"	23° 26' 14"	3 m 26 s
16	59° 51' 52"	0.90"	57° 40' 01"	20° 07' 04"	1.0120055	15' 48.25"	23° 26' 14"	3 m 26 s
17	59° 54' 16"	0.90"	57° 42' 31"	20° 07' 35"	1.0120135	15' 48.24"	23° 26' 14"	3 m 26 s
18	59° 56' 40"	0.90"	57° 45' 02"	20° 08' 06"	1.0120214	15' 48.23"	23° 26' 14"	3 m 25 s
19	59° 59' 05"	0.90"	57° 47' 32"	20° 08' 36"	1.0120294	15' 48.22"	23° 26' 14"	3 m 25 s
20	60° 01' 29"	0.90"	57° 50' 02"	20° 09' 07"	1.0120373	15' 48.22"	23° 26' 14"	3 m 25 s
21	60° 03' 53"	0.90"	57° 52' 32"	20° 09' 37"	1.0120452	15' 48.21"	23° 26' 14"	3 m 25 s
22	60° 06' 17"	0.90"	57° 55' 03"	20° 10' 08"	1.0120532	15' 48.20"	23° 26' 14"	3 m 25 s
23	60° 08' 42"	0.90"	57° 57' 33"	20° 10' 38"	1.0120611	15' 48.19"	23° 26' 14"	3 m 25 s
24	60° 11' 06"	0.90"	58° 00' 03"	20° 11' 09"	1.0120690	15' 48.19"	23° 26' 14"	3 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	151° 38' 49"	5° 13' 17"	155° 35' 27"	15° 45' 35"	0° 57' 19"	15' 37.20"	291° 32' 56"	0.52233
1	152° 12' 01"	5° 13' 45"	156° 07' 36"	15° 33' 58"	0° 57' 21"	15' 37.79"	291° 41' 25"	0.52678
2	152° 45' 16"	5° 14' 12"	156° 39' 44"	15° 22' 15"	0° 57' 24"	15' 38.37"	291° 49' 48"	0.53124
3	153° 18' 34"	5° 14' 36"	157° 11' 51"	15° 10' 27"	0° 57' 26"	15' 38.96"	291° 58' 05"	0.53570
4	153° 51' 54"	5° 14' 59"	157° 43' 57"	14° 58' 34"	0° 57' 28"	15' 39.55"	292° 6' 15"	0.54017
5	154° 25' 16"	5° 15' 20"	158° 16' 02"	14° 46' 35"	0° 57' 30"	15' 40.15"	292° 14' 19"	0.54464
6	154° 58' 41"	5° 15' 40"	158° 48' 06"	14° 34' 31"	0° 57' 32"	15' 40.74"	292° 22' 17"	0.54911
7	155° 32' 09"	5° 15' 58"	159° 20' 08"	14° 22' 22"	0° 57' 34"	15' 41.34"	292° 30' 08"	0.55358
8	156° 05' 40"	5° 16' 14"	159° 52' 10"	14° 10' 07"	0° 57' 37"	15' 41.94"	292° 37' 52"	0.55805
9	156° 39' 13"	5° 16' 28"	160° 24' 11"	13° 57' 47"	0° 57' 39"	15' 42.54"	292° 45' 29"	0.56253
10	157° 12' 49"	5° 16' 40"	160° 56' 10"	13° 45' 22"	0° 57' 41"	15' 43.14"	292° 53' 00"	0.56701
11	157° 46' 27"	5° 16' 51"	161° 28' 09"	13° 32' 52"	0° 57' 43"	15' 43.75"	293° 0' 25"	0.57148
12	158° 20' 08"	5° 16' 59"	162° 00' 07"	13° 20' 16"	0° 57' 46"	15' 44.35"	293° 7' 42"	0.57596
13	158° 53' 52"	5° 17' 06"	162° 32' 04"	13° 07' 36"	0° 57' 48"	15' 44.96"	293° 14' 53"	0.58044
14	159° 27' 38"	5° 17' 12"	163° 04' 00"	12° 54' 51"	0° 57' 50"	15' 45.57"	293° 21' 57"	0.58492
15	160° 01' 27"	5° 17' 15"	163° 35' 56"	12° 42' 01"	0° 57' 52"	15' 46.18"	293° 28' 54"	0.58940
16	160° 35' 19"	5° 17' 16"	164° 07' 51"	12° 29' 06"	0° 57' 54"	15' 46.79"	293° 35' 45"	0.59387
17	161° 09' 13"	5° 17' 16"	164° 39' 45"	12° 16' 07"	0° 57' 57"	15' 47.40"	293° 42' 28"	0.59835
18	161° 43' 10"	5° 17' 14"	165° 11' 38"	12° 03' 02"	0° 57' 59"	15' 48.01"	293° 49' 05"	0.60282
19	162° 17' 10"	5° 17' 10"	165° 43' 31"	11° 49' 53"	0° 58' 01"	15' 48.63"	293° 55' 34"	0.60729
20	162° 51' 12"	5° 17' 04"	166° 15' 24"	11° 36' 40"	0° 58' 03"	15' 49.24"	294° 1' 57"	0.61176
21	163° 25' 17"	5° 16' 56"	166° 47' 16"	11° 23' 21"	0° 58' 06"	15' 49.86"	294° 8' 12"	0.61622
22	163° 59' 25"	5° 16' 47"	167° 19' 07"	11° 09' 59"	0° 58' 08"	15' 50.48"	294° 14' 21"	0.62068
23	164° 33' 36"	5° 16' 35"	167° 50' 58"	10° 56' 32"	0° 58' 10"	15' 51.09"	294° 20' 22"	0.62514
24	165° 07' 49"	5° 16' 22"	168° 22' 49"	10° 42' 60"	0° 58' 13"	15' 51.71"	294° 26' 16"	0.62959

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	60° 11' 06"	0.90"	58° 00' 03"	20° 11' 09"	1.0120690	15' 48.19"	23° 26' 14"	3 m 24 s
1	60° 13' 30"	0.89"	58° 02' 33"	20° 11' 39"	1.0120769	15' 48.18"	23° 26' 14"	3 m 24 s
2	60° 15' 55"	0.89"	58° 05' 04"	20° 12' 10"	1.0120848	15' 48.17"	23° 26' 14"	3 m 24 s
3	60° 18' 19"	0.89"	58° 07' 34"	20° 12' 40"	1.0120927	15' 48.16"	23° 26' 14"	3 m 24 s
4	60° 20' 43"	0.89"	58° 10' 04"	20° 13' 10"	1.0121006	15' 48.16"	23° 26' 14"	3 m 24 s
5	60° 23' 07"	0.89"	58° 12' 35"	20° 13' 41"	1.0121085	15' 48.15"	23° 26' 14"	3 m 24 s
6	60° 25' 32"	0.89"	58° 15' 05"	20° 14' 11"	1.0121164	15' 48.14"	23° 26' 14"	3 m 23 s
7	60° 27' 56"	0.89"	58° 17' 35"	20° 14' 41"	1.0121243	15' 48.13"	23° 26' 14"	3 m 23 s
8	60° 30' 20"	0.89"	58° 20' 06"	20° 15' 11"	1.0121322	15' 48.13"	23° 26' 14"	3 m 23 s
9	60° 32' 45"	0.88"	58° 22' 36"	20° 15' 41"	1.0121400	15' 48.12"	23° 26' 14"	3 m 23 s
10	60° 35' 09"	0.88"	58° 25' 07"	20° 16' 11"	1.0121479	15' 48.11"	23° 26' 14"	3 m 23 s
11	60° 37' 33"	0.88"	58° 27' 37"	20° 16' 41"	1.0121558	15' 48.11"	23° 26' 14"	3 m 23 s
12	60° 39' 57"	0.88"	58° 30' 07"	20° 17' 11"	1.0121636	15' 48.10"	23° 26' 14"	3 m 22 s
13	60° 42' 22"	0.88"	58° 32' 38"	20° 17' 41"	1.0121715	15' 48.09"	23° 26' 14"	3 m 22 s
14	60° 44' 46"	0.88"	58° 35' 08"	20° 18' 11"	1.0121793	15' 48.08"	23° 26' 14"	3 m 22 s
15	60° 47' 10"	0.87"	58° 37' 39"	20° 18' 41"	1.0121872	15' 48.08"	23° 26' 14"	3 m 22 s
16	60° 49' 34"	0.87"	58° 40' 09"	20° 19' 11"	1.0121950	15' 48.07"	23° 26' 14"	3 m 22 s
17	60° 51' 59"	0.87"	58° 42' 40"	20° 19' 41"	1.0122028	15' 48.06"	23° 26' 14"	3 m 22 s
18	60° 54' 23"	0.87"	58° 45' 10"	20° 20' 10"	1.0122107	15' 48.05"	23° 26' 14"	3 m 21 s
19	60° 56' 47"	0.87"	58° 47' 41"	20° 20' 40"	1.0122185	15' 48.05"	23° 26' 14"	3 m 21 s
20	60° 59' 11"	0.86"	58° 50' 11"	20° 21' 10"	1.0122263	15' 48.04"	23° 26' 14"	3 m 21 s
21	61° 01' 36"	0.86"	58° 52' 42"	20° 21' 40"	1.0122341	15' 48.03"	23° 26' 14"	3 m 21 s
22	61° 03' 60"	0.86"	58° 55' 13"	20° 22' 09"	1.0122419	15' 48.02"	23° 26' 14"	3 m 21 s
23	61° 06' 24"	0.86"	58° 57' 43"	20° 22' 39"	1.0122497	15' 48.02"	23° 26' 14"	3 m 20 s
24	61° 08' 48"	0.85"	59° 00' 14"	20° 23' 08"	1.0122575	15' 48.01"	23° 26' 14"	3 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	165° 07' 49"	5° 16' 22"	168° 22' 49"	10° 42' 60"	0° 58' 13"	15' 51.71"	294° 26' 16"	0.62959
1	165° 42' 05"	5° 16' 06"	168° 54' 39"	10° 29' 24"	0° 58' 15"	15' 52.33"	294° 32' 03"	0.63404
2	166° 16' 24"	5° 15' 49"	169° 26' 30"	10° 15' 44"	0° 58' 17"	15' 52.95"	294° 37' 43"	0.63848
3	166° 50' 45"	5° 15' 30"	169° 58' 20"	10° 01' 60"	0° 58' 19"	15' 53.57"	294° 43' 15"	0.64292
4	167° 25' 09"	5° 15' 09"	170° 30' 09"	9° 48' 11"	0° 58' 22"	15' 54.19"	294° 48' 41"	0.64735
5	167° 59' 36"	5° 14' 46"	171° 01' 59"	9° 34' 19"	0° 58' 24"	15' 54.81"	294° 53' 59"	0.65177
6	168° 34' 06"	5° 14' 21"	171° 33' 49"	9° 20' 22"	0° 58' 26"	15' 55.43"	294° 59' 10"	0.65619
7	169° 08' 38"	5° 13' 55"	172° 05' 39"	9° 06' 22"	0° 58' 28"	15' 56.06"	295° 4' 13"	0.66060
8	169° 43' 14"	5° 13' 26"	172° 37' 28"	8° 52' 17"	0° 58' 31"	15' 56.68"	295° 9' 09"	0.66501
9	170° 17' 51"	5° 12' 55"	173° 09' 18"	8° 38' 09"	0° 58' 33"	15' 57.30"	295° 13' 57"	0.66940
10	170° 52' 32"	5° 12' 23"	173° 41' 08"	8° 23' 57"	0° 58' 35"	15' 57.92"	295° 18' 39"	0.67379
11	171° 27' 15"	5° 11' 48"	174° 12' 59"	8° 09' 41"	0° 58' 38"	15' 58.54"	295° 23' 12"	0.67817
12	172° 02' 02"	5° 11' 12"	174° 44' 49"	7° 55' 22"	0° 58' 40"	15' 59.16"	295° 27' 38"	0.68254
13	172° 36' 50"	5° 10' 33"	175° 16' 40"	7° 40' 59"	0° 58' 42"	15' 59.78"	295° 31' 57"	0.68690
14	173° 11' 42"	5° 09' 53"	175° 48' 32"	7° 26' 33"	0° 58' 44"	16' 00.40"	295° 36' 08"	0.69124
15	173° 46' 36"	5° 09' 10"	176° 20' 24"	7° 12' 03"	0° 58' 47"	16' 01.02"	295° 40' 12"	0.69558
16	174° 21' 33"	5° 08' 26"	176° 52' 16"	6° 57' 29"	0° 58' 49"	16' 01.64"	295° 44' 07"	0.69991
17	174° 56' 33"	5° 07' 40"	177° 24' 09"	6° 42' 53"	0° 58' 51"	16' 02.26"	295° 47' 56"	0.70422
18	175° 31' 36"	5° 06' 51"	177° 56' 02"	6° 28' 13"	0° 58' 54"	16' 02.88"	295° 51' 36"	0.70853
19	176° 06' 41"	5° 06' 01"	178° 27' 57"	6° 13' 30"	0° 58' 56"	16' 03.50"	295° 55' 09"	0.71282
20	176° 41' 49"	5° 05' 09"	178° 59' 52"	5° 58' 44"	0° 58' 58"	16' 04.11"	295° 58' 34"	0.71709
21	177° 16' 59"	5° 04' 15"	179° 31' 48"	5° 43' 55"	0° 59' 00"	16' 04.73"	296° 1' 52"	0.72136
22	177° 52' 13"	5° 03' 19"	180° 03' 44"	5° 29' 03"	0° 59' 03"	16' 05.34"	296° 5' 01"	0.72561
23	178° 27' 29"	5° 02' 20"	180° 35' 42"	5° 14' 08"	0° 59' 05"	16' 05.95"	296° 8' 03"	0.72984
24	179° 02' 48"	5° 01' 20"	181° 07' 41"	4° 59' 10"	0° 59' 07"	16' 06.56"	296° 10' 57"	0.73406

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	61° 08' 48"	0.85"	59° 00' 14"	20° 23' 08"	1.0122575	15' 48.01"	23° 26' 14"	3 m 20 s
1	61° 11' 13"	0.85"	59° 02' 44"	20° 23' 38"	1.0122653	15' 48.00"	23° 26' 14"	3 m 20 s
2	61° 13' 37"	0.85"	59° 05' 15"	20° 24' 07"	1.0122731	15' 48.00"	23° 26' 14"	3 m 20 s
3	61° 16' 01"	0.85"	59° 07' 46"	20° 24' 37"	1.0122809	15' 47.99"	23° 26' 14"	3 m 20 s
4	61° 18' 25"	0.85"	59° 10' 16"	20° 25' 06"	1.0122886	15' 47.98"	23° 26' 14"	3 m 20 s
5	61° 20' 49"	0.84"	59° 12' 47"	20° 25' 36"	1.0122964	15' 47.97"	23° 26' 14"	3 m 19 s
6	61° 23' 14"	0.84"	59° 15' 18"	20° 26' 05"	1.0123042	15' 47.97"	23° 26' 14"	3 m 19 s
7	61° 25' 38"	0.84"	59° 17' 48"	20° 26' 34"	1.0123119	15' 47.96"	23° 26' 14"	3 m 19 s
8	61° 28' 02"	0.84"	59° 20' 19"	20° 27' 03"	1.0123197	15' 47.95"	23° 26' 14"	3 m 19 s
9	61° 30' 26"	0.83"	59° 22' 50"	20° 27' 33"	1.0123274	15' 47.94"	23° 26' 14"	3 m 19 s
10	61° 32' 51"	0.83"	59° 25' 20"	20° 28' 02"	1.0123352	15' 47.94"	23° 26' 14"	3 m 18 s
11	61° 35' 15"	0.83"	59° 27' 51"	20° 28' 31"	1.0123429	15' 47.93"	23° 26' 14"	3 m 18 s
12	61° 37' 39"	0.82"	59° 30' 22"	20° 29' 00"	1.0123507	15' 47.92"	23° 26' 14"	3 m 18 s
13	61° 40' 03"	0.82"	59° 32' 53"	20° 29' 29"	1.0123584	15' 47.92"	23° 26' 14"	3 m 18 s
14	61° 42' 27"	0.82"	59° 35' 23"	20° 29' 58"	1.0123661	15' 47.91"	23° 26' 14"	3 m 18 s
15	61° 44' 52"	0.82"	59° 37' 54"	20° 30' 27"	1.0123739	15' 47.90"	23° 26' 14"	3 m 17 s
16	61° 47' 16"	0.81"	59° 40' 25"	20° 30' 56"	1.0123816	15' 47.89"	23° 26' 14"	3 m 17 s
17	61° 49' 40"	0.81"	59° 42' 56"	20° 31' 25"	1.0123893	15' 47.89"	23° 26' 14"	3 m 17 s
18	61° 52' 04"	0.81"	59° 45' 27"	20° 31' 54"	1.0123970	15' 47.88"	23° 26' 14"	3 m 17 s
19	61° 54' 28"	0.80"	59° 47' 58"	20° 32' 23"	1.0124047	15' 47.87"	23° 26' 14"	3 m 17 s
20	61° 56' 52"	0.80"	59° 50' 28"	20° 32' 52"	1.0124124	15' 47.86"	23° 26' 14"	3 m 16 s
21	61° 59' 17"	0.80"	59° 52' 59"	20° 33' 21"	1.0124201	15' 47.86"	23° 26' 14"	3 m 16 s
22	62° 01' 41"	0.79"	59° 55' 30"	20° 33' 49"	1.0124278	15' 47.85"	23° 26' 14"	3 m 16 s
23	62° 04' 05"	0.79"	59° 58' 01"	20° 34' 18"	1.0124355	15' 47.84"	23° 26' 14"	3 m 16 s
24	62° 06' 29"	0.79"	60° 00' 32"	20° 34' 47"	1.0124432	15' 47.84"	23° 26' 14"	3 m 16 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	179° 02' 48"	5° 01' 20"	181° 07' 41"	4° 59' 10"	0° 59' 07"	16' 06.56"	296° 10' 57"	0.73406
1	179° 38' 09"	5° 00' 18"	181° 39' 41"	4° 44' 09"	0° 59' 09"	16' 07.17"	296° 13' 43"	0.73827
2	180° 13' 33"	4° 59' 14"	182° 11' 42"	4° 29' 06"	0° 59' 12"	16' 07.78"	296° 16' 21"	0.74246
3	180° 49' 00"	4° 58' 08"	182° 43' 44"	4° 14' 00"	0° 59' 14"	16' 08.39"	296° 18' 52"	0.74663
4	181° 24' 30"	4° 56' 60"	183° 15' 47"	3° 58' 52"	0° 59' 16"	16' 08.99"	296° 21' 14"	0.75079
5	182° 00' 02"	4° 55' 50"	183° 47' 52"	3° 43' 41"	0° 59' 18"	16' 09.60"	296° 23' 28"	0.75493
6	182° 35' 37"	4° 54' 38"	184° 19' 58"	3° 28' 28"	0° 59' 20"	16' 10.20"	296° 25' 35"	0.75905
7	183° 11' 14"	4° 53' 24"	184° 52' 06"	3° 13' 13"	0° 59' 23"	16' 10.80"	296° 27' 33"	0.76315
8	183° 46' 54"	4° 52' 08"	185° 24' 15"	2° 57' 56"	0° 59' 25"	16' 11.39"	296° 29' 24"	0.76724
9	184° 22' 37"	4° 50' 50"	185° 56' 26"	2° 42' 36"	0° 59' 27"	16' 11.99"	296° 31' 06"	0.77130
10	184° 58' 22"	4° 49' 30"	186° 28' 38"	2° 27' 14"	0° 59' 29"	16' 12.58"	296° 32' 40"	0.77535
11	185° 34' 10"	4° 48' 08"	187° 00' 52"	2° 11' 50"	0° 59' 31"	16' 13.17"	296° 34' 06"	0.77937
12	186° 10' 01"	4° 46' 44"	187° 33' 08"	1° 56' 25"	0° 59' 33"	16' 13.76"	296° 35' 24"	0.78337
13	186° 45' 54"	4° 45' 18"	188° 05' 26"	1° 40' 58"	0° 59' 36"	16' 14.34"	296° 36' 34"	0.78736
14	187° 21' 50"	4° 43' 50"	188° 37' 46"	1° 25' 29"	0° 59' 38"	16' 14.92"	296° 37' 36"	0.79132
15	187° 57' 48"	4° 42' 20"	189° 10' 08"	1° 09' 58"	0° 59' 40"	16' 15.50"	296° 38' 29"	0.79526
16	188° 33' 49"	4° 40' 49"	189° 42' 32"	0° 54' 26"	0° 59' 42"	16' 16.08"	296° 39' 15"	0.79917
17	189° 09' 52"	4° 39' 15"	190° 14' 58"	0° 38' 52"	0° 59' 44"	16' 16.65"	296° 39' 52"	0.80307
18	189° 45' 58"	4° 37' 39"	190° 47' 26"	0° 23' 17"	0° 59' 46"	16' 17.22"	296° 40' 21"	0.80693
19	190° 22' 07"	4° 36' 01"	191° 19' 56"	0° 07' 41"	0° 59' 48"	16' 17.79"	296° 40' 41"	0.81078
20	190° 58' 18"	4° 34' 22"	191° 52' 29"	0° -7' 57"	0° 59' 50"	16' 18.35"	296° 40' 53"	0.81460
21	191° 34' 31"	4° 32' 40"	192° 25' 05"	0° -23' 36"	0° 59' 52"	16' 18.91"	296° 40' 57"	0.81839
22	192° 10' 47"	4° 30' 57"	192° 57' 42"	0° -39' 15"	0° 59' 54"	16' 19.47"	296° 40' 53"	0.82216
23	192° 47' 05"	4° 29' 11"	193° 30' 23"	0° -54' 56"	0° 59' 56"	16' 20.02"	296° 40' 41"	0.82590
24	193° 23' 26"	4° 27' 24"	194° 03' 06"	-1° 10' 37"	0° 59' 58"	16' 20.57"	296° 40' 20"	0.82962

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	62° 06' 29"	0.79"	60° 00' 32"	20° 34' 47"	1.0124432	15' 47.84"	23° 26' 14"	3 m 16 s
1	62° 08' 53"	0.78"	60° 03' 03"	20° 35' 15"	1.0124508	15' 47.83"	23° 26' 14"	3 m 15 s
2	62° 11' 17"	0.78"	60° 05' 34"	20° 35' 44"	1.0124585	15' 47.82"	23° 26' 14"	3 m 15 s
3	62° 13' 42"	0.78"	60° 08' 05"	20° 36' 13"	1.0124662	15' 47.81"	23° 26' 14"	3 m 15 s
4	62° 16' 06"	0.77"	60° 10' 36"	20° 36' 41"	1.0124738	15' 47.81"	23° 26' 14"	3 m 15 s
5	62° 18' 30"	0.77"	60° 13' 07"	20° 37' 10"	1.0124815	15' 47.80"	23° 26' 14"	3 m 14 s
6	62° 20' 54"	0.77"	60° 15' 38"	20° 37' 38"	1.0124892	15' 47.79"	23° 26' 14"	3 m 14 s
7	62° 23' 18"	0.76"	60° 18' 09"	20° 38' 06"	1.0124968	15' 47.79"	23° 26' 14"	3 m 14 s
8	62° 25' 42"	0.76"	60° 20' 40"	20° 38' 35"	1.0125045	15' 47.78"	23° 26' 14"	3 m 14 s
9	62° 28' 07"	0.75"	60° 23' 11"	20° 39' 03"	1.0125121	15' 47.77"	23° 26' 14"	3 m 14 s
10	62° 30' 31"	0.75"	60° 25' 42"	20° 39' 31"	1.0125197	15' 47.76"	23° 26' 14"	3 m 13 s
11	62° 32' 55"	0.75"	60° 28' 13"	20° 39' 60"	1.0125274	15' 47.76"	23° 26' 14"	3 m 13 s
12	62° 35' 19"	0.74"	60° 30' 44"	20° 40' 28"	1.0125350	15' 47.75"	23° 26' 14"	3 m 13 s
13	62° 37' 43"	0.74"	60° 33' 15"	20° 40' 56"	1.0125426	15' 47.74"	23° 26' 14"	3 m 13 s
14	62° 40' 07"	0.74"	60° 35' 46"	20° 41' 24"	1.0125503	15' 47.74"	23° 26' 14"	3 m 13 s
15	62° 42' 31"	0.73"	60° 38' 17"	20° 41' 52"	1.0125579	15' 47.73"	23° 26' 14"	3 m 12 s
16	62° 44' 55"	0.73"	60° 40' 48"	20° 42' 21"	1.0125655	15' 47.72"	23° 26' 14"	3 m 12 s
17	62° 47' 20"	0.72"	60° 43' 19"	20° 42' 49"	1.0125731	15' 47.71"	23° 26' 14"	3 m 12 s
18	62° 49' 44"	0.72"	60° 45' 51"	20° 43' 17"	1.0125807	15' 47.71"	23° 26' 14"	3 m 12 s
19	62° 52' 08"	0.71"	60° 48' 22"	20° 43' 45"	1.0125883	15' 47.70"	23° 26' 14"	3 m 11 s
20	62° 54' 32"	0.71"	60° 50' 53"	20° 44' 12"	1.0125959	15' 47.69"	23° 26' 14"	3 m 11 s
21	62° 56' 56"	0.71"	60° 53' 24"	20° 44' 40"	1.0126035	15' 47.69"	23° 26' 14"	3 m 11 s
22	62° 59' 20"	0.70"	60° 55' 55"	20° 45' 08"	1.0126111	15' 47.68"	23° 26' 14"	3 m 11 s
23	63° 01' 44"	0.70"	60° 58' 27"	20° 45' 36"	1.0126187	15' 47.67"	23° 26' 14"	3 m 10 s
24	63° 04' 08"	0.69"	61° 00' 58"	20° 46' 04"	1.0126262	15' 47.66"	23° 26' 14"	3 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	193° 23' 26"	4° 27' 24"	194° 03' 06"	-1° 10' 37"	0° 59' 58"	16' 20.57"	296° 40' 20"	0.82962
1	193° 59' 49"	4° 25' 35"	194° 35' 51"	-1° 26' 19"	1° 00' 00"	16' 21.11"	296° 39' 50"	0.83331
2	194° 36' 14"	4° 23' 43"	195° 08' 39"	-1° 42' 02"	1° 00' 02"	16' 21.65"	296° 39' 12"	0.83697
3	195° 12' 42"	4° 21' 50"	195° 41' 31"	-1° 57' 45"	1° 00' 04"	16' 22.19"	296° 38' 26"	0.84060
4	195° 49' 12"	4° 19' 55"	196° 14' 25"	-2° 13' 29"	1° 00' 06"	16' 22.72"	296° 37' 32"	0.84420
5	196° 25' 45"	4° 17' 58"	196° 47' 22"	-2° 29' 13"	1° 00' 08"	16' 23.25"	296° 36' 29"	0.84778
6	197° 02' 20"	4° 15' 60"	197° 20' 22"	-2° 44' 57"	1° 00' 10"	16' 23.77"	296° 35' 18"	0.85132
7	197° 38' 57"	4° 13' 59"	197° 53' 25"	-3° 00' 42"	1° 00' 12"	16' 24.29"	296° 33' 58"	0.85483
8	198° 15' 36"	4° 11' 56"	198° 26' 32"	-3° 16' 26"	1° 00' 14"	16' 24.80"	296° 32' 30"	0.85832
9	198° 52' 18"	4° 09' 52"	198° 59' 41"	-3° 32' 11"	1° 00' 16"	16' 25.31"	296° 30' 54"	0.86177
10	199° 29' 01"	4° 07' 46"	199° 32' 54"	-3° 47' 55"	1° 00' 18"	16' 25.81"	296° 29' 09"	0.86519
11	200° 05' 47"	4° 05' 38"	200° 06' 10"	-4° 03' 39"	1° 00' 20"	16' 26.31"	296° 27' 15"	0.86857
12	200° 42' 36"	4° 03' 28"	200° 39' 30"	-4° 19' 23"	1° 00' 21"	16' 26.80"	296° 25' 14"	0.87193
13	201° 19' 26"	4° 01' 16"	201° 12' 53"	-4° 35' 06"	1° 00' 23"	16' 27.29"	296° 23' 04"	0.87525
14	201° 56' 18"	3° 59' 03"	201° 46' 20"	-4° 50' 49"	1° 00' 25"	16' 27.78"	296° 20' 45"	0.87854
15	202° 33' 13"	3° 56' 48"	202° 19' 51"	-5° 06' 31"	1° 00' 27"	16' 28.25"	296° 18' 18"	0.88179
16	203° 10' 10"	3° 54' 30"	202° 53' 25"	-5° 22' 13"	1° 00' 28"	16' 28.72"	296° 15' 43"	0.88501
17	203° 47' 08"	3° 52' 12"	203° 27' 03"	-5° 37' 53"	1° 00' 30"	16' 29.19"	296° 12' 60"	0.88819
18	204° 24' 09"	3° 49' 51"	204° 00' 45"	-5° 53' 32"	1° 00' 32"	16' 29.65"	296° 10' 08"	0.89134
19	205° 01' 12"	3° 47' 29"	204° 34' 31"	-6° 09' 11"	1° 00' 33"	16' 30.11"	296° 7' 08"	0.89445
20	205° 38' 16"	3° 45' 05"	205° 08' 20"	-6° 24' 48"	1° 00' 35"	16' 30.55"	296° 3' 59"	0.89752
21	206° 15' 23"	3° 42' 39"	205° 42' 14"	-6° 40' 24"	1° 00' 37"	16' 31.00"	296° 0' 43"	0.90056
22	206° 52' 32"	3° 40' 12"	206° 16' 12"	-6° 55' 58"	1° 00' 38"	16' 31.43"	295° 57' 18"	0.90356
23	207° 29' 42"	3° 37' 43"	206° 50' 14"	-7° 11' 31"	1° 00' 40"	16' 31.86"	295° 53' 45"	0.90652
24	208° 06' 54"	3° 35' 12"	207° 24' 20"	-7° 27' 02"	1° 00' 41"	16' 32.28"	295° 50' 04"	0.90944

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	63° 04' 08"	0.69"	61° 00' 58"	20° 46' 04"	1.0126262	15' 47.66"	23° 26' 14"	3 m 10 s
1	63° 06' 32"	0.69"	61° 03' 29"	20° 46' 32"	1.0126338	15' 47.66"	23° 26' 14"	3 m 10 s
2	63° 08' 57"	0.69"	61° 06' 00"	20° 46' 59"	1.0126414	15' 47.65"	23° 26' 14"	3 m 10 s
3	63° 11' 21"	0.68"	61° 08' 31"	20° 47' 27"	1.0126489	15' 47.64"	23° 26' 14"	3 m 10 s
4	63° 13' 45"	0.68"	61° 11' 03"	20° 47' 55"	1.0126565	15' 47.64"	23° 26' 14"	3 m 09 s
5	63° 16' 09"	0.67"	61° 13' 34"	20° 48' 22"	1.0126641	15' 47.63"	23° 26' 14"	3 m 09 s
6	63° 18' 33"	0.67"	61° 16' 05"	20° 48' 50"	1.0126716	15' 47.62"	23° 26' 14"	3 m 09 s
7	63° 20' 57"	0.66"	61° 18' 37"	20° 49' 17"	1.0126792	15' 47.62"	23° 26' 14"	3 m 09 s
8	63° 23' 21"	0.66"	61° 21' 08"	20° 49' 45"	1.0126867	15' 47.61"	23° 26' 14"	3 m 08 s
9	63° 25' 45"	0.65"	61° 23' 39"	20° 50' 12"	1.0126943	15' 47.60"	23° 26' 14"	3 m 08 s
10	63° 28' 09"	0.65"	61° 26' 11"	20° 50' 40"	1.0127018	15' 47.59"	23° 26' 14"	3 m 08 s
11	63° 30' 33"	0.64"	61° 28' 42"	20° 51' 07"	1.0127093	15' 47.59"	23° 26' 14"	3 m 08 s
12	63° 32' 57"	0.64"	61° 31' 13"	20° 51' 34"	1.0127169	15' 47.58"	23° 26' 14"	3 m 07 s
13	63° 35' 22"	0.64"	61° 33' 45"	20° 52' 02"	1.0127244	15' 47.57"	23° 26' 14"	3 m 07 s
14	63° 37' 46"	0.63"	61° 36' 16"	20° 52' 29"	1.0127319	15' 47.57"	23° 26' 14"	3 m 07 s
15	63° 40' 10"	0.63"	61° 38' 48"	20° 52' 56"	1.0127394	15' 47.56"	23° 26' 14"	3 m 07 s
16	63° 42' 34"	0.62"	61° 41' 19"	20° 53' 23"	1.0127469	15' 47.55"	23° 26' 14"	3 m 06 s
17	63° 44' 58"	0.62"	61° 43' 50"	20° 53' 51"	1.0127545	15' 47.54"	23° 26' 14"	3 m 06 s
18	63° 47' 22"	0.61"	61° 46' 22"	20° 54' 18"	1.0127620	15' 47.54"	23° 26' 14"	3 m 06 s
19	63° 49' 46"	0.61"	61° 48' 53"	20° 54' 45"	1.0127695	15' 47.53"	23° 26' 14"	3 m 06 s
20	63° 52' 10"	0.60"	61° 51' 25"	20° 55' 12"	1.0127770	15' 47.52"	23° 26' 14"	3 m 06 s
21	63° 54' 34"	0.60"	61° 53' 56"	20° 55' 39"	1.0127845	15' 47.52"	23° 26' 14"	3 m 05 s
22	63° 56' 58"	0.59"	61° 56' 28"	20° 56' 06"	1.0127919	15' 47.51"	23° 26' 14"	3 m 05 s
23	63° 59' 22"	0.59"	61° 58' 59"	20° 56' 33"	1.0127994	15' 47.50"	23° 26' 14"	3 m 05 s
24	64° 01' 46"	0.58"	62° 01' 31"	20° 56' 60"	1.0128069	15' 47.50"	23° 26' 14"	3 m 05 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	208° 06' 54"	3° 35' 12"	207° 24' 20"	-7° 27' 02"	1° 00' 41"	16' 32.28"	295° 50' 04"	0.90944
1	208° 44' 08"	3° 32' 39"	207° 58' 30"	-7° 42' 32"	1° 00' 43"	16' 32.70"	295° 46' 15"	0.91232
2	209° 21' 24"	3° 30' 05"	208° 32' 45"	-7° 57' 59"	1° 00' 44"	16' 33.11"	295° 42' 18"	0.91516
3	209° 58' 42"	3° 27' 30"	209° 07' 05"	-8° 13' 25"	1° 00' 46"	16' 33.51"	295° 38' 13"	0.91797
4	210° 36' 01"	3° 24' 52"	209° 41' 28"	-8° 28' 48"	1° 00' 47"	16' 33.91"	295° 34' 00"	0.92073
5	211° 13' 23"	3° 22' 13"	210° 15' 56"	-8° 44' 10"	1° 00' 49"	16' 34.30"	295° 29' 40"	0.92345
6	211° 50' 45"	3° 19' 33"	210° 50' 29"	-8° 59' 29"	1° 00' 50"	16' 34.68"	295° 25' 11"	0.92613
7	212° 28' 10"	3° 16' 51"	211° 25' 07"	-9° 14' 45"	1° 00' 52"	16' 35.06"	295° 20' 36"	0.92877
8	213° 05' 36"	3° 14' 07"	211° 59' 49"	-9° 29' 59"	1° 00' 53"	16' 35.43"	295° 15' 52"	0.93137
9	213° 43' 04"	3° 11' 22"	212° 34' 35"	-9° 45' 10"	1° 00' 54"	16' 35.79"	295° 11' 02"	0.93392
10	214° 20' 33"	3° 08' 36"	213° 09' 27"	-10° 00' 18"	1° 00' 56"	16' 36.14"	295° 6' 04"	0.93643
11	214° 58' 03"	3° 05' 48"	213° 44' 24"	-10° 15' 24"	1° 00' 57"	16' 36.49"	295° 0' 59"	0.93890
12	215° 35' 36"	3° 02' 58"	214° 19' 25"	-10° 30' 26"	1° 00' 58"	16' 36.83"	294° 55' 48"	0.94132
13	216° 13' 09"	3° 00' 08"	214° 54' 31"	-10° 45' 25"	1° 00' 59"	16' 37.16"	294° 50' 29"	0.94370
14	216° 50' 44"	2° 57' 15"	215° 29' 42"	-11° 00' 21"	1° 01' 01"	16' 37.48"	294° 45' 05"	0.94604
15	217° 28' 21"	2° 54' 22"	216° 04' 59"	-11° 15' 13"	1° 01' 02"	16' 37.80"	294° 39' 33"	0.94833
16	218° 05' 58"	2° 51' 27"	216° 40' 20"	-11° 30' 02"	1° 01' 03"	16' 38.10"	294° 33' 56"	0.95057
17	218° 43' 37"	2° 48' 30"	217° 15' 47"	-11° 44' 47"	1° 01' 04"	16' 38.40"	294° 28' 13"	0.95277
18	219° 21' 18"	2° 45' 32"	217° 51' 18"	-11° 59' 29"	1° 01' 05"	16' 38.69"	294° 22' 25"	0.95492
19	219° 58' 59"	2° 42' 33"	218° 26' 55"	-12° 14' 06"	1° 01' 06"	16' 38.98"	294° 16' 31"	0.95703
20	220° 36' 42"	2° 39' 33"	219° 02' 37"	-12° 28' 39"	1° 01' 07"	16' 39.25"	294° 10' 33"	0.95909
21	221° 14' 26"	2° 36' 31"	219° 38' 24"	-12° 43' 08"	1° 01' 08"	16' 39.52"	294° 4' 30"	0.96110
22	221° 52' 11"	2° 33' 29"	220° 14' 17"	-12° 57' 33"	1° 01' 09"	16' 39.78"	293° 58' 23"	0.96306
23	222° 29' 57"	2° 30' 25"	220° 50' 15"	-13° 11' 54"	1° 01' 10"	16' 40.03"	293° 52' 12"	0.96498
24	223° 07' 44"	2° 27' 19"	221° 26' 18"	-13° 26' 09"	1° 01' 11"	16' 40.27"	293° 45' 59"	0.96685

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	64° 01' 46"	0.58"	62° 01' 31"	20° 56' 60"	1.0128069	15' 47.50"	23° 26' 14"	3 m 05 s
1	64° 04' 10"	0.58"	62° 04' 02"	20° 57' 26"	1.0128144	15' 47.49"	23° 26' 14"	3 m 04 s
2	64° 06' 34"	0.57"	62° 06' 34"	20° 57' 53"	1.0128219	15' 47.48"	23° 26' 14"	3 m 04 s
3	64° 08' 58"	0.57"	62° 09' 06"	20° 58' 20"	1.0128293	15' 47.47"	23° 26' 14"	3 m 04 s
4	64° 11' 22"	0.56"	62° 11' 37"	20° 58' 47"	1.0128368	15' 47.47"	23° 26' 14"	3 m 04 s
5	64° 13' 46"	0.56"	62° 14' 09"	20° 59' 13"	1.0128443	15' 47.46"	23° 26' 14"	3 m 03 s
6	64° 16' 10"	0.55"	62° 16' 40"	20° 59' 40"	1.0128517	15' 47.45"	23° 26' 14"	3 m 03 s
7	64° 18' 34"	0.55"	62° 19' 12"	21° 00' 07"	1.0128592	15' 47.45"	23° 26' 14"	3 m 03 s
8	64° 20' 58"	0.54"	62° 21' 44"	21° 00' 33"	1.0128666	15' 47.44"	23° 26' 14"	3 m 02 s
9	64° 23' 22"	0.54"	62° 24' 15"	21° 00' 60"	1.0128741	15' 47.43"	23° 26' 14"	3 m 02 s
10	64° 25' 47"	0.53"	62° 26' 47"	21° 01' 26"	1.0128815	15' 47.43"	23° 26' 14"	3 m 02 s
11	64° 28' 11"	0.53"	62° 29' 19"	21° 01' 53"	1.0128890	15' 47.42"	23° 26' 14"	3 m 02 s
12	64° 30' 35"	0.52"	62° 31' 50"	21° 02' 19"	1.0128964	15' 47.41"	23° 26' 14"	3 m 01 s
13	64° 32' 59"	0.51"	62° 34' 22"	21° 02' 46"	1.0129038	15' 47.40"	23° 26' 14"	3 m 01 s
14	64° 35' 23"	0.51"	62° 36' 54"	21° 03' 12"	1.0129112	15' 47.40"	23° 26' 14"	3 m 01 s
15	64° 37' 47"	0.50"	62° 39' 25"	21° 03' 38"	1.0129187	15' 47.39"	23° 26' 14"	3 m 01 s
16	64° 40' 11"	0.50"	62° 41' 57"	21° 04' 05"	1.0129261	15' 47.38"	23° 26' 14"	3 m 00 s
17	64° 42' 35"	0.49"	62° 44' 29"	21° 04' 31"	1.0129335	15' 47.38"	23° 26' 14"	3 m 00 s
18	64° 44' 59"	0.49"	62° 47' 01"	21° 04' 57"	1.0129409	15' 47.37"	23° 26' 14"	2 m 60 s
19	64° 47' 23"	0.48"	62° 49' 32"	21° 05' 23"	1.0129483	15' 47.36"	23° 26' 14"	2 m 60 s
20	64° 49' 47"	0.48"	62° 52' 04"	21° 05' 49"	1.0129557	15' 47.36"	23° 26' 14"	2 m 59 s
21	64° 52' 11"	0.47"	62° 54' 36"	21° 06' 15"	1.0129631	15' 47.35"	23° 26' 14"	2 m 59 s
22	64° 54' 35"	0.47"	62° 57' 08"	21° 06' 41"	1.0129705	15' 47.34"	23° 26' 14"	2 m 59 s
23	64° 56' 59"	0.46"	62° 59' 40"	21° 07' 08"	1.0129779	15' 47.34"	23° 26' 14"	2 m 59 s
24	64° 59' 23"	0.46"	63° 02' 11"	21° 07' 33"	1.0129853	15' 47.33"	23° 26' 14"	2 m 58 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	223° 07' 44"	2° 27' 19"	221° 26' 18"	-13° 26' 09"	1° 01' 11"	16' 40.27"	293° 45' 59"	0.96685
1	223° 45' 32"	2° 24' 13"	222° 02' 27"	-13° 40' 20"	1° 01' 12"	16' 40.50"	293° 39' 44"	0.96866
2	224° 23' 21"	2° 21' 05"	222° 38' 41"	-13° 54' 27"	1° 01' 12"	16' 40.72"	293° 33' 26"	0.97044
3	225° 01' 11"	2° 17' 57"	223° 15' 01"	-14° 08' 28"	1° 01' 13"	16' 40.94"	293° 27' 08"	0.97216
4	225° 39' 02"	2° 14' 47"	223° 51' 26"	-14° 22' 24"	1° 01' 14"	16' 41.15"	293° 20' 50"	0.97383
5	226° 16' 53"	2° 11' 36"	224° 27' 57"	-14° 36' 15"	1° 01' 15"	16' 41.34"	293° 14' 33"	0.97545
6	226° 54' 46"	2° 08' 24"	225° 04' 33"	-14° 50' 01"	1° 01' 15"	16' 41.53"	293° 8' 18"	0.97702
7	227° 32' 39"	2° 05' 12"	225° 41' 15"	-15° 03' 41"	1° 01' 16"	16' 41.71"	293° 2' 07"	0.97855
8	228° 10' 33"	2° 01' 58"	226° 18' 02"	-15° 17' 16"	1° 01' 17"	16' 41.89"	292° 56' 00"	0.98002
9	228° 48' 28"	1° 58' 43"	226° 54' 55"	-15° 30' 45"	1° 01' 17"	16' 42.05"	292° 50' 01"	0.98144
10	229° 26' 23"	1° 55' 27"	227° 31' 54"	-15° 44' 08"	1° 01' 18"	16' 42.20"	292° 44' 09"	0.98281
11	230° 04' 19"	1° 52' 10"	228° 08' 58"	-15° 57' 25"	1° 01' 18"	16' 42.34"	292° 38' 29"	0.98413
12	230° 42' 16"	1° 48' 53"	228° 46' 07"	-16° 10' 36"	1° 01' 19"	16' 42.48"	292° 33' 02"	0.98539
13	231° 20' 13"	1° 45' 34"	229° 23' 22"	-16° 23' 41"	1° 01' 19"	16' 42.60"	292° 27' 51"	0.98661
14	231° 58' 10"	1° 42' 15"	230° 00' 43"	-16° 36' 39"	1° 01' 20"	16' 42.72"	292° 23' 01"	0.98777
15	232° 36' 08"	1° 38' 55"	230° 38' 10"	-16° 49' 31"	1° 01' 20"	16' 42.83"	292° 18' 36"	0.98888
16	233° 14' 04"	1° 35' 35"	231° 15' 39"	-17° 02' 16"	1° 01' 20"	16' 42.93"	292° 14' 41"	0.98994
17	233° 52' 02"	1° 32' 13"	231° 53' 17"	-17° 14' 54"	1° 01' 21"	16' 43.01"	292° 11' 23"	0.99095
18	234° 30' 01"	1° 28' 51"	232° 30' 60"	-17° 27' 26"	1° 01' 21"	16' 43.09"	292° 8' 49"	0.99190
19	235° 08' 01"	1° 25' 28"	233° 08' 48"	-17° 39' 51"	1° 01' 21"	16' 43.16"	292° 7' 10"	0.99281
20	235° 46' 00"	1° 22' 04"	233° 46' 43"	-17° 52' 08"	1° 01' 22"	16' 43.22"	292° 6' 39"	0.99365
21	236° 24' 00"	1° 18' 40"	234° 24' 42"	-18° 04' 19"	1° 01' 22"	16' 43.27"	292° 7' 30"	0.99445
22	237° 01' 60"	1° 15' 15"	235° 02' 48"	-18° 16' 22"	1° 01' 22"	16' 43.32"	292° 10' 06"	0.99519
23	237° 39' 60"	1° 11' 50"	235° 40' 59"	-18° 28' 17"	1° 01' 22"	16' 43.35"	292° 14' 53"	0.99588
24	238° 17' 60"	1° 08' 24"	236° 19' 15"	-18° 40' 05"	1° 01' 22"	16' 43.37"	292° 22' 29"	0.99652

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	64° 59' 23"	0.46"	63° 02' 11"	21° 07' 33"	1.0129853	15' 47.33"	23° 26' 14"	2 m 58 s
1	65° 01' 47"	0.45"	63° 04' 43"	21° 07' 59"	1.0129927	15' 47.32"	23° 26' 14"	2 m 58 s
2	65° 04' 11"	0.45"	63° 07' 15"	21° 08' 25"	1.0130001	15' 47.31"	23° 26' 14"	2 m 58 s
3	65° 06' 35"	0.44"	63° 09' 47"	21° 08' 51"	1.0130075	15' 47.31"	23° 26' 14"	2 m 57 s
4	65° 08' 59"	0.43"	63° 12' 19"	21° 09' 17"	1.0130148	15' 47.30"	23° 26' 14"	2 m 57 s
5	65° 11' 23"	0.43"	63° 14' 51"	21° 09' 43"	1.0130222	15' 47.29"	23° 26' 14"	2 m 57 s
6	65° 13' 47"	0.42"	63° 17' 23"	21° 10' 09"	1.0130296	15' 47.29"	23° 26' 14"	2 m 57 s
7	65° 16' 10"	0.42"	63° 19' 55"	21° 10' 34"	1.0130369	15' 47.28"	23° 26' 14"	2 m 56 s
8	65° 18' 34"	0.41"	63° 22' 27"	21° 10' 60"	1.0130443	15' 47.27"	23° 26' 14"	2 m 56 s
9	65° 20' 58"	0.41"	63° 24' 59"	21° 11' 26"	1.0130516	15' 47.27"	23° 26' 14"	2 m 56 s
10	65° 23' 22"	0.40"	63° 27' 30"	21° 11' 51"	1.0130590	15' 47.26"	23° 26' 14"	2 m 56 s
11	65° 25' 46"	0.40"	63° 30' 02"	21° 12' 17"	1.0130663	15' 47.25"	23° 26' 14"	2 m 55 s
12	65° 28' 10"	0.39"	63° 32' 34"	21° 12' 42"	1.0130737	15' 47.25"	23° 26' 14"	2 m 55 s
13	65° 30' 34"	0.38"	63° 35' 06"	21° 13' 08"	1.0130810	15' 47.24"	23° 26' 14"	2 m 55 s
14	65° 32' 58"	0.38"	63° 37' 38"	21° 13' 33"	1.0130883	15' 47.23"	23° 26' 14"	2 m 54 s
15	65° 35' 22"	0.37"	63° 40' 10"	21° 13' 59"	1.0130957	15' 47.23"	23° 26' 14"	2 m 54 s
16	65° 37' 46"	0.37"	63° 42' 43"	21° 14' 24"	1.0131030	15' 47.22"	23° 26' 14"	2 m 54 s
17	65° 40' 10"	0.36"	63° 45' 15"	21° 14' 49"	1.0131103	15' 47.21"	23° 26' 14"	2 m 54 s
18	65° 42' 34"	0.36"	63° 47' 47"	21° 15' 15"	1.0131176	15' 47.20"	23° 26' 14"	2 m 53 s
19	65° 44' 58"	0.35"	63° 50' 19"	21° 15' 40"	1.0131249	15' 47.20"	23° 26' 14"	2 m 53 s
20	65° 47' 22"	0.35"	63° 52' 51"	21° 16' 05"	1.0131323	15' 47.19"	23° 26' 14"	2 m 53 s
21	65° 49' 46"	0.34"	63° 55' 23"	21° 16' 30"	1.0131396	15' 47.18"	23° 26' 14"	2 m 52 s
22	65° 52' 10"	0.33"	63° 57' 55"	21° 16' 55"	1.0131469	15' 47.18"	23° 26' 14"	2 m 52 s
23	65° 54' 34"	0.33"	64° 00' 27"	21° 17' 21"	1.0131542	15' 47.17"	23° 26' 14"	2 m 52 s
24	65° 56' 58"	0.32"	64° 02' 59"	21° 17' 46"	1.0131615	15' 47.16"	23° 26' 14"	2 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	238° 17' 60"	1° 08' 24"	236° 19' 15"	-18° 40' 05"	1° 01' 22"	16' 43.37"	292° 22' 29"	0.99652
1	238° 56' 00"	1° 04' 57"	236° 57' 36"	-18° 51' 45"	1° 01' 22"	16' 43.38"	292° 33' 44"	0.99710
2	239° 34' 00"	1° 01' 30"	237° 36' 03"	-19° 03' 18"	1° 01' 22"	16' 43.39"	292° 49' 51"	0.99763
3	240° 12' 00"	0° 58' 03"	238° 14' 36"	-19° 14' 42"	1° 01' 22"	16' 43.38"	293° 12' 38"	0.99811
4	240° 50' 00"	0° 54' 35"	238° 53' 13"	-19° 25' 58"	1° 01' 22"	16' 43.36"	293° 44' 49"	0.99853
5	241° 27' 60"	0° 51' 07"	239° 31' 56"	-19° 37' 06"	1° 01' 22"	16' 43.34"	294° 30' 49"	0.99890
6	242° 05' 59"	0° 47' 38"	240° 10' 44"	-19° 48' 06"	1° 01' 22"	16' 43.30"	295° 38' 18"	0.99921
7	242° 43' 59"	0° 44' 09"	240° 49' 38"	-19° 58' 57"	1° 01' 22"	16' 43.26"	297° 21' 36"	0.99947
8	243° 21' 58"	0° 40' 40"	241° 28' 36"	-20° 09' 40"	1° 01' 22"	16' 43.21"	300° 11' 10"	0.99968
9	243° 59' 57"	0° 37' 10"	242° 07' 40"	-20° 20' 14"	1° 01' 21"	16' 43.14"	305° 23' 20"	0.99983
10	244° 37' 55"	0° 33' 41"	242° 46' 48"	-20° 30' 39"	1° 01' 21"	16' 43.07"	317° 5' 14"	0.99993
11	245° 15' 53"	0° 30' 11"	243° 26' 02"	-20° 40' 56"	1° 01' 21"	16' 42.99"	352° 18' 32"	0.99998
12	245° 53' 51"	0° 26' 40"	244° 05' 20"	-20° 51' 03"	1° 01' 20"	16' 42.89"	54° 2' 43"	0.99997
13	246° 31' 48"	0° 23' 10"	244° 44' 43"	-21° 01' 02"	1° 01' 20"	16' 42.79"	79° 4' 52"	0.99991
14	247° 09' 44"	0° 19' 40"	245° 24' 11"	-21° 10' 51"	1° 01' 20"	16' 42.68"	88° 3' 41"	0.99979
15	247° 47' 40"	0° 16' 09"	246° 03' 43"	-21° 20' 30"	1° 01' 19"	16' 42.56"	92° 20' 12"	0.99963
16	248° 25' 36"	0° 12' 38"	246° 43' 20"	-21° 30' 01"	1° 01' 19"	16' 42.43"	94° 44' 33"	0.99940
17	249° 03' 31"	0° 09' 08"	247° 23' 02"	-21° 39' 22"	1° 01' 18"	16' 42.29"	96° 13' 55"	0.99913
18	249° 41' 25"	0° 05' 37"	248° 02' 48"	-21° 48' 33"	1° 01' 18"	16' 42.15"	97° 12' 24"	0.99880
19	250° 19' 18"	0° 02' 06"	248° 42' 38"	-21° 57' 35"	1° 01' 17"	16' 41.99"	97° 51' 51"	0.99841
20	250° 57' 11"	0° -1' 24"	249° 22' 32"	-22° 06' 26"	1° 01' 16"	16' 41.82"	98° 18' 44"	0.99798
21	251° 35' 03"	0° -4' 55"	250° 02' 31"	-22° 15' 08"	1° 01' 16"	16' 41.65"	98° 36' 53"	0.99749
22	252° 12' 54"	0° -8' 25"	250° 42' 33"	-22° 23' 40"	1° 01' 15"	16' 41.46"	98° 48' 41"	0.99695
23	252° 50' 44"	0° -11' 55"	251° 22' 40"	-22° 32' 02"	1° 01' 14"	16' 41.27"	98° 55' 46"	0.99635
24	253° 28' 33"	0° -15' 25"	252° 02' 50"	-22° 40' 14"	1° 01' 14"	16' 41.06"	98° 59' 11"	0.99571

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	65° 56' 58"	0.32"	64° 02' 59"	21° 17' 46"	1.0131615	15' 47.16"	23° 26' 14"	2 m 52 s
1	65° 59' 22"	0.32"	64° 05' 31"	21° 18' 11"	1.0131688	15' 47.16"	23° 26' 14"	2 m 51 s
2	66° 01' 46"	0.31"	64° 08' 04"	21° 18' 36"	1.0131760	15' 47.15"	23° 26' 14"	2 m 51 s
3	66° 04' 10"	0.31"	64° 10' 36"	21° 19' 01"	1.0131833	15' 47.14"	23° 26' 14"	2 m 51 s
4	66° 06' 34"	0.30"	64° 13' 08"	21° 19' 25"	1.0131906	15' 47.14"	23° 26' 14"	2 m 50 s
5	66° 08' 57"	0.30"	64° 15' 40"	21° 19' 50"	1.0131979	15' 47.13"	23° 26' 14"	2 m 50 s
6	66° 11' 21"	0.29"	64° 18' 12"	21° 20' 15"	1.0132051	15' 47.12"	23° 26' 14"	2 m 50 s
7	66° 13' 45"	0.28"	64° 20' 45"	21° 20' 40"	1.0132124	15' 47.12"	23° 26' 14"	2 m 49 s
8	66° 16' 09"	0.28"	64° 23' 17"	21° 21' 05"	1.0132197	15' 47.11"	23° 26' 14"	2 m 49 s
9	66° 18' 33"	0.27"	64° 25' 49"	21° 21' 29"	1.0132269	15' 47.10"	23° 26' 14"	2 m 49 s
10	66° 20' 57"	0.27"	64° 28' 21"	21° 21' 54"	1.0132342	15' 47.10"	23° 26' 14"	2 m 49 s
11	66° 23' 21"	0.26"	64° 30' 54"	21° 22' 19"	1.0132414	15' 47.09"	23° 26' 14"	2 m 48 s
12	66° 25' 45"	0.26"	64° 33' 26"	21° 22' 43"	1.0132487	15' 47.08"	23° 26' 14"	2 m 48 s
13	66° 28' 09"	0.25"	64° 35' 58"	21° 23' 08"	1.0132559	15' 47.08"	23° 26' 14"	2 m 48 s
14	66° 30' 33"	0.25"	64° 38' 30"	21° 23' 32"	1.0132632	15' 47.07"	23° 26' 14"	2 m 47 s
15	66° 32' 57"	0.24"	64° 41' 03"	21° 23' 57"	1.0132704	15' 47.06"	23° 26' 14"	2 m 47 s
16	66° 35' 21"	0.24"	64° 43' 35"	21° 24' 21"	1.0132776	15' 47.06"	23° 26' 14"	2 m 47 s
17	66° 37' 45"	0.23"	64° 46' 07"	21° 24' 46"	1.0132849	15' 47.05"	23° 26' 14"	2 m 46 s
18	66° 40' 08"	0.22"	64° 48' 40"	21° 25' 10"	1.0132921	15' 47.04"	23° 26' 14"	2 m 46 s
19	66° 42' 32"	0.22"	64° 51' 12"	21° 25' 35"	1.0132993	15' 47.04"	23° 26' 14"	2 m 46 s
20	66° 44' 56"	0.21"	64° 53' 45"	21° 25' 59"	1.0133065	15' 47.03"	23° 26' 14"	2 m 46 s
21	66° 47' 20"	0.21"	64° 56' 17"	21° 26' 23"	1.0133137	15' 47.02"	23° 26' 14"	2 m 45 s
22	66° 49' 44"	0.20"	64° 58' 49"	21° 26' 47"	1.0133209	15' 47.01"	23° 26' 14"	2 m 45 s
23	66° 52' 08"	0.20"	65° 01' 22"	21° 27' 12"	1.0133281	15' 47.01"	23° 26' 14"	2 m 45 s
24	66° 54' 32"	0.19"	65° 03' 54"	21° 27' 36"	1.0133353	15' 47.00"	23° 26' 14"	2 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	253° 28' 33"	0°-15' 25"	252° 02' 50"	-22° 40' 14"	1° 01' 14"	16' 41.06"	98° 59' 11"	0.99571
1	254° 06' 21"	0°-18' 55"	252° 43' 04"	-22° 48' 15"	1° 01' 13"	16' 40.85"	98° 59' 45"	0.99501
2	254° 44' 08"	0°-22' 25"	253° 23' 22"	-22° 56' 06"	1° 01' 12"	16' 40.63"	98° 57' 60"	0.99425
3	255° 21' 55"	0°-25' 54"	254° 03' 43"	-23° 03' 47"	1° 01' 11"	16' 40.40"	98° 54' 22"	0.99345
4	255° 59' 40"	0°-29' 23"	254° 44' 08"	-23° 11' 17"	1° 01' 10"	16' 40.16"	98° 49' 10"	0.99259
5	256° 37' 24"	0°-32' 52"	255° 24' 35"	-23° 18' 37"	1° 01' 09"	16' 39.91"	98° 42' 39"	0.99168
6	257° 15' 07"	0°-36' 21"	256° 05' 06"	-23° 25' 46"	1° 01' 08"	16' 39.65"	98° 35' 02"	0.99072
7	257° 52' 48"	0°-39' 49"	256° 45' 40"	-23° 32' 44"	1° 01' 08"	16' 39.39"	98° 26' 27"	0.98971
8	258° 30' 29"	0°-43' 16"	257° 26' 17"	-23° 39' 32"	1° 01' 07"	16' 39.11"	98° 17' 02"	0.98865
9	259° 08' 08"	0°-46' 44"	258° 06' 56"	-23° 46' 08"	1° 01' 05"	16' 38.83"	98° 6' 54"	0.98754
10	259° 45' 46"	0°-50' 11"	258° 47' 38"	-23° 52' 34"	1° 01' 04"	16' 38.54"	97° 56' 07"	0.98637
11	260° 23' 22"	0°-53' 37"	259° 28' 23"	-23° 58' 49"	1° 01' 03"	16' 38.24"	97° 44' 47"	0.98516
12	261° 00' 57"	0°-57' 03"	260° 09' 10"	-24° 04' 53"	1° 01' 02"	16' 37.93"	97° 32' 56"	0.98389
13	261° 38' 31"	-1° 00' 28"	260° 49' 59"	-24° 10' 46"	1° 01' 01"	16' 37.61"	97° 20' 38"	0.98258
14	262° 16' 03"	-1° 03' 53"	261° 30' 50"	-24° 16' 28"	1° 00' 60"	16' 37.29"	97° 7' 55"	0.98121
15	262° 53' 34"	-1° 07' 17"	262° 11' 43"	-24° 21' 58"	1° 00' 59"	16' 36.96"	96° 54' 51"	0.97980
16	263° 31' 03"	-1° 10' 40"	262° 52' 38"	-24° 27' 18"	1° 00' 57"	16' 36.62"	96° 41' 26"	0.97834
17	264° 08' 31"	-1° 14' 03"	263° 33' 34"	-24° 32' 26"	1° 00' 56"	16' 36.27"	96° 27' 44"	0.97683
18	264° 45' 57"	-1° 17' 25"	264° 14' 32"	-24° 37' 23"	1° 00' 55"	16' 35.91"	96° 13' 44"	0.97527
19	265° 23' 22"	-1° 20' 46"	264° 55' 31"	-24° 42' 08"	1° 00' 53"	16' 35.54"	95° 59' 29"	0.97366
20	266° 00' 45"	-1° 24' 07"	265° 36' 31"	-24° 46' 42"	1° 00' 52"	16' 35.17"	95° 45' 00"	0.97200
21	266° 38' 06"	-1° 27' 27"	266° 17' 32"	-24° 51' 05"	1° 00' 51"	16' 34.79"	95° 30' 18"	0.97030
22	267° 15' 25"	-1° 30' 46"	266° 58' 35"	-24° 55' 17"	1° 00' 49"	16' 34.40"	95° 15' 25"	0.96854
23	267° 52' 43"	-1° 34' 05"	267° 39' 37"	-24° 59' 17"	1° 00' 48"	16' 34.01"	95° 0' 20"	0.96675
24	268° 29' 59"	-1° 37' 22"	268° 20' 41"	-25° 03' 05"	1° 00' 46"	16' 33.61"	94° 45' 05"	0.96490

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	66° 54' 32"	0.19"	65° 03' 54"	21° 27' 36"	1.0133353	15' 47.00"	23° 26' 14"	2 m 44 s
1	66° 56' 56"	0.19"	65° 06' 27"	21° 27' 60"	1.0133425	15' 46.99"	23° 26' 14"	2 m 44 s
2	66° 59' 20"	0.18"	65° 08' 59"	21° 28' 24"	1.0133497	15' 46.99"	23° 26' 14"	2 m 44 s
3	67° 01' 44"	0.18"	65° 11' 32"	21° 28' 48"	1.0133569	15' 46.98"	23° 26' 14"	2 m 43 s
4	67° 04' 07"	0.17"	65° 14' 04"	21° 29' 12"	1.0133641	15' 46.97"	23° 26' 14"	2 m 43 s
5	67° 06' 31"	0.16"	65° 16' 36"	21° 29' 36"	1.0133712	15' 46.97"	23° 26' 14"	2 m 43 s
6	67° 08' 55"	0.16"	65° 19' 09"	21° 29' 60"	1.0133784	15' 46.96"	23° 26' 14"	2 m 42 s
7	67° 11' 19"	0.15"	65° 21' 41"	21° 30' 24"	1.0133856	15' 46.95"	23° 26' 14"	2 m 42 s
8	67° 13' 43"	0.15"	65° 24' 14"	21° 30' 47"	1.0133927	15' 46.95"	23° 26' 14"	2 m 42 s
9	67° 16' 07"	0.14"	65° 26' 47"	21° 31' 11"	1.0133999	15' 46.94"	23° 26' 14"	2 m 42 s
10	67° 18' 31"	0.14"	65° 29' 19"	21° 31' 35"	1.0134070	15' 46.93"	23° 26' 14"	2 m 41 s
11	67° 20' 55"	0.13"	65° 31' 52"	21° 31' 59"	1.0134142	15' 46.93"	23° 26' 14"	2 m 41 s
12	67° 23' 18"	0.13"	65° 34' 24"	21° 32' 22"	1.0134213	15' 46.92"	23° 26' 14"	2 m 41 s
13	67° 25' 42"	0.12"	65° 36' 57"	21° 32' 46"	1.0134285	15' 46.91"	23° 26' 14"	2 m 40 s
14	67° 28' 06"	0.12"	65° 39' 29"	21° 33' 10"	1.0134356	15' 46.91"	23° 26' 14"	2 m 40 s
15	67° 30' 30"	0.11"	65° 42' 02"	21° 33' 33"	1.0134427	15' 46.90"	23° 26' 14"	2 m 40 s
16	67° 32' 54"	0.11"	65° 44' 35"	21° 33' 57"	1.0134499	15' 46.89"	23° 26' 14"	2 m 39 s
17	67° 35' 18"	0.10"	65° 47' 07"	21° 34' 20"	1.0134570	15' 46.89"	23° 26' 14"	2 m 39 s
18	67° 37' 42"	0.10"	65° 49' 40"	21° 34' 44"	1.0134641	15' 46.88"	23° 26' 14"	2 m 39 s
19	67° 40' 06"	0.09"	65° 52' 13"	21° 35' 07"	1.0134712	15' 46.87"	23° 26' 14"	2 m 38 s
20	67° 42' 29"	0.09"	65° 54' 45"	21° 35' 30"	1.0134783	15' 46.87"	23° 26' 14"	2 m 38 s
21	67° 44' 53"	0.08"	65° 57' 18"	21° 35' 54"	1.0134854	15' 46.86"	23° 26' 14"	2 m 38 s
22	67° 47' 17"	0.08"	65° 59' 51"	21° 36' 17"	1.0134925	15' 46.85"	23° 26' 14"	2 m 37 s
23	67° 49' 41"	0.07"	66° 02' 23"	21° 36' 40"	1.0134996	15' 46.85"	23° 26' 14"	2 m 37 s
24	67° 52' 05"	0.07"	66° 04' 56"	21° 37' 03"	1.0135067	15' 46.84"	23° 26' 14"	2 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	268° 29' 59"	-1° 37' 22"	268° 20' 41"	-25° 03' 05"	1° 00' 46"	16' 33.61"	94° 45' 05"	0.96490
1	269° 07' 13"	-1° 40' 39"	269° 01' 44"	-25° 06' 42"	1° 00' 45"	16' 33.19"	94° 29' 41"	0.96301
2	269° 44' 26"	-1° 43' 55"	269° 42' 48"	-25° 10' 08"	1° 00' 43"	16' 32.78"	94° 14' 08"	0.96107
3	270° 21' 36"	-1° 47' 09"	270° 23' 52"	-25° 13' 22"	1° 00' 42"	16' 32.35"	93° 58' 28"	0.95909
4	270° 58' 45"	-1° 50' 23"	271° 04' 56"	-25° 16' 24"	1° 00' 40"	16' 31.92"	93° 42' 40"	0.95706
5	271° 35' 51"	-1° 53' 36"	271° 45' 59"	-25° 19' 15"	1° 00' 38"	16' 31.48"	93° 26' 45"	0.95499
6	272° 12' 56"	-1° 56' 49"	272° 27' 02"	-25° 21' 55"	1° 00' 37"	16' 31.04"	93° 10' 44"	0.95287
7	272° 49' 58"	-1° 59' 60"	273° 08' 04"	-25° 24' 23"	1° 00' 35"	16' 30.59"	92° 54' 38"	0.95071
8	273° 26' 59"	-2° 03' 10"	273° 49' 06"	-25° 26' 39"	1° 00' 34"	16' 30.13"	92° 38' 26"	0.94851
9	274° 03' 58"	-2° 06' 19"	274° 30' 07"	-25° 28' 44"	1° 00' 32"	16' 29.66"	92° 22' 09"	0.94626
10	274° 40' 54"	-2° 09' 27"	275° 11' 06"	-25° 30' 37"	1° 00' 30"	16' 29.19"	92° 5' 49"	0.94397
11	275° 17' 48"	-2° 12' 33"	275° 52' 04"	-25° 32' 19"	1° 00' 28"	16' 28.71"	91° 49' 24"	0.94164
12	275° 54' 41"	-2° 15' 39"	276° 33' 01"	-25° 33' 50"	1° 00' 27"	16' 28.23"	91° 32' 56"	0.93926
13	276° 31' 31"	-2° 18' 44"	277° 13' 56"	-25° 35' 09"	1° 00' 25"	16' 27.74"	91° 16' 25"	0.93685
14	277° 08' 19"	-2° 21' 47"	277° 54' 50"	-25° 36' 16"	1° 00' 23"	16' 27.24"	90° 59' 51"	0.93439
15	277° 45' 05"	-2° 24' 50"	278° 35' 41"	-25° 37' 12"	1° 00' 21"	16' 26.74"	90° 43' 15"	0.93189
16	278° 21' 48"	-2° 27' 51"	279° 16' 31"	-25° 37' 57"	1° 00' 19"	16' 26.23"	90° 26' 36"	0.92935
17	278° 58' 29"	-2° 30' 51"	279° 57' 18"	-25° 38' 30"	1° 00' 17"	16' 25.72"	90° 9' 56"	0.92678
18	279° 35' 08"	-2° 33' 49"	280° 38' 03"	-25° 38' 52"	1° 00' 15"	16' 25.20"	89° 53' 15"	0.92416
19	280° 11' 45"	-2° 36' 47"	281° 18' 45"	-25° 39' 03"	1° 00' 14"	16' 24.67"	89° 36' 33"	0.92150
20	280° 48' 19"	-2° 39' 43"	281° 59' 25"	-25° 39' 02"	1° 00' 12"	16' 24.14"	89° 19' 50"	0.91881
21	281° 24' 51"	-2° 42' 38"	282° 40' 01"	-25° 38' 50"	1° 00' 10"	16' 23.61"	89° 3' 06"	0.91607
22	282° 01' 21"	-2° 45' 31"	283° 20' 35"	-25° 38' 27"	1° 00' 08"	16' 23.06"	88° 46' 22"	0.91330
23	282° 37' 48"	-2° 48' 24"	284° 01' 05"	-25° 37' 53"	1° 00' 06"	16' 22.52"	88° 29' 38"	0.91049
24	283° 14' 13"	-2° 51' 15"	284° 41' 33"	-25° 37' 07"	1° 00' 04"	16' 21.97"	88° 12' 55"	0.90765

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	67° 52' 05"	0.07"	66° 04' 56"	21° 37' 03"	1.0135067	15' 46.84"	23° 26' 14"	2 m 37 s
1	67° 54' 29"	0.06"	66° 07' 29"	21° 37' 27"	1.0135138	15' 46.83"	23° 26' 14"	2 m 36 s
2	67° 56' 53"	0.06"	66° 10' 01"	21° 37' 50"	1.0135209	15' 46.83"	23° 26' 14"	2 m 36 s
3	67° 59' 16"	0.05"	66° 12' 34"	21° 38' 13"	1.0135280	15' 46.82"	23° 26' 14"	2 m 36 s
4	68° 01' 40"	0.05"	66° 15' 07"	21° 38' 36"	1.0135350	15' 46.81"	23° 26' 14"	2 m 35 s
5	68° 04' 04"	0.04"	66° 17' 40"	21° 38' 59"	1.0135421	15' 46.81"	23° 26' 14"	2 m 35 s
6	68° 06' 28"	0.04"	66° 20' 13"	21° 39' 22"	1.0135492	15' 46.80"	23° 26' 14"	2 m 35 s
7	68° 08' 52"	0.03"	66° 22' 45"	21° 39' 45"	1.0135562	15' 46.80"	23° 26' 14"	2 m 34 s
8	68° 11' 16"	0.03"	66° 25' 18"	21° 40' 08"	1.0135633	15' 46.79"	23° 26' 14"	2 m 34 s
9	68° 13' 39"	0.02"	66° 27' 51"	21° 40' 31"	1.0135703	15' 46.78"	23° 26' 14"	2 m 34 s
10	68° 16' 03"	0.02"	66° 30' 24"	21° 40' 53"	1.0135774	15' 46.78"	23° 26' 14"	2 m 33 s
11	68° 18' 27"	0.01"	66° 32' 57"	21° 41' 16"	1.0135844	15' 46.77"	23° 26' 14"	2 m 33 s
12	68° 20' 51"	0.01"	66° 35' 30"	21° 41' 39"	1.0135914	15' 46.76"	23° 26' 14"	2 m 33 s
13	68° 23' 15"	0.00"	66° 38' 02"	21° 42' 02"	1.0135984	15' 46.76"	23° 26' 14"	2 m 32 s
14	68° 25' 39"	-0.00"	66° 40' 35"	21° 42' 24"	1.0136055	15' 46.75"	23° 26' 14"	2 m 32 s
15	68° 28' 02"	-0.00"	66° 43' 08"	21° 42' 47"	1.0136125	15' 46.74"	23° 26' 14"	2 m 32 s
16	68° 30' 26"	-0.01"	66° 45' 41"	21° 43' 10"	1.0136195	15' 46.74"	23° 26' 14"	2 m 31 s
17	68° 32' 50"	-0.01"	66° 48' 14"	21° 43' 32"	1.0136265	15' 46.73"	23° 26' 14"	2 m 31 s
18	68° 35' 14"	-0.02"	66° 50' 47"	21° 43' 55"	1.0136335	15' 46.72"	23° 26' 14"	2 m 31 s
19	68° 37' 38"	-0.02"	66° 53' 20"	21° 44' 17"	1.0136405	15' 46.72"	23° 26' 14"	2 m 30 s
20	68° 40' 02"	-0.03"	66° 55' 53"	21° 44' 40"	1.0136475	15' 46.71"	23° 26' 14"	2 m 30 s
21	68° 42' 25"	-0.03"	66° 58' 26"	21° 45' 02"	1.0136545	15' 46.70"	23° 26' 14"	2 m 30 s
22	68° 44' 49"	-0.04"	67° 00' 59"	21° 45' 24"	1.0136615	15' 46.70"	23° 26' 14"	2 m 29 s
23	68° 47' 13"	-0.04"	67° 03' 32"	21° 45' 47"	1.0136685	15' 46.69"	23° 26' 14"	2 m 29 s
24	68° 49' 37"	-0.04"	67° 06' 05"	21° 46' 09"	1.0136754	15' 46.68"	23° 26' 14"	2 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	283° 14' 13"	-2° 51' 15"	284° 41' 33"	-25° 37' 07"	1° 00' 04"	16' 21.97"	88° 12' 55"	0.90765
1	283° 50' 36"	-2° 54' 04"	285° 21' 56"	-25° 36' 11"	1° 00' 02"	16' 21.41"	87° 56' 12"	0.90477
2	284° 26' 56"	-2° 56' 52"	286° 02' 16"	-25° 35' 03"	0° 59' 59"	16' 20.85"	87° 39' 30"	0.90185
3	285° 03' 13"	-2° 59' 39"	286° 42' 33"	-25° 33' 45"	0° 59' 57"	16' 20.29"	87° 22' 49"	0.89890
4	285° 39' 28"	-3° 02' 25"	287° 22' 45"	-25° 32' 16"	0° 59' 55"	16' 19.72"	87° 6' 09"	0.89591
5	286° 15' 41"	-3° 05' 09"	288° 02' 54"	-25° 30' 36"	0° 59' 53"	16' 19.15"	86° 49' 31"	0.89289
6	286° 51' 51"	-3° 07' 51"	288° 42' 58"	-25° 28' 45"	0° 59' 51"	16' 18.57"	86° 32' 55"	0.88984
7	287° 27' 59"	-3° 10' 32"	289° 22' 58"	-25° 26' 43"	0° 59' 49"	16' 17.99"	86° 16' 20"	0.88675
8	288° 04' 04"	-3° 13' 12"	290° 02' 53"	-25° 24' 31"	0° 59' 47"	16' 17.40"	85° 59' 48"	0.88363
9	288° 40' 06"	-3° 15' 50"	290° 42' 44"	-25° 22' 08"	0° 59' 45"	16' 16.81"	85° 43' 18"	0.88047
10	289° 16' 06"	-3° 18' 27"	291° 22' 31"	-25° 19' 35"	0° 59' 42"	16' 16.22"	85° 26' 51"	0.87729
11	289° 52' 03"	-3° 21' 02"	292° 02' 12"	-25° 16' 51"	0° 59' 40"	16' 15.62"	85° 10' 27"	0.87407
12	290° 27' 58"	-3° 23' 36"	292° 41' 49"	-25° 13' 57"	0° 59' 38"	16' 15.02"	84° 54' 06"	0.87082
13	291° 03' 50"	-3° 26' 08"	293° 21' 20"	-25° 10' 52"	0° 59' 36"	16' 14.42"	84° 37' 48"	0.86754
14	291° 39' 39"	-3° 28' 39"	294° 00' 46"	-25° 07' 38"	0° 59' 34"	16' 13.81"	84° 21' 33"	0.86423
15	292° 15' 26"	-3° 31' 08"	294° 40' 07"	-25° 04' 13"	0° 59' 31"	16' 13.20"	84° 5' 22"	0.86089
16	292° 51' 10"	-3° 33' 35"	295° 19' 23"	-25° 00' 38"	0° 59' 29"	16' 12.58"	83° 49' 14"	0.85752
17	293° 26' 51"	-3° 36' 01"	295° 58' 33"	-24° 56' 53"	0° 59' 27"	16' 11.97"	83° 33' 11"	0.85413
18	294° 02' 30"	-3° 38' 26"	296° 37' 38"	-24° 52' 58"	0° 59' 25"	16' 11.35"	83° 17' 11"	0.85070
19	294° 38' 06"	-3° 40' 48"	297° 16' 37"	-24° 48' 53"	0° 59' 22"	16' 10.72"	83° 1' 16"	0.84725
20	295° 13' 39"	-3° 43' 10"	297° 55' 30"	-24° 44' 39"	0° 59' 20"	16' 10.10"	82° 45' 25"	0.84377
21	295° 49' 10"	-3° 45' 29"	298° 34' 17"	-24° 40' 15"	0° 59' 18"	16' 09.47"	82° 29' 39"	0.84026
22	296° 24' 38"	-3° 47' 47"	299° 12' 58"	-24° 35' 41"	0° 59' 15"	16' 08.84"	82° 13' 57"	0.83673
23	297° 00' 03"	-3° 50' 03"	299° 51' 34"	-24° 30' 58"	0° 59' 13"	16' 08.21"	81° 58' 21"	0.83317
24	297° 35' 25"	-3° 52' 18"	300° 30' 03"	-24° 26' 06"	0° 59' 11"	16' 07.58"	81° 42' 49"	0.82958

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	68° 49' 37"	-0.04"	67° 06' 05"	21° 46' 09"	1.0136754	15' 46.68"	23° 26' 14"	2 m 29 s
1	68° 52' 01"	-0.05"	67° 08' 38"	21° 46' 31"	1.0136824	15' 46.68"	23° 26' 14"	2 m 28 s
2	68° 54' 25"	-0.05"	67° 11' 11"	21° 46' 53"	1.0136894	15' 46.67"	23° 26' 14"	2 m 28 s
3	68° 56' 48"	-0.06"	67° 13' 44"	21° 47' 15"	1.0136963	15' 46.66"	23° 26' 14"	2 m 28 s
4	68° 59' 12"	-0.06"	67° 16' 17"	21° 47' 38"	1.0137033	15' 46.66"	23° 26' 14"	2 m 27 s
5	69° 01' 36"	-0.07"	67° 18' 50"	21° 47' 60"	1.0137102	15' 46.65"	23° 26' 14"	2 m 27 s
6	69° 03' 60"	-0.07"	67° 21' 23"	21° 48' 22"	1.0137172	15' 46.64"	23° 26' 14"	2 m 26 s
7	69° 06' 24"	-0.07"	67° 23' 56"	21° 48' 44"	1.0137241	15' 46.64"	23° 26' 14"	2 m 26 s
8	69° 08' 47"	-0.08"	67° 26' 29"	21° 49' 06"	1.0137310	15' 46.63"	23° 26' 14"	2 m 26 s
9	69° 11' 11"	-0.08"	67° 29' 02"	21° 49' 28"	1.0137379	15' 46.63"	23° 26' 14"	2 m 25 s
10	69° 13' 35"	-0.09"	67° 31' 35"	21° 49' 49"	1.0137449	15' 46.62"	23° 26' 14"	2 m 25 s
11	69° 15' 59"	-0.09"	67° 34' 08"	21° 50' 11"	1.0137518	15' 46.61"	23° 26' 14"	2 m 25 s
12	69° 18' 23"	-0.09"	67° 36' 42"	21° 50' 33"	1.0137587	15' 46.61"	23° 26' 14"	2 m 24 s
13	69° 20' 46"	-0.10"	67° 39' 15"	21° 50' 55"	1.0137656	15' 46.60"	23° 26' 14"	2 m 24 s
14	69° 23' 10"	-0.10"	67° 41' 48"	21° 51' 17"	1.0137725	15' 46.59"	23° 26' 14"	2 m 24 s
15	69° 25' 34"	-0.10"	67° 44' 21"	21° 51' 38"	1.0137794	15' 46.59"	23° 26' 14"	2 m 23 s
16	69° 27' 58"	-0.11"	67° 46' 54"	21° 51' 60"	1.0137863	15' 46.58"	23° 26' 14"	2 m 23 s
17	69° 30' 22"	-0.11"	67° 49' 27"	21° 52' 22"	1.0137932	15' 46.57"	23° 26' 14"	2 m 23 s
18	69° 32' 45"	-0.12"	67° 52' 01"	21° 52' 43"	1.0138000	15' 46.57"	23° 26' 14"	2 m 22 s
19	69° 35' 09"	-0.12"	67° 54' 34"	21° 53' 05"	1.0138069	15' 46.56"	23° 26' 14"	2 m 22 s
20	69° 37' 33"	-0.12"	67° 57' 07"	21° 53' 26"	1.0138138	15' 46.55"	23° 26' 14"	2 m 21 s
21	69° 39' 57"	-0.13"	67° 59' 40"	21° 53' 48"	1.0138206	15' 46.55"	23° 26' 14"	2 m 21 s
22	69° 42' 20"	-0.13"	68° 02' 13"	21° 54' 09"	1.0138275	15' 46.54"	23° 26' 14"	2 m 21 s
23	69° 44' 44"	-0.13"	68° 04' 47"	21° 54' 30"	1.0138343	15' 46.54"	23° 26' 14"	2 m 20 s
24	69° 47' 08"	-0.14"	68° 07' 20"	21° 54' 52"	1.0138412	15' 46.53"	23° 26' 14"	2 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	297° 35' 25"	-3° 52' 18"	300° 30' 03"	-24° 26' 06"	0° 59' 11"	16' 07.58"	81° 42' 49"	0.82958
1	298° 10' 45"	-3° 54' 31"	301° 08' 26"	-24° 21' 04"	0° 59' 08"	16' 06.94"	81° 27' 22"	0.82597
2	298° 46' 02"	-3° 56' 42"	301° 46' 42"	-24° 15' 53"	0° 59' 06"	16' 06.30"	81° 12' 00"	0.82234
3	299° 21' 16"	-3° 58' 52"	302° 24' 53"	-24° 10' 33"	0° 59' 04"	16' 05.66"	80° 56' 44"	0.81868
4	299° 56' 27"	-4° 00' 60"	303° 02' 56"	-24° 05' 04"	0° 59' 01"	16' 05.02"	80° 41' 34"	0.81500
5	300° 31' 36"	-4° 03' 06"	303° 40' 54"	-23° 59' 26"	0° 58' 59"	16' 04.37"	80° 26' 28"	0.81129
6	301° 06' 41"	-4° 05' 11"	304° 18' 44"	-23° 53' 39"	0° 58' 57"	16' 03.73"	80° 11' 29"	0.80757
7	301° 41' 44"	-4° 07' 14"	304° 56' 29"	-23° 47' 43"	0° 58' 54"	16' 03.08"	79° 56' 35"	0.80382
8	302° 16' 45"	-4° 09' 15"	305° 34' 06"	-23° 41' 39"	0° 58' 52"	16' 02.43"	79° 41' 48"	0.80004
9	302° 51' 42"	-4° 11' 14"	306° 11' 37"	-23° 35' 26"	0° 58' 50"	16' 01.78"	79° 27' 06"	0.79625
10	303° 26' 37"	-4° 13' 12"	306° 49' 01"	-23° 29' 05"	0° 58' 47"	16' 01.13"	79° 12' 31"	0.79244
11	304° 01' 28"	-4° 15' 08"	307° 26' 18"	-23° 22' 36"	0° 58' 45"	16' 00.48"	78° 58' 01"	0.78861
12	304° 36' 17"	-4° 17' 02"	308° 03' 28"	-23° 15' 58"	0° 58' 42"	15' 59.83"	78° 43' 38"	0.78475
13	305° 11' 03"	-4° 18' 55"	308° 40' 31"	-23° 09' 12"	0° 58' 40"	15' 59.17"	78° 29' 22"	0.78088
14	305° 45' 47"	-4° 20' 46"	309° 17' 28"	-23° 02' 18"	0° 58' 38"	15' 58.52"	78° 15' 12"	0.77699
15	306° 20' 27"	-4° 22' 35"	309° 54' 17"	-22° 55' 16"	0° 58' 35"	15' 57.87"	78° 1' 08"	0.77308
16	306° 55' 05"	-4° 24' 22"	310° 30' 59"	-22° 48' 06"	0° 58' 33"	15' 57.21"	77° 47' 11"	0.76916
17	307° 29' 40"	-4° 26' 08"	311° 07' 35"	-22° 40' 49"	0° 58' 30"	15' 56.55"	77° 33' 21"	0.76521
18	308° 04' 12"	-4° 27' 52"	311° 44' 03"	-22° 33' 23"	0° 58' 28"	15' 55.90"	77° 19' 38"	0.76125
19	308° 38' 41"	-4° 29' 34"	312° 20' 24"	-22° 25' 51"	0° 58' 25"	15' 55.24"	77° 6' 02"	0.75727
20	309° 13' 08"	-4° 31' 14"	312° 56' 38"	-22° 18' 10"	0° 58' 23"	15' 54.59"	76° 52' 32"	0.75328
21	309° 47' 31"	-4° 32' 52"	313° 32' 45"	-22° 10' 23"	0° 58' 21"	15' 53.93"	76° 39' 09"	0.74927
22	310° 21' 52"	-4° 34' 29"	314° 08' 45"	-22° 02' 28"	0° 58' 18"	15' 53.27"	76° 25' 54"	0.74524
23	310° 56' 10"	-4° 36' 04"	314° 44' 38"	-21° 54' 26"	0° 58' 16"	15' 52.62"	76° 12' 46"	0.74120
24	311° 30' 25"	-4° 37' 37"	315° 20' 23"	-21° 46' 17"	0° 58' 13"	15' 51.96"	75° 59' 44"	0.73714

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	69° 47' 08"	-0.14"	68° 07' 20"	21° 54' 52"	1.0138412	15' 46.53"	23° 26' 14"	2 m 20 s
1	69° 49' 32"	-0.14"	68° 09' 53"	21° 55' 13"	1.0138480	15' 46.52"	23° 26' 14"	2 m 20 s
2	69° 51' 56"	-0.14"	68° 12' 27"	21° 55' 34"	1.0138548	15' 46.52"	23° 26' 14"	2 m 19 s
3	69° 54' 19"	-0.15"	68° 14' 60"	21° 55' 55"	1.0138617	15' 46.51"	23° 26' 14"	2 m 19 s
4	69° 56' 43"	-0.15"	68° 17' 33"	21° 56' 17"	1.0138685	15' 46.50"	23° 26' 14"	2 m 19 s
5	69° 59' 07"	-0.15"	68° 20' 06"	21° 56' 38"	1.0138753	15' 46.50"	23° 26' 14"	2 m 18 s
6	70° 01' 31"	-0.16"	68° 22' 40"	21° 56' 59"	1.0138821	15' 46.49"	23° 26' 14"	2 m 18 s
7	70° 03' 54"	-0.16"	68° 25' 13"	21° 57' 20"	1.0138889	15' 46.48"	23° 26' 14"	2 m 17 s
8	70° 06' 18"	-0.16"	68° 27' 47"	21° 57' 41"	1.0138957	15' 46.48"	23° 26' 14"	2 m 17 s
9	70° 08' 42"	-0.16"	68° 30' 20"	21° 58' 02"	1.0139025	15' 46.47"	23° 26' 14"	2 m 17 s
10	70° 11' 06"	-0.17"	68° 32' 53"	21° 58' 23"	1.0139093	15' 46.47"	23° 26' 14"	2 m 16 s
11	70° 13' 30"	-0.17"	68° 35' 27"	21° 58' 44"	1.0139161	15' 46.46"	23° 26' 14"	2 m 16 s
12	70° 15' 53"	-0.17"	68° 38' 00"	21° 59' 05"	1.0139228	15' 46.45"	23° 26' 14"	2 m 16 s
13	70° 18' 17"	-0.18"	68° 40' 33"	21° 59' 25"	1.0139296	15' 46.45"	23° 26' 14"	2 m 15 s
14	70° 20' 41"	-0.18"	68° 43' 07"	21° 59' 46"	1.0139364	15' 46.44"	23° 26' 14"	2 m 15 s
15	70° 23' 05"	-0.18"	68° 45' 40"	22° 00' 07"	1.0139431	15' 46.43"	23° 26' 14"	2 m 15 s
16	70° 25' 28"	-0.18"	68° 48' 14"	22° 00' 28"	1.0139499	15' 46.43"	23° 26' 14"	2 m 14 s
17	70° 27' 52"	-0.19"	68° 50' 47"	22° 00' 48"	1.0139566	15' 46.42"	23° 26' 14"	2 m 14 s
18	70° 30' 16"	-0.19"	68° 53' 21"	22° 01' 09"	1.0139633	15' 46.41"	23° 26' 14"	2 m 13 s
19	70° 32' 40"	-0.19"	68° 55' 54"	22° 01' 29"	1.0139701	15' 46.41"	23° 26' 14"	2 m 13 s
20	70° 35' 03"	-0.19"	68° 58' 28"	22° 01' 50"	1.0139768	15' 46.40"	23° 26' 14"	2 m 13 s
21	70° 37' 27"	-0.20"	69° 01' 01"	22° 02' 10"	1.0139835	15' 46.40"	23° 26' 14"	2 m 12 s
22	70° 39' 51"	-0.20"	69° 03' 35"	22° 02' 31"	1.0139902	15' 46.39"	23° 26' 14"	2 m 12 s
23	70° 42' 15"	-0.20"	69° 06' 08"	22° 02' 51"	1.0139969	15' 46.38"	23° 26' 14"	2 m 11 s
24	70° 44' 38"	-0.20"	69° 08' 42"	22° 03' 12"	1.0140036	15' 46.38"	23° 26' 14"	2 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	311° 30' 25"	-4° 37' 37"	315° 20' 23"	-21° 46' 17"	0° 58' 13"	15' 51.96"	75° 59' 44"	0.73714
1	312° 04' 38"	-4° 39' 09"	315° 56' 01"	-21° 38' 01"	0° 58' 11"	15' 51.30"	75° 46' 50"	0.73308
2	312° 38' 47"	-4° 40' 39"	316° 31' 32"	-21° 29' 38"	0° 58' 09"	15' 50.65"	75° 34' 04"	0.72899
3	313° 12' 54"	-4° 42' 06"	317° 06' 56"	-21° 21' 09"	0° 58' 06"	15' 49.99"	75° 21' 24"	0.72490
4	313° 46' 58"	-4° 43' 32"	317° 42' 13"	-21° 12' 32"	0° 58' 04"	15' 49.34"	75° 8' 52"	0.72079
5	314° 20' 59"	-4° 44' 57"	318° 17' 23"	-21° 03' 50"	0° 58' 01"	15' 48.68"	74° 56' 27"	0.71667
6	314° 54' 57"	-4° 46' 19"	318° 52' 25"	-20° 55' 00"	0° 57' 59"	15' 48.03"	74° 44' 10"	0.71254
7	315° 28' 53"	-4° 47' 40"	319° 27' 20"	-20° 46' 05"	0° 57' 57"	15' 47.38"	74° 32' 00"	0.70839
8	316° 02' 46"	-4° 48' 59"	320° 02' 09"	-20° 37' 03"	0° 57' 54"	15' 46.73"	74° 19' 58"	0.70424
9	316° 36' 36"	-4° 50' 16"	320° 36' 50"	-20° 27' 55"	0° 57' 52"	15' 46.08"	74° 8' 03"	0.70007
10	317° 10' 23"	-4° 51' 31"	321° 11' 23"	-20° 18' 41"	0° 57' 49"	15' 45.43"	73° 56' 16"	0.69590
11	317° 44' 07"	-4° 52' 45"	321° 45' 50"	-20° 09' 21"	0° 57' 47"	15' 44.78"	73° 44' 36"	0.69171
12	318° 17' 49"	-4° 53' 57"	322° 20' 10"	-19° 59' 55"	0° 57' 45"	15' 44.13"	73° 33' 04"	0.68751
13	318° 51' 28"	-4° 55' 07"	322° 54' 23"	-19° 50' 23"	0° 57' 42"	15' 43.49"	73° 21' 39"	0.68331
14	319° 25' 04"	-4° 56' 15"	323° 28' 28"	-19° 40' 46"	0° 57' 40"	15' 42.84"	73° 10' 22"	0.67910
15	319° 58' 38"	-4° 57' 22"	324° 02' 27"	-19° 31' 03"	0° 57' 38"	15' 42.20"	72° 59' 13"	0.67488
16	320° 32' 09"	-4° 58' 26"	324° 36' 19"	-19° 21' 14"	0° 57' 35"	15' 41.56"	72° 48' 12"	0.67065
17	321° 05' 37"	-4° 59' 29"	325° 10' 03"	-19° 11' 20"	0° 57' 33"	15' 40.92"	72° 37' 18"	0.66641
18	321° 39' 02"	-5° 00' 30"	325° 43' 41"	-19° 01' 21"	0° 57' 31"	15' 40.28"	72° 26' 32"	0.66217
19	322° 12' 24"	-5° 01' 30"	326° 17' 12"	-18° 51' 17"	0° 57' 28"	15' 39.64"	72° 15' 53"	0.65792
20	322° 45' 44"	-5° 02' 27"	326° 50' 36"	-18° 41' 07"	0° 57' 26"	15' 39.01"	72° 5' 22"	0.65366
21	323° 19' 02"	-5° 03' 23"	327° 23' 53"	-18° 30' 53"	0° 57' 24"	15' 38.38"	71° 54' 59"	0.64940
22	323° 52' 16"	-5° 04' 17"	327° 57' 04"	-18° 20' 33"	0° 57' 21"	15' 37.75"	71° 44' 44"	0.64513
23	324° 25' 28"	-5° 05' 09"	328° 30' 08"	-18° 10' 09"	0° 57' 19"	15' 37.12"	71° 34' 36"	0.64085
24	324° 58' 37"	-5° 05' 60"	329° 03' 05"	-17° 59' 40"	0° 57' 17"	15' 36.49"	71° 24' 37"	0.63657

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	70° 44' 38"	-0.20"	69° 08' 42"	22° 03' 12"	1.0140036	15' 46.38"	23° 26' 14"	2 m 11 s
1	70° 47' 02"	-0.20"	69° 11' 15"	22° 03' 32"	1.0140103	15' 46.37"	23° 26' 14"	2 m 11 s
2	70° 49' 26"	-0.21"	69° 13' 49"	22° 03' 52"	1.0140170	15' 46.36"	23° 26' 14"	2 m 10 s
3	70° 51' 50"	-0.21"	69° 16' 22"	22° 04' 13"	1.0140237	15' 46.36"	23° 26' 14"	2 m 10 s
4	70° 54' 13"	-0.21"	69° 18' 56"	22° 04' 33"	1.0140303	15' 46.35"	23° 26' 14"	2 m 10 s
5	70° 56' 37"	-0.21"	69° 21' 29"	22° 04' 53"	1.0140370	15' 46.35"	23° 26' 14"	2 m 09 s
6	70° 59' 01"	-0.22"	69° 24' 03"	22° 05' 13"	1.0140437	15' 46.34"	23° 26' 14"	2 m 09 s
7	71° 01' 25"	-0.22"	69° 26' 37"	22° 05' 33"	1.0140503	15' 46.33"	23° 26' 14"	2 m 08 s
8	71° 03' 48"	-0.22"	69° 29' 10"	22° 05' 53"	1.0140570	15' 46.33"	23° 26' 14"	2 m 08 s
9	71° 06' 12"	-0.22"	69° 31' 44"	22° 06' 13"	1.0140636	15' 46.32"	23° 26' 14"	2 m 08 s
10	71° 08' 36"	-0.22"	69° 34' 18"	22° 06' 33"	1.0140702	15' 46.32"	23° 26' 14"	2 m 07 s
11	71° 10' 60"	-0.22"	69° 36' 51"	22° 06' 53"	1.0140769	15' 46.31"	23° 26' 14"	2 m 07 s
12	71° 13' 23"	-0.23"	69° 39' 25"	22° 07' 13"	1.0140835	15' 46.30"	23° 26' 14"	2 m 06 s
13	71° 15' 47"	-0.23"	69° 41' 59"	22° 07' 33"	1.0140901	15' 46.30"	23° 26' 14"	2 m 06 s
14	71° 18' 11"	-0.23"	69° 44' 32"	22° 07' 53"	1.0140967	15' 46.29"	23° 26' 14"	2 m 06 s
15	71° 20' 34"	-0.23"	69° 47' 06"	22° 08' 12"	1.0141033	15' 46.28"	23° 26' 14"	2 m 05 s
16	71° 22' 58"	-0.23"	69° 49' 40"	22° 08' 32"	1.0141099	15' 46.28"	23° 26' 14"	2 m 05 s
17	71° 25' 22"	-0.23"	69° 52' 13"	22° 08' 52"	1.0141165	15' 46.27"	23° 26' 14"	2 m 05 s
18	71° 27' 46"	-0.23"	69° 54' 47"	22° 09' 12"	1.0141231	15' 46.27"	23° 26' 14"	2 m 04 s
19	71° 30' 09"	-0.24"	69° 57' 21"	22° 09' 31"	1.0141296	15' 46.26"	23° 26' 14"	2 m 04 s
20	71° 32' 33"	-0.24"	69° 59' 54"	22° 09' 51"	1.0141362	15' 46.25"	23° 26' 14"	2 m 03 s
21	71° 34' 57"	-0.24"	70° 02' 28"	22° 10' 10"	1.0141428	15' 46.25"	23° 26' 14"	2 m 03 s
22	71° 37' 21"	-0.24"	70° 05' 02"	22° 10' 30"	1.0141493	15' 46.24"	23° 26' 14"	2 m 03 s
23	71° 39' 44"	-0.24"	70° 07' 36"	22° 10' 49"	1.0141559	15' 46.24"	23° 26' 14"	2 m 02 s
24	71° 42' 08"	-0.24"	70° 10' 10"	22° 11' 09"	1.0141624	15' 46.23"	23° 26' 14"	2 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	324° 58' 37"	-5° 05' 60"	329° 03' 05"	-17° 59' 40"	0° 57' 17"	15' 36.49"	71° 24' 37"	0.63657
1	325° 31' 44"	-5° 06' 48"	329° 35' 55"	-17° 49' 06"	0° 57' 14"	15' 35.86"	71° 14' 44"	0.63229
2	326° 04' 48"	-5° 07' 35"	330° 08' 39"	-17° 38' 27"	0° 57' 12"	15' 35.24"	71° 5' 00"	0.62800
3	326° 37' 49"	-5° 08' 21"	330° 41' 17"	-17° 27' 44"	0° 57' 10"	15' 34.62"	70° 55' 23"	0.62371
4	327° 10' 47"	-5° 09' 04"	331° 13' 47"	-17° 16' 57"	0° 57' 08"	15' 34.00"	70° 45' 54"	0.61942
5	327° 43' 43"	-5° 09' 46"	331° 46' 12"	-17° 06' 05"	0° 57' 05"	15' 33.39"	70° 36' 33"	0.61512
6	328° 16' 37"	-5° 10' 26"	332° 18' 30"	-16° 55' 09"	0° 57' 03"	15' 32.78"	70° 27' 20"	0.61082
7	328° 49' 28"	-5° 11' 04"	332° 50' 41"	-16° 44' 09"	0° 57' 01"	15' 32.17"	70° 18' 14"	0.60651
8	329° 22' 16"	-5° 11' 40"	333° 22' 47"	-16° 33' 05"	0° 56' 59"	15' 31.56"	70° 9' 16"	0.60221
9	329° 55' 02"	-5° 12' 15"	333° 54' 46"	-16° 21' 57"	0° 56' 56"	15' 30.95"	70° 0' 25"	0.59790
10	330° 27' 45"	-5° 12' 48"	334° 26' 38"	-16° 10' 45"	0° 56' 54"	15' 30.35"	69° 51' 43"	0.59359
11	331° 00' 26"	-5° 13' 19"	334° 58' 25"	-15° 59' 29"	0° 56' 52"	15' 29.75"	69° 43' 08"	0.58928
12	331° 33' 04"	-5° 13' 49"	335° 30' 06"	-15° 48' 09"	0° 56' 50"	15' 29.15"	69° 34' 40"	0.58497
13	332° 05' 39"	-5° 14' 16"	336° 01' 40"	-15° 36' 46"	0° 56' 48"	15' 28.56"	69° 26' 21"	0.58066
14	332° 38' 12"	-5° 14' 42"	336° 33' 09"	-15° 25' 19"	0° 56' 45"	15' 27.97"	69° 18' 09"	0.57634
15	333° 10' 43"	-5° 15' 07"	337° 04' 31"	-15° 13' 48"	0° 56' 43"	15' 27.38"	69° 10' 04"	0.57203
16	333° 43' 11"	-5° 15' 29"	337° 35' 48"	-15° 02' 14"	0° 56' 41"	15' 26.79"	69° 2' 07"	0.56772
17	334° 15' 37"	-5° 15' 50"	338° 06' 59"	-14° 50' 37"	0° 56' 39"	15' 26.21"	68° 54' 18"	0.56341
18	334° 48' 00"	-5° 16' 10"	338° 38' 05"	-14° 38' 56"	0° 56' 37"	15' 25.63"	68° 46' 36"	0.55910
19	335° 20' 21"	-5° 16' 27"	339° 09' 04"	-14° 27' 12"	0° 56' 35"	15' 25.05"	68° 39' 02"	0.55479
20	335° 52' 39"	-5° 16' 43"	339° 39' 58"	-14° 15' 25"	0° 56' 33"	15' 24.48"	68° 31' 36"	0.55049
21	336° 24' 55"	-5° 16' 57"	340° 10' 47"	-14° 03' 35"	0° 56' 30"	15' 23.91"	68° 24' 17"	0.54618
22	336° 57' 09"	-5° 17' 10"	340° 41' 30"	-13° 51' 42"	0° 56' 28"	15' 23.34"	68° 17' 05"	0.54188
23	337° 29' 20"	-5° 17' 21"	341° 12' 07"	-13° 39' 46"	0° 56' 26"	15' 22.78"	68° 10' 01"	0.53758
24	338° 01' 29"	-5° 17' 30"	341° 42' 39"	-13° 27' 47"	0° 56' 24"	15' 22.22"	68° 3' 04"	0.53328

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	71° 42' 08"	-0.24"	70° 10' 10"	22° 11' 09"	1.0141624	15' 46.23"	23° 26' 14"	2 m 02 s
1	71° 44' 32"	-0.24"	70° 12' 43"	22° 11' 28"	1.0141689	15' 46.22"	23° 26' 14"	2 m 01 s
2	71° 46' 55"	-0.24"	70° 15' 17"	22° 11' 47"	1.0141755	15' 46.22"	23° 26' 14"	2 m 01 s
3	71° 49' 19"	-0.24"	70° 17' 51"	22° 12' 07"	1.0141820	15' 46.21"	23° 26' 14"	2 m 01 s
4	71° 51' 43"	-0.25"	70° 20' 25"	22° 12' 26"	1.0141885	15' 46.20"	23° 26' 14"	2 m 00 s
5	71° 54' 07"	-0.25"	70° 22' 59"	22° 12' 45"	1.0141950	15' 46.20"	23° 26' 14"	1 m 60 s
6	71° 56' 30"	-0.25"	70° 25' 32"	22° 13' 04"	1.0142015	15' 46.19"	23° 26' 14"	1 m 59 s
7	71° 58' 54"	-0.25"	70° 28' 06"	22° 13' 23"	1.0142080	15' 46.19"	23° 26' 14"	1 m 59 s
8	72° 01' 18"	-0.25"	70° 30' 40"	22° 13' 42"	1.0142145	15' 46.18"	23° 26' 14"	1 m 59 s
9	72° 03' 41"	-0.25"	70° 33' 14"	22° 14' 02"	1.0142209	15' 46.17"	23° 26' 14"	1 m 58 s
10	72° 06' 05"	-0.25"	70° 35' 48"	22° 14' 21"	1.0142274	15' 46.17"	23° 26' 14"	1 m 58 s
11	72° 08' 29"	-0.25"	70° 38' 22"	22° 14' 39"	1.0142339	15' 46.16"	23° 26' 14"	1 m 57 s
12	72° 10' 52"	-0.25"	70° 40' 56"	22° 14' 58"	1.0142403	15' 46.16"	23° 26' 14"	1 m 57 s
13	72° 13' 16"	-0.25"	70° 43' 30"	22° 15' 17"	1.0142468	15' 46.15"	23° 26' 14"	1 m 57 s
14	72° 15' 40"	-0.25"	70° 46' 04"	22° 15' 36"	1.0142532	15' 46.14"	23° 26' 14"	1 m 56 s
15	72° 18' 04"	-0.25"	70° 48' 38"	22° 15' 55"	1.0142596	15' 46.14"	23° 26' 14"	1 m 56 s
16	72° 20' 27"	-0.25"	70° 51' 11"	22° 16' 14"	1.0142661	15' 46.13"	23° 26' 14"	1 m 55 s
17	72° 22' 51"	-0.25"	70° 53' 45"	22° 16' 32"	1.0142725	15' 46.13"	23° 26' 14"	1 m 55 s
18	72° 25' 15"	-0.25"	70° 56' 19"	22° 16' 51"	1.0142789	15' 46.12"	23° 26' 14"	1 m 55 s
19	72° 27' 38"	-0.25"	70° 58' 53"	22° 17' 10"	1.0142853	15' 46.11"	23° 26' 14"	1 m 54 s
20	72° 30' 02"	-0.25"	71° 01' 27"	22° 17' 28"	1.0142917	15' 46.11"	23° 26' 14"	1 m 54 s
21	72° 32' 26"	-0.25"	71° 04' 01"	22° 17' 47"	1.0142981	15' 46.10"	23° 26' 14"	1 m 53 s
22	72° 34' 49"	-0.25"	71° 06' 35"	22° 18' 05"	1.0143045	15' 46.10"	23° 26' 14"	1 m 53 s
23	72° 37' 13"	-0.25"	71° 09' 09"	22° 18' 24"	1.0143108	15' 46.09"	23° 26' 14"	1 m 52 s
24	72° 39' 37"	-0.25"	71° 11' 43"	22° 18' 42"	1.0143172	15' 46.08"	23° 26' 14"	1 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	338° 01' 29"	-5° 17' 30"	341° 42' 39"	-13° 27' 47"	0° 56' 24"	15' 22.22"	68° 3' 04"	0.53328
1	338° 33' 36"	-5° 17' 37"	342° 13' 06"	-13° 15' 46"	0° 56' 22"	15' 21.66"	67° 56' 15"	0.52899
2	339° 05' 40"	-5° 17' 43"	342° 43' 28"	-13° 03' 41"	0° 56' 20"	15' 21.10"	67° 49' 34"	0.52470
3	339° 37' 42"	-5° 17' 47"	343° 13' 44"	-12° 51' 34"	0° 56' 18"	15' 20.55"	67° 42' 59"	0.52041
4	340° 09' 41"	-5° 17' 50"	343° 43' 56"	-12° 39' 24"	0° 56' 16"	15' 20.01"	67° 36' 33"	0.51613
5	340° 41' 39"	-5° 17' 50"	344° 14' 02"	-12° 27' 12"	0° 56' 14"	15' 19.46"	67° 30' 13"	0.51185
6	341° 13' 34"	-5° 17' 50"	344° 44' 03"	-12° 14' 58"	0° 56' 12"	15' 18.92"	67° 24' 01"	0.50757
7	341° 45' 26"	-5° 17' 47"	345° 13' 60"	-12° 02' 40"	0° 56' 10"	15' 18.39"	67° 17' 56"	0.50330
8	342° 17' 17"	-5° 17' 43"	345° 43' 51"	-11° 50' 21"	0° 56' 08"	15' 17.85"	67° 11' 59"	0.49904
9	342° 49' 05"	-5° 17' 38"	346° 13' 38"	-11° 37' 59"	0° 56' 06"	15' 17.33"	67° 6' 09"	0.49478
10	343° 20' 52"	-5° 17' 30"	346° 43' 21"	-11° 25' 36"	0° 56' 04"	15' 16.80"	67° 0' 26"	0.49053
11	343° 52' 36"	-5° 17' 22"	347° 12' 58"	-11° 13' 10"	0° 56' 02"	15' 16.28"	66° 54' 50"	0.48628
12	344° 24' 17"	-5° 17' 11"	347° 42' 31"	-11° 00' 42"	0° 56' 01"	15' 15.76"	66° 49' 22"	0.48204
13	344° 55' 57"	-5° 16' 59"	348° 11' 60"	-10° 48' 12"	0° 55' 59"	15' 15.24"	66° 44' 00"	0.47780
14	345° 27' 35"	-5° 16' 45"	348° 41' 24"	-10° 35' 40"	0° 55' 57"	15' 14.73"	66° 38' 46"	0.47357
15	345° 59' 10"	-5° 16' 30"	349° 10' 44"	-10° 23' 06"	0° 55' 55"	15' 14.23"	66° 33' 40"	0.46935
16	346° 30' 43"	-5° 16' 13"	349° 39' 59"	-10° 10' 30"	0° 55' 53"	15' 13.72"	66° 28' 40"	0.46514
17	347° 02' 14"	-5° 15' 55"	350° 09' 10"	-9° 57' 53"	0° 55' 51"	15' 13.22"	66° 23' 47"	0.46093
18	347° 33' 44"	-5° 15' 35"	350° 38' 17"	-9° 45' 13"	0° 55' 49"	15' 12.73"	66° 19' 02"	0.45673
19	348° 05' 11"	-5° 15' 14"	351° 07' 20"	-9° 32' 33"	0° 55' 48"	15' 12.24"	66° 14' 24"	0.45253
20	348° 36' 36"	-5° 14' 51"	351° 36' 19"	-9° 19' 50"	0° 55' 46"	15' 11.75"	66° 9' 52"	0.44835
21	349° 07' 59"	-5° 14' 26"	352° 05' 15"	-9° 07' 06"	0° 55' 44"	15' 11.27"	66° 5' 28"	0.44417
22	349° 39' 20"	-5° 13' 60"	352° 34' 06"	-8° 54' 21"	0° 55' 42"	15' 10.79"	66° 1' 11"	0.44001
23	350° 10' 39"	-5° 13' 32"	353° 02' 53"	-8° 41' 34"	0° 55' 41"	15' 10.31"	65° 57' 01"	0.43585
24	350° 41' 56"	-5° 13' 03"	353° 31' 37"	-8° 28' 46"	0° 55' 39"	15' 09.84"	65° 52' 57"	0.43170

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	72° 39' 37"	-0.25"	71° 11' 43"	22° 18' 42"	1.0143172	15' 46.08"	23° 26' 14"	1 m 52 s
1	72° 42' 01"	-0.25"	71° 14' 17"	22° 19' 01"	1.0143236	15' 46.08"	23° 26' 14"	1 m 52 s
2	72° 44' 24"	-0.25"	71° 16' 51"	22° 19' 19"	1.0143299	15' 46.07"	23° 26' 14"	1 m 51 s
3	72° 46' 48"	-0.25"	71° 19' 26"	22° 19' 37"	1.0143362	15' 46.07"	23° 26' 14"	1 m 51 s
4	72° 49' 12"	-0.25"	71° 21' 60"	22° 19' 56"	1.0143426	15' 46.06"	23° 26' 14"	1 m 50 s
5	72° 51' 35"	-0.25"	71° 24' 34"	22° 20' 14"	1.0143489	15' 46.06"	23° 26' 14"	1 m 50 s
6	72° 53' 59"	-0.25"	71° 27' 08"	22° 20' 32"	1.0143552	15' 46.05"	23° 26' 14"	1 m 50 s
7	72° 56' 23"	-0.25"	71° 29' 42"	22° 20' 50"	1.0143615	15' 46.04"	23° 26' 14"	1 m 49 s
8	72° 58' 46"	-0.25"	71° 32' 16"	22° 21' 08"	1.0143679	15' 46.04"	23° 26' 14"	1 m 49 s
9	73° 01' 10"	-0.25"	71° 34' 50"	22° 21' 27"	1.0143741	15' 46.03"	23° 26' 14"	1 m 48 s
10	73° 03' 34"	-0.25"	71° 37' 24"	22° 21' 45"	1.0143804	15' 46.03"	23° 26' 14"	1 m 48 s
11	73° 05' 57"	-0.24"	71° 39' 58"	22° 22' 03"	1.0143867	15' 46.02"	23° 26' 14"	1 m 48 s
12	73° 08' 21"	-0.24"	71° 42' 32"	22° 22' 21"	1.0143930	15' 46.01"	23° 26' 14"	1 m 47 s
13	73° 10' 45"	-0.24"	71° 45' 07"	22° 22' 38"	1.0143993	15' 46.01"	23° 26' 14"	1 m 47 s
14	73° 13' 08"	-0.24"	71° 47' 41"	22° 22' 56"	1.0144055	15' 46.00"	23° 26' 14"	1 m 46 s
15	73° 15' 32"	-0.24"	71° 50' 15"	22° 23' 14"	1.0144118	15' 46.00"	23° 26' 14"	1 m 46 s
16	73° 17' 56"	-0.24"	71° 52' 49"	22° 23' 32"	1.0144180	15' 45.99"	23° 26' 14"	1 m 45 s
17	73° 20' 19"	-0.24"	71° 55' 23"	22° 23' 50"	1.0144242	15' 45.98"	23° 26' 14"	1 m 45 s
18	73° 22' 43"	-0.24"	71° 57' 58"	22° 24' 07"	1.0144305	15' 45.98"	23° 26' 14"	1 m 45 s
19	73° 25' 07"	-0.24"	72° 00' 32"	22° 24' 25"	1.0144367	15' 45.97"	23° 26' 14"	1 m 44 s
20	73° 27' 30"	-0.23"	72° 03' 06"	22° 24' 43"	1.0144429	15' 45.97"	23° 26' 14"	1 m 44 s
21	73° 29' 54"	-0.23"	72° 05' 40"	22° 25' 00"	1.0144491	15' 45.96"	23° 26' 14"	1 m 43 s
22	73° 32' 18"	-0.23"	72° 08' 14"	22° 25' 18"	1.0144553	15' 45.96"	23° 26' 14"	1 m 43 s
23	73° 34' 41"	-0.23"	72° 10' 49"	22° 25' 35"	1.0144615	15' 45.95"	23° 26' 14"	1 m 42 s
24	73° 37' 05"	-0.23"	72° 13' 23"	22° 25' 53"	1.0144677	15' 45.94"	23° 26' 14"	1 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	350° 41' 56"	-5° 13' 03"	353° 31' 37"	-8° 28' 46"	0° 55' 39"	15' 09.84"	65° 52' 57"	0.43170
1	351° 13' 11"	-5° 12' 32"	354° 00' 17"	-8° 15' 56"	0° 55' 37"	15' 09.37"	65° 49' 01"	0.42756
2	351° 44' 25"	-5° 12' 00"	354° 28' 54"	-8° 03' 05"	0° 55' 35"	15' 08.91"	65° 45' 12"	0.42343
3	352° 15' 36"	-5° 11' 27"	354° 57' 27"	-7° 50' 13"	0° 55' 34"	15' 08.45"	65° 41' 29"	0.41931
4	352° 46' 45"	-5° 10' 51"	355° 25' 56"	-7° 37' 20"	0° 55' 32"	15' 07.99"	65° 37' 54"	0.41519
5	353° 17' 53"	-5° 10' 15"	355° 54' 22"	-7° 24' 26"	0° 55' 30"	15' 07.54"	65° 34' 25"	0.41109
6	353° 48' 59"	-5° 09' 37"	356° 22' 45"	-7° 11' 30"	0° 55' 29"	15' 07.09"	65° 31' 04"	0.40700
7	354° 20' 02"	-5° 08' 57"	356° 51' 05"	-6° 58' 34"	0° 55' 27"	15' 06.65"	65° 27' 49"	0.40292
8	354° 51' 05"	-5° 08' 16"	357° 19' 21"	-6° 45' 36"	0° 55' 26"	15' 06.21"	65° 24' 41"	0.39885
9	355° 22' 05"	-5° 07' 33"	357° 47' 35"	-6° 32' 38"	0° 55' 24"	15' 05.77"	65° 21' 39"	0.39479
10	355° 53' 03"	-5° 06' 49"	358° 15' 45"	-6° 19' 39"	0° 55' 22"	15' 05.34"	65° 18' 45"	0.39075
11	356° 23' 60"	-5° 06' 04"	358° 43' 52"	-6° 06' 39"	0° 55' 21"	15' 04.91"	65° 15' 57"	0.38671
12	356° 54' 55"	-5° 05' 17"	359° 11' 57"	-5° 53' 39"	0° 55' 19"	15' 04.49"	65° 13' 16"	0.38268
13	357° 25' 48"	-5° 04' 29"	359° 39' 58"	-5° 40' 37"	0° 55' 18"	15' 04.07"	65° 10' 42"	0.37867
14	357° 56' 40"	-5° 03' 39"	0° 07' 57"	-5° 27' 35"	0° 55' 16"	15' 03.66"	65° 8' 15"	0.37467
15	358° 27' 29"	-5° 02' 48"	0° 35' 54"	-5° 14' 33"	0° 55' 15"	15' 03.25"	65° 5' 54"	0.37068
16	358° 58' 18"	-5° 01' 55"	1° 03' 47"	-5° 01' 29"	0° 55' 13"	15' 02.84"	65° 3' 40"	0.36671
17	359° 29' 04"	-5° 01' 01"	1° 31' 38"	-4° 48' 26"	0° 55' 12"	15' 02.44"	65° 1' 33"	0.36274
18	0° 00' -11"	-5° 00' 06"	1° 59' 27"	-4° 35' 22"	0° 55' 10"	15' 02.04"	64° 59' 32"	0.35879
19	0° 30' 32"	-4° 59' 09"	2° 27' 13"	-4° 22' 17"	0° 55' 09"	15' 01.65"	64° 57' 38"	0.35485
20	1° 01' 14"	-4° 58' 11"	2° 54' 57"	-4° 09' 12"	0° 55' 07"	15' 01.26"	64° 55' 51"	0.35093
21	1° 31' 54"	-4° 57' 12"	3° 22' 39"	-3° 56' 07"	0° 55' 06"	15' 00.87"	64° 54' 10"	0.34702
22	2° 02' 32"	-4° 56' 11"	3° 50' 18"	-3° 43' 01"	0° 55' 05"	15' 00.49"	64° 52' 36"	0.34312
23	2° 33' 09"	-4° 55' 09"	4° 17' 55"	-3° 29' 55"	0° 55' 03"	15' 00.11"	64° 51' 08"	0.33924
24	3° 03' 44"	-4° 54' 05"	4° 45' 30"	-3° 16' 49"	0° 55' 02"	14' 59.74"	64° 49' 47"	0.33537

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	73° 37' 05"	-0.23"	72° 13' 23"	22° 25' 53"	1.0144677	15' 45.94"	23° 26' 14"	1 m 42 s
1	73° 39' 29"	-0.23"	72° 15' 57"	22° 26' 10"	1.0144738	15' 45.94"	23° 26' 14"	1 m 42 s
2	73° 41' 52"	-0.23"	72° 18' 31"	22° 26' 28"	1.0144800	15' 45.93"	23° 26' 14"	1 m 41 s
3	73° 44' 16"	-0.22"	72° 21' 06"	22° 26' 45"	1.0144862	15' 45.93"	23° 26' 14"	1 m 41 s
4	73° 46' 40"	-0.22"	72° 23' 40"	22° 27' 02"	1.0144923	15' 45.92"	23° 26' 14"	1 m 40 s
5	73° 49' 03"	-0.22"	72° 26' 14"	22° 27' 20"	1.0144984	15' 45.92"	23° 26' 14"	1 m 40 s
6	73° 51' 27"	-0.22"	72° 28' 49"	22° 27' 37"	1.0145046	15' 45.91"	23° 26' 14"	1 m 39 s
7	73° 53' 51"	-0.22"	72° 31' 23"	22° 27' 54"	1.0145107	15' 45.90"	23° 26' 14"	1 m 39 s
8	73° 56' 14"	-0.22"	72° 33' 57"	22° 28' 11"	1.0145168	15' 45.90"	23° 26' 14"	1 m 39 s
9	73° 58' 38"	-0.21"	72° 36' 32"	22° 28' 28"	1.0145229	15' 45.89"	23° 26' 14"	1 m 38 s
10	74° 01' 01"	-0.21"	72° 39' 06"	22° 28' 45"	1.0145290	15' 45.89"	23° 26' 14"	1 m 38 s
11	74° 03' 25"	-0.21"	72° 41' 40"	22° 29' 02"	1.0145351	15' 45.88"	23° 26' 14"	1 m 37 s
12	74° 05' 49"	-0.21"	72° 44' 15"	22° 29' 19"	1.0145412	15' 45.88"	23° 26' 14"	1 m 37 s
13	74° 08' 12"	-0.20"	72° 46' 49"	22° 29' 36"	1.0145473	15' 45.87"	23° 26' 14"	1 m 36 s
14	74° 10' 36"	-0.20"	72° 49' 24"	22° 29' 53"	1.0145533	15' 45.86"	23° 26' 14"	1 m 36 s
15	74° 12' 60"	-0.20"	72° 51' 58"	22° 30' 10"	1.0145594	15' 45.86"	23° 26' 14"	1 m 36 s
16	74° 15' 23"	-0.20"	72° 54' 32"	22° 30' 27"	1.0145654	15' 45.85"	23° 26' 14"	1 m 35 s
17	74° 17' 47"	-0.20"	72° 57' 07"	22° 30' 44"	1.0145715	15' 45.85"	23° 26' 14"	1 m 35 s
18	74° 20' 11"	-0.19"	72° 59' 41"	22° 31' 00"	1.0145775	15' 45.84"	23° 26' 14"	1 m 34 s
19	74° 22' 34"	-0.19"	73° 02' 16"	22° 31' 17"	1.0145835	15' 45.84"	23° 26' 14"	1 m 34 s
20	74° 24' 58"	-0.19"	73° 04' 50"	22° 31' 34"	1.0145895	15' 45.83"	23° 26' 14"	1 m 33 s
21	74° 27' 21"	-0.19"	73° 07' 25"	22° 31' 50"	1.0145956	15' 45.83"	23° 26' 14"	1 m 33 s
22	74° 29' 45"	-0.18"	73° 09' 59"	22° 32' 07"	1.0146016	15' 45.82"	23° 26' 14"	1 m 32 s
23	74° 32' 09"	-0.18"	73° 12' 33"	22° 32' 23"	1.0146075	15' 45.81"	23° 26' 14"	1 m 32 s
24	74° 34' 32"	-0.18"	73° 15' 08"	22° 32' 40"	1.0146135	15' 45.81"	23° 26' 14"	1 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	3° 03' 44"	-4° 54' 05"	4° 45' 30"	-3° 16' 49"	0° 55' 02"	14' 59.74"	64° 49' 47"	0.33537
1	3° 34' 18"	-4° 53' 00"	5° 13' 04"	-3° 03' 43"	0° 55' 00"	14' 59.37"	64° 48' 33"	0.33151
2	4° 04' 51"	-4° 51' 54"	5° 40' 35"	-2° 50' 37"	0° 54' 59"	14' 59.01"	64° 47' 25"	0.32767
3	4° 35' 21"	-4° 50' 46"	6° 08' 04"	-2° 37' 30"	0° 54' 58"	14' 58.65"	64° 46' 24"	0.32385
4	5° 05' 51"	-4° 49' 38"	6° 35' 32"	-2° 24' 24"	0° 54' 56"	14' 58.29"	64° 45' 29"	0.32003
5	5° 36' 19"	-4° 48' 27"	7° 02' 58"	-2° 11' 18"	0° 54' 55"	14' 57.94"	64° 44' 41"	0.31624
6	6° 06' 45"	-4° 47' 16"	7° 30' 22"	-1° 58' 12"	0° 54' 54"	14' 57.59"	64° 43' 59"	0.31245
7	6° 37' 11"	-4° 46' 03"	7° 57' 45"	-1° 45' 05"	0° 54' 53"	14' 57.25"	64° 43' 24"	0.30869
8	7° 07' 34"	-4° 44' 49"	8° 25' 06"	-1° 31' 59"	0° 54' 51"	14' 56.91"	64° 42' 55"	0.30494
9	7° 37' 57"	-4° 43' 34"	8° 52' 25"	-1° 18' 54"	0° 54' 50"	14' 56.58"	64° 42' 33"	0.30120
10	8° 08' 18"	-4° 42' 17"	9° 19' 44"	-1° 05' 48"	0° 54' 49"	14' 56.25"	64° 42' 17"	0.29748
11	8° 38' 37"	-4° 40' 59"	9° 47' 00"	0°-52' 43"	0° 54' 48"	14' 55.92"	64° 42' 08"	0.29378
12	9° 08' 56"	-4° 39' 40"	10° 14' 16"	0°-39' 38"	0° 54' 47"	14' 55.60"	64° 42' 05"	0.29009
13	9° 39' 13"	-4° 38' 20"	10° 41' 30"	0°-26' 33"	0° 54' 45"	14' 55.28"	64° 42' 09"	0.28642
14	10° 09' 29"	-4° 36' 58"	11° 08' 44"	0°-13' 29"	0° 54' 44"	14' 54.97"	64° 42' 19"	0.28276
15	10° 39' 43"	-4° 35' 36"	11° 35' 56"	0° 00'-25"	0° 54' 43"	14' 54.66"	64° 42' 36"	0.27913
16	11° 09' 57"	-4° 34' 12"	12° 03' 07"	0° 12' 38"	0° 54' 42"	14' 54.35"	64° 42' 59"	0.27550
17	11° 40' 09"	-4° 32' 46"	12° 30' 17"	0° 25' 41"	0° 54' 41"	14' 54.05"	64° 43' 28"	0.27190
18	12° 10' 20"	-4° 31' 20"	12° 57' 27"	0° 38' 43"	0° 54' 40"	14' 53.76"	64° 44' 04"	0.26831
19	12° 40' 29"	-4° 29' 52"	13° 24' 35"	0° 51' 45"	0° 54' 39"	14' 53.46"	64° 44' 46"	0.26474
20	13° 10' 38"	-4° 28' 24"	13° 51' 43"	1° 04' 46"	0° 54' 38"	14' 53.18"	64° 45' 35"	0.26119
21	13° 40' 45"	-4° 26' 54"	14° 18' 50"	1° 17' 46"	0° 54' 37"	14' 52.89"	64° 46' 30"	0.25766
22	14° 10' 52"	-4° 25' 22"	14° 45' 56"	1° 30' 45"	0° 54' 36"	14' 52.61"	64° 47' 31"	0.25414
23	14° 40' 57"	-4° 23' 50"	15° 13' 02"	1° 43' 44"	0° 54' 35"	14' 52.34"	64° 48' 39"	0.25064
24	15° 11' 01"	-4° 22' 16"	15° 40' 07"	1° 56' 42"	0° 54' 34"	14' 52.06"	64° 49' 54"	0.24716

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	74° 34' 32"	-0.18"	73° 15' 08"	22° 32' 40"	1.0146135	15' 45.81"	23° 26' 14"	1 m 32 s
1	74° 36' 56"	-0.18"	73° 17' 42"	22° 32' 56"	1.0146195	15' 45.80"	23° 26' 14"	1 m 31 s
2	74° 39' 20"	-0.17"	73° 20' 17"	22° 33' 13"	1.0146255	15' 45.80"	23° 26' 14"	1 m 31 s
3	74° 41' 43"	-0.17"	73° 22' 51"	22° 33' 29"	1.0146314	15' 45.79"	23° 26' 14"	1 m 30 s
4	74° 44' 07"	-0.17"	73° 25' 26"	22° 33' 45"	1.0146374	15' 45.79"	23° 26' 14"	1 m 30 s
5	74° 46' 30"	-0.16"	73° 28' 00"	22° 34' 02"	1.0146433	15' 45.78"	23° 26' 14"	1 m 29 s
6	74° 48' 54"	-0.16"	73° 30' 35"	22° 34' 18"	1.0146492	15' 45.78"	23° 26' 14"	1 m 29 s
7	74° 51' 18"	-0.16"	73° 33' 10"	22° 34' 34"	1.0146552	15' 45.77"	23° 26' 14"	1 m 28 s
8	74° 53' 41"	-0.16"	73° 35' 44"	22° 34' 50"	1.0146611	15' 45.76"	23° 26' 14"	1 m 28 s
9	74° 56' 05"	-0.15"	73° 38' 19"	22° 35' 06"	1.0146670	15' 45.76"	23° 26' 14"	1 m 28 s
10	74° 58' 29"	-0.15"	73° 40' 53"	22° 35' 22"	1.0146729	15' 45.75"	23° 26' 14"	1 m 27 s
11	75° 00' 52"	-0.15"	73° 43' 28"	22° 35' 38"	1.0146788	15' 45.75"	23° 26' 14"	1 m 27 s
12	75° 03' 16"	-0.14"	73° 46' 02"	22° 35' 54"	1.0146846	15' 45.74"	23° 26' 14"	1 m 26 s
13	75° 05' 39"	-0.14"	73° 48' 37"	22° 36' 10"	1.0146905	15' 45.74"	23° 26' 14"	1 m 26 s
14	75° 08' 03"	-0.14"	73° 51' 12"	22° 36' 26"	1.0146964	15' 45.73"	23° 26' 14"	1 m 25 s
15	75° 10' 27"	-0.13"	73° 53' 46"	22° 36' 42"	1.0147022	15' 45.73"	23° 26' 14"	1 m 25 s
16	75° 12' 50"	-0.13"	73° 56' 21"	22° 36' 58"	1.0147081	15' 45.72"	23° 26' 14"	1 m 24 s
17	75° 15' 14"	-0.13"	73° 58' 55"	22° 37' 14"	1.0147139	15' 45.71"	23° 26' 14"	1 m 24 s
18	75° 17' 37"	-0.12"	74° 01' 30"	22° 37' 29"	1.0147197	15' 45.71"	23° 26' 14"	1 m 24 s
19	75° 20' 01"	-0.12"	74° 04' 05"	22° 37' 45"	1.0147256	15' 45.70"	23° 26' 14"	1 m 23 s
20	75° 22' 25"	-0.12"	74° 06' 39"	22° 38' 01"	1.0147314	15' 45.70"	23° 26' 14"	1 m 23 s
21	75° 24' 48"	-0.11"	74° 09' 14"	22° 38' 16"	1.0147372	15' 45.69"	23° 26' 14"	1 m 22 s
22	75° 27' 12"	-0.11"	74° 11' 49"	22° 38' 32"	1.0147430	15' 45.69"	23° 26' 14"	1 m 22 s
23	75° 29' 35"	-0.10"	74° 14' 23"	22° 38' 48"	1.0147487	15' 45.68"	23° 26' 14"	1 m 21 s
24	75° 31' 59"	-0.10"	74° 16' 58"	22° 39' 03"	1.0147545	15' 45.68"	23° 26' 14"	1 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	15° 11' 01"	-4° 22' 16"	15° 40' 07"	1° 56' 42"	0° 54' 34"	14' 52.06"	64° 49' 54"	0.24716
1	15° 41' 04"	-4° 20' 42"	16° 07' 12"	2° 09' 39"	0° 54' 33"	14' 51.80"	64° 51' 14"	0.24370
2	16° 11' 05"	-4° 19' 06"	16° 34' 17"	2° 22' 35"	0° 54' 32"	14' 51.53"	64° 52' 42"	0.24025
3	16° 41' 06"	-4° 17' 29"	17° 01' 21"	2° 35' 31"	0° 54' 31"	14' 51.27"	64° 54' 15"	0.23683
4	17° 11' 06"	-4° 15' 51"	17° 28' 25"	2° 48' 25"	0° 54' 30"	14' 51.02"	64° 55' 55"	0.23342
5	17° 41' 05"	-4° 14' 12"	17° 55' 29"	3° 01' 18"	0° 54' 29"	14' 50.77"	64° 57' 42"	0.23003
6	18° 11' 03"	-4° 12' 32"	18° 22' 32"	3° 14' 11"	0° 54' 28"	14' 50.52"	64° 59' 34"	0.22667
7	18° 40' 59"	-4° 10' 50"	18° 49' 36"	3° 27' 02"	0° 54' 27"	14' 50.28"	65° 1' 34"	0.22332
8	19° 10' 55"	-4° 09' 08"	19° 16' 39"	3° 39' 52"	0° 54' 26"	14' 50.04"	65° 3' 39"	0.21999
9	19° 40' 50"	-4° 07' 24"	19° 43' 43"	3° 52' 41"	0° 54' 25"	14' 49.80"	65° 5' 51"	0.21668
10	20° 10' 44"	-4° 05' 40"	20° 10' 46"	4° 05' 28"	0° 54' 24"	14' 49.57"	65° 8' 10"	0.21339
11	20° 40' 37"	-4° 03' 54"	20° 37' 50"	4° 18' 15"	0° 54' 24"	14' 49.35"	65° 10' 35"	0.21012
12	21° 10' 29"	-4° 02' 07"	21° 04' 54"	4° 30' 60"	0° 54' 23"	14' 49.12"	65° 13' 06"	0.20687
13	21° 40' 21"	-4° 00' 20"	21° 31' 58"	4° 43' 44"	0° 54' 22"	14' 48.90"	65° 15' 44"	0.20364
14	22° 10' 11"	-3° 58' 31"	21° 59' 03"	4° 56' 26"	0° 54' 21"	14' 48.69"	65° 18' 28"	0.20043
15	22° 40' 01"	-3° 56' 41"	22° 26' 08"	5° 09' 07"	0° 54' 20"	14' 48.48"	65° 21' 19"	0.19724
16	23° 09' 49"	-3° 54' 50"	22° 53' 13"	5° 21' 47"	0° 54' 20"	14' 48.27"	65° 24' 16"	0.19407
17	23° 39' 37"	-3° 52' 58"	23° 20' 19"	5° 34' 25"	0° 54' 19"	14' 48.07"	65° 27' 19"	0.19092
18	24° 09' 24"	-3° 51' 05"	23° 47' 26"	5° 47' 02"	0° 54' 18"	14' 47.87"	65° 30' 30"	0.18779
19	24° 39' 11"	-3° 49' 12"	24° 14' 33"	5° 59' 37"	0° 54' 18"	14' 47.68"	65° 33' 46"	0.18469
20	25° 08' 56"	-3° 47' 17"	24° 41' 41"	6° 12' 10"	0° 54' 17"	14' 47.49"	65° 37' 09"	0.18160
21	25° 38' 41"	-3° 45' 21"	25° 08' 49"	6° 24' 42"	0° 54' 16"	14' 47.30"	65° 40' 39"	0.17854
22	26° 08' 25"	-3° 43' 24"	25° 35' 59"	6° 37' 12"	0° 54' 15"	14' 47.12"	65° 44' 15"	0.17549
23	26° 38' 09"	-3° 41' 26"	26° 03' 09"	6° 49' 40"	0° 54' 15"	14' 46.94"	65° 47' 58"	0.17247
24	27° 07' 52"	-3° 39' 28"	26° 30' 20"	7° 02' 07"	0° 54' 14"	14' 46.76"	65° 51' 47"	0.16948

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	75° 31' 59"	-0.10"	74° 16' 58"	22° 39' 03"	1.0147545	15' 45.68"	23° 26' 14"	1 m 21 s
1	75° 34' 23"	-0.10"	74° 19' 33"	22° 39' 19"	1.0147603	15' 45.67"	23° 26' 14"	1 m 20 s
2	75° 36' 46"	-0.09"	74° 22' 07"	22° 39' 34"	1.0147660	15' 45.67"	23° 26' 14"	1 m 20 s
3	75° 39' 10"	-0.09"	74° 24' 42"	22° 39' 49"	1.0147718	15' 45.66"	23° 26' 14"	1 m 19 s
4	75° 41' 33"	-0.09"	74° 27' 17"	22° 40' 05"	1.0147775	15' 45.66"	23° 26' 14"	1 m 19 s
5	75° 43' 57"	-0.08"	74° 29' 52"	22° 40' 20"	1.0147832	15' 45.65"	23° 26' 14"	1 m 19 s
6	75° 46' 21"	-0.08"	74° 32' 26"	22° 40' 35"	1.0147890	15' 45.64"	23° 26' 14"	1 m 18 s
7	75° 48' 44"	-0.07"	74° 35' 01"	22° 40' 50"	1.0147947	15' 45.64"	23° 26' 14"	1 m 18 s
8	75° 51' 08"	-0.07"	74° 37' 36"	22° 41' 06"	1.0148004	15' 45.63"	23° 26' 14"	1 m 17 s
9	75° 53' 31"	-0.07"	74° 40' 11"	22° 41' 21"	1.0148061	15' 45.63"	23° 26' 14"	1 m 17 s
10	75° 55' 55"	-0.06"	74° 42' 45"	22° 41' 36"	1.0148118	15' 45.62"	23° 26' 14"	1 m 16 s
11	75° 58' 19"	-0.06"	74° 45' 20"	22° 41' 51"	1.0148174	15' 45.62"	23° 26' 14"	1 m 16 s
12	76° 00' 42"	-0.05"	74° 47' 55"	22° 42' 06"	1.0148231	15' 45.61"	23° 26' 14"	1 m 15 s
13	76° 03' 06"	-0.05"	74° 50' 30"	22° 42' 21"	1.0148288	15' 45.61"	23° 26' 14"	1 m 15 s
14	76° 05' 29"	-0.05"	74° 53' 05"	22° 42' 36"	1.0148344	15' 45.60"	23° 26' 14"	1 m 14 s
15	76° 07' 53"	-0.04"	74° 55' 39"	22° 42' 51"	1.0148400	15' 45.60"	23° 26' 14"	1 m 14 s
16	76° 10' 16"	-0.04"	74° 58' 14"	22° 43' 05"	1.0148457	15' 45.59"	23° 26' 14"	1 m 14 s
17	76° 12' 40"	-0.03"	75° 00' 49"	22° 43' 20"	1.0148513	15' 45.59"	23° 26' 14"	1 m 13 s
18	76° 15' 04"	-0.03"	75° 03' 24"	22° 43' 35"	1.0148569	15' 45.58"	23° 26' 14"	1 m 13 s
19	76° 17' 27"	-0.02"	75° 05' 59"	22° 43' 50"	1.0148625	15' 45.58"	23° 26' 14"	1 m 12 s
20	76° 19' 51"	-0.02"	75° 08' 34"	22° 44' 04"	1.0148681	15' 45.57"	23° 26' 14"	1 m 12 s
21	76° 22' 14"	-0.01"	75° 11' 08"	22° 44' 19"	1.0148737	15' 45.57"	23° 26' 14"	1 m 11 s
22	76° 24' 38"	-0.01"	75° 13' 43"	22° 44' 33"	1.0148793	15' 45.56"	23° 26' 14"	1 m 11 s
23	76° 27' 01"	-0.01"	75° 16' 18"	22° 44' 48"	1.0148848	15' 45.56"	23° 26' 14"	1 m 10 s
24	76° 29' 25"	-0.00"	75° 18' 53"	22° 45' 03"	1.0148904	15' 45.55"	23° 26' 14"	1 m 10 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	27° 07' 52"	-3° 39' 28"	26° 30' 20"	7° 02' 07"	0° 54' 14"	14' 46.76"	65° 51' 47"	0.16948
1	27° 37' 34"	-3° 37' 28"	26° 57' 32"	7° 14' 32"	0° 54' 14"	14' 46.59"	65° 55' 42"	0.16650
2	28° 07' 15"	-3° 35' 27"	27° 24' 45"	7° 26' 55"	0° 54' 13"	14' 46.42"	65° 59' 45"	0.16354
3	28° 36' 56"	-3° 33' 26"	27° 51' 59"	7° 39' 16"	0° 54' 12"	14' 46.26"	66° 3' 54"	0.16061
4	29° 06' 36"	-3° 31' 23"	28° 19' 14"	7° 51' 35"	0° 54' 12"	14' 46.10"	66° 8' 09"	0.15770
5	29° 36' 15"	-3° 29' 20"	28° 46' 31"	8° 03' 53"	0° 54' 11"	14' 45.94"	66° 12' 31"	0.15481
6	30° 05' 54"	-3° 27' 16"	29° 13' 48"	8° 16' 08"	0° 54' 11"	14' 45.79"	66° 16' 60"	0.15195
7	30° 35' 33"	-3° 25' 11"	29° 41' 07"	8° 28' 21"	0° 54' 10"	14' 45.64"	66° 21' 35"	0.14911
8	31° 05' 10"	-3° 23' 05"	30° 08' 28"	8° 40' 32"	0° 54' 10"	14' 45.50"	66° 26' 17"	0.14629
9	31° 34' 48"	-3° 20' 58"	30° 35' 49"	8° 52' 41"	0° 54' 09"	14' 45.35"	66° 31' 06"	0.14349
10	32° 04' 24"	-3° 18' 50"	31° 03' 12"	9° 04' 48"	0° 54' 08"	14' 45.22"	66° 36' 02"	0.14072
11	32° 34' 00"	-3° 16' 42"	31° 30' 37"	9° 16' 53"	0° 54' 08"	14' 45.08"	66° 41' 04"	0.13797
12	33° 03' 36"	-3° 14' 32"	31° 58' 03"	9° 28' 55"	0° 54' 08"	14' 44.95"	66° 46' 13"	0.13524
13	33° 33' 11"	-3° 12' 22"	32° 25' 31"	9° 40' 55"	0° 54' 07"	14' 44.83"	66° 51' 29"	0.13254
14	34° 02' 46"	-3° 10' 11"	32° 52' 60"	9° 52' 53"	0° 54' 07"	14' 44.70"	66° 56' 51"	0.12986
15	34° 32' 20"	-3° 07' 59"	33° 20' 31"	10° 04' 49"	0° 54' 06"	14' 44.58"	67° 2' 21"	0.12720
16	35° 01' 54"	-3° 05' 46"	33° 48' 04"	10° 16' 42"	0° 54' 06"	14' 44.47"	67° 7' 57"	0.12457
17	35° 31' 27"	-3° 03' 33"	34° 15' 38"	10° 28' 32"	0° 54' 05"	14' 44.36"	67° 13' 40"	0.12196
18	36° 01' 00"	-3° 01' 18"	34° 43' 15"	10° 40' 20"	0° 54' 05"	14' 44.25"	67° 19' 31"	0.11938
19	36° 30' 33"	-2° 59' 03"	35° 10' 53"	10° 52' 06"	0° 54' 05"	14' 44.14"	67° 25' 28"	0.11682
20	37° 00' 05"	-2° 56' 47"	35° 38' 33"	11° 03' 49"	0° 54' 04"	14' 44.04"	67° 31' 32"	0.11429
21	37° 29' 37"	-2° 54' 31"	36° 06' 15"	11° 15' 29"	0° 54' 04"	14' 43.94"	67° 37' 43"	0.11178
22	37° 59' 08"	-2° 52' 13"	36° 33' 59"	11° 27' 07"	0° 54' 03"	14' 43.85"	67° 44' 01"	0.10929
23	38° 28' 39"	-2° 49' 55"	37° 01' 45"	11° 38' 42"	0° 54' 03"	14' 43.76"	67° 50' 27"	0.10683
24	38° 58' 10"	-2° 47' 36"	37° 29' 34"	11° 50' 14"	0° 54' 03"	14' 43.67"	67° 56' 59"	0.10440

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	76° 29' 25"	-0.00"	75° 18' 53"	22° 45' 03"	1.0148904	15' 45.55"	23° 26' 14"	1 m 10 s
1	76° 31' 49"	0.00"	75° 21' 28"	22° 45' 17"	1.0148959	15' 45.55"	23° 26' 14"	1 m 09 s
2	76° 34' 12"	0.01"	75° 24' 03"	22° 45' 31"	1.0149015	15' 45.54"	23° 26' 14"	1 m 09 s
3	76° 36' 36"	0.01"	75° 26' 38"	22° 45' 46"	1.0149070	15' 45.53"	23° 26' 14"	1 m 08 s
4	76° 38' 59"	0.02"	75° 29' 13"	22° 46' 00"	1.0149125	15' 45.53"	23° 26' 14"	1 m 08 s
5	76° 41' 23"	0.02"	75° 31' 48"	22° 46' 14"	1.0149181	15' 45.52"	23° 26' 14"	1 m 07 s
6	76° 43' 46"	0.03"	75° 34' 23"	22° 46' 29"	1.0149236	15' 45.52"	23° 26' 14"	1 m 07 s
7	76° 46' 10"	0.03"	75° 36' 57"	22° 46' 43"	1.0149290	15' 45.51"	23° 26' 14"	1 m 07 s
8	76° 48' 34"	0.04"	75° 39' 32"	22° 46' 57"	1.0149345	15' 45.51"	23° 26' 14"	1 m 06 s
9	76° 50' 57"	0.04"	75° 42' 07"	22° 47' 11"	1.0149400	15' 45.50"	23° 26' 14"	1 m 06 s
10	76° 53' 21"	0.05"	75° 44' 42"	22° 47' 25"	1.0149455	15' 45.50"	23° 26' 14"	1 m 05 s
11	76° 55' 44"	0.05"	75° 47' 17"	22° 47' 39"	1.0149509	15' 45.49"	23° 26' 14"	1 m 05 s
12	76° 58' 08"	0.06"	75° 49' 52"	22° 47' 53"	1.0149564	15' 45.49"	23° 26' 14"	1 m 04 s
13	77° 00' 31"	0.06"	75° 52' 27"	22° 48' 07"	1.0149618	15' 45.48"	23° 26' 14"	1 m 04 s
14	77° 02' 55"	0.07"	75° 55' 02"	22° 48' 21"	1.0149672	15' 45.48"	23° 26' 14"	1 m 03 s
15	77° 05' 18"	0.07"	75° 57' 37"	22° 48' 35"	1.0149727	15' 45.47"	23° 26' 14"	1 m 03 s
16	77° 07' 42"	0.08"	76° 00' 12"	22° 48' 49"	1.0149781	15' 45.47"	23° 26' 14"	1 m 02 s
17	77° 10' 06"	0.08"	76° 02' 47"	22° 49' 03"	1.0149835	15' 45.46"	23° 26' 14"	1 m 02 s
18	77° 12' 29"	0.09"	76° 05' 22"	22° 49' 16"	1.0149889	15' 45.46"	23° 26' 14"	1 m 01 s
19	77° 14' 53"	0.09"	76° 07' 57"	22° 49' 30"	1.0149942	15' 45.45"	23° 26' 14"	1 m 01 s
20	77° 17' 16"	0.10"	76° 10' 32"	22° 49' 44"	1.0149996	15' 45.45"	23° 26' 14"	1 m 00 s
21	77° 19' 40"	0.10"	76° 13' 07"	22° 49' 57"	1.0150050	15' 45.44"	23° 26' 14"	0 m 60 s
22	77° 22' 03"	0.11"	76° 15' 42"	22° 50' 11"	1.0150103	15' 45.44"	23° 26' 14"	0 m 59 s
23	77° 24' 27"	0.11"	76° 18' 17"	22° 50' 25"	1.0150157	15' 45.43"	23° 26' 14"	0 m 59 s
24	77° 26' 50"	0.12"	76° 20' 53"	22° 50' 38"	1.0150210	15' 45.43"	23° 26' 14"	0 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	38° 58' 10"	-2° 47' 36"	37° 29' 34"	11° 50' 14"	0° 54' 03"	14' 43.67"	67° 56' 59"	0.10440
1	39° 27' 40"	-2° 45' 17"	37° 57' 24"	12° 01' 43"	0° 54' 03"	14' 43.59"	68° 3' 39"	0.10199
2	39° 57' 11"	-2° 42' 57"	38° 25' 17"	12° 13' 10"	0° 54' 02"	14' 43.51"	68° 10' 26"	0.09960
3	40° 26' 40"	-2° 40' 36"	38° 53' 12"	12° 24' 34"	0° 54' 02"	14' 43.43"	68° 17' 21"	0.09724
4	40° 56' 10"	-2° 38' 14"	39° 21' 09"	12° 35' 54"	0° 54' 02"	14' 43.36"	68° 24' 22"	0.09491
5	41° 25' 39"	-2° 35' 52"	39° 49' 09"	12° 47' 12"	0° 54' 01"	14' 43.29"	68° 31' 31"	0.09260
6	41° 55' 08"	-2° 33' 29"	40° 17' 11"	12° 58' 27"	0° 54' 01"	14' 43.22"	68° 38' 48"	0.09032
7	42° 24' 37"	-2° 31' 05"	40° 45' 15"	13° 09' 39"	0° 54' 01"	14' 43.16"	68° 46' 12"	0.08806
8	42° 54' 06"	-2° 28' 41"	41° 13' 22"	13° 20' 48"	0° 54' 01"	14' 43.10"	68° 53' 43"	0.08583
9	43° 23' 34"	-2° 26' 16"	41° 41' 31"	13° 31' 53"	0° 54' 01"	14' 43.04"	69° 1' 23"	0.08362
10	43° 53' 03"	-2° 23' 50"	42° 09' 43"	13° 42' 55"	0° 54' 00"	14' 42.99"	69° 9' 10"	0.08144
11	44° 22' 31"	-2° 21' 24"	42° 37' 58"	13° 53' 55"	0° 54' 00"	14' 42.94"	69° 17' 05"	0.07929
12	44° 51' 59"	-2° 18' 57"	43° 06' 15"	14° 04' 50"	0° 53' 60"	14' 42.89"	69° 25' 07"	0.07717
13	45° 21' 27"	-2° 16' 29"	43° 34' 35"	14° 15' 43"	0° 53' 60"	14' 42.85"	69° 33' 18"	0.07507
14	45° 50' 54"	-2° 14' 01"	44° 02' 57"	14° 26' 32"	0° 53' 60"	14' 42.81"	69° 41' 36"	0.07299
15	46° 20' 22"	-2° 11' 33"	44° 31' 22"	14° 37' 18"	0° 53' 60"	14' 42.77"	69° 50' 03"	0.07095
16	46° 49' 49"	-2° 09' 03"	44° 59' 50"	14° 48' 00"	0° 53' 59"	14' 42.73"	69° 58' 38"	0.06893
17	47° 19' 17"	-2° 06' 34"	45° 28' 21"	14° 58' 39"	0° 53' 59"	14' 42.70"	70° 7' 22"	0.06694
18	47° 48' 44"	-2° 04' 03"	45° 56' 55"	15° 09' 14"	0° 53' 59"	14' 42.68"	70° 16' 13"	0.06497
19	48° 18' 11"	-2° 01' 32"	46° 25' 31"	15° 19' 46"	0° 53' 59"	14' 42.65"	70° 25' 14"	0.06304
20	48° 47' 38"	-1° 59' 01"	46° 54' 11"	15° 30' 14"	0° 53' 59"	14' 42.63"	70° 34' 23"	0.06113
21	49° 17' 05"	-1° 56' 29"	47° 22' 53"	15° 40' 38"	0° 53' 59"	14' 42.61"	70° 43' 41"	0.05924
22	49° 46' 32"	-1° 53' 57"	47° 51' 39"	15° 50' 59"	0° 53' 59"	14' 42.60"	70° 53' 07"	0.05739
23	50° 15' 59"	-1° 51' 24"	48° 20' 27"	16° 01' 16"	0° 53' 59"	14' 42.58"	71° 2' 43"	0.05556
24	50° 45' 27"	-1° 48' 50"	48° 49' 18"	16° 11' 29"	0° 53' 59"	14' 42.58"	71° 12' 28"	0.05376

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	77° 26' 50"	0.12"	76° 20' 53"	22° 50' 38"	1.0150210	15' 45.43"	23° 26' 14"	0 m 58 s
1	77° 29' 14"	0.12"	76° 23' 28"	22° 50' 51"	1.0150263	15' 45.42"	23° 26' 14"	0 m 58 s
2	77° 31' 37"	0.13"	76° 26' 03"	22° 51' 05"	1.0150317	15' 45.42"	23° 26' 14"	0 m 58 s
3	77° 34' 01"	0.13"	76° 28' 38"	22° 51' 18"	1.0150370	15' 45.41"	23° 26' 14"	0 m 57 s
4	77° 36' 24"	0.14"	76° 31' 13"	22° 51' 32"	1.0150423	15' 45.41"	23° 26' 14"	0 m 57 s
5	77° 38' 48"	0.14"	76° 33' 48"	22° 51' 45"	1.0150475	15' 45.40"	23° 26' 14"	0 m 56 s
6	77° 41' 12"	0.15"	76° 36' 23"	22° 51' 58"	1.0150528	15' 45.40"	23° 26' 14"	0 m 56 s
7	77° 43' 35"	0.15"	76° 38' 58"	22° 52' 11"	1.0150581	15' 45.39"	23° 26' 14"	0 m 55 s
8	77° 45' 59"	0.16"	76° 41' 33"	22° 52' 25"	1.0150634	15' 45.39"	23° 26' 14"	0 m 55 s
9	77° 48' 22"	0.16"	76° 44' 08"	22° 52' 38"	1.0150686	15' 45.38"	23° 26' 14"	0 m 54 s
10	77° 50' 46"	0.17"	76° 46' 44"	22° 52' 51"	1.0150738	15' 45.38"	23° 26' 14"	0 m 54 s
11	77° 53' 09"	0.17"	76° 49' 19"	22° 53' 04"	1.0150791	15' 45.37"	23° 26' 14"	0 m 53 s
12	77° 55' 33"	0.18"	76° 51' 54"	22° 53' 17"	1.0150843	15' 45.37"	23° 26' 14"	0 m 53 s
13	77° 57' 56"	0.18"	76° 54' 29"	22° 53' 30"	1.0150895	15' 45.36"	23° 26' 14"	0 m 52 s
14	78° 00' 20"	0.19"	76° 57' 04"	22° 53' 43"	1.0150947	15' 45.36"	23° 26' 14"	0 m 52 s
15	78° 02' 43"	0.19"	76° 59' 39"	22° 53' 55"	1.0150999	15' 45.36"	23° 26' 14"	0 m 51 s
16	78° 05' 07"	0.20"	77° 02' 15"	22° 54' 08"	1.0151051	15' 45.35"	23° 26' 14"	0 m 51 s
17	78° 07' 30"	0.21"	77° 04' 50"	22° 54' 21"	1.0151103	15' 45.35"	23° 26' 14"	0 m 50 s
18	78° 09' 54"	0.21"	77° 07' 25"	22° 54' 34"	1.0151154	15' 45.34"	23° 26' 14"	0 m 50 s
19	78° 12' 17"	0.22"	77° 10' 00"	22° 54' 47"	1.0151206	15' 45.34"	23° 26' 14"	0 m 49 s
20	78° 14' 41"	0.22"	77° 12' 35"	22° 54' 59"	1.0151257	15' 45.33"	23° 26' 14"	0 m 49 s
21	78° 17' 04"	0.23"	77° 15' 10"	22° 55' 12"	1.0151309	15' 45.33"	23° 26' 14"	0 m 48 s
22	78° 19' 28"	0.23"	77° 17' 46"	22° 55' 24"	1.0151360	15' 45.32"	23° 26' 14"	0 m 48 s
23	78° 21' 51"	0.24"	77° 20' 21"	22° 55' 37"	1.0151411	15' 45.32"	23° 26' 14"	0 m 47 s
24	78° 24' 15"	0.24"	77° 22' 56"	22° 55' 49"	1.0151462	15' 45.31"	23° 26' 14"	0 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	50° 45' 27"	-1° 48' 50"	48° 49' 18"	16° 11' 29"	0° 53' 59"	14' 42.58"	71° 12' 28"	0.05376
1	51° 14' 54"	-1° 46' 16"	49° 18' 13"	16° 21' 38"	0° 53' 59"	14' 42.57"	71° 22' 23"	0.05199
2	51° 44' 21"	-1° 43' 42"	49° 47' 10"	16° 31' 43"	0° 53' 59"	14' 42.57"	71° 32' 27"	0.05024
3	52° 13' 48"	-1° 41' 07"	50° 16' 11"	16° 41' 44"	0° 53' 59"	14' 42.57"	71° 42' 41"	0.04853
4	52° 43' 15"	-1° 38' 32"	50° 45' 15"	16° 51' 42"	0° 53' 59"	14' 42.57"	71° 53' 05"	0.04684
5	53° 12' 42"	-1° 35' 56"	51° 14' 22"	17° 01' 35"	0° 53' 59"	14' 42.58"	72° 3' 39"	0.04518
6	53° 42' 10"	-1° 33' 20"	51° 43' 32"	17° 11' 24"	0° 53' 59"	14' 42.58"	72° 14' 24"	0.04355
7	54° 11' 37"	-1° 30' 43"	52° 12' 46"	17° 21' 09"	0° 53' 59"	14' 42.60"	72° 25' 20"	0.04195
8	54° 41' 04"	-1° 28' 06"	52° 42' 03"	17° 30' 50"	0° 53' 59"	14' 42.61"	72° 36' 26"	0.04037
9	55° 10' 32"	-1° 25' 28"	53° 11' 23"	17° 40' 26"	0° 53' 59"	14' 42.63"	72° 47' 44"	0.03883
10	55° 39' 60"	-1° 22' 51"	53° 40' 46"	17° 49' 58"	0° 53' 59"	14' 42.65"	72° 59' 14"	0.03731
11	56° 09' 28"	-1° 20' 12"	54° 10' 13"	17° 59' 26"	0° 53' 59"	14' 42.67"	73° 10' 56"	0.03583
12	56° 38' 56"	-1° 17' 34"	54° 39' 43"	18° 08' 50"	0° 53' 59"	14' 42.70"	73° 22' 50"	0.03437
13	57° 08' 24"	-1° 14' 55"	55° 09' 17"	18° 18' 09"	0° 53' 59"	14' 42.73"	73° 34' 57"	0.03294
14	57° 37' 52"	-1° 12' 16"	55° 38' 53"	18° 27' 23"	0° 53' 59"	14' 42.76"	73° 47' 17"	0.03154
15	58° 07' 21"	-1° 09' 36"	56° 08' 34"	18° 36' 33"	0° 53' 60"	14' 42.80"	73° 59' 52"	0.03017
16	58° 36' 49"	-1° 06' 56"	56° 38' 17"	18° 45' 39"	0° 53' 60"	14' 42.83"	74° 12' 40"	0.02883
17	59° 06' 18"	-1° 04' 16"	57° 08' 05"	18° 54' 40"	0° 53' 60"	14' 42.87"	74° 25' 44"	0.02751
18	59° 35' 47"	-1° 01' 35"	57° 37' 55"	19° 03' 36"	0° 54' 00"	14' 42.92"	74° 39' 04"	0.02623
19	60° 05' 17"	0°-58' 54"	58° 07' 49"	19° 12' 27"	0° 54' 00"	14' 42.96"	74° 52' 40"	0.02498
20	60° 34' 46"	0°-56' 13"	58° 37' 47"	19° 21' 14"	0° 54' 00"	14' 43.01"	75° 6' 33"	0.02376
21	61° 04' 16"	0°-53' 32"	59° 07' 48"	19° 29' 55"	0° 54' 01"	14' 43.06"	75° 20' 44"	0.02256
22	61° 33' 46"	0°-50' 50"	59° 37' 53"	19° 38' 32"	0° 54' 01"	14' 43.12"	75° 35' 15"	0.02140
23	62° 03' 16"	0°-48' 08"	60° 08' 01"	19° 47' 04"	0° 54' 01"	14' 43.17"	75° 50' 06"	0.02027
24	62° 32' 47"	0°-45' 26"	60° 38' 13"	19° 55' 31"	0° 54' 01"	14' 43.23"	76° 5' 19"	0.01916

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	78° 24' 15"	0.24"	77° 22' 56"	22° 55' 49"	1.0151462	15' 45.31"	23° 26' 14"	0 m 47 s
1	78° 26' 38"	0.25"	77° 25' 31"	22° 56' 02"	1.0151513	15' 45.31"	23° 26' 14"	0 m 46 s
2	78° 29' 02"	0.25"	77° 28' 07"	22° 56' 14"	1.0151564	15' 45.30"	23° 26' 14"	0 m 46 s
3	78° 31' 25"	0.26"	77° 30' 42"	22° 56' 27"	1.0151615	15' 45.30"	23° 26' 14"	0 m 45 s
4	78° 33' 49"	0.27"	77° 33' 17"	22° 56' 39"	1.0151665	15' 45.29"	23° 26' 14"	0 m 45 s
5	78° 36' 12"	0.27"	77° 35' 52"	22° 56' 51"	1.0151716	15' 45.29"	23° 26' 14"	0 m 44 s
6	78° 38' 36"	0.28"	77° 38' 28"	22° 57' 04"	1.0151766	15' 45.28"	23° 26' 14"	0 m 44 s
7	78° 40' 59"	0.28"	77° 41' 03"	22° 57' 16"	1.0151817	15' 45.28"	23° 26' 14"	0 m 43 s
8	78° 43' 23"	0.29"	77° 43' 38"	22° 57' 28"	1.0151867	15' 45.27"	23° 26' 14"	0 m 43 s
9	78° 45' 46"	0.29"	77° 46' 14"	22° 57' 40"	1.0151917	15' 45.27"	23° 26' 14"	0 m 42 s
10	78° 48' 10"	0.30"	77° 48' 49"	22° 57' 52"	1.0151967	15' 45.27"	23° 26' 14"	0 m 42 s
11	78° 50' 33"	0.30"	77° 51' 24"	22° 58' 04"	1.0152017	15' 45.26"	23° 26' 14"	0 m 41 s
12	78° 52' 57"	0.31"	77° 53' 59"	22° 58' 16"	1.0152067	15' 45.26"	23° 26' 14"	0 m 41 s
13	78° 55' 20"	0.31"	77° 56' 35"	22° 58' 28"	1.0152117	15' 45.25"	23° 26' 14"	0 m 41 s
14	78° 57' 44"	0.32"	77° 59' 10"	22° 58' 40"	1.0152167	15' 45.25"	23° 26' 14"	0 m 40 s
15	79° 00' 07"	0.33"	78° 01' 45"	22° 58' 52"	1.0152216	15' 45.24"	23° 26' 14"	0 m 40 s
16	79° 02' 31"	0.33"	78° 04' 21"	22° 59' 04"	1.0152266	15' 45.24"	23° 26' 14"	0 m 39 s
17	79° 04' 54"	0.34"	78° 06' 56"	22° 59' 15"	1.0152315	15' 45.23"	23° 26' 14"	0 m 39 s
18	79° 07' 18"	0.34"	78° 09' 31"	22° 59' 27"	1.0152365	15' 45.23"	23° 26' 14"	0 m 38 s
19	79° 09' 41"	0.35"	78° 12' 07"	22° 59' 39"	1.0152414	15' 45.22"	23° 26' 14"	0 m 38 s
20	79° 12' 05"	0.35"	78° 14' 42"	22° 59' 50"	1.0152463	15' 45.22"	23° 26' 14"	0 m 37 s
21	79° 14' 28"	0.36"	78° 17' 17"	23° 00' 02"	1.0152512	15' 45.21"	23° 26' 14"	0 m 37 s
22	79° 16' 52"	0.36"	78° 19' 53"	23° 00' 14"	1.0152561	15' 45.21"	23° 26' 14"	0 m 36 s
23	79° 19' 15"	0.37"	78° 22' 28"	23° 00' 25"	1.0152610	15' 45.21"	23° 26' 14"	0 m 36 s
24	79° 21' 39"	0.37"	78° 25' 04"	23° 00' 37"	1.0152659	15' 45.20"	23° 26' 14"	0 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	62° 32' 47"	0°-45' 26"	60° 38' 13"	19° 55' 31"	0° 54' 01"	14' 43.23"	76° 5' 19"	0.01916
1	63° 02' 18"	0°-42' 44"	61° 08' 28"	20° 03' 53"	0° 54' 01"	14' 43.30"	76° 20' 55"	0.01809
2	63° 31' 49"	0°-40' 01"	61° 38' 47"	20° 12' 10"	0° 54' 02"	14' 43.36"	76° 36' 55"	0.01705
3	64° 01' 20"	0°-37' 18"	62° 09' 09"	20° 20' 22"	0° 54' 02"	14' 43.43"	76° 53' 22"	0.01604
4	64° 30' 52"	0°-34' 35"	62° 39' 35"	20° 28' 29"	0° 54' 02"	14' 43.50"	77° 10' 17"	0.01505
5	65° 00' 24"	0°-31' 52"	63° 10' 05"	20° 36' 30"	0° 54' 02"	14' 43.57"	77° 27' 44"	0.01410
6	65° 29' 57"	0°-29' 09"	63° 40' 38"	20° 44' 26"	0° 54' 03"	14' 43.65"	77° 45' 43"	0.01318
7	65° 59' 30"	0°-26' 25"	64° 11' 14"	20° 52' 17"	0° 54' 03"	14' 43.73"	78° 4' 19"	0.01229
8	66° 29' 03"	0°-23' 41"	64° 41' 55"	21° 00' 03"	0° 54' 03"	14' 43.81"	78° 23' 34"	0.01143
9	66° 58' 37"	0°-20' 58"	65° 12' 38"	21° 07' 43"	0° 54' 04"	14' 43.89"	78° 43' 34"	0.01060
10	67° 28' 10"	0°-18' 14"	65° 43' 26"	21° 15' 17"	0° 54' 04"	14' 43.97"	79° 4' 21"	0.00980
11	67° 57' 45"	0°-15' 30"	66° 14' 17"	21° 22' 47"	0° 54' 04"	14' 44.06"	79° 26' 03"	0.00904
12	68° 27' 20"	0°-12' 45"	66° 45' 11"	21° 30' 10"	0° 54' 05"	14' 44.15"	79° 48' 45"	0.00830
13	68° 56' 55"	0°-10' 01"	67° 16' 10"	21° 37' 28"	0° 54' 05"	14' 44.25"	80° 12' 34"	0.00759
14	69° 26' 30"	0° -7' 19"	67° 47' 12"	21° 44' 38"	0° 54' 05"	14' 44.34"	80° 37' 26"	0.00692
15	69° 56' 06"	0° -4' 35"	68° 18' 17"	21° 51' 45"	0° 54' 06"	14' 44.44"	81° 3' 59"	0.00628
16	70° 25' 43"	0° -1' 50"	68° 49' 26"	21° 58' 46"	0° 54' 06"	14' 44.54"	81° 32' 12"	0.00567
17	70° 55' 20"	0° 00' 54"	69° 20' 38"	22° 05' 41"	0° 54' 06"	14' 44.64"	82° 2' 20"	0.00509
18	71° 24' 57"	0° 03' 39"	69° 51' 54"	22° 12' 30"	0° 54' 07"	14' 44.75"	82° 34' 45"	0.00454
19	71° 54' 35"	0° 06' 23"	70° 23' 13"	22° 19' 14"	0° 54' 07"	14' 44.86"	83° 9' 50"	0.00402
20	72° 24' 13"	0° 09' 08"	70° 54' 36"	22° 25' 51"	0° 54' 08"	14' 44.97"	83° 48' 07"	0.00353
21	72° 53' 52"	0° 11' 52"	71° 26' 03"	22° 32' 23"	0° 54' 08"	14' 45.08"	84° 30' 14"	0.00308
22	73° 23' 32"	0° 14' 37"	71° 57' 33"	22° 38' 48"	0° 54' 08"	14' 45.20"	85° 17' 05"	0.00265
23	73° 53' 11"	0° 17' 21"	72° 29' 06"	22° 45' 08"	0° 54' 09"	14' 45.31"	86° 9' 48"	0.00226
24	74° 22' 52"	0° 20' 06"	73° 00' 43"	22° 51' 21"	0° 54' 09"	14' 45.43"	87° 9' 57"	0.00190

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	79° 21' 39"	0.37"	78° 25' 04"	23° 00' 37"	1.0152659	15' 45.20"	23° 26' 14"	0 m 35 s
1	79° 24' 02"	0.38"	78° 27' 39"	23° 00' 48"	1.0152707	15' 45.20"	23° 26' 14"	0 m 35 s
2	79° 26' 26"	0.39"	78° 30' 14"	23° 00' 60"	1.0152756	15' 45.19"	23° 26' 14"	0 m 34 s
3	79° 28' 49"	0.39"	78° 32' 50"	23° 01' 11"	1.0152804	15' 45.19"	23° 26' 14"	0 m 34 s
4	79° 31' 13"	0.40"	78° 35' 25"	23° 01' 22"	1.0152852	15' 45.18"	23° 26' 14"	0 m 33 s
5	79° 33' 36"	0.40"	78° 38' 01"	23° 01' 33"	1.0152901	15' 45.18"	23° 26' 14"	0 m 33 s
6	79° 35' 59"	0.41"	78° 40' 36"	23° 01' 45"	1.0152949	15' 45.17"	23° 26' 14"	0 m 32 s
7	79° 38' 23"	0.41"	78° 43' 11"	23° 01' 56"	1.0152997	15' 45.17"	23° 26' 14"	0 m 32 s
8	79° 40' 46"	0.42"	78° 45' 47"	23° 02' 07"	1.0153045	15' 45.16"	23° 26' 14"	0 m 31 s
9	79° 43' 10"	0.42"	78° 48' 22"	23° 02' 18"	1.0153093	15' 45.16"	23° 26' 14"	0 m 31 s
10	79° 45' 33"	0.43"	78° 50' 58"	23° 02' 29"	1.0153140	15' 45.16"	23° 26' 14"	0 m 30 s
11	79° 47' 57"	0.43"	78° 53' 33"	23° 02' 40"	1.0153188	15' 45.15"	23° 26' 14"	0 m 30 s
12	79° 50' 20"	0.44"	78° 56' 09"	23° 02' 51"	1.0153236	15' 45.15"	23° 26' 14"	0 m 29 s
13	79° 52' 44"	0.45"	78° 58' 44"	23° 03' 02"	1.0153283	15' 45.14"	23° 26' 14"	0 m 29 s
14	79° 55' 07"	0.45"	79° 01' 20"	23° 03' 13"	1.0153330	15' 45.14"	23° 26' 14"	0 m 28 s
15	79° 57' 31"	0.46"	79° 03' 55"	23° 03' 24"	1.0153378	15' 45.13"	23° 26' 14"	0 m 28 s
16	79° 59' 54"	0.46"	79° 06' 30"	23° 03' 35"	1.0153425	15' 45.13"	23° 26' 14"	0 m 27 s
17	80° 02' 18"	0.47"	79° 09' 06"	23° 03' 45"	1.0153472	15' 45.12"	23° 26' 14"	0 m 27 s
18	80° 04' 41"	0.47"	79° 11' 41"	23° 03' 56"	1.0153519	15' 45.12"	23° 26' 14"	0 m 26 s
19	80° 07' 04"	0.48"	79° 14' 17"	23° 04' 07"	1.0153566	15' 45.12"	23° 26' 14"	0 m 26 s
20	80° 09' 28"	0.48"	79° 16' 52"	23° 04' 17"	1.0153613	15' 45.11"	23° 26' 14"	0 m 25 s
21	80° 11' 51"	0.49"	79° 19' 28"	23° 04' 28"	1.0153659	15' 45.11"	23° 26' 14"	0 m 25 s
22	80° 14' 15"	0.49"	79° 22' 03"	23° 04' 39"	1.0153706	15' 45.10"	23° 26' 14"	0 m 24 s
23	80° 16' 38"	0.50"	79° 24' 39"	23° 04' 49"	1.0153752	15' 45.10"	23° 26' 14"	0 m 23 s
24	80° 19' 02"	0.50"	79° 27' 14"	23° 04' 60"	1.0153799	15' 45.09"	23° 26' 14"	0 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	74° 22' 52"	0° 20' 06"	73° 00' 43"	22° 51' 21"	0° 54' 09"	14' 45.43"	87° 9' 57"	0.00190
1	74° 52' 33"	0° 22' 50"	73° 32' 23"	22° 57' 28"	0° 54' 10"	14' 45.56"	88° 19' 42"	0.00158
2	75° 22' 14"	0° 25' 35"	74° 04' 06"	23° 03' 29"	0° 54' 10"	14' 45.68"	89° 42' 12"	0.00128
3	75° 51' 56"	0° 28' 19"	74° 35' 53"	23° 09' 24"	0° 54' 11"	14' 45.81"	91° 22' 01"	0.00102
4	76° 21' 39"	0° 31' 03"	75° 07' 44"	23° 15' 12"	0° 54' 11"	14' 45.94"	93° 26' 18"	0.00078
5	76° 51' 22"	0° 33' 47"	75° 39' 38"	23° 20' 55"	0° 54' 12"	14' 46.07"	96° 6' 28"	0.00058
6	77° 21' 06"	0° 36' 31"	76° 11' 35"	23° 26' 30"	0° 54' 12"	14' 46.20"	99° 42' 10"	0.00041
7	77° 50' 50"	0° 39' 15"	76° 43' 35"	23° 31' 60"	0° 54' 13"	14' 46.34"	104° 49' 07"	0.00028
8	78° 20' 35"	0° 41' 59"	77° 15' 39"	23° 37' 23"	0° 54' 13"	14' 46.48"	112° 37' 14"	0.00017
9	78° 50' 20"	0° 44' 43"	77° 47' 45"	23° 42' 39"	0° 54' 14"	14' 46.62"	125° 27' 43"	0.00010
10	79° 20' 07"	0° 47' 26"	78° 19' 55"	23° 47' 49"	0° 54' 14"	14' 46.76"	147° 15' 03"	0.00006
11	79° 49' 53"	0° 50' 09"	78° 52' 08"	23° 52' 52"	0° 54' 15"	14' 46.91"	177° 54' 24"	0.00005
12	80° 19' 41"	0° 52' 53"	79° 24' 25"	23° 57' 49"	0° 54' 15"	14' 47.06"	204° 54' 05"	0.00008
13	80° 49' 29"	0° 55' 36"	79° 56' 44"	24° 02' 39"	0° 54' 16"	14' 47.21"	221° 39' 11"	0.00013
14	81° 19' 17"	0° 58' 18"	80° 29' 06"	24° 07' 22"	0° 54' 16"	14' 47.36"	231° 33' 06"	0.00022
15	81° 49' 07"	1° 01' 01"	81° 01' 32"	24° 11' 59"	0° 54' 17"	14' 47.51"	237° 48' 12"	0.00034
16	82° 18' 56"	1° 03' 43"	81° 33' 60"	24° 16' 28"	0° 54' 18"	14' 47.67"	242° 3' 37"	0.00050
17	82° 48' 47"	1° 06' 25"	82° 06' 31"	24° 20' 51"	0° 54' 18"	14' 47.83"	245° 8' 47"	0.00068
18	83° 18' 38"	1° 09' 07"	82° 39' 06"	24° 25' 07"	0° 54' 19"	14' 47.99"	247° 29' 52"	0.00090
19	83° 48' 30"	1° 11' 49"	83° 11' 43"	24° 29' 17"	0° 54' 19"	14' 48.15"	249° 21' 40"	0.00115
20	84° 18' 23"	1° 14' 30"	83° 44' 23"	24° 33' 19"	0° 54' 20"	14' 48.32"	250° 53' 08"	0.00144
21	84° 48' 17"	1° 17' 11"	84° 17' 05"	24° 37' 14"	0° 54' 21"	14' 48.49"	252° 9' 58"	0.00175
22	85° 18' 11"	1° 19' 52"	84° 49' 51"	24° 41' 03"	0° 54' 21"	14' 48.66"	253° 15' 55"	0.00210
23	85° 48' 06"	1° 22' 32"	85° 22' 39"	24° 44' 44"	0° 54' 22"	14' 48.83"	254° 13' 34"	0.00248
24	86° 18' 01"	1° 25' 12"	85° 55' 30"	24° 48' 18"	0° 54' 22"	14' 49.01"	255° 4' 45"	0.00289

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	80° 19' 02"	0.50"	79° 27' 14"	23° 04' 60"	1.0153799	15' 45.09"	23° 26' 14"	0 m 23 s
1	80° 21' 25"	0.51"	79° 29' 50"	23° 05' 10"	1.0153845	15' 45.09"	23° 26' 14"	0 m 22 s
2	80° 23' 49"	0.51"	79° 32' 25"	23° 05' 20"	1.0153891	15' 45.09"	23° 26' 14"	0 m 22 s
3	80° 26' 12"	0.52"	79° 35' 01"	23° 05' 31"	1.0153937	15' 45.08"	23° 26' 14"	0 m 21 s
4	80° 28' 35"	0.52"	79° 37' 37"	23° 05' 41"	1.0153983	15' 45.08"	23° 26' 14"	0 m 21 s
5	80° 30' 59"	0.53"	79° 40' 12"	23° 05' 51"	1.0154029	15' 45.07"	23° 26' 14"	0 m 20 s
6	80° 33' 22"	0.53"	79° 42' 48"	23° 06' 02"	1.0154075	15' 45.07"	23° 26' 14"	0 m 20 s
7	80° 35' 46"	0.54"	79° 45' 23"	23° 06' 12"	1.0154121	15' 45.06"	23° 26' 14"	0 m 19 s
8	80° 38' 09"	0.54"	79° 47' 59"	23° 06' 22"	1.0154166	15' 45.06"	23° 26' 14"	0 m 19 s
9	80° 40' 33"	0.55"	79° 50' 34"	23° 06' 32"	1.0154212	15' 45.06"	23° 26' 14"	0 m 18 s
10	80° 42' 56"	0.55"	79° 53' 10"	23° 06' 42"	1.0154257	15' 45.05"	23° 26' 14"	0 m 18 s
11	80° 45' 19"	0.56"	79° 55' 45"	23° 06' 52"	1.0154302	15' 45.05"	23° 26' 14"	0 m 17 s
12	80° 47' 43"	0.56"	79° 58' 21"	23° 07' 02"	1.0154347	15' 45.04"	23° 26' 14"	0 m 17 s
13	80° 50' 06"	0.57"	80° 00' 57"	23° 07' 12"	1.0154393	15' 45.04"	23° 26' 14"	0 m 16 s
14	80° 52' 30"	0.57"	80° 03' 32"	23° 07' 22"	1.0154438	15' 45.04"	23° 26' 14"	0 m 16 s
15	80° 54' 53"	0.58"	80° 06' 08"	23° 07' 32"	1.0154482	15' 45.03"	23° 26' 14"	0 m 15 s
16	80° 57' 17"	0.58"	80° 08' 43"	23° 07' 41"	1.0154527	15' 45.03"	23° 26' 14"	0 m 15 s
17	80° 59' 40"	0.59"	80° 11' 19"	23° 07' 51"	1.0154572	15' 45.02"	23° 26' 14"	0 m 14 s
18	81° 02' 03"	0.59"	80° 13' 55"	23° 08' 01"	1.0154617	15' 45.02"	23° 26' 14"	0 m 14 s
19	81° 04' 27"	0.60"	80° 16' 30"	23° 08' 10"	1.0154661	15' 45.01"	23° 26' 14"	0 m 13 s
20	81° 06' 50"	0.60"	80° 19' 06"	23° 08' 20"	1.0154705	15' 45.01"	23° 26' 14"	0 m 13 s
21	81° 09' 14"	0.61"	80° 21' 41"	23° 08' 30"	1.0154750	15' 45.01"	23° 26' 14"	0 m 12 s
22	81° 11' 37"	0.61"	80° 24' 17"	23° 08' 39"	1.0154794	15' 45.00"	23° 26' 14"	0 m 12 s
23	81° 14' 01"	0.62"	80° 26' 53"	23° 08' 49"	1.0154838	15' 45.00"	23° 26' 14"	0 m 11 s
24	81° 16' 24"	0.62"	80° 29' 28"	23° 08' 58"	1.0154882	15' 44.99"	23° 26' 14"	0 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	86° 18' 01"	1° 25' 12"	85° 55' 30"	24° 48' 18"	0° 54' 22"	14' 49.01"	255° 4' 45"	0.00289
1	86° 47' 58"	1° 27' 52"	86° 28' 23"	24° 51' 45"	0° 54' 23"	14' 49.18"	255° 50' 49"	0.00334
2	87° 17' 55"	1° 30' 32"	87° 01' 19"	24° 55' 05"	0° 54' 24"	14' 49.36"	256° 32' 46"	0.00382
3	87° 47' 53"	1° 33' 11"	87° 34' 18"	24° 58' 18"	0° 54' 24"	14' 49.54"	257° 11' 20"	0.00433
4	88° 17' 51"	1° 35' 49"	88° 07' 19"	25° 01' 23"	0° 54' 25"	14' 49.73"	257° 47' 07"	0.00487
5	88° 47' 51"	1° 38' 28"	88° 40' 22"	25° 04' 22"	0° 54' 26"	14' 49.91"	258° 20' 34"	0.00545
6	89° 17' 51"	1° 41' 06"	89° 13' 28"	25° 07' 13"	0° 54' 26"	14' 50.10"	258° 52' 03"	0.00606
7	89° 47' 52"	1° 43' 43"	89° 46' 36"	25° 09' 57"	0° 54' 27"	14' 50.29"	259° 21' 51"	0.00670
8	90° 17' 54"	1° 46' 20"	90° 19' 46"	25° 12' 33"	0° 54' 28"	14' 50.48"	259° 50' 14"	0.00737
9	90° 47' 56"	1° 48' 57"	90° 52' 59"	25° 15' 02"	0° 54' 29"	14' 50.68"	260° 17' 22"	0.00808
10	91° 17' 60"	1° 51' 33"	91° 26' 13"	25° 17' 24"	0° 54' 29"	14' 50.87"	260° 43' 25"	0.00881
11	91° 48' 04"	1° 54' 09"	91° 59' 30"	25° 19' 38"	0° 54' 30"	14' 51.07"	261° 8' 31"	0.00959
12	92° 18' 09"	1° 56' 44"	92° 32' 49"	25° 21' 45"	0° 54' 31"	14' 51.27"	261° 32' 48"	0.01039
13	92° 48' 15"	1° 59' 19"	93° 06' 09"	25° 23' 45"	0° 54' 31"	14' 51.47"	261° 56' 21"	0.01123
14	93° 18' 22"	2° 01' 54"	93° 39' 32"	25° 25' 37"	0° 54' 32"	14' 51.68"	262° 19' 14"	0.01209
15	93° 48' 30"	2° 04' 28"	94° 12' 57"	25° 27' 21"	0° 54' 33"	14' 51.89"	262° 41' 33"	0.01300
16	94° 18' 39"	2° 07' 01"	94° 46' 23"	25° 28' 58"	0° 54' 34"	14' 52.10"	263° 3' 21"	0.01393
17	94° 48' 48"	2° 09' 34"	95° 19' 51"	25° 30' 27"	0° 54' 35"	14' 52.31"	263° 24' 40"	0.01490
18	95° 18' 58"	2° 12' 06"	95° 53' 21"	25° 31' 49"	0° 54' 35"	14' 52.52"	263° 45' 35"	0.01590
19	95° 49' 10"	2° 14' 38"	96° 26' 52"	25° 33' 03"	0° 54' 36"	14' 52.74"	264° 6' 06"	0.01693
20	96° 19' 22"	2° 17' 09"	97° 00' 25"	25° 34' 10"	0° 54' 37"	14' 52.96"	264° 26' 16"	0.01799
21	96° 49' 35"	2° 19' 40"	97° 33' 59"	25° 35' 09"	0° 54' 38"	14' 53.18"	264° 46' 08"	0.01909
22	97° 19' 49"	2° 22' 10"	98° 07' 35"	25° 36' 00"	0° 54' 39"	14' 53.40"	265° 5' 42"	0.02022
23	97° 50' 04"	2° 24' 39"	98° 41' 12"	25° 36' 44"	0° 54' 39"	14' 53.62"	265° 25' 00"	0.02138
24	98° 20' 20"	2° 27' 08"	99° 14' 50"	25° 37' 20"	0° 54' 40"	14' 53.85"	265° 44' 03"	0.02257

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	81° 16' 24"	0.62"	80° 29' 28"	23° 08' 58"	1.0154882	15' 44.99"	23° 26' 14"	0 m 11 s
1	81° 18' 47"	0.63"	80° 32' 04"	23° 09' 08"	1.0154926	15' 44.99"	23° 26' 14"	0 m 10 s
2	81° 21' 11"	0.63"	80° 34' 40"	23° 09' 17"	1.0154970	15' 44.99"	23° 26' 14"	0 m 10 s
3	81° 23' 34"	0.64"	80° 37' 15"	23° 09' 26"	1.0155013	15' 44.98"	23° 26' 14"	0 m 09 s
4	81° 25' 58"	0.64"	80° 39' 51"	23° 09' 35"	1.0155057	15' 44.98"	23° 26' 14"	0 m 09 s
5	81° 28' 21"	0.64"	80° 42' 27"	23° 09' 45"	1.0155101	15' 44.97"	23° 26' 14"	0 m 08 s
6	81° 30' 44"	0.65"	80° 45' 02"	23° 09' 54"	1.0155144	15' 44.97"	23° 26' 14"	0 m 08 s
7	81° 33' 08"	0.65"	80° 47' 38"	23° 10' 03"	1.0155187	15' 44.97"	23° 26' 14"	0 m 07 s
8	81° 35' 31"	0.66"	80° 50' 14"	23° 10' 12"	1.0155230	15' 44.96"	23° 26' 14"	0 m 07 s
9	81° 37' 55"	0.66"	80° 52' 49"	23° 10' 21"	1.0155274	15' 44.96"	23° 26' 14"	0 m 06 s
10	81° 40' 18"	0.67"	80° 55' 25"	23° 10' 30"	1.0155317	15' 44.95"	23° 26' 14"	0 m 06 s
11	81° 42' 41"	0.67"	80° 58' 01"	23° 10' 39"	1.0155360	15' 44.95"	23° 26' 14"	0 m 05 s
12	81° 45' 05"	0.68"	81° 00' 36"	23° 10' 48"	1.0155402	15' 44.95"	23° 26' 14"	0 m 05 s
13	81° 47' 28"	0.68"	81° 03' 12"	23° 10' 57"	1.0155445	15' 44.94"	23° 26' 14"	0 m 04 s
14	81° 49' 52"	0.68"	81° 05' 48"	23° 11' 06"	1.0155488	15' 44.94"	23° 26' 14"	0 m 03 s
15	81° 52' 15"	0.69"	81° 08' 23"	23° 11' 15"	1.0155530	15' 44.93"	23° 26' 14"	0 m 03 s
16	81° 54' 38"	0.69"	81° 10' 59"	23° 11' 24"	1.0155573	15' 44.93"	23° 26' 14"	0 m 02 s
17	81° 57' 02"	0.70"	81° 13' 35"	23° 11' 32"	1.0155615	15' 44.93"	23° 26' 14"	0 m 02 s
18	81° 59' 25"	0.70"	81° 16' 11"	23° 11' 41"	1.0155657	15' 44.92"	23° 26' 14"	0 m 01 s
19	82° 01' 48"	0.70"	81° 18' 46"	23° 11' 50"	1.0155699	15' 44.92"	23° 26' 14"	0 m 01 s
20	82° 04' 12"	0.71"	81° 21' 22"	23° 11' 58"	1.0155741	15' 44.91"	23° 26' 14"	0 m 00 s
21	82° 06' 35"	0.71"	81° 23' 58"	23° 12' 07"	1.0155783	15' 44.91"	23° 26' 14"	0 m -0 s
22	82° 08' 59"	0.72"	81° 26' 33"	23° 12' 15"	1.0155825	15' 44.91"	23° 26' 14"	0 m -1 s
23	82° 11' 22"	0.72"	81° 29' 09"	23° 12' 24"	1.0155867	15' 44.90"	23° 26' 14"	0 m -1 s
24	82° 13' 45"	0.72"	81° 31' 45"	23° 12' 32"	1.0155908	15' 44.90"	23° 26' 14"	0 m -2 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	98° 20' 20"	2° 27' 08"	99° 14' 50"	25° 37' 20"	0° 54' 40"	14' 53.85"	265° 44' 03"	0.02257
1	98° 50' 37"	2° 29' 36"	99° 48' 30"	25° 37' 48"	0° 54' 41"	14' 54.08"	266° 2' 53"	0.02380
2	99° 20' 55"	2° 32' 04"	100° 22' 11"	25° 38' 09"	0° 54' 42"	14' 54.31"	266° 21' 30"	0.02505
3	99° 51' 13"	2° 34' 31"	100° 55' 53"	25° 38' 21"	0° 54' 43"	14' 54.54"	266° 39' 56"	0.02634
4	100° 21' 33"	2° 36' 57"	101° 29' 36"	25° 38' 27"	0° 54' 44"	14' 54.78"	266° 58' 11"	0.02767
5	100° 51' 54"	2° 39' 23"	102° 03' 20"	25° 38' 24"	0° 54' 44"	14' 55.01"	267° 16' 15"	0.02902
6	101° 22' 16"	2° 41' 48"	102° 37' 04"	25° 38' 14"	0° 54' 45"	14' 55.25"	267° 34' 10"	0.03041
7	101° 52' 38"	2° 44' 12"	103° 07' 50"	25° 37' 55"	0° 54' 46"	14' 55.49"	267° 51' 56"	0.03183
8	102° 23' 02"	2° 46' 35"	103° 44' 37"	25° 37' 29"	0° 54' 47"	14' 55.74"	268° 9' 33"	0.03328
9	102° 53' 27"	2° 48' 58"	104° 18' 24"	25° 36' 56"	0° 54' 48"	14' 55.98"	268° 27' 03"	0.03476
10	103° 23' 53"	2° 51' 20"	104° 52' 12"	25° 36' 14"	0° 54' 49"	14' 56.23"	268° 44' 24"	0.03628
11	103° 54' 19"	2° 53' 42"	105° 26' 00"	25° 35' 25"	0° 54' 50"	14' 56.48"	269° 1' 39"	0.03783
12	104° 24' 47"	2° 56' 02"	105° 59' 49"	25° 34' 28"	0° 54' 51"	14' 56.73"	269° 18' 46"	0.03941
13	104° 55' 16"	2° 58' 22"	106° 33' 38"	25° 33' 23"	0° 54' 52"	14' 56.99"	269° 35' 47"	0.04102
14	105° 25' 46"	3° 00' 41"	107° 07' 28"	25° 32' 10"	0° 54' 53"	14' 57.24"	269° 52' 42"	0.04266
15	105° 56' 17"	3° 02' 59"	107° 41' 18"	25° 30' 49"	0° 54' 54"	14' 57.50"	270° 9' 31"	0.04433
16	106° 26' 49"	3° 05' 17"	108° 15' 09"	25° 29' 21"	0° 54' 55"	14' 57.76"	270° 26' 13"	0.04604
17	106° 57' 23"	3° 07' 34"	108° 48' 59"	25° 27' 45"	0° 54' 56"	14' 58.03"	270° 42' 50"	0.04778
18	107° 27' 57"	3° 09' 49"	109° 22' 50"	25° 26' 01"	0° 54' 56"	14' 58.29"	270° 59' 21"	0.04955
19	107° 58' 32"	3° 12' 04"	109° 56' 40"	25° 24' 09"	0° 54' 57"	14' 58.56"	271° 15' 47"	0.05135
20	108° 29' 09"	3° 14' 19"	110° 30' 31"	25° 22' 09"	0° 54' 58"	14' 58.83"	271° 32' 08"	0.05318
21	108° 59' 46"	3° 16' 32"	111° 04' 22"	25° 20' 02"	0° 54' 59"	14' 59.10"	271° 48' 24"	0.05505
22	109° 30' 25"	3° 18' 44"	111° 38' 12"	25° 17' 47"	0° 55' 00"	14' 59.37"	272° 4' 34"	0.05694
23	110° 01' 05"	3° 20' 56"	112° 12' 03"	25° 15' 24"	0° 55' 01"	14' 59.65"	272° 20' 40"	0.05887
24	110° 31' 46"	3° 23' 07"	112° 45' 53"	25° 12' 53"	0° 55' 02"	14' 59.93"	272° 36' 40"	0.06083

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	82° 13' 45"	0.72"	81° 31' 45"	23° 12' 32"	1.0155908	15' 44.90"	23° 26' 14"	0 m -2 s
1	82° 16' 09"	0.73"	81° 34' 21"	23° 12' 41"	1.0155950	15' 44.89"	23° 26' 14"	0 m -2 s
2	82° 18' 32"	0.73"	81° 36' 56"	23° 12' 49"	1.0155991	15' 44.89"	23° 26' 14"	0 m -3 s
3	82° 20' 56"	0.74"	81° 39' 32"	23° 12' 57"	1.0156033	15' 44.89"	23° 26' 14"	0 m -3 s
4	82° 23' 19"	0.74"	81° 42' 08"	23° 13' 05"	1.0156074	15' 44.88"	23° 26' 14"	0 m -4 s
5	82° 25' 42"	0.74"	81° 44' 44"	23° 13' 14"	1.0156115	15' 44.88"	23° 26' 14"	0 m -4 s
6	82° 28' 06"	0.75"	81° 47' 19"	23° 13' 22"	1.0156156	15' 44.88"	23° 26' 14"	0 m -5 s
7	82° 30' 29"	0.75"	81° 49' 55"	23° 13' 30"	1.0156197	15' 44.87"	23° 26' 14"	0 m -5 s
8	82° 32' 52"	0.75"	81° 52' 31"	23° 13' 38"	1.0156238	15' 44.87"	23° 26' 14"	0 m -6 s
9	82° 35' 16"	0.76"	81° 55' 07"	23° 13' 46"	1.0156279	15' 44.86"	23° 26' 14"	0 m -6 s
10	82° 37' 39"	0.76"	81° 57' 42"	23° 13' 54"	1.0156319	15' 44.86"	23° 26' 14"	0 m -7 s
11	82° 40' 02"	0.76"	82° 00' 18"	23° 14' 02"	1.0156360	15' 44.86"	23° 26' 14"	0 m -7 s
12	82° 42' 26"	0.77"	82° 02' 54"	23° 14' 10"	1.0156400	15' 44.85"	23° 26' 14"	0 m -8 s
13	82° 44' 49"	0.77"	82° 05' 30"	23° 14' 18"	1.0156441	15' 44.85"	23° 26' 14"	0 m -9 s
14	82° 47' 13"	0.77"	82° 08' 06"	23° 14' 26"	1.0156481	15' 44.84"	23° 26' 14"	0 m -9 s
15	82° 49' 36"	0.78"	82° 10' 41"	23° 14' 33"	1.0156521	15' 44.84"	23° 26' 14"	0 m -10 s
16	82° 51' 59"	0.78"	82° 13' 17"	23° 14' 41"	1.0156561	15' 44.84"	23° 26' 14"	0 m -10 s
17	82° 54' 23"	0.78"	82° 15' 53"	23° 14' 49"	1.0156601	15' 44.83"	23° 26' 14"	0 m -11 s
18	82° 56' 46"	0.79"	82° 18' 29"	23° 14' 56"	1.0156641	15' 44.83"	23° 26' 14"	0 m -11 s
19	82° 59' 09"	0.79"	82° 21' 05"	23° 15' 04"	1.0156681	15' 44.83"	23° 26' 14"	0 m -12 s
20	83° 01' 33"	0.79"	82° 23' 40"	23° 15' 12"	1.0156721	15' 44.82"	23° 26' 14"	0 m -12 s
21	83° 03' 56"	0.80"	82° 26' 16"	23° 15' 19"	1.0156760	15' 44.82"	23° 26' 14"	0 m -13 s
22	83° 06' 19"	0.80"	82° 28' 52"	23° 15' 27"	1.0156800	15' 44.82"	23° 26' 14"	0 m -13 s
23	83° 08' 43"	0.80"	82° 31' 28"	23° 15' 34"	1.0156839	15' 44.81"	23° 26' 14"	0 m -14 s
24	83° 11' 06"	0.80"	82° 34' 04"	23° 15' 42"	1.0156878	15' 44.81"	23° 26' 14"	0 m -14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	110° 31' 46"	3° 23' 07"	112° 45' 53"	25° 12' 53"	0° 55' 02"	14' 59.93"	272° 36' 40"	0.06083
1	111° 02' 28"	3° 25' 17"	113° 19' 42"	25° 10' 14"	0° 55' 04"	15' 00.21"	272° 52' 36"	0.06281
2	111° 33' 12"	3° 27' 25"	113° 53' 32"	25° 07' 28"	0° 55' 05"	15' 00.49"	273° 8' 27"	0.06483
3	112° 03' 56"	3° 29' 33"	114° 27' 21"	25° 04' 33"	0° 55' 06"	15' 00.77"	273° 24' 14"	0.06689
4	112° 34' 42"	3° 31' 40"	115° 01' 09"	25° 01' 32"	0° 55' 07"	15' 01.06"	273° 39' 56"	0.06897
5	113° 05' 29"	3° 33' 46"	115° 34' 57"	24° 58' 22"	0° 55' 08"	15' 01.35"	273° 55' 33"	0.07108
6	113° 36' 17"	3° 35' 51"	116° 08' 44"	24° 55' 04"	0° 55' 09"	15' 01.64"	274° 11' 05"	0.07322
7	114° 07' 06"	3° 37' 56"	116° 42' 31"	24° 51' 39"	0° 55' 10"	15' 01.93"	274° 26' 33"	0.07540
8	114° 37' 57"	3° 39' 59"	117° 16' 17"	24° 48' 06"	0° 55' 11"	15' 02.23"	274° 41' 57"	0.07760
9	115° 08' 48"	3° 42' 01"	117° 50' 02"	24° 44' 26"	0° 55' 12"	15' 02.53"	274° 57' 15"	0.07984
10	115° 39' 41"	3° 44' 02"	118° 23' 46"	24° 40' 37"	0° 55' 13"	15' 02.83"	275° 12' 30"	0.08210
11	116° 10' 36"	3° 46' 02"	118° 57' 29"	24° 36' 41"	0° 55' 14"	15' 03.13"	275° 27' 39"	0.08440
12	116° 41' 31"	3° 48' 01"	119° 31' 12"	24° 32' 38"	0° 55' 15"	15' 03.43"	275° 42' 44"	0.08672
13	117° 12' 28"	3° 49' 59"	120° 04' 53"	24° 28' 26"	0° 55' 16"	15' 03.74"	275° 57' 45"	0.08908
14	117° 43' 26"	3° 51' 56"	120° 38' 34"	24° 24' 07"	0° 55' 18"	15' 04.05"	276° 12' 41"	0.09147
15	118° 14' 25"	3° 53' 52"	121° 12' 13"	24° 19' 41"	0° 55' 19"	15' 04.36"	276° 27' 32"	0.09388
16	118° 45' 25"	3° 55' 47"	121° 45' 51"	24° 15' 07"	0° 55' 20"	15' 04.67"	276° 42' 19"	0.09633
17	119° 16' 27"	3° 57' 41"	122° 19' 28"	24° 10' 25"	0° 55' 21"	15' 04.99"	276° 57' 01"	0.09880
18	119° 47' 30"	3° 59' 34"	122° 53' 03"	24° 05' 36"	0° 55' 22"	15' 05.30"	277° 11' 38"	0.10131
19	120° 18' 35"	4° 01' 25"	123° 26' 38"	24° 00' 39"	0° 55' 23"	15' 05.62"	277° 26' 11"	0.10384
20	120° 49' 40"	4° 03' 16"	124° 00' 11"	23° 55' 35"	0° 55' 25"	15' 05.95"	277° 40' 39"	0.10641
21	121° 20' 48"	4° 05' 05"	124° 33' 42"	23° 50' 23"	0° 55' 26"	15' 06.27"	277° 55' 02"	0.10900
22	121° 51' 56"	4° 06' 53"	125° 07' 12"	23° 45' 04"	0° 55' 27"	15' 06.60"	278° 9' 20"	0.11162
23	122° 23' 06"	4° 08' 41"	125° 40' 41"	23° 39' 37"	0° 55' 28"	15' 06.92"	278° 23' 34"	0.11427
24	122° 54' 17"	4° 10' 26"	126° 14' 08"	23° 34' 03"	0° 55' 29"	15' 07.26"	278° 37' 42"	0.11696

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	83° 11' 06"	0.80"	82° 34' 04"	23° 15' 42"	1.0156878	15' 44.81"	23° 26' 14"	0 m-14 s
1	83° 13' 29"	0.81"	82° 36' 39"	23° 15' 49"	1.0156917	15' 44.80"	23° 26' 14"	0 m-15 s
2	83° 15' 53"	0.81"	82° 39' 15"	23° 15' 56"	1.0156957	15' 44.80"	23° 26' 14"	0 m-15 s
3	83° 18' 16"	0.81"	82° 41' 51"	23° 16' 03"	1.0156996	15' 44.80"	23° 26' 14"	0 m-16 s
4	83° 20' 39"	0.82"	82° 44' 27"	23° 16' 11"	1.0157034	15' 44.79"	23° 26' 14"	0 m-16 s
5	83° 23' 03"	0.82"	82° 47' 03"	23° 16' 18"	1.0157073	15' 44.79"	23° 26' 14"	0 m-17 s
6	83° 25' 26"	0.82"	82° 49' 39"	23° 16' 25"	1.0157112	15' 44.79"	23° 26' 14"	0 m-17 s
7	83° 27' 49"	0.82"	82° 52' 14"	23° 16' 32"	1.0157151	15' 44.78"	23° 26' 14"	0 m-18 s
8	83° 30' 13"	0.83"	82° 54' 50"	23° 16' 39"	1.0157189	15' 44.78"	23° 26' 14"	0 m-19 s
9	83° 32' 36"	0.83"	82° 57' 26"	23° 16' 46"	1.0157228	15' 44.78"	23° 26' 14"	0 m-19 s
10	83° 34' 59"	0.83"	83° 00' 02"	23° 16' 53"	1.0157266	15' 44.77"	23° 26' 14"	0 m-20 s
11	83° 37' 23"	0.83"	83° 02' 38"	23° 17' 00"	1.0157304	15' 44.77"	23° 26' 14"	0 m-20 s
12	83° 39' 46"	0.83"	83° 05' 14"	23° 17' 07"	1.0157342	15' 44.76"	23° 26' 14"	0 m-21 s
13	83° 42' 09"	0.84"	83° 07' 50"	23° 17' 14"	1.0157380	15' 44.76"	23° 26' 14"	0 m-21 s
14	83° 44' 33"	0.84"	83° 10' 25"	23° 17' 21"	1.0157418	15' 44.76"	23° 26' 14"	0 m-22 s
15	83° 46' 56"	0.84"	83° 13' 01"	23° 17' 27"	1.0157456	15' 44.75"	23° 26' 14"	0 m-22 s
16	83° 49' 19"	0.84"	83° 15' 37"	23° 17' 34"	1.0157494	15' 44.75"	23° 26' 14"	0 m-23 s
17	83° 51' 43"	0.85"	83° 18' 13"	23° 17' 41"	1.0157531	15' 44.75"	23° 26' 14"	0 m-23 s
18	83° 54' 06"	0.85"	83° 20' 49"	23° 17' 47"	1.0157569	15' 44.74"	23° 26' 14"	0 m-24 s
19	83° 56' 29"	0.85"	83° 23' 25"	23° 17' 54"	1.0157607	15' 44.74"	23° 26' 14"	0 m-24 s
20	83° 58' 53"	0.85"	83° 26' 01"	23° 18' 01"	1.0157644	15' 44.74"	23° 26' 14"	0 m-25 s
21	84° 01' 16"	0.85"	83° 28' 37"	23° 18' 07"	1.0157681	15' 44.73"	23° 26' 14"	0 m-25 s
22	84° 03' 39"	0.85"	83° 31' 12"	23° 18' 14"	1.0157718	15' 44.73"	23° 26' 14"	0 m-26 s
23	84° 06' 03"	0.86"	83° 33' 48"	23° 18' 20"	1.0157755	15' 44.73"	23° 26' 14"	0 m-27 s
24	84° 08' 26"	0.86"	83° 36' 24"	23° 18' 26"	1.0157792	15' 44.72"	23° 26' 14"	0 m-27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	122° 54' 17"	4° 10' 26"	126° 14' 08"	23° 34' 03"	0° 55' 29"	15' 07.26"	278° 37' 42"	0.11696
1	123° 25' 29"	4° 12' 11"	126° 47' 34"	23° 28' 22"	0° 55' 31"	15' 07.59"	278° 51' 46"	0.11966
2	123° 56' 43"	4° 13' 55"	127° 20' 58"	23° 22' 33"	0° 55' 32"	15' 07.92"	279° 5' 45"	0.12240
3	124° 27' 58"	4° 15' 37"	127° 54' 20"	23° 16' 37"	0° 55' 33"	15' 08.26"	279° 19' 39"	0.12517
4	124° 59' 15"	4° 17' 18"	128° 27' 41"	23° 10' 34"	0° 55' 34"	15' 08.60"	279° 33' 27"	0.12796
5	125° 30' 33"	4° 18' 58"	129° 00' 60"	23° 04' 23"	0° 55' 36"	15' 08.94"	279° 47' 11"	0.13079
6	126° 01' 52"	4° 20' 37"	129° 34' 17"	22° 58' 06"	0° 55' 37"	15' 09.29"	280° 0' 50"	0.13364
7	126° 33' 13"	4° 22' 15"	130° 07' 32"	22° 51' 40"	0° 55' 38"	15' 09.63"	280° 14' 23"	0.13652
8	127° 04' 35"	4° 23' 51"	130° 40' 46"	22° 45' 08"	0° 55' 39"	15' 09.98"	280° 27' 51"	0.13942
9	127° 35' 59"	4° 25' 26"	131° 13' 58"	22° 38' 29"	0° 55' 41"	15' 10.33"	280° 41' 14"	0.14236
10	128° 07' 24"	4° 26' 60"	131° 47' 08"	22° 31' 42"	0° 55' 42"	15' 10.69"	280° 54' 32"	0.14532
11	128° 38' 50"	4° 28' 32"	132° 20' 16"	22° 24' 49"	0° 55' 43"	15' 11.04"	281° 7' 45"	0.14831
12	129° 10' 18"	4° 30' 03"	132° 53' 22"	22° 17' 48"	0° 55' 45"	15' 11.40"	281° 20' 52"	0.15133
13	129° 41' 48"	4° 31' 33"	133° 26' 26"	22° 10' 41"	0° 55' 46"	15' 11.76"	281° 33' 53"	0.15438
14	130° 13' 19"	4° 33' 02"	133° 59' 28"	22° 03' 26"	0° 55' 47"	15' 12.12"	281° 46' 50"	0.15745
15	130° 44' 51"	4° 34' 29"	134° 32' 28"	21° 56' 04"	0° 55' 49"	15' 12.49"	281° 59' 40"	0.16055
16	131° 16' 25"	4° 35' 55"	135° 05' 27"	21° 48' 36"	0° 55' 50"	15' 12.85"	282° 12' 25"	0.16367
17	131° 48' 00"	4° 37' 20"	135° 38' 23"	21° 41' 01"	0° 55' 51"	15' 13.22"	282° 25' 05"	0.16682
18	132° 19' 37"	4° 38' 43"	136° 11' 17"	21° 33' 19"	0° 55' 53"	15' 13.59"	282° 37' 39"	0.17000
19	132° 51' 16"	4° 40' 05"	136° 44' 09"	21° 25' 30"	0° 55' 54"	15' 13.97"	282° 50' 07"	0.17321
20	133° 22' 55"	4° 41' 26"	137° 16' 59"	21° 17' 34"	0° 55' 55"	15' 14.34"	283° 2' 30"	0.17644
21	133° 54' 37"	4° 42' 45"	137° 49' 47"	21° 09' 32"	0° 55' 57"	15' 14.72"	283° 14' 46"	0.17970
22	134° 26' 20"	4° 44' 03"	138° 22' 33"	21° 01' 22"	0° 55' 58"	15' 15.10"	283° 26' 57"	0.18298
23	134° 58' 05"	4° 45' 19"	138° 55' 16"	20° 53' 07"	0° 55' 60"	15' 15.48"	283° 39' 03"	0.18629
24	135° 29' 51"	4° 46' 34"	139° 27' 58"	20° 44' 44"	0° 56' 01"	15' 15.87"	283° 51' 02"	0.18962

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	84° 08' 26"	0.86"	83° 36' 24"	23° 18' 26"	1.0157792	15' 44.72"	23° 26' 14"	0 m-27 s
1	84° 10' 49"	0.86"	83° 39' 00"	23° 18' 33"	1.0157829	15' 44.72"	23° 26' 14"	0 m-28 s
2	84° 13' 12"	0.86"	83° 41' 36"	23° 18' 39"	1.0157866	15' 44.72"	23° 26' 14"	0 m-28 s
3	84° 15' 36"	0.86"	83° 44' 12"	23° 18' 45"	1.0157903	15' 44.71"	23° 26' 14"	0 m-29 s
4	84° 17' 59"	0.86"	83° 46' 48"	23° 18' 51"	1.0157940	15' 44.71"	23° 26' 14"	0 m-29 s
5	84° 20' 22"	0.87"	83° 49' 24"	23° 18' 58"	1.0157976	15' 44.71"	23° 26' 14"	0 m-30 s
6	84° 22' 46"	0.87"	83° 51' 60"	23° 19' 04"	1.0158012	15' 44.70"	23° 26' 14"	0 m-30 s
7	84° 25' 09"	0.87"	83° 54' 36"	23° 19' 10"	1.0158049	15' 44.70"	23° 26' 14"	0 m-31 s
8	84° 27' 32"	0.87"	83° 57' 11"	23° 19' 16"	1.0158085	15' 44.70"	23° 26' 14"	0 m-31 s
9	84° 29' 56"	0.87"	83° 59' 47"	23° 19' 22"	1.0158121	15' 44.69"	23° 26' 14"	0 m-32 s
10	84° 32' 19"	0.87"	84° 02' 23"	23° 19' 28"	1.0158157	15' 44.69"	23° 26' 14"	0 m-32 s
11	84° 34' 42"	0.87"	84° 04' 59"	23° 19' 34"	1.0158193	15' 44.69"	23° 26' 14"	0 m-33 s
12	84° 37' 05"	0.87"	84° 07' 35"	23° 19' 39"	1.0158229	15' 44.68"	23° 26' 14"	0 m-33 s
13	84° 39' 29"	0.88"	84° 10' 11"	23° 19' 45"	1.0158265	15' 44.68"	23° 26' 14"	0 m-34 s
14	84° 41' 52"	0.88"	84° 12' 47"	23° 19' 51"	1.0158301	15' 44.68"	23° 26' 14"	0 m-35 s
15	84° 44' 15"	0.88"	84° 15' 23"	23° 19' 57"	1.0158336	15' 44.67"	23° 26' 14"	0 m-35 s
16	84° 46' 39"	0.88"	84° 17' 59"	23° 20' 02"	1.0158372	15' 44.67"	23° 26' 14"	0 m-36 s
17	84° 49' 02"	0.88"	84° 20' 35"	23° 20' 08"	1.0158407	15' 44.67"	23° 26' 14"	0 m-36 s
18	84° 51' 25"	0.88"	84° 23' 11"	23° 20' 14"	1.0158442	15' 44.66"	23° 26' 14"	0 m-37 s
19	84° 53' 48"	0.88"	84° 25' 47"	23° 20' 19"	1.0158478	15' 44.66"	23° 26' 14"	0 m-37 s
20	84° 56' 12"	0.88"	84° 28' 22"	23° 20' 25"	1.0158513	15' 44.66"	23° 26' 14"	0 m-38 s
21	84° 58' 35"	0.88"	84° 30' 58"	23° 20' 30"	1.0158548	15' 44.65"	23° 26' 14"	0 m-38 s
22	85° 00' 58"	0.88"	84° 33' 34"	23° 20' 36"	1.0158583	15' 44.65"	23° 26' 14"	0 m-39 s
23	85° 03' 21"	0.88"	84° 36' 10"	23° 20' 41"	1.0158618	15' 44.65"	23° 26' 14"	0 m-39 s
24	85° 05' 45"	0.88"	84° 38' 46"	23° 20' 46"	1.0158653	15' 44.64"	23° 26' 14"	0 m-40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	135° 29' 51"	4° 46' 34"	139° 27' 58"	20° 44' 44"	0° 56' 01"	15' 15.87"	283° 51' 02"	0.18962
1	136° 01' 38"	4° 47' 48"	140° 00' 37"	20° 36' 15"	0° 56' 02"	15' 16.25"	284° 2' 55"	0.19298
2	136° 33' 28"	4° 48' 60"	140° 33' 14"	20° 27' 40"	0° 56' 04"	15' 16.64"	284° 14' 43"	0.19637
3	137° 05' 19"	4° 50' 11"	141° 05' 49"	20° 18' 58"	0° 56' 05"	15' 17.04"	284° 26' 24"	0.19978
4	137° 37' 11"	4° 51' 20"	141° 38' 22"	20° 10' 10"	0° 56' 07"	15' 17.43"	284° 37' 59"	0.20321
5	138° 09' 05"	4° 52' 28"	142° 10' 53"	20° 01' 15"	0° 56' 08"	15' 17.82"	284° 49' 29"	0.20667
6	138° 41' 01"	4° 53' 34"	142° 43' 21"	19° 52' 14"	0° 56' 10"	15' 18.22"	285° 0' 52"	0.21016
7	139° 12' 58"	4° 54' 39"	143° 15' 48"	19° 43' 07"	0° 56' 11"	15' 18.62"	285° 12' 09"	0.21366
8	139° 44' 57"	4° 55' 43"	143° 48' 12"	19° 33' 53"	0° 56' 13"	15' 19.03"	285° 23' 20"	0.21720
9	140° 16' 58"	4° 56' 45"	144° 20' 34"	19° 24' 33"	0° 56' 14"	15' 19.43"	285° 34' 24"	0.22075
10	140° 49' 00"	4° 57' 45"	144° 52' 54"	19° 15' 07"	0° 56' 16"	15' 19.84"	285° 45' 22"	0.22433
11	141° 21' 04"	4° 58' 44"	145° 25' 12"	19° 05' 35"	0° 56' 17"	15' 20.25"	285° 56' 14"	0.22794
12	141° 53' 10"	4° 59' 42"	145° 57' 27"	18° 55' 56"	0° 56' 19"	15' 20.66"	286° 6' 60"	0.23156
13	142° 25' 17"	5° 00' 38"	146° 29' 41"	18° 46' 12"	0° 56' 20"	15' 21.07"	286° 17' 39"	0.23521
14	142° 57' 26"	5° 01' 32"	147° 01' 52"	18° 36' 21"	0° 56' 22"	15' 21.49"	286° 28' 12"	0.23889
15	143° 29' 37"	5° 02' 25"	147° 34' 01"	18° 26' 25"	0° 56' 23"	15' 21.91"	286° 38' 38"	0.24258
16	144° 01' 49"	5° 03' 17"	148° 06' 08"	18° 16' 23"	0° 56' 25"	15' 22.33"	286° 48' 58"	0.24630
17	144° 34' 03"	5° 04' 06"	148° 38' 13"	18° 06' 15"	0° 56' 26"	15' 22.75"	286° 59' 11"	0.25004
18	145° 06' 19"	5° 04' 55"	149° 10' 16"	17° 56' 01"	0° 56' 28"	15' 23.17"	287° 9' 18"	0.25380
19	145° 38' 37"	5° 05' 41"	149° 42' 17"	17° 45' 41"	0° 56' 29"	15' 23.60"	287° 19' 18"	0.25759
20	146° 10' 56"	5° 06' 26"	150° 14' 15"	17° 35' 16"	0° 56' 31"	15' 24.03"	287° 29' 12"	0.26139
21	146° 43' 17"	5° 07' 10"	150° 46' 12"	17° 24' 44"	0° 56' 33"	15' 24.46"	287° 38' 59"	0.26522
22	147° 15' 40"	5° 07' 52"	151° 18' 07"	17° 14' 08"	0° 56' 34"	15' 24.89"	287° 48' 39"	0.26907
23	147° 48' 04"	5° 08' 32"	151° 49' 59"	17° 03' 25"	0° 56' 36"	15' 25.33"	287° 58' 12"	0.27294
24	148° 20' 31"	5° 09' 11"	152° 21' 50"	16° 52' 37"	0° 56' 37"	15' 25.76"	288° 7' 39"	0.27683

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	85° 05' 45"	0.88"	84° 38' 46"	23° 20' 46"	1.0158653	15' 44.64"	23° 26' 14"	0 m-40 s
1	85° 08' 08"	0.88"	84° 41' 22"	23° 20' 52"	1.0158687	15' 44.64"	23° 26' 14"	0 m-40 s
2	85° 10' 31"	0.88"	84° 43' 58"	23° 20' 57"	1.0158722	15' 44.64"	23° 26' 14"	0 m-41 s
3	85° 12' 55"	0.88"	84° 46' 34"	23° 21' 02"	1.0158756	15' 44.63"	23° 26' 14"	0 m-42 s
4	85° 15' 18"	0.88"	84° 49' 10"	23° 21' 07"	1.0158791	15' 44.63"	23° 26' 14"	0 m-42 s
5	85° 17' 41"	0.88"	84° 51' 46"	23° 21' 12"	1.0158825	15' 44.63"	23° 26' 14"	0 m-43 s
6	85° 20' 04"	0.88"	84° 54' 22"	23° 21' 18"	1.0158859	15' 44.62"	23° 26' 14"	0 m-43 s
7	85° 22' 28"	0.88"	84° 56' 58"	23° 21' 23"	1.0158894	15' 44.62"	23° 26' 14"	0 m-44 s
8	85° 24' 51"	0.88"	84° 59' 34"	23° 21' 28"	1.0158928	15' 44.62"	23° 26' 14"	0 m-44 s
9	85° 27' 14"	0.88"	85° 02' 10"	23° 21' 33"	1.0158962	15' 44.61"	23° 26' 14"	0 m-45 s
10	85° 29' 37"	0.88"	85° 04' 46"	23° 21' 37"	1.0158995	15' 44.61"	23° 26' 14"	0 m-45 s
11	85° 32' 01"	0.88"	85° 07' 22"	23° 21' 42"	1.0159029	15' 44.61"	23° 26' 14"	0 m-46 s
12	85° 34' 24"	0.88"	85° 09' 58"	23° 21' 47"	1.0159063	15' 44.60"	23° 26' 14"	0 m-46 s
13	85° 36' 47"	0.88"	85° 12' 34"	23° 21' 52"	1.0159097	15' 44.60"	23° 26' 14"	0 m-47 s
14	85° 39' 10"	0.88"	85° 15' 10"	23° 21' 57"	1.0159130	15' 44.60"	23° 26' 14"	0 m-47 s
15	85° 41' 34"	0.88"	85° 17' 45"	23° 22' 01"	1.0159164	15' 44.60"	23° 26' 14"	0 m-48 s
16	85° 43' 57"	0.88"	85° 20' 21"	23° 22' 06"	1.0159197	15' 44.59"	23° 26' 14"	0 m-49 s
17	85° 46' 20"	0.88"	85° 22' 57"	23° 22' 11"	1.0159230	15' 44.59"	23° 26' 14"	0 m-49 s
18	85° 48' 43"	0.88"	85° 25' 33"	23° 22' 15"	1.0159263	15' 44.59"	23° 26' 14"	0 m-50 s
19	85° 51' 07"	0.88"	85° 28' 09"	23° 22' 20"	1.0159296	15' 44.58"	23° 26' 14"	0 m-50 s
20	85° 53' 30"	0.88"	85° 30' 45"	23° 22' 24"	1.0159329	15' 44.58"	23° 26' 14"	0 m-51 s
21	85° 55' 53"	0.88"	85° 33' 21"	23° 22' 29"	1.0159362	15' 44.58"	23° 26' 14"	0 m-51 s
22	85° 58' 16"	0.88"	85° 35' 57"	23° 22' 33"	1.0159395	15' 44.57"	23° 26' 14"	0 m-52 s
23	86° 00' 40"	0.88"	85° 38' 33"	23° 22' 37"	1.0159428	15' 44.57"	23° 26' 14"	0 m-52 s
24	86° 03' 03"	0.88"	85° 41' 09"	23° 22' 42"	1.0159461	15' 44.57"	23° 26' 14"	0 m-53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	148° 20' 31"	5° 09' 11"	152° 21' 50"	16° 52' 37"	0° 56' 37"	15' 25.76"	288° 7' 39"	0.27683
1	148° 52' 59"	5° 09' 48"	152° 53' 38"	16° 41' 44"	0° 56' 39"	15' 26.20"	288° 16' 59"	0.28074
2	149° 25' 29"	5° 10' 24"	153° 25' 25"	16° 30' 45"	0° 56' 41"	15' 26.64"	288° 26' 12"	0.28468
3	149° 58' 01"	5° 10' 58"	153° 57' 10"	16° 19' 41"	0° 56' 42"	15' 27.09"	288° 35' 18"	0.28863
4	150° 30' 34"	5° 11' 30"	154° 28' 53"	16° 08' 31"	0° 56' 44"	15' 27.53"	288° 44' 17"	0.29260
5	151° 03' 10"	5° 12' 01"	155° 00' 34"	15° 57' 17"	0° 56' 45"	15' 27.98"	288° 53' 10"	0.29659
6	151° 35' 47"	5° 12' 29"	155° 32' 13"	15° 45' 56"	0° 56' 47"	15' 28.43"	289° 1' 55"	0.30060
7	152° 08' 26"	5° 12' 57"	156° 03' 50"	15° 34' 31"	0° 56' 49"	15' 28.88"	289° 10' 34"	0.30463
8	152° 41' 07"	5° 13' 22"	156° 35' 26"	15° 23' 01"	0° 56' 50"	15' 29.33"	289° 19' 05"	0.30868
9	153° 13' 49"	5° 13' 46"	157° 06' 60"	15° 11' 25"	0° 56' 52"	15' 29.79"	289° 27' 30"	0.31275
10	153° 46' 34"	5° 14' 09"	157° 38' 32"	14° 59' 45"	0° 56' 54"	15' 30.25"	289° 35' 47"	0.31684
11	154° 19' 20"	5° 14' 29"	158° 10' 02"	14° 47' 59"	0° 56' 55"	15' 30.71"	289° 43' 58"	0.32094
12	154° 52' 09"	5° 14' 48"	158° 41' 31"	14° 36' 09"	0° 56' 57"	15' 31.17"	289° 52' 01"	0.32507
13	155° 24' 59"	5° 15' 05"	159° 12' 58"	14° 24' 13"	0° 56' 59"	15' 31.63"	289° 59' 57"	0.32921
14	155° 57' 51"	5° 15' 21"	159° 44' 23"	14° 12' 13"	0° 57' 01"	15' 32.09"	290° 7' 46"	0.33336
15	156° 30' 45"	5° 15' 35"	160° 15' 47"	14° 00' 08"	0° 57' 02"	15' 32.56"	290° 15' 28"	0.33754
16	157° 03' 41"	5° 15' 47"	160° 47' 10"	13° 47' 58"	0° 57' 04"	15' 33.03"	290° 23' 02"	0.34173
17	157° 36' 39"	5° 15' 57"	161° 18' 31"	13° 35' 44"	0° 57' 06"	15' 33.50"	290° 30' 30"	0.34594
18	158° 09' 39"	5° 16' 06"	161° 49' 50"	13° 23' 25"	0° 57' 07"	15' 33.97"	290° 37' 50"	0.35017
19	158° 42' 40"	5° 16' 13"	162° 21' 09"	13° 11' 01"	0° 57' 09"	15' 34.44"	290° 45' 02"	0.35441
20	159° 15' 44"	5° 16' 18"	162° 52' 25"	12° 58' 33"	0° 57' 11"	15' 34.92"	290° 52' 08"	0.35866
21	159° 48' 50"	5° 16' 21"	163° 23' 41"	12° 46' 00"	0° 57' 13"	15' 35.40"	290° 59' 06"	0.36294
22	160° 21' 57"	5° 16' 23"	163° 54' 55"	12° 33' 23"	0° 57' 14"	15' 35.88"	291° 5' 57"	0.36723
23	160° 55' 07"	5° 16' 23"	164° 26' 08"	12° 20' 42"	0° 57' 16"	15' 36.36"	291° 12' 40"	0.37153
24	161° 28' 18"	5° 16' 21"	164° 57' 20"	12° 07' 56"	0° 57' 18"	15' 36.84"	291° 19' 16"	0.37585

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	86° 03' 03"	0.88"	85° 41' 09"	23° 22' 42"	1.0159461	15' 44.57"	23° 26' 14"	0 m-53 s
1	86° 05' 26"	0.88"	85° 43' 45"	23° 22' 46"	1.0159493	15' 44.56"	23° 26' 14"	0 m-53 s
2	86° 07' 49"	0.88"	85° 46' 21"	23° 22' 50"	1.0159526	15' 44.56"	23° 26' 14"	0 m-54 s
3	86° 10' 13"	0.87"	85° 48' 57"	23° 22' 54"	1.0159558	15' 44.56"	23° 26' 14"	0 m-54 s
4	86° 12' 36"	0.87"	85° 51' 33"	23° 22' 58"	1.0159590	15' 44.56"	23° 26' 14"	0 m-55 s
5	86° 14' 59"	0.87"	85° 54' 09"	23° 23' 03"	1.0159623	15' 44.55"	23° 26' 14"	0 m-56 s
6	86° 17' 22"	0.87"	85° 56' 45"	23° 23' 07"	1.0159655	15' 44.55"	23° 26' 14"	0 m-56 s
7	86° 19' 45"	0.87"	85° 59' 21"	23° 23' 11"	1.0159687	15' 44.55"	23° 26' 14"	0 m-57 s
8	86° 22' 09"	0.87"	86° 01' 57"	23° 23' 15"	1.0159719	15' 44.54"	23° 26' 14"	0 m-57 s
9	86° 24' 32"	0.87"	86° 04' 33"	23° 23' 18"	1.0159751	15' 44.54"	23° 26' 14"	0 m-58 s
10	86° 26' 55"	0.87"	86° 07' 09"	23° 23' 22"	1.0159783	15' 44.54"	23° 26' 14"	0 m-58 s
11	86° 29' 18"	0.86"	86° 09' 45"	23° 23' 26"	1.0159814	15' 44.53"	23° 26' 14"	0 m-59 s
12	86° 31' 42"	0.86"	86° 12' 21"	23° 23' 30"	1.0159846	15' 44.53"	23° 26' 14"	0 m-59 s
13	86° 34' 05"	0.86"	86° 14' 57"	23° 23' 34"	1.0159878	15' 44.53"	23° 26' 14"	0 m-60 s
14	86° 36' 28"	0.86"	86° 17' 33"	23° 23' 37"	1.0159909	15' 44.53"	23° 26' 14"	-1 m 00 s
15	86° 38' 51"	0.86"	86° 20' 09"	23° 23' 41"	1.0159941	15' 44.52"	23° 26' 14"	-1 m 01 s
16	86° 41' 14"	0.86"	86° 22' 45"	23° 23' 45"	1.0159972	15' 44.52"	23° 26' 14"	-1 m 01 s
17	86° 43' 38"	0.86"	86° 25' 21"	23° 23' 48"	1.0160003	15' 44.52"	23° 26' 14"	-1 m 02 s
18	86° 46' 01"	0.85"	86° 27' 57"	23° 23' 52"	1.0160034	15' 44.51"	23° 26' 14"	-1 m 03 s
19	86° 48' 24"	0.85"	86° 30' 33"	23° 23' 55"	1.0160065	15' 44.51"	23° 26' 14"	-1 m 03 s
20	86° 50' 47"	0.85"	86° 33' 09"	23° 23' 59"	1.0160096	15' 44.51"	23° 26' 14"	-1 m 04 s
21	86° 53' 10"	0.85"	86° 35' 45"	23° 24' 02"	1.0160127	15' 44.51"	23° 26' 14"	-1 m 04 s
22	86° 55' 34"	0.85"	86° 38' 21"	23° 24' 05"	1.0160158	15' 44.50"	23° 26' 14"	-1 m 05 s
23	86° 57' 57"	0.84"	86° 40' 57"	23° 24' 09"	1.0160189	15' 44.50"	23° 26' 14"	-1 m 05 s
24	87° 00' 20"	0.84"	86° 43' 33"	23° 24' 12"	1.0160220	15' 44.50"	23° 26' 14"	-1 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	161° 28' 18"	5° 16' 21"	164° 57' 20"	12° 07' 56"	0° 57' 18"	15' 36.84"	291° 19' 16"	0.37585
1	162° 01' 32"	5° 16' 17"	165° 28' 30"	11° 55' 06"	0° 57' 20"	15' 37.32"	291° 25' 44"	0.38018
2	162° 34' 47"	5° 16' 12"	165° 59' 40"	11° 42' 12"	0° 57' 22"	15' 37.81"	291° 32' 05"	0.38453
3	163° 08' 05"	5° 16' 05"	166° 30' 49"	11° 29' 14"	0° 57' 23"	15' 38.30"	291° 38' 19"	0.38889
4	163° 41' 24"	5° 15' 56"	167° 01' 56"	11° 16' 11"	0° 57' 25"	15' 38.78"	291° 44' 25"	0.39326
5	164° 14' 45"	5° 15' 45"	167° 33' 03"	11° 03' 05"	0° 57' 27"	15' 39.27"	291° 50' 23"	0.39765
6	164° 48' 09"	5° 15' 33"	168° 04' 08"	10° 49' 54"	0° 57' 29"	15' 39.77"	291° 56' 14"	0.40205
7	165° 21' 34"	5° 15' 18"	168° 35' 13"	10° 36' 40"	0° 57' 31"	15' 40.26"	292° 01' 58"	0.40646
8	165° 55' 02"	5° 15' 02"	169° 06' 17"	10° 23' 22"	0° 57' 32"	15' 40.75"	292° 07' 33"	0.41088
9	166° 28' 31"	5° 14' 44"	169° 37' 21"	10° 09' 60"	0° 57' 34"	15' 41.25"	292° 13' 01"	0.41532
10	167° 02' 03"	5° 14' 25"	170° 08' 23"	9° 56' 34"	0° 57' 36"	15' 41.74"	292° 18' 22"	0.41977
11	167° 35' 37"	5° 14' 03"	170° 39' 25"	9° 43' 05"	0° 57' 38"	15' 42.24"	292° 23' 34"	0.42423
12	168° 09' 12"	5° 13' 40"	171° 10' 27"	9° 29' 31"	0° 57' 40"	15' 42.74"	292° 28' 39"	0.42870
13	168° 42' 50"	5° 13' 15"	171° 41' 28"	9° 15' 55"	0° 57' 41"	15' 43.24"	292° 33' 37"	0.43318
14	169° 16' 30"	5° 12' 48"	172° 12' 28"	9° 02' 15"	0° 57' 43"	15' 43.74"	292° 38' 26"	0.43768
15	169° 50' 11"	5° 12' 19"	172° 43' 28"	8° 48' 31"	0° 57' 45"	15' 44.25"	292° 43' 08"	0.44218
16	170° 23' 55"	5° 11' 48"	173° 14' 28"	8° 34' 44"	0° 57' 47"	15' 44.75"	292° 47' 41"	0.44669
17	170° 57' 41"	5° 11' 16"	173° 45' 27"	8° 20' 53"	0° 57' 49"	15' 45.26"	292° 52' 07"	0.45121
18	171° 31' 29"	5° 10' 41"	174° 16' 26"	8° 06' 60"	0° 57' 51"	15' 45.76"	292° 56' 26"	0.45574
19	172° 05' 19"	5° 10' 05"	174° 47' 25"	7° 53' 03"	0° 57' 53"	15' 46.27"	293° 0' 36"	0.46028
20	172° 39' 12"	5° 09' 27"	175° 18' 24"	7° 39' 03"	0° 57' 54"	15' 46.78"	293° 4' 38"	0.46483
21	173° 13' 06"	5° 08' 48"	175° 49' 23"	7° 24' 60"	0° 57' 56"	15' 47.29"	293° 8' 32"	0.46939
22	173° 47' 02"	5° 08' 06"	176° 20' 22"	7° 10' 53"	0° 57' 58"	15' 47.80"	293° 12' 19"	0.47395
23	174° 21' 01"	5° 07' 23"	176° 51' 20"	6° 56' 44"	0° 58' 00"	15' 48.31"	293° 15' 57"	0.47852
24	174° 55' 01"	5° 06' 37"	177° 22' 19"	6° 42' 32"	0° 58' 02"	15' 48.82"	293° 19' 28"	0.48310

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	87° 00' 20"	0.84"	86° 43' 33"	23° 24' 12"	1.0160220	15' 44.50"	23° 26' 14"	-1 m 06 s
1	87° 02' 43"	0.84"	86° 46' 09"	23° 24' 15"	1.0160250	15' 44.49"	23° 26' 14"	-1 m 06 s
2	87° 05' 06"	0.84"	86° 48' 45"	23° 24' 19"	1.0160281	15' 44.49"	23° 26' 14"	-1 m 07 s
3	87° 07' 30"	0.84"	86° 51' 21"	23° 24' 22"	1.0160311	15' 44.49"	23° 26' 14"	-1 m 07 s
4	87° 09' 53"	0.83"	86° 53' 57"	23° 24' 25"	1.0160341	15' 44.49"	23° 26' 14"	-1 m 08 s
5	87° 12' 16"	0.83"	86° 56' 33"	23° 24' 28"	1.0160372	15' 44.48"	23° 26' 14"	-1 m 09 s
6	87° 14' 39"	0.83"	86° 59' 09"	23° 24' 31"	1.0160402	15' 44.48"	23° 26' 14"	-1 m 09 s
7	87° 17' 02"	0.83"	87° 01' 45"	23° 24' 34"	1.0160432	15' 44.48"	23° 26' 14"	-1 m 10 s
8	87° 19' 26"	0.82"	87° 04' 21"	23° 24' 37"	1.0160462	15' 44.47"	23° 26' 14"	-1 m 10 s
9	87° 21' 49"	0.82"	87° 06' 57"	23° 24' 40"	1.0160492	15' 44.47"	23° 26' 14"	-1 m 11 s
10	87° 24' 12"	0.82"	87° 09' 33"	23° 24' 42"	1.0160522	15' 44.47"	23° 26' 14"	-1 m 11 s
11	87° 26' 35"	0.82"	87° 12' 09"	23° 24' 45"	1.0160552	15' 44.47"	23° 26' 14"	-1 m 12 s
12	87° 28' 58"	0.81"	87° 14' 45"	23° 24' 48"	1.0160581	15' 44.46"	23° 26' 14"	-1 m 12 s
13	87° 31' 21"	0.81"	87° 17' 21"	23° 24' 51"	1.0160611	15' 44.46"	23° 26' 14"	-1 m 13 s
14	87° 33' 45"	0.81"	87° 19' 57"	23° 24' 53"	1.0160641	15' 44.46"	23° 26' 14"	-1 m 13 s
15	87° 36' 08"	0.80"	87° 22' 33"	23° 24' 56"	1.0160670	15' 44.46"	23° 26' 14"	-1 m 14 s
16	87° 38' 31"	0.80"	87° 25' 09"	23° 24' 59"	1.0160700	15' 44.45"	23° 26' 14"	-1 m 15 s
17	87° 40' 54"	0.80"	87° 27' 45"	23° 25' 01"	1.0160729	15' 44.45"	23° 26' 14"	-1 m 15 s
18	87° 43' 17"	0.80"	87° 30' 21"	23° 25' 04"	1.0160758	15' 44.45"	23° 26' 14"	-1 m 16 s
19	87° 45' 41"	0.79"	87° 32' 57"	23° 25' 06"	1.0160787	15' 44.44"	23° 26' 14"	-1 m 16 s
20	87° 48' 04"	0.79"	87° 35' 33"	23° 25' 08"	1.0160817	15' 44.44"	23° 26' 14"	-1 m 17 s
21	87° 50' 27"	0.79"	87° 38' 09"	23° 25' 11"	1.0160846	15' 44.44"	23° 26' 14"	-1 m 17 s
22	87° 52' 50"	0.78"	87° 40' 45"	23° 25' 13"	1.0160875	15' 44.44"	23° 26' 14"	-1 m 18 s
23	87° 55' 13"	0.78"	87° 43' 21"	23° 25' 15"	1.0160903	15' 44.43"	23° 26' 14"	-1 m 18 s
24	87° 57' 36"	0.78"	87° 45' 57"	23° 25' 18"	1.0160932	15' 44.43"	23° 26' 14"	-1 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	174° 55' 01"	5° 06' 37"	177° 22' 19"	6° 42' 32"	0° 58' 02"	15' 48.82"	293° 19' 28"	0.48310
1	175° 29' 04"	5° 05' 50"	177° 53' 19"	6° 28' 17"	0° 58' 04"	15' 49.33"	293° 22' 50"	0.48768
2	176° 03' 09"	5° 05' 01"	178° 24' 18"	6° 13' 59"	0° 58' 06"	15' 49.84"	293° 26' 04"	0.49228
3	176° 37' 16"	5° 04' 10"	178° 55' 18"	5° 59' 39"	0° 58' 08"	15' 50.36"	293° 29' 10"	0.49687
4	177° 11' 25"	5° 03' 18"	179° 26' 18"	5° 45' 15"	0° 58' 09"	15' 50.87"	293° 32' 08"	0.50147
5	177° 45' 36"	5° 02' 23"	179° 57' 18"	5° 30' 50"	0° 58' 11"	15' 51.39"	293° 34' 58"	0.50608
6	178° 19' 50"	5° 01' 27"	180° 28' 19"	5° 16' 21"	0° 58' 13"	15' 51.90"	293° 37' 39"	0.51069
7	178° 54' 05"	5° 00' 29"	180° 59' 21"	5° 01' 50"	0° 58' 15"	15' 52.42"	293° 40' 13"	0.51531
8	179° 28' 23"	4° 59' 28"	181° 30' 23"	4° 47' 17"	0° 58' 17"	15' 52.93"	293° 42' 38"	0.51993
9	180° 02' 42"	4° 58' 27"	182° 01' 26"	4° 32' 41"	0° 58' 19"	15' 53.45"	293° 44' 55"	0.52455
10	180° 37' 04"	4° 57' 23"	182° 32' 30"	4° 18' 04"	0° 58' 21"	15' 53.96"	293° 47' 03"	0.52918
11	181° 11' 28"	4° 56' 17"	183° 03' 34"	4° 03' 23"	0° 58' 23"	15' 54.48"	293° 49' 03"	0.53381
12	181° 45' 54"	4° 55' 10"	183° 34' 40"	3° 48' 41"	0° 58' 25"	15' 55.00"	293° 50' 55"	0.53844
13	182° 20' 23"	4° 54' 00"	184° 05' 46"	3° 33' 57"	0° 58' 26"	15' 55.51"	293° 52' 39"	0.54308
14	182° 54' 53"	4° 52' 49"	184° 36' 54"	3° 19' 10"	0° 58' 28"	15' 56.03"	293° 54' 13"	0.54771
15	183° 29' 26"	4° 51' 36"	185° 08' 02"	3° 04' 22"	0° 58' 30"	15' 56.55"	293° 55' 40"	0.55235
16	184° 04' 00"	4° 50' 22"	185° 39' 12"	2° 49' 32"	0° 58' 32"	15' 57.06"	293° 56' 58"	0.55699
17	184° 38' 37"	4° 49' 05"	186° 10' 23"	2° 34' 40"	0° 58' 34"	15' 57.58"	293° 58' 07"	0.56163
18	185° 13' 16"	4° 47' 46"	186° 41' 35"	2° 19' 46"	0° 58' 36"	15' 58.10"	293° 59' 08"	0.56627
19	185° 47' 57"	4° 46' 26"	187° 12' 49"	2° 04' 51"	0° 58' 38"	15' 58.61"	294° 0' 00"	0.57090
20	186° 22' 41"	4° 45' 04"	187° 44' 04"	1° 49' 54"	0° 58' 40"	15' 59.13"	294° 0' 44"	0.57554
21	186° 57' 26"	4° 43' 40"	188° 15' 21"	1° 34' 55"	0° 58' 42"	15' 59.64"	294° 1' 19"	0.58018
22	187° 32' 14"	4° 42' 14"	188° 46' 40"	1° 19' 55"	0° 58' 44"	16' 00.16"	294° 1' 45"	0.58481
23	188° 07' 03"	4° 40' 47"	189° 17' 60"	1° 04' 54"	0° 58' 45"	16' 00.67"	294° 2' 02"	0.58944
24	188° 41' 55"	4° 39' 17"	189° 49' 21"	0° 49' 51"	0° 58' 47"	16' 01.18"	294° 2' 11"	0.59407

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	87° 57' 36"	0.78"	87° 45' 57"	23° 25' 18"	1.0160932	15' 44.43"	23° 26' 14"	-1 m 19 s
1	87° 59' 60"	0.77"	87° 48' 33"	23° 25' 20"	1.0160961	15' 44.43"	23° 26' 14"	-1 m 19 s
2	88° 02' 23"	0.77"	87° 51' 09"	23° 25' 22"	1.0160990	15' 44.43"	23° 26' 14"	-1 m 20 s
3	88° 04' 46"	0.77"	87° 53' 45"	23° 25' 24"	1.0161018	15' 44.42"	23° 26' 14"	-1 m 21 s
4	88° 07' 09"	0.76"	87° 56' 21"	23° 25' 26"	1.0161047	15' 44.42"	23° 26' 14"	-1 m 21 s
5	88° 09' 32"	0.76"	87° 58' 57"	23° 25' 28"	1.0161075	15' 44.42"	23° 26' 14"	-1 m 22 s
6	88° 11' 55"	0.76"	88° 01' 33"	23° 25' 30"	1.0161104	15' 44.42"	23° 26' 14"	-1 m 22 s
7	88° 14' 18"	0.75"	88° 04' 09"	23° 25' 32"	1.0161132	15' 44.41"	23° 26' 14"	-1 m 23 s
8	88° 16' 42"	0.75"	88° 06' 45"	23° 25' 34"	1.0161160	15' 44.41"	23° 26' 14"	-1 m 23 s
9	88° 19' 05"	0.75"	88° 09' 21"	23° 25' 36"	1.0161188	15' 44.41"	23° 26' 14"	-1 m 24 s
10	88° 21' 28"	0.74"	88° 11' 57"	23° 25' 38"	1.0161216	15' 44.40"	23° 26' 14"	-1 m 24 s
11	88° 23' 51"	0.74"	88° 14' 33"	23° 25' 39"	1.0161244	15' 44.40"	23° 26' 14"	-1 m 25 s
12	88° 26' 14"	0.74"	88° 17' 09"	23° 25' 41"	1.0161272	15' 44.40"	23° 26' 14"	-1 m 25 s
13	88° 28' 37"	0.73"	88° 19' 45"	23° 25' 43"	1.0161300	15' 44.40"	23° 26' 14"	-1 m 26 s
14	88° 31' 00"	0.73"	88° 22' 21"	23° 25' 45"	1.0161328	15' 44.39"	23° 26' 14"	-1 m 27 s
15	88° 33' 24"	0.72"	88° 24' 57"	23° 25' 46"	1.0161356	15' 44.39"	23° 26' 14"	-1 m 27 s
16	88° 35' 47"	0.72"	88° 27' 33"	23° 25' 48"	1.0161383	15' 44.39"	23° 26' 14"	-1 m 28 s
17	88° 38' 10"	0.72"	88° 30' 09"	23° 25' 49"	1.0161411	15' 44.39"	23° 26' 14"	-1 m 28 s
18	88° 40' 33"	0.71"	88° 32' 45"	23° 25' 51"	1.0161438	15' 44.38"	23° 26' 14"	-1 m 29 s
19	88° 42' 56"	0.71"	88° 35' 21"	23° 25' 52"	1.0161466	15' 44.38"	23° 26' 14"	-1 m 29 s
20	88° 45' 19"	0.70"	88° 37' 57"	23° 25' 53"	1.0161493	15' 44.38"	23° 26' 14"	-1 m 30 s
21	88° 47' 42"	0.70"	88° 40' 33"	23° 25' 55"	1.0161520	15' 44.38"	23° 26' 14"	-1 m 30 s
22	88° 50' 06"	0.70"	88° 43' 09"	23° 25' 56"	1.0161548	15' 44.37"	23° 26' 14"	-1 m 31 s
23	88° 52' 29"	0.69"	88° 45' 45"	23° 25' 57"	1.0161575	15' 44.37"	23° 26' 14"	-1 m 31 s
24	88° 54' 52"	0.69"	88° 48' 21"	23° 25' 58"	1.0161602	15' 44.37"	23° 26' 14"	-1 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	188° 41' 55"	4° 39' 17"	189° 49' 21"	0° 49' 51"	0° 58' 47"	16' 01.18"	294° 2' 11"	0.59407
1	189° 16' 49"	4° 37' 46"	190° 20' 45"	0° 34' 47"	0° 58' 49"	16' 01.70"	294° 2' 11"	0.59870
2	189° 51' 45"	4° 36' 13"	190° 52' 10"	0° 19' 42"	0° 58' 51"	16' 02.21"	294° 2' 02"	0.60332
3	190° 26' 44"	4° 34' 38"	191° 23' 38"	0° 04' 36"	0° 58' 53"	16' 02.72"	294° 1' 44"	0.60794
4	191° 01' 44"	4° 33' 01"	191° 55' 07"	0° -10' 31"	0° 58' 55"	16' 03.23"	294° 1' 17"	0.61255
5	191° 36' 47"	4° 31' 23"	192° 26' 39"	0° -25' 40"	0° 58' 57"	16' 03.74"	294° 0' 41"	0.61716
6	192° 11' 51"	4° 29' 42"	192° 58' 13"	0° -40' 49"	0° 58' 59"	16' 04.25"	293° 59' 56"	0.62176
7	192° 46' 58"	4° 28' 00"	193° 29' 49"	0° -55' 58"	0° 59' 00"	16' 04.76"	293° 59' 03"	0.62636
8	193° 22' 07"	4° 26' 17"	194° 01' 27"	-1° 11' 09"	0° 59' 02"	16' 05.26"	293° 57' 60"	0.63096
9	193° 57' 18"	4° 24' 31"	194° 33' 08"	-1° 26' 20"	0° 59' 04"	16' 05.77"	293° 56' 47"	0.63554
10	194° 32' 31"	4° 22' 44"	195° 04' 51"	-1° 41' 32"	0° 59' 06"	16' 06.27"	293° 55' 26"	0.64012
11	195° 07' 47"	4° 20' 54"	195° 36' 37"	-1° 56' 44"	0° 59' 08"	16' 06.77"	293° 53' 56"	0.64469
12	195° 43' 04"	4° 19' 03"	196° 08' 26"	-2° 11' 56"	0° 59' 10"	16' 07.28"	293° 52' 16"	0.64925
13	196° 18' 24"	4° 17' 11"	196° 40' 17"	-2° 27' 09"	0° 59' 11"	16' 07.77"	293° 50' 27"	0.65381
14	196° 53' 45"	4° 15' 16"	197° 12' 11"	-2° 42' 22"	0° 59' 13"	16' 08.27"	293° 48' 28"	0.65835
15	197° 29' 09"	4° 13' 20"	197° 44' 08"	-2° 57' 35"	0° 59' 15"	16' 08.77"	293° 46' 21"	0.66289
16	198° 04' 35"	4° 11' 22"	198° 16' 07"	-3° 12' 48"	0° 59' 17"	16' 09.26"	293° 44' 03"	0.66742
17	198° 40' 03"	4° 09' 23"	198° 48' 10"	-3° 28' 01"	0° 59' 19"	16' 09.75"	293° 41' 37"	0.67193
18	199° 15' 32"	4° 07' 21"	199° 20' 16"	-3° 43' 14"	0° 59' 21"	16' 10.25"	293° 39' 00"	0.67644
19	199° 51' 04"	4° 05' 18"	199° 52' 25"	-3° 58' 27"	0° 59' 22"	16' 10.73"	293° 36' 14"	0.68093
20	200° 26' 39"	4° 03' 14"	200° 24' 37"	-4° 13' 40"	0° 59' 24"	16' 11.22"	293° 33' 19"	0.68541
21	201° 02' 15"	4° 01' 07"	200° 56' 52"	-4° 28' 52"	0° 59' 26"	16' 11.70"	293° 30' 14"	0.68988
22	201° 37' 53"	3° 58' 59"	201° 29' 11"	-4° 44' 04"	0° 59' 28"	16' 12.19"	293° 26' 59"	0.69434
23	202° 13' 33"	3° 56' 50"	202° 01' 33"	-4° 59' 15"	0° 59' 29"	16' 12.67"	293° 23' 34"	0.69878
24	202° 49' 15"	3° 54' 38"	202° 33' 59"	-5° 14' 25"	0° 59' 31"	16' 13.14"	293° 19' 60"	0.70321

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	88° 54' 52"	0.69"	88° 48' 21"	23° 25' 58"	1.0161602	15' 44.37"	23° 26' 14"	-1 m 32 s
1	88° 57' 15"	0.68"	88° 50' 57"	23° 25' 60"	1.0161629	15' 44.37"	23° 26' 14"	-1 m 32 s
2	88° 59' 38"	0.68"	88° 53' 33"	23° 26' 01"	1.0161656	15' 44.36"	23° 26' 14"	-1 m 33 s
3	89° 02' 01"	0.68"	88° 56' 09"	23° 26' 02"	1.0161683	15' 44.36"	23° 26' 14"	-1 m 34 s
4	89° 04' 24"	0.67"	88° 58' 45"	23° 26' 03"	1.0161710	15' 44.36"	23° 26' 14"	-1 m 34 s
5	89° 06' 48"	0.67"	89° 01' 21"	23° 26' 04"	1.0161736	15' 44.36"	23° 26' 14"	-1 m 35 s
6	89° 09' 11"	0.66"	89° 03' 57"	23° 26' 05"	1.0161763	15' 44.35"	23° 26' 14"	-1 m 35 s
7	89° 11' 34"	0.66"	89° 06' 33"	23° 26' 06"	1.0161790	15' 44.35"	23° 26' 14"	-1 m 36 s
8	89° 13' 57"	0.65"	89° 09' 08"	23° 26' 07"	1.0161816	15' 44.35"	23° 26' 14"	-1 m 36 s
9	89° 16' 20"	0.65"	89° 11' 44"	23° 26' 07"	1.0161843	15' 44.35"	23° 26' 14"	-1 m 37 s
10	89° 18' 43"	0.64"	89° 14' 20"	23° 26' 08"	1.0161869	15' 44.34"	23° 26' 14"	-1 m 37 s
11	89° 21' 06"	0.64"	89° 16' 56"	23° 26' 09"	1.0161895	15' 44.34"	23° 26' 14"	-1 m 38 s
12	89° 23' 29"	0.64"	89° 19' 32"	23° 26' 10"	1.0161922	15' 44.34"	23° 26' 14"	-1 m 38 s
13	89° 25' 52"	0.63"	89° 22' 08"	23° 26' 10"	1.0161948	15' 44.34"	23° 26' 14"	-1 m 39 s
14	89° 28' 16"	0.63"	89° 24' 44"	23° 26' 11"	1.0161974	15' 44.33"	23° 26' 14"	-1 m 40 s
15	89° 30' 39"	0.62"	89° 27' 20"	23° 26' 11"	1.0162000	15' 44.33"	23° 26' 14"	-1 m 40 s
16	89° 33' 02"	0.62"	89° 29' 56"	23° 26' 12"	1.0162026	15' 44.33"	23° 26' 14"	-1 m 41 s
17	89° 35' 25"	0.61"	89° 32' 32"	23° 26' 12"	1.0162052	15' 44.33"	23° 26' 14"	-1 m 41 s
18	89° 37' 48"	0.61"	89° 35' 08"	23° 26' 13"	1.0162078	15' 44.32"	23° 26' 14"	-1 m 42 s
19	89° 40' 11"	0.60"	89° 37' 44"	23° 26' 13"	1.0162104	15' 44.32"	23° 26' 14"	-1 m 42 s
20	89° 42' 34"	0.60"	89° 40' 20"	23° 26' 13"	1.0162130	15' 44.32"	23° 26' 14"	-1 m 43 s
21	89° 44' 57"	0.59"	89° 42' 56"	23° 26' 14"	1.0162155	15' 44.32"	23° 26' 14"	-1 m 43 s
22	89° 47' 20"	0.59"	89° 45' 32"	23° 26' 14"	1.0162181	15' 44.32"	23° 26' 14"	-1 m 44 s
23	89° 49' 44"	0.58"	89° 48' 08"	23° 26' 14"	1.0162207	15' 44.31"	23° 26' 14"	-1 m 44 s
24	89° 52' 07"	0.58"	89° 50' 44"	23° 26' 14"	1.0162232	15' 44.31"	23° 26' 14"	-1 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	202° 49' 15"	3° 54' 38"	202° 33' 59"	-5° 14' 25"	0° 59' 31"	16' 13.14"	293° 19' 60"	0.70321
1	203° 24' 59"	3° 52' 25"	203° 06' 28"	-5° 29' 35"	0° 59' 33"	16' 13.62"	293° 16' 15"	0.70762
2	204° 00' 46"	3° 50' 10"	203° 39' 01"	-5° 44' 44"	0° 59' 35"	16' 14.09"	293° 12' 21"	0.71203
3	204° 36' 34"	3° 47' 54"	204° 11' 38"	-5° 59' 52"	0° 59' 36"	16' 14.56"	293° 8' 17"	0.71641
4	205° 12' 24"	3° 45' 36"	204° 44' 19"	-6° 14' 59"	0° 59' 38"	16' 15.03"	293° 4' 03"	0.72078
5	205° 48' 16"	3° 43' 17"	205° 17' 03"	-6° 30' 05"	0° 59' 40"	16' 15.49"	292° 59' 38"	0.72513
6	206° 24' 11"	3° 40' 55"	205° 49' 51"	-6° 45' 09"	0° 59' 41"	16' 15.95"	292° 55' 04"	0.72947
7	207° 00' 07"	3° 38' 33"	206° 22' 44"	-7° 00' 13"	0° 59' 43"	16' 16.41"	292° 50' 19"	0.73379
8	207° 36' 05"	3° 36' 08"	206° 55' 40"	-7° 15' 15"	0° 59' 45"	16' 16.86"	292° 45' 24"	0.73809
9	208° 12' 05"	3° 33' 43"	207° 28' 41"	-7° 30' 15"	0° 59' 47"	16' 17.31"	292° 40' 19"	0.74237
10	208° 48' 07"	3° 31' 15"	208° 01' 46"	-7° 45' 14"	0° 59' 48"	16' 17.76"	292° 35' 03"	0.74664
11	209° 24' 11"	3° 28' 46"	208° 34' 55"	-8° 00' 11"	0° 59' 50"	16' 18.21"	292° 29' 37"	0.75088
12	210° 00' 17"	3° 26' 16"	209° 08' 08"	-8° 15' 07"	0° 59' 51"	16' 18.65"	292° 24' 00"	0.75510
13	210° 36' 24"	3° 23' 44"	209° 41' 26"	-8° 30' 00"	0° 59' 53"	16' 19.09"	292° 18' 13"	0.75931
14	211° 12' 34"	3° 21' 11"	210° 14' 48"	-8° 44' 52"	0° 59' 55"	16' 19.52"	292° 12' 15"	0.76349
15	211° 48' 45"	3° 18' 36"	210° 48' 15"	-8° 59' 41"	0° 59' 56"	16' 19.95"	292° 6' 07"	0.76766
16	212° 24' 59"	3° 15' 59"	211° 21' 47"	-9° 14' 29"	0° 59' 58"	16' 20.38"	291° 59' 47"	0.77180
17	213° 01' 14"	3° 13' 22"	211° 55' 23"	-9° 29' 14"	0° 59' 59"	16' 20.80"	291° 53' 17"	0.77591
18	213° 37' 31"	3° 10' 42"	212° 29' 04"	-9° 43' 56"	1° 00' 01"	16' 21.22"	291° 46' 36"	0.78001
19	214° 13' 49"	3° 08' 02"	213° 02' 50"	-9° 58' 36"	1° 00' 02"	16' 21.64"	291° 39' 44"	0.78408
20	214° 50' 10"	3° 05' 20"	213° 36' 41"	-10° 13' 14"	1° 00' 04"	16' 22.05"	291° 32' 41"	0.78813
21	215° 26' 32"	3° 02' 36"	214° 10' 36"	-10° 27' 48"	1° 00' 05"	16' 22.45"	291° 25' 27"	0.79215
22	216° 02' 56"	2° 59' 51"	214° 44' 37"	-10° 42' 20"	1° 00' 07"	16' 22.85"	291° 18' 02"	0.79615
23	216° 39' 22"	2° 57' 05"	215° 18' 43"	-10° 56' 49"	1° 00' 08"	16' 23.25"	291° 10' 25"	0.80013
24	217° 15' 49"	2° 54' 18"	215° 52' 54"	-11° 11' 15"	1° 00' 10"	16' 23.65"	291° 2' 38"	0.80407

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	89° 52' 07"	0.58"	89° 50' 44"	23° 26' 14"	1.0162232	15' 44.31"	23° 26' 14"	-1 m 45 s
1	89° 54' 30"	0.57"	89° 53' 20"	23° 26' 15"	1.0162257	15' 44.31"	23° 26' 14"	-1 m 46 s
2	89° 56' 53"	0.57"	89° 55' 56"	23° 26' 15"	1.0162283	15' 44.31"	23° 26' 14"	-1 m 46 s
3	89° 59' 16"	0.56"	89° 58' 32"	23° 26' 15"	1.0162308	15' 44.30"	23° 26' 14"	-1 m 47 s
4	90° 01' 39"	0.56"	90° 01' 08"	23° 26' 15"	1.0162333	15' 44.30"	23° 26' 14"	-1 m 47 s
5	90° 04' 02"	0.55"	90° 03' 44"	23° 26' 15"	1.0162359	15' 44.30"	23° 26' 14"	-1 m 48 s
6	90° 06' 25"	0.55"	90° 06' 20"	23° 26' 15"	1.0162384	15' 44.30"	23° 26' 14"	-1 m 48 s
7	90° 08' 48"	0.54"	90° 08' 56"	23° 26' 14"	1.0162409	15' 44.29"	23° 26' 14"	-1 m 49 s
8	90° 11' 11"	0.54"	90° 11' 32"	23° 26' 14"	1.0162434	15' 44.29"	23° 26' 14"	-1 m 49 s
9	90° 13' 34"	0.53"	90° 14' 08"	23° 26' 14"	1.0162459	15' 44.29"	23° 26' 14"	-1 m 50 s
10	90° 15' 58"	0.53"	90° 16' 44"	23° 26' 14"	1.0162484	15' 44.29"	23° 26' 14"	-1 m 50 s
11	90° 18' 21"	0.52"	90° 19' 20"	23° 26' 13"	1.0162508	15' 44.28"	23° 26' 14"	-1 m 51 s
12	90° 20' 44"	0.52"	90° 21' 56"	23° 26' 13"	1.0162533	15' 44.28"	23° 26' 14"	-1 m 52 s
13	90° 23' 07"	0.51"	90° 24' 32"	23° 26' 13"	1.0162558	15' 44.28"	23° 26' 14"	-1 m 52 s
14	90° 25' 30"	0.51"	90° 27' 08"	23° 26' 12"	1.0162582	15' 44.28"	23° 26' 14"	-1 m 53 s
15	90° 27' 53"	0.50"	90° 29' 44"	23° 26' 12"	1.0162607	15' 44.28"	23° 26' 14"	-1 m 53 s
16	90° 30' 16"	0.50"	90° 32' 19"	23° 26' 11"	1.0162632	15' 44.27"	23° 26' 14"	-1 m 54 s
17	90° 32' 39"	0.49"	90° 34' 55"	23° 26' 11"	1.0162656	15' 44.27"	23° 26' 14"	-1 m 54 s
18	90° 35' 02"	0.49"	90° 37' 31"	23° 26' 10"	1.0162680	15' 44.27"	23° 26' 14"	-1 m 55 s
19	90° 37' 25"	0.48"	90° 40' 07"	23° 26' 09"	1.0162705	15' 44.27"	23° 26' 14"	-1 m 55 s
20	90° 39' 48"	0.47"	90° 42' 43"	23° 26' 09"	1.0162729	15' 44.26"	23° 26' 14"	-1 m 56 s
21	90° 42' 11"	0.47"	90° 45' 19"	23° 26' 08"	1.0162753	15' 44.26"	23° 26' 14"	-1 m 56 s
22	90° 44' 35"	0.46"	90° 47' 55"	23° 26' 07"	1.0162777	15' 44.26"	23° 26' 14"	-1 m 57 s
23	90° 46' 58"	0.46"	90° 50' 31"	23° 26' 06"	1.0162801	15' 44.26"	23° 26' 14"	-1 m 57 s
24	90° 49' 21"	0.45"	90° 53' 07"	23° 26' 06"	1.0162825	15' 44.26"	23° 26' 14"	-1 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	217° 15' 49"	2° 54' 18"	215° 52' 54"	-11° 11' 15"	1° 00' 10"	16' 23.65"	291° 2' 38"	0.80407
1	217° 52' 19"	2° 51' 29"	216° 27' 09"	-11° 25' 38"	1° 00' 11"	16' 24.03"	290° 54' 38"	0.80799
2	218° 28' 50"	2° 48' 39"	217° 01' 31"	-11° 39' 57"	1° 00' 13"	16' 24.42"	290° 46' 28"	0.81189
3	219° 05' 22"	2° 45' 48"	217° 35' 57"	-11° 54' 13"	1° 00' 14"	16' 24.80"	290° 38' 06"	0.81576
4	219° 41' 56"	2° 42' 55"	218° 10' 29"	-12° 08' 26"	1° 00' 15"	16' 25.17"	290° 29' 32"	0.81959
5	220° 18' 32"	2° 40' 01"	218° 45' 06"	-12° 22' 35"	1° 00' 17"	16' 25.54"	290° 20' 46"	0.82341
6	220° 55' 10"	2° 37' 06"	219° 19' 49"	-12° 36' 40"	1° 00' 18"	16' 25.91"	290° 11' 48"	0.82719
7	221° 31' 49"	2° 34' 10"	219° 54' 37"	-12° 50' 42"	1° 00' 19"	16' 26.26"	290° 2' 39"	0.83094
8	222° 08' 29"	2° 31' 12"	220° 29' 31"	-13° 04' 40"	1° 00' 21"	16' 26.62"	289° 53' 18"	0.83466
9	222° 45' 11"	2° 28' 14"	221° 04' 30"	-13° 18' 33"	1° 00' 22"	16' 26.97"	289° 43' 44"	0.83835
10	223° 21' 55"	2° 25' 14"	221° 39' 35"	-13° 32' 22"	1° 00' 23"	16' 27.31"	289° 33' 58"	0.84201
11	223° 58' 40"	2° 22' 13"	222° 14' 46"	-13° 46' 08"	1° 00' 24"	16' 27.65"	289° 24' 00"	0.84564
12	224° 35' 27"	2° 19' 11"	222° 50' 02"	-13° 59' 48"	1° 00' 26"	16' 27.98"	289° 13' 50"	0.84924
13	225° 12' 15"	2° 16' 08"	223° 25' 24"	-14° 13' 24"	1° 00' 27"	16' 28.31"	289° 3' 27"	0.85281
14	225° 49' 05"	2° 13' 04"	224° 00' 52"	-14° 26' 56"	1° 00' 28"	16' 28.63"	288° 52' 51"	0.85634
15	226° 25' 56"	2° 09' 59"	224° 36' 25"	-14° 40' 23"	1° 00' 29"	16' 28.94"	288° 42' 03"	0.85984
16	227° 02' 48"	2° 06' 52"	225° 12' 05"	-14° 53' 45"	1° 00' 30"	16' 29.25"	288° 31' 01"	0.86331
17	227° 39' 42"	2° 03' 45"	225° 47' 50"	-15° 07' 02"	1° 00' 31"	16' 29.56"	288° 19' 47"	0.86674
18	228° 16' 37"	2° 00' 37"	226° 23' 42"	-15° 20' 13"	1° 00' 33"	16' 29.85"	288° 8' 20"	0.87013
19	228° 53' 33"	1° 57' 28"	226° 59' 39"	-15° 33' 20"	1° 00' 34"	16' 30.14"	287° 56' 39"	0.87349
20	229° 30' 31"	1° 54' 18"	227° 35' 42"	-15° 46' 21"	1° 00' 35"	16' 30.43"	287° 44' 44"	0.87682
21	230° 07' 30"	1° 51' 07"	228° 11' 52"	-15° 59' 17"	1° 00' 36"	16' 30.71"	287° 32' 36"	0.88011
22	230° 44' 30"	1° 47' 55"	228° 48' 07"	-16° 12' 07"	1° 00' 37"	16' 30.98"	287° 20' 15"	0.88336
23	231° 21' 32"	1° 44' 42"	229° 24' 28"	-16° 24' 52"	1° 00' 38"	16' 31.25"	287° 7' 39"	0.88658
24	231° 58' 35"	1° 41' 29"	230° 00' 56"	-16° 37' 31"	1° 00' 39"	16' 31.51"	286° 54' 49"	0.88976

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	90° 49' 21"	0.45"	90° 53' 07"	23° 26' 06"	1.0162825	15' 44.26"	23° 26' 14"	-1 m 58 s
1	90° 51' 44"	0.45"	90° 55' 43"	23° 26' 05"	1.0162849	15' 44.25"	23° 26' 14"	-1 m 59 s
2	90° 54' 07"	0.44"	90° 58' 19"	23° 26' 04"	1.0162873	15' 44.25"	23° 26' 14"	-1 m 59 s
3	90° 56' 30"	0.44"	91° 00' 55"	23° 26' 03"	1.0162897	15' 44.25"	23° 26' 14"	-1 m 60 s
4	90° 58' 53"	0.43"	91° 03' 31"	23° 26' 02"	1.0162921	15' 44.25"	23° 26' 14"	-2 m 00 s
5	91° 01' 16"	0.43"	91° 06' 07"	23° 26' 01"	1.0162945	15' 44.24"	23° 26' 14"	-2 m 01 s
6	91° 03' 39"	0.42"	91° 08' 43"	23° 25' 59"	1.0162968	15' 44.24"	23° 26' 14"	-2 m 01 s
7	91° 06' 02"	0.41"	91° 11' 19"	23° 25' 58"	1.0162992	15' 44.24"	23° 26' 14"	-2 m 02 s
8	91° 08' 25"	0.41"	91° 13' 54"	23° 25' 57"	1.0163015	15' 44.24"	23° 26' 14"	-2 m 02 s
9	91° 10' 48"	0.40"	91° 16' 30"	23° 25' 56"	1.0163039	15' 44.24"	23° 26' 14"	-2 m 03 s
10	91° 13' 11"	0.40"	91° 19' 06"	23° 25' 55"	1.0163062	15' 44.23"	23° 26' 14"	-2 m 03 s
11	91° 15' 34"	0.39"	91° 21' 42"	23° 25' 53"	1.0163086	15' 44.23"	23° 26' 14"	-2 m 04 s
12	91° 17' 57"	0.39"	91° 24' 18"	23° 25' 52"	1.0163109	15' 44.23"	23° 26' 14"	-2 m 05 s
13	91° 20' 21"	0.38"	91° 26' 54"	23° 25' 50"	1.0163132	15' 44.23"	23° 26' 14"	-2 m 05 s
14	91° 22' 44"	0.38"	91° 29' 30"	23° 25' 49"	1.0163156	15' 44.22"	23° 26' 14"	-2 m 06 s
15	91° 25' 07"	0.37"	91° 32' 06"	23° 25' 47"	1.0163179	15' 44.22"	23° 26' 14"	-2 m 06 s
16	91° 27' 30"	0.37"	91° 34' 42"	23° 25' 46"	1.0163202	15' 44.22"	23° 26' 14"	-2 m 07 s
17	91° 29' 53"	0.36"	91° 37' 18"	23° 25' 44"	1.0163225	15' 44.22"	23° 26' 14"	-2 m 07 s
18	91° 32' 16"	0.35"	91° 39' 54"	23° 25' 43"	1.0163248	15' 44.22"	23° 26' 14"	-2 m 08 s
19	91° 34' 39"	0.35"	91° 42' 29"	23° 25' 41"	1.0163271	15' 44.21"	23° 26' 14"	-2 m 08 s
20	91° 37' 02"	0.34"	91° 45' 05"	23° 25' 39"	1.0163294	15' 44.21"	23° 26' 14"	-2 m 09 s
21	91° 39' 25"	0.34"	91° 47' 41"	23° 25' 37"	1.0163316	15' 44.21"	23° 26' 14"	-2 m 09 s
22	91° 41' 48"	0.33"	91° 50' 17"	23° 25' 36"	1.0163339	15' 44.21"	23° 26' 14"	-2 m 10 s
23	91° 44' 11"	0.33"	91° 52' 53"	23° 25' 34"	1.0163362	15' 44.21"	23° 26' 14"	-2 m 10 s
24	91° 46' 34"	0.32"	91° 55' 29"	23° 25' 32"	1.0163384	15' 44.20"	23° 26' 14"	-2 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	231° 58' 35"	1° 41' 29"	230° 00' 56"	-16° 37' 31"	1° 00' 39"	16' 31.51"	286° 54' 49"	0.88976
1	232° 35' 38"	1° 38' 14"	230° 37' 29"	-16° 50' 03"	1° 00' 40"	16' 31.76"	286° 41' 45"	0.89290
2	233° 12' 44"	1° 34' 59"	231° 14' 09"	-17° 02' 30"	1° 00' 40"	16' 32.00"	286° 28' 27"	0.89600
3	233° 49' 50"	1° 31' 43"	231° 50' 54"	-17° 14' 51"	1° 00' 41"	16' 32.24"	286° 14' 53"	0.89907
4	234° 26' 57"	1° 28' 27"	232° 27' 46"	-17° 27' 05"	1° 00' 42"	16' 32.48"	286° 1' 05"	0.90209
5	235° 04' 05"	1° 25' 09"	233° 04' 44"	-17° 39' 13"	1° 00' 43"	16' 32.70"	285° 47' 01"	0.90507
6	235° 41' 12"	1° 21' 51"	233° 41' 45"	-17° 51' 13"	1° 00' 44"	16' 32.92"	285° 32' 44"	0.90802
7	236° 18' 22"	1° 18' 33"	234° 18' 55"	-18° 03' 07"	1° 00' 45"	16' 33.13"	285° 18' 09"	0.91092
8	236° 55' 33"	1° 15' 13"	234° 56' 11"	-18° 14' 55"	1° 00' 45"	16' 33.34"	285° 3' 18"	0.91378
9	237° 32' 45"	1° 11' 53"	235° 33' 33"	-18° 26' 36"	1° 00' 46"	16' 33.54"	284° 48' 11"	0.91661
10	238° 09' 59"	1° 08' 33"	236° 11' 02"	-18° 38' 10"	1° 00' 47"	16' 33.73"	284° 32' 47"	0.91939
11	238° 47' 13"	1° 05' 12"	236° 48' 36"	-18° 49' 37"	1° 00' 47"	16' 33.91"	284° 17' 06"	0.92213
12	239° 24' 28"	1° 01' 50"	237° 26' 16"	-19° 00' 56"	1° 00' 48"	16' 34.09"	284° 1' 08"	0.92482
13	240° 01' 44"	0° 58' 28"	238° 04' 03"	-19° 12' 08"	1° 00' 49"	16' 34.26"	283° 44' 52"	0.92748
14	240° 39' 00"	0° 55' 05"	238° 41' 55"	-19° 23' 13"	1° 00' 49"	16' 34.42"	283° 28' 17"	0.93009
15	241° 16' 17"	0° 51' 42"	239° 19' 54"	-19° 34' 10"	1° 00' 50"	16' 34.57"	283° 11' 24"	0.93265
16	241° 53' 36"	0° 48' 18"	239° 57' 58"	-19° 44' 59"	1° 00' 50"	16' 34.72"	282° 54' 11"	0.93518
17	242° 30' 54"	0° 44' 55"	240° 36' 09"	-19° 55' 40"	1° 00' 51"	16' 34.86"	282° 36' 39"	0.93765
18	243° 08' 14"	0° 41' 30"	241° 14' 25"	-20° 06' 14"	1° 00' 51"	16' 34.99"	282° 18' 46"	0.94009
19	243° 45' 34"	0° 38' 06"	241° 52' 47"	-20° 16' 39"	1° 00' 52"	16' 35.11"	282° 0' 31"	0.94248
20	244° 22' 55"	0° 34' 41"	242° 31' 15"	-20° 26' 56"	1° 00' 52"	16' 35.23"	281° 41' 55"	0.94482
21	245° 00' 16"	0° 31' 15"	243° 09' 49"	-20° 37' 05"	1° 00' 53"	16' 35.33"	281° 22' 56"	0.94712
22	245° 37' 38"	0° 27' 50"	243° 48' 28"	-20° 47' 05"	1° 00' 53"	16' 35.43"	281° 3' 34"	0.94937
23	246° 15' 00"	0° 24' 24"	244° 27' 13"	-20° 56' 57"	1° 00' 53"	16' 35.53"	280° 43' 47"	0.95158
24	246° 52' 23"	0° 20' 58"	245° 06' 04"	-21° 06' 40"	1° 00' 54"	16' 35.61"	280° 23' 34"	0.95374

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	91° 46' 34"	0.32"	91° 55' 29"	23° 25' 32"	1.0163384	15' 44.20"	23° 26' 14"	-2 m 11 s
1	91° 48' 57"	0.31"	91° 58' 05"	23° 25' 30"	1.0163407	15' 44.20"	23° 26' 14"	-2 m 12 s
2	91° 51' 20"	0.31"	92° 00' 41"	23° 25' 28"	1.0163430	15' 44.20"	23° 26' 14"	-2 m 12 s
3	91° 53' 43"	0.30"	92° 03' 17"	23° 25' 26"	1.0163452	15' 44.20"	23° 26' 14"	-2 m 13 s
4	91° 56' 06"	0.30"	92° 05' 52"	23° 25' 24"	1.0163474	15' 44.19"	23° 26' 14"	-2 m 13 s
5	91° 58' 29"	0.29"	92° 08' 28"	23° 25' 22"	1.0163497	15' 44.19"	23° 26' 14"	-2 m 14 s
6	92° 00' 52"	0.29"	92° 11' 04"	23° 25' 20"	1.0163519	15' 44.19"	23° 26' 14"	-2 m 14 s
7	92° 03' 15"	0.28"	92° 13' 40"	23° 25' 17"	1.0163541	15' 44.19"	23° 26' 14"	-2 m 15 s
8	92° 05' 39"	0.28"	92° 16' 16"	23° 25' 15"	1.0163564	15' 44.19"	23° 26' 14"	-2 m 15 s
9	92° 08' 02"	0.27"	92° 18' 52"	23° 25' 13"	1.0163586	15' 44.18"	23° 26' 14"	-2 m 16 s
10	92° 10' 25"	0.26"	92° 21' 28"	23° 25' 11"	1.0163608	15' 44.18"	23° 26' 14"	-2 m 16 s
11	92° 12' 48"	0.26"	92° 24' 04"	23° 25' 08"	1.0163630	15' 44.18"	23° 26' 14"	-2 m 17 s
12	92° 15' 11"	0.25"	92° 26' 39"	23° 25' 06"	1.0163652	15' 44.18"	23° 26' 14"	-2 m 17 s
13	92° 17' 34"	0.25"	92° 29' 15"	23° 25' 03"	1.0163674	15' 44.18"	23° 26' 14"	-2 m 18 s
14	92° 19' 57"	0.24"	92° 31' 51"	23° 25' 01"	1.0163695	15' 44.17"	23° 26' 14"	-2 m 19 s
15	92° 22' 20"	0.24"	92° 34' 27"	23° 24' 58"	1.0163717	15' 44.17"	23° 26' 14"	-2 m 19 s
16	92° 24' 43"	0.23"	92° 37' 03"	23° 24' 56"	1.0163739	15' 44.17"	23° 26' 14"	-2 m 20 s
17	92° 27' 06"	0.22"	92° 39' 39"	23° 24' 53"	1.0163761	15' 44.17"	23° 26' 14"	-2 m 20 s
18	92° 29' 29"	0.22"	92° 42' 15"	23° 24' 50"	1.0163782	15' 44.17"	23° 26' 14"	-2 m 21 s
19	92° 31' 52"	0.21"	92° 44' 50"	23° 24' 48"	1.0163804	15' 44.16"	23° 26' 14"	-2 m 21 s
20	92° 34' 15"	0.21"	92° 47' 26"	23° 24' 45"	1.0163825	15' 44.16"	23° 26' 14"	-2 m 22 s
21	92° 36' 38"	0.20"	92° 50' 02"	23° 24' 42"	1.0163847	15' 44.16"	23° 26' 14"	-2 m 22 s
22	92° 39' 01"	0.20"	92° 52' 38"	23° 24' 39"	1.0163868	15' 44.16"	23° 26' 14"	-2 m 23 s
23	92° 41' 24"	0.19"	92° 55' 14"	23° 24' 36"	1.0163890	15' 44.16"	23° 26' 14"	-2 m 23 s
24	92° 43' 47"	0.19"	92° 57' 50"	23° 24' 33"	1.0163911	15' 44.15"	23° 26' 14"	-2 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	246° 52' 23"	0° 20' 58"	245° 06' 04"	-21° 06' 40"	1° 00' 54"	16' 35.61"	280° 23' 34"	0.95374
1	247° 29' 47"	0° 17' 32"	245° 45' 00"	-21° 16' 15"	1° 00' 54"	16' 35.69"	280° 2' 55"	0.95585
2	248° 07' 10"	0° 14' 05"	246° 24' 02"	-21° 25' 40"	1° 00' 54"	16' 35.76"	279° 41' 47"	0.95792
3	248° 44' 35"	0° 10' 39"	247° 03' 09"	-21° 34' 57"	1° 00' 54"	16' 35.82"	279° 20' 11"	0.95993
4	249° 21' 59"	0° 07' 12"	247° 42' 22"	-21° 44' 04"	1° 00' 55"	16' 35.87"	278° 58' 03"	0.96190
5	249° 59' 24"	0° 03' 46"	248° 21' 40"	-21° 53' 02"	1° 00' 55"	16' 35.91"	278° 35' 22"	0.96383
6	250° 36' 49"	0° 00' 19"	249° 01' 03"	-22° 01' 52"	1° 00' 55"	16' 35.95"	278° 12' 06"	0.96570
7	251° 14' 14"	0° -3' 08"	249° 40' 31"	-22° 10' 31"	1° 00' 55"	16' 35.98"	277° 48' 14"	0.96753
8	251° 51' 40"	0° -6' 34"	250° 20' 04"	-22° 19' 01"	1° 00' 55"	16' 36.00"	277° 23' 42"	0.96931
9	252° 29' 06"	0° -10' 01"	250° 59' 42"	-22° 27' 22"	1° 00' 55"	16' 36.01"	276° 58' 29"	0.97103
10	253° 06' 31"	0° -13' 28"	251° 39' 25"	-22° 35' 33"	1° 00' 55"	16' 36.01"	276° 32' 30"	0.97271
11	253° 43' 57"	0° -16' 54"	252° 19' 13"	-22° 43' 34"	1° 00' 55"	16' 36.01"	276° 5' 43"	0.97434
12	254° 21' 23"	0° -20' 20"	252° 59' 06"	-22° 51' 25"	1° 00' 55"	16' 36.00"	275° 38' 03"	0.97593
13	254° 58' 50"	0° -23' 47"	253° 39' 03"	-22° 59' 07"	1° 00' 55"	16' 35.97"	275° 9' 26"	0.97746
14	255° 36' 16"	0° -27' 13"	254° 19' 04"	-23° 06' 38"	1° 00' 55"	16' 35.95"	274° 39' 48"	0.97894
15	256° 13' 42"	0° -30' 38"	254° 59' 10"	-23° 13' 59"	1° 00' 55"	16' 35.91"	274° 9' 02"	0.98037
16	256° 51' 08"	0° -34' 04"	255° 39' 20"	-23° 21' 10"	1° 00' 55"	16' 35.86"	273° 37' 01"	0.98175
17	257° 28' 34"	0° -37' 29"	256° 19' 35"	-23° 28' 10"	1° 00' 54"	16' 35.81"	273° 3' 39"	0.98308
18	258° 05' 59"	0° -40' 54"	256° 59' 53"	-23° 35' 01"	1° 00' 54"	16' 35.74"	272° 28' 45"	0.98436
19	258° 43' 25"	0° -44' 19"	257° 40' 15"	-23° 41' 40"	1° 00' 54"	16' 35.67"	271° 52' 10"	0.98559
20	259° 20' 50"	0° -47' 43"	258° 20' 41"	-23° 48' 10"	1° 00' 54"	16' 35.59"	271° 13' 41"	0.98677
21	259° 58' 15"	0° -51' 07"	259° 01' 11"	-23° 54' 28"	1° 00' 53"	16' 35.51"	270° 33' 04"	0.98789
22	260° 35' 40"	0° -54' 31"	259° 41' 44"	-24° 00' 36"	1° 00' 53"	16' 35.41"	269° 50' 02"	0.98897
23	261° 13' 05"	0° -57' 54"	260° 22' 21"	-24° 06' 33"	1° 00' 53"	16' 35.31"	269° 4' 13"	0.99000
24	261° 50' 29"	-1° 01' 17"	261° 03' 01"	-24° 12' 20"	1° 00' 52"	16' 35.19"	268° 15' 13"	0.99097

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	92° 43' 47"	0.19"	92° 57' 50"	23° 24' 33"	1.0163911	15' 44.15"	23° 26' 14"	-2 m 24 s
1	92° 46' 10"	0.18"	93° 00' 25"	23° 24' 31"	1.0163932	15' 44.15"	23° 26' 14"	-2 m 24 s
2	92° 48' 33"	0.17"	93° 03' 01"	23° 24' 27"	1.0163953	15' 44.15"	23° 26' 14"	-2 m 25 s
3	92° 50' 56"	0.17"	93° 05' 37"	23° 24' 24"	1.0163974	15' 44.15"	23° 26' 14"	-2 m 26 s
4	92° 53' 19"	0.16"	93° 08' 13"	23° 24' 21"	1.0163996	15' 44.15"	23° 26' 14"	-2 m 26 s
5	92° 55' 42"	0.16"	93° 10' 49"	23° 24' 18"	1.0164017	15' 44.14"	23° 26' 14"	-2 m 27 s
6	92° 58' 05"	0.15"	93° 13' 25"	23° 24' 15"	1.0164037	15' 44.14"	23° 26' 14"	-2 m 27 s
7	93° 00' 28"	0.15"	93° 16' 00"	23° 24' 12"	1.0164058	15' 44.14"	23° 26' 14"	-2 m 28 s
8	93° 02' 51"	0.14"	93° 18' 36"	23° 24' 09"	1.0164079	15' 44.14"	23° 26' 14"	-2 m 28 s
9	93° 05' 14"	0.14"	93° 21' 12"	23° 24' 05"	1.0164100	15' 44.14"	23° 26' 14"	-2 m 29 s
10	93° 07' 37"	0.13"	93° 23' 48"	23° 24' 02"	1.0164121	15' 44.13"	23° 26' 14"	-2 m 29 s
11	93° 10' 00"	0.13"	93° 26' 24"	23° 23' 58"	1.0164141	15' 44.13"	23° 26' 14"	-2 m 30 s
12	93° 12' 23"	0.12"	93° 28' 59"	23° 23' 55"	1.0164162	15' 44.13"	23° 26' 14"	-2 m 30 s
13	93° 14' 46"	0.11"	93° 31' 35"	23° 23' 52"	1.0164183	15' 44.13"	23° 26' 14"	-2 m 31 s
14	93° 17' 09"	0.11"	93° 34' 11"	23° 23' 48"	1.0164203	15' 44.13"	23° 26' 14"	-2 m 31 s
15	93° 19' 32"	0.10"	93° 36' 47"	23° 23' 44"	1.0164224	15' 44.13"	23° 26' 14"	-2 m 32 s
16	93° 21' 55"	0.10"	93° 39' 23"	23° 23' 41"	1.0164244	15' 44.12"	23° 26' 14"	-2 m 32 s
17	93° 24' 18"	0.09"	93° 41' 58"	23° 23' 37"	1.0164264	15' 44.12"	23° 26' 14"	-2 m 33 s
18	93° 26' 42"	0.09"	93° 44' 34"	23° 23' 33"	1.0164285	15' 44.12"	23° 26' 14"	-2 m 34 s
19	93° 29' 05"	0.08"	93° 47' 10"	23° 23' 30"	1.0164305	15' 44.12"	23° 26' 14"	-2 m 34 s
20	93° 31' 28"	0.08"	93° 49' 46"	23° 23' 26"	1.0164325	15' 44.12"	23° 26' 14"	-2 m 35 s
21	93° 33' 51"	0.07"	93° 52' 22"	23° 23' 22"	1.0164345	15' 44.11"	23° 26' 14"	-2 m 35 s
22	93° 36' 14"	0.07"	93° 54' 57"	23° 23' 18"	1.0164365	15' 44.11"	23° 26' 14"	-2 m 36 s
23	93° 38' 37"	0.06"	93° 57' 33"	23° 23' 14"	1.0164385	15' 44.11"	23° 26' 14"	-2 m 36 s
24	93° 40' 60"	0.06"	94° 00' 09"	23° 23' 10"	1.0164405	15' 44.11"	23° 26' 14"	-2 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	261° 50' 29"	-1° 01' 17"	261° 03' 01"	-24° 12' 20"	1° 00' 52"	16' 35.19"	268° 15' 13"	0.99097
1	262° 27' 53"	-1° 04' 39"	261° 43' 44"	-24° 17' 55"	1° 00' 52"	16' 35.07"	267° 22' 31"	0.99189
2	263° 05' 16"	-1° 08' 00"	262° 24' 30"	-24° 23' 19"	1° 00' 51"	16' 34.94"	266° 25' 31"	0.99276
3	263° 42' 39"	-1° 11' 22"	263° 05' 19"	-24° 28' 33"	1° 00' 51"	16' 34.81"	265° 23' 25"	0.99358
4	264° 20' 01"	-1° 14' 42"	263° 46' 10"	-24° 33' 35"	1° 00' 50"	16' 34.66"	264° 15' 16"	0.99435
5	264° 57' 23"	-1° 18' 02"	264° 27' 04"	-24° 38' 27"	1° 00' 50"	16' 34.51"	262° 59' 49"	0.99507
6	265° 34' 45"	-1° 21' 21"	265° 08' 00"	-24° 43' 07"	1° 00' 49"	16' 34.35"	261° 35' 29"	0.99573
7	266° 12' 05"	-1° 24' 40"	265° 48' 59"	-24° 47' 36"	1° 00' 48"	16' 34.18"	260° 0' 11"	0.99635
8	266° 49' 25"	-1° 27' 58"	266° 29' 60"	-24° 51' 53"	1° 00' 48"	16' 34.00"	258° 11' 09"	0.99691
9	267° 26' 45"	-1° 31' 15"	267° 11' 02"	-24° 55' 60"	1° 00' 47"	16' 33.81"	256° 4' 39"	0.99742
10	268° 04' 03"	-1° 34' 32"	267° 52' 07"	-24° 59' 55"	1° 00' 46"	16' 33.62"	253° 35' 30"	0.99788
11	268° 41' 21"	-1° 37' 48"	268° 33' 13"	-25° 03' 38"	1° 00' 46"	16' 33.41"	250° 36' 29"	0.99828
12	269° 18' 38"	-1° 41' 03"	269° 14' 20"	-25° 07' 10"	1° 00' 45"	16' 33.20"	246° 57' 15"	0.99864
13	269° 55' 55"	-1° 44' 17"	269° 55' 29"	-25° 10' 31"	1° 00' 44"	16' 32.99"	242° 22' 47"	0.99894
14	270° 33' 10"	-1° 47' 31"	270° 36' 39"	-25° 13' 40"	1° 00' 43"	16' 32.76"	236° 31' 24"	0.99919
15	271° 10' 25"	-1° 50' 43"	271° 17' 50"	-25° 16' 38"	1° 00' 42"	16' 32.52"	228° 52' 44"	0.99939
16	271° 47' 38"	-1° 53' 55"	271° 59' 01"	-25° 19' 24"	1° 00' 41"	16' 32.28"	218° 49' 15"	0.99954
17	272° 24' 51"	-1° 57' 05"	272° 40' 13"	-25° 21' 59"	1° 00' 41"	16' 32.03"	205° 50' 38"	0.99964
18	273° 02' 02"	-2° 00' 15"	273° 21' 26"	-25° 24' 22"	1° 00' 40"	16' 31.77"	190° 13' 31"	0.99968
19	273° 39' 13"	-2° 03' 24"	274° 02' 39"	-25° 26' 34"	1° 00' 39"	16' 31.51"	173° 39' 58"	0.99968
20	274° 16' 23"	-2° 06' 32"	274° 43' 51"	-25° 28' 34"	1° 00' 38"	16' 31.23"	158° 32' 51"	0.99962
21	274° 53' 31"	-2° 09' 39"	275° 25' 04"	-25° 30' 22"	1° 00' 37"	16' 30.95"	146° 14' 45"	0.99951
22	275° 30' 38"	-2° 12' 45"	276° 06' 17"	-25° 31' 59"	1° 00' 35"	16' 30.66"	136° 47' 09"	0.99935
23	276° 07' 45"	-2° 15' 50"	276° 47' 29"	-25° 33' 24"	1° 00' 34"	16' 30.37"	129° 35' 37"	0.99914
24	276° 44' 49"	-2° 18' 53"	277° 28' 41"	-25° 34' 38"	1° 00' 33"	16' 30.06"	124° 3' 41"	0.99888

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	93° 40' 60"	0.06"	94° 00' 09"	23° 23' 10"	1.0164405	15' 44.11"	23° 26' 14"	-2 m 37 s
1	93° 43' 23"	0.05"	94° 02' 45"	23° 23' 06"	1.0164425	15' 44.11"	23° 26' 14"	-2 m 37 s
2	93° 45' 46"	0.05"	94° 05' 20"	23° 23' 02"	1.0164445	15' 44.10"	23° 26' 14"	-2 m 38 s
3	93° 48' 09"	0.04"	94° 07' 56"	23° 22' 58"	1.0164465	15' 44.10"	23° 26' 14"	-2 m 38 s
4	93° 50' 32"	0.04"	94° 10' 32"	23° 22' 54"	1.0164485	15' 44.10"	23° 26' 14"	-2 m 39 s
5	93° 52' 55"	0.03"	94° 13' 08"	23° 22' 50"	1.0164504	15' 44.10"	23° 26' 14"	-2 m 39 s
6	93° 55' 18"	0.03"	94° 15' 43"	23° 22' 46"	1.0164524	15' 44.10"	23° 26' 14"	-2 m 40 s
7	93° 57' 41"	0.02"	94° 18' 19"	23° 22' 42"	1.0164544	15' 44.10"	23° 26' 14"	-2 m 40 s
8	94° 00' 04"	0.02"	94° 20' 55"	23° 22' 37"	1.0164563	15' 44.09"	23° 26' 14"	-2 m 41 s
9	94° 02' 27"	0.01"	94° 23' 31"	23° 22' 33"	1.0164583	15' 44.09"	23° 26' 14"	-2 m 41 s
10	94° 04' 50"	0.01"	94° 26' 06"	23° 22' 29"	1.0164602	15' 44.09"	23° 26' 14"	-2 m 42 s
11	94° 07' 13"	0.00"	94° 28' 42"	23° 22' 24"	1.0164621	15' 44.09"	23° 26' 14"	-2 m 43 s
12	94° 09' 36"	-0.00"	94° 31' 18"	23° 22' 20"	1.0164641	15' 44.09"	23° 26' 14"	-2 m 43 s
13	94° 11' 59"	-0.01"	94° 33' 53"	23° 22' 15"	1.0164660	15' 44.08"	23° 26' 14"	-2 m 44 s
14	94° 14' 22"	-0.01"	94° 36' 29"	23° 22' 11"	1.0164679	15' 44.08"	23° 26' 14"	-2 m 44 s
15	94° 16' 45"	-0.02"	94° 39' 05"	23° 22' 06"	1.0164698	15' 44.08"	23° 26' 14"	-2 m 45 s
16	94° 19' 08"	-0.02"	94° 41' 41"	23° 22' 01"	1.0164717	15' 44.08"	23° 26' 14"	-2 m 45 s
17	94° 21' 31"	-0.03"	94° 44' 16"	23° 21' 57"	1.0164736	15' 44.08"	23° 26' 14"	-2 m 46 s
18	94° 23' 54"	-0.03"	94° 46' 52"	23° 21' 52"	1.0164755	15' 44.08"	23° 26' 14"	-2 m 46 s
19	94° 26' 17"	-0.04"	94° 49' 28"	23° 21' 47"	1.0164774	15' 44.07"	23° 26' 14"	-2 m 47 s
20	94° 28' 40"	-0.04"	94° 52' 03"	23° 21' 42"	1.0164793	15' 44.07"	23° 26' 14"	-2 m 47 s
21	94° 31' 03"	-0.05"	94° 54' 39"	23° 21' 37"	1.0164812	15' 44.07"	23° 26' 14"	-2 m 48 s
22	94° 33' 26"	-0.05"	94° 57' 15"	23° 21' 33"	1.0164831	15' 44.07"	23° 26' 14"	-2 m 48 s
23	94° 35' 49"	-0.05"	94° 59' 51"	23° 21' 28"	1.0164849	15' 44.07"	23° 26' 14"	-2 m 49 s
24	94° 38' 12"	-0.06"	95° 02' 26"	23° 21' 23"	1.0164868	15' 44.07"	23° 26' 14"	-2 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	276° 44' 49"	-2° 18' 53"	277° 28' 41"	-25° 34' 38"	1° 00' 33"	16' 30.06"	124° 3' 41"	0.99888
1	277° 21' 53"	-2° 21' 56"	278° 09' 51"	-25° 35' 40"	1° 00' 32"	16' 29.75"	119° 43' 01"	0.99857
2	277° 58' 56"	-2° 24' 58"	278° 51' 01"	-25° 36' 30"	1° 00' 31"	16' 29.43"	116° 13' 37"	0.99821
3	278° 35' 57"	-2° 27' 58"	279° 32' 10"	-25° 37' 09"	1° 00' 30"	16' 29.11"	113° 21' 43"	0.99780
4	279° 12' 56"	-2° 30' 57"	280° 13' 17"	-25° 37' 36"	1° 00' 29"	16' 28.77"	110° 57' 47"	0.99734
5	279° 49' 55"	-2° 33' 55"	280° 54' 23"	-25° 37' 52"	1° 00' 27"	16' 28.43"	108° 55' 07"	0.99682
6	280° 26' 52"	-2° 36' 52"	281° 35' 27"	-25° 37' 56"	1° 00' 26"	16' 28.09"	107° 8' 55"	0.99626
7	281° 03' 47"	-2° 39' 48"	282° 16' 30"	-25° 37' 49"	1° 00' 25"	16' 27.73"	105° 35' 43"	0.99565
8	281° 40' 41"	-2° 42' 42"	282° 57' 30"	-25° 37' 31"	1° 00' 23"	16' 27.37"	104° 12' 55"	0.99499
9	282° 17' 34"	-2° 45' 35"	283° 38' 29"	-25° 37' 01"	1° 00' 22"	16' 27.00"	102° 58' 33"	0.99428
10	282° 54' 25"	-2° 48' 27"	284° 19' 25"	-25° 36' 19"	1° 00' 21"	16' 26.62"	101° 51' 07"	0.99352
11	283° 31' 15"	-2° 51' 18"	285° 00' 18"	-25° 35' 26"	1° 00' 19"	16' 26.24"	100° 49' 28"	0.99271
12	284° 08' 03"	-2° 54' 07"	285° 41' 09"	-25° 34' 22"	1° 00' 18"	16' 25.85"	99° 52' 40"	0.99185
13	284° 44' 49"	-2° 56' 55"	286° 21' 57"	-25° 33' 07"	1° 00' 16"	16' 25.46"	98° 59' 59"	0.99095
14	285° 21' 33"	-2° 59' 41"	287° 02' 43"	-25° 31' 40"	1° 00' 15"	16' 25.05"	98° 10' 49"	0.98999
15	285° 58' 16"	-3° 02' 26"	287° 43' 25"	-25° 30' 02"	1° 00' 13"	16' 24.64"	97° 24' 42"	0.98899
16	286° 34' 58"	-3° 05' 10"	288° 24' 03"	-25° 28' 13"	1° 00' 12"	16' 24.23"	96° 41' 13"	0.98794
17	287° 11' 37"	-3° 07' 53"	289° 04' 39"	-25° 26' 13"	1° 00' 10"	16' 23.81"	96° 0' 02"	0.98685
18	287° 48' 15"	-3° 10' 33"	289° 45' 10"	-25° 24' 02"	1° 00' 09"	16' 23.38"	95° 20' 54"	0.98570
19	288° 24' 51"	-3° 13' 13"	290° 25' 38"	-25° 21' 40"	1° 00' 07"	16' 22.95"	94° 43' 34"	0.98451
20	289° 01' 25"	-3° 15' 51"	291° 06' 03"	-25° 19' 07"	1° 00' 06"	16' 22.51"	94° 7' 50"	0.98327
21	289° 37' 57"	-3° 18' 27"	291° 46' 23"	-25° 16' 23"	1° 00' 04"	16' 22.06"	93° 33' 32"	0.98199
22	290° 14' 27"	-3° 21' 02"	292° 26' 39"	-25° 13' 29"	1° 00' 02"	16' 21.61"	93° 0' 32"	0.98066
23	290° 50' 56"	-3° 23' 36"	293° 06' 50"	-25° 10' 23"	1° 00' 01"	16' 21.15"	92° 28' 42"	0.97928
24	291° 27' 22"	-3° 26' 08"	293° 46' 57"	-25° 07' 07"	0° 59' 59"	16' 20.68"	91° 57' 56"	0.97786

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	94° 38' 12"	-0.06"	95° 02' 26"	23° 21' 23"	1.0164868	15' 44.07"	23° 26' 14"	-2 m 49 s
1	94° 40' 35"	-0.06"	95° 05' 02"	23° 21' 18"	1.0164887	15' 44.06"	23° 26' 14"	-2 m 50 s
2	94° 42' 58"	-0.07"	95° 07' 38"	23° 21' 13"	1.0164905	15' 44.06"	23° 26' 14"	-2 m 50 s
3	94° 45' 21"	-0.07"	95° 10' 13"	23° 21' 07"	1.0164924	15' 44.06"	23° 26' 14"	-2 m 51 s
4	94° 47' 44"	-0.08"	95° 12' 49"	23° 21' 02"	1.0164942	15' 44.06"	23° 26' 14"	-2 m 52 s
5	94° 50' 07"	-0.08"	95° 15' 25"	23° 20' 57"	1.0164960	15' 44.06"	23° 26' 14"	-2 m 52 s
6	94° 52' 30"	-0.09"	95° 18' 00"	23° 20' 52"	1.0164979	15' 44.06"	23° 26' 14"	-2 m 53 s
7	94° 54' 53"	-0.09"	95° 20' 36"	23° 20' 47"	1.0164997	15' 44.05"	23° 26' 14"	-2 m 53 s
8	94° 57' 16"	-0.09"	95° 23' 12"	23° 20' 41"	1.0165015	15' 44.05"	23° 26' 14"	-2 m 54 s
9	94° 59' 39"	-0.10"	95° 25' 47"	23° 20' 36"	1.0165033	15' 44.05"	23° 26' 14"	-2 m 54 s
10	95° 02' 02"	-0.10"	95° 28' 23"	23° 20' 31"	1.0165051	15' 44.05"	23° 26' 14"	-2 m 55 s
11	95° 04' 25"	-0.11"	95° 30' 58"	23° 20' 25"	1.0165069	15' 44.05"	23° 26' 14"	-2 m 55 s
12	95° 06' 48"	-0.11"	95° 33' 34"	23° 20' 20"	1.0165087	15' 44.05"	23° 26' 14"	-2 m 56 s
13	95° 09' 11"	-0.11"	95° 36' 10"	23° 20' 14"	1.0165105	15' 44.04"	23° 26' 14"	-2 m 56 s
14	95° 11' 34"	-0.12"	95° 38' 45"	23° 20' 08"	1.0165123	15' 44.04"	23° 26' 14"	-2 m 57 s
15	95° 13' 57"	-0.12"	95° 41' 21"	23° 20' 03"	1.0165141	15' 44.04"	23° 26' 14"	-2 m 57 s
16	95° 16' 20"	-0.13"	95° 43' 57"	23° 19' 57"	1.0165158	15' 44.04"	23° 26' 14"	-2 m 58 s
17	95° 18' 43"	-0.13"	95° 46' 32"	23° 19' 51"	1.0165176	15' 44.04"	23° 26' 14"	-2 m 58 s
18	95° 21' 06"	-0.13"	95° 49' 08"	23° 19' 46"	1.0165193	15' 44.04"	23° 26' 14"	-2 m 59 s
19	95° 23' 29"	-0.14"	95° 51' 43"	23° 19' 40"	1.0165211	15' 44.03"	23° 26' 14"	-2 m 59 s
20	95° 25' 52"	-0.14"	95° 54' 19"	23° 19' 34"	1.0165228	15' 44.03"	23° 26' 14"	-2 m 60 s
21	95° 28' 15"	-0.15"	95° 56' 55"	23° 19' 28"	1.0165246	15' 44.03"	23° 26' 14"	-3 m 00 s
22	95° 30' 38"	-0.15"	95° 59' 30"	23° 19' 22"	1.0165263	15' 44.03"	23° 26' 14"	-3 m 01 s
23	95° 33' 01"	-0.15"	96° 02' 06"	23° 19' 16"	1.0165281	15' 44.03"	23° 26' 14"	-3 m 01 s
24	95° 35' 24"	-0.16"	96° 04' 41"	23° 19' 10"	1.0165298	15' 44.03"	23° 26' 14"	-3 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	291° 27' 22"	-3° 26' 08"	293° 46' 57"	-25° 07' 07"	0° 59' 59"	16' 20.68"	91° 57' 56"	0.97786
1	292° 03' 46"	-3° 28' 38"	294° 27' 00"	-25° 03' 41"	0° 59' 57"	16' 20.22"	91° 28' 09"	0.97640
2	292° 40' 09"	-3° 31' 07"	295° 06' 58"	-25° 00' 04"	0° 59' 55"	16' 19.74"	90° 59' 14"	0.97489
3	293° 16' 29"	-3° 33' 34"	295° 46' 51"	-24° 56' 16"	0° 59' 54"	16' 19.26"	90° 31' 09"	0.97333
4	293° 52' 48"	-3° 35' 60"	296° 26' 39"	-24° 52' 18"	0° 59' 52"	16' 18.77"	90° 3' 48"	0.97173
5	294° 29' 04"	-3° 38' 24"	297° 06' 22"	-24° 48' 10"	0° 59' 50"	16' 18.28"	89° 37' 10"	0.97009
6	295° 05' 18"	-3° 40' 46"	297° 45' 60"	-24° 43' 51"	0° 59' 48"	16' 17.79"	89° 11' 11"	0.96840
7	295° 41' 30"	-3° 43' 07"	298° 25' 32"	-24° 39' 23"	0° 59' 46"	16' 17.29"	88° 45' 48"	0.96667
8	296° 17' 40"	-3° 45' 26"	299° 04' 59"	-24° 34' 44"	0° 59' 45"	16' 16.78"	88° 20' 59"	0.96489
9	296° 53' 48"	-3° 47' 44"	299° 44' 21"	-24° 29' 56"	0° 59' 43"	16' 16.27"	87° 56' 42"	0.96308
10	297° 29' 54"	-3° 49' 60"	300° 23' 36"	-24° 24' 57"	0° 59' 41"	16' 15.75"	87° 32' 55"	0.96122
11	298° 05' 57"	-3° 52' 14"	301° 02' 46"	-24° 19' 49"	0° 59' 39"	16' 15.23"	87° 9' 37"	0.95932
12	298° 41' 58"	-3° 54' 26"	301° 41' 51"	-24° 14' 31"	0° 59' 37"	16' 14.71"	86° 46' 45"	0.95738
13	299° 17' 57"	-3° 56' 37"	302° 20' 49"	-24° 09' 04"	0° 59' 35"	16' 14.18"	86° 24' 20"	0.95540
14	299° 53' 54"	-3° 58' 46"	302° 59' 41"	-24° 03' 27"	0° 59' 33"	16' 13.64"	86° 2' 18"	0.95337
15	300° 29' 48"	-4° 00' 54"	303° 38' 27"	-23° 57' 40"	0° 59' 31"	16' 13.10"	85° 40' 40"	0.95131
16	301° 05' 40"	-4° 02' 59"	304° 17' 07"	-23° 51' 45"	0° 59' 29"	16' 12.56"	85° 19' 24"	0.94921
17	301° 41' 30"	-4° 05' 03"	304° 55' 40"	-23° 45' 40"	0° 59' 27"	16' 12.01"	84° 58' 29"	0.94706
18	302° 17' 17"	-4° 07' 05"	305° 34' 07"	-23° 39' 26"	0° 59' 25"	16' 11.46"	84° 37' 55"	0.94488
19	302° 53' 02"	-4° 09' 06"	306° 12' 28"	-23° 33' 03"	0° 59' 23"	16' 10.91"	84° 17' 41"	0.94266
20	303° 28' 44"	-4° 11' 05"	306° 50' 42"	-23° 26' 31"	0° 59' 21"	16' 10.35"	83° 57' 45"	0.94040
21	304° 04' 24"	-4° 13' 01"	307° 28' 50"	-23° 19' 50"	0° 59' 19"	16' 09.79"	83° 38' 08"	0.93810
22	304° 40' 02"	-4° 14' 57"	308° 06' 50"	-23° 13' 01"	0° 59' 17"	16' 09.22"	83° 18' 49"	0.93576
23	305° 15' 37"	-4° 16' 50"	308° 44' 45"	-23° 06' 03"	0° 59' 15"	16' 08.65"	82° 59' 48"	0.93339
24	305° 51' 10"	-4° 18' 41"	309° 22' 32"	-22° 58' 56"	0° 59' 13"	16' 08.08"	82° 41' 03"	0.93098

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	95° 35' 24"	-0.16"	96° 04' 41"	23° 19' 10"	1.0165298	15' 44.03"	23° 26' 14"	-3 m 02 s
1	95° 37' 47"	-0.16"	96° 07' 17"	23° 19' 04"	1.0165315	15' 44.02"	23° 26' 14"	-3 m 02 s
2	95° 40' 10"	-0.16"	96° 09' 53"	23° 18' 58"	1.0165332	15' 44.02"	23° 26' 14"	-3 m 03 s
3	95° 42' 33"	-0.17"	96° 12' 28"	23° 18' 52"	1.0165349	15' 44.02"	23° 26' 14"	-3 m 04 s
4	95° 44' 56"	-0.17"	96° 15' 04"	23° 18' 46"	1.0165366	15' 44.02"	23° 26' 14"	-3 m 04 s
5	95° 47' 19"	-0.17"	96° 17' 39"	23° 18' 40"	1.0165383	15' 44.02"	23° 26' 14"	-3 m 05 s
6	95° 49' 42"	-0.18"	96° 20' 15"	23° 18' 33"	1.0165400	15' 44.02"	23° 26' 14"	-3 m 05 s
7	95° 52' 05"	-0.18"	96° 22' 50"	23° 18' 27"	1.0165417	15' 44.01"	23° 26' 14"	-3 m 06 s
8	95° 54' 28"	-0.18"	96° 25' 26"	23° 18' 21"	1.0165433	15' 44.01"	23° 26' 14"	-3 m 06 s
9	95° 56' 51"	-0.19"	96° 28' 02"	23° 18' 14"	1.0165450	15' 44.01"	23° 26' 14"	-3 m 07 s
10	95° 59' 14"	-0.19"	96° 30' 37"	23° 18' 08"	1.0165467	15' 44.01"	23° 26' 14"	-3 m 07 s
11	96° 01' 37"	-0.19"	96° 33' 13"	23° 18' 02"	1.0165483	15' 44.01"	23° 26' 14"	-3 m 08 s
12	96° 03' 60"	-0.20"	96° 35' 48"	23° 17' 55"	1.0165500	15' 44.01"	23° 26' 14"	-3 m 08 s
13	96° 06' 23"	-0.20"	96° 38' 24"	23° 17' 48"	1.0165516	15' 44.01"	23° 26' 14"	-3 m 09 s
14	96° 08' 46"	-0.20"	96° 40' 59"	23° 17' 42"	1.0165533	15' 44.00"	23° 26' 14"	-3 m 09 s
15	96° 11' 09"	-0.21"	96° 43' 35"	23° 17' 35"	1.0165549	15' 44.00"	23° 26' 14"	-3 m 10 s
16	96° 13' 32"	-0.21"	96° 46' 10"	23° 17' 29"	1.0165565	15' 44.00"	23° 26' 14"	-3 m 10 s
17	96° 15' 55"	-0.21"	96° 48' 46"	23° 17' 22"	1.0165581	15' 44.00"	23° 26' 14"	-3 m 11 s
18	96° 18' 18"	-0.21"	96° 51' 21"	23° 17' 15"	1.0165597	15' 44.00"	23° 26' 14"	-3 m 11 s
19	96° 20' 41"	-0.22"	96° 53' 57"	23° 17' 08"	1.0165613	15' 44.00"	23° 26' 14"	-3 m 12 s
20	96° 23' 04"	-0.22"	96° 56' 32"	23° 17' 01"	1.0165629	15' 43.99"	23° 26' 14"	-3 m 12 s
21	96° 25' 27"	-0.22"	96° 59' 08"	23° 16' 54"	1.0165645	15' 43.99"	23° 26' 14"	-3 m 13 s
22	96° 27' 50"	-0.23"	97° 01' 43"	23° 16' 48"	1.0165661	15' 43.99"	23° 26' 14"	-3 m 13 s
23	96° 30' 13"	-0.23"	97° 04' 19"	23° 16' 41"	1.0165677	15' 43.99"	23° 26' 14"	-3 m 14 s
24	96° 32' 36"	-0.23"	97° 06' 54"	23° 16' 34"	1.0165693	15' 43.99"	23° 26' 14"	-3 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	305° 51' 10"	-4° 18' 41"	309° 22' 32"	-22° 58' 56"	0° 59' 13"	16' 08.08"	82° 41' 03"	0.93098
1	306° 26' 40"	-4° 20' 31"	310° 00' 12"	-22° 51' 41"	0° 59' 10"	16' 07.50"	82° 22' 34"	0.92853
2	307° 02' 07"	-4° 22' 19"	310° 37' 46"	-22° 44' 18"	0° 59' 08"	16' 06.92"	82° 4' 21"	0.92605
3	307° 37' 33"	-4° 24' 05"	311° 15' 13"	-22° 36' 46"	0° 59' 06"	16' 06.34"	81° 46' 24"	0.92353
4	308° 12' 55"	-4° 25' 49"	311° 52' 32"	-22° 29' 07"	0° 59' 04"	16' 05.75"	81° 28' 43"	0.92098
5	308° 48' 15"	-4° 27' 32"	312° 29' 45"	-22° 21' 19"	0° 59' 02"	16' 05.17"	81° 11' 16"	0.91839
6	309° 23' 33"	-4° 29' 13"	313° 06' 51"	-22° 13' 24"	0° 58' 60"	16' 04.57"	80° 54' 03"	0.91577
7	309° 58' 48"	-4° 30' 51"	313° 43' 49"	-22° 05' 21"	0° 58' 58"	16' 03.98"	80° 37' 05"	0.91311
8	310° 34' 00"	-4° 32' 28"	314° 20' 40"	-21° 57' 10"	0° 58' 55"	16' 03.38"	80° 20' 21"	0.91042
9	311° 09' 10"	-4° 34' 04"	314° 57' 25"	-21° 48' 51"	0° 58' 53"	16' 02.79"	80° 3' 51"	0.90770
10	311° 44' 17"	-4° 35' 37"	315° 34' 02"	-21° 40' 26"	0° 58' 51"	16' 02.18"	79° 47' 34"	0.90494
11	312° 19' 22"	-4° 37' 08"	316° 10' 32"	-21° 31' 52"	0° 58' 49"	16' 01.58"	79° 31' 31"	0.90215
12	312° 54' 23"	-4° 38' 38"	316° 46' 54"	-21° 23' 12"	0° 58' 47"	16' 00.98"	79° 15' 41"	0.89933
13	313° 29' 23"	-4° 40' 06"	317° 23' 09"	-21° 14' 24"	0° 58' 44"	16' 00.37"	79° 0' 04"	0.89647
14	314° 04' 19"	-4° 41' 31"	317° 59' 18"	-21° 05' 30"	0° 58' 42"	15' 59.76"	78° 44' 39"	0.89359
15	314° 39' 13"	-4° 42' 55"	318° 35' 18"	-20° 56' 28"	0° 58' 40"	15' 59.15"	78° 29' 27"	0.89068
16	315° 14' 04"	-4° 44' 18"	319° 11' 12"	-20° 47' 20"	0° 58' 38"	15' 58.53"	78° 14' 28"	0.88773
17	315° 48' 53"	-4° 45' 38"	319° 46' 58"	-20° 38' 05"	0° 58' 35"	15' 57.92"	77° 59' 41"	0.88475
18	316° 23' 38"	-4° 46' 56"	320° 22' 37"	-20° 28' 43"	0° 58' 33"	15' 57.30"	77° 45' 06"	0.88175
19	316° 58' 22"	-4° 48' 13"	320° 58' 09"	-20° 19' 15"	0° 58' 31"	15' 56.68"	77° 30' 43"	0.87872
20	317° 33' 02"	-4° 49' 28"	321° 33' 33"	-20° 09' 41"	0° 58' 29"	15' 56.06"	77° 16' 32"	0.87565
21	318° 07' 40"	-4° 50' 41"	322° 08' 51"	-20° 00' 00"	0° 58' 26"	15' 55.44"	77° 2' 33"	0.87256
22	318° 42' 15"	-4° 51' 51"	322° 44' 01"	-19° 50' 13"	0° 58' 24"	15' 54.82"	76° 48' 45"	0.86944
23	319° 16' 47"	-4° 53' 01"	323° 19' 03"	-19° 40' 20"	0° 58' 22"	15' 54.20"	76° 35' 09"	0.86630
24	319° 51' 16"	-4° 54' 08"	323° 53' 59"	-19° 30' 21"	0° 58' 19"	15' 53.57"	76° 21' 44"	0.86312

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	96° 32' 36"	-0.23"	97° 06' 54"	23° 16' 34"	1.0165693	15' 43.99"	23° 26' 14"	-3 m 14 s
1	96° 34' 59"	-0.23"	97° 09' 30"	23° 16' 26"	1.0165708	15' 43.99"	23° 26' 14"	-3 m 15 s
2	96° 37' 22"	-0.24"	97° 12' 05"	23° 16' 19"	1.0165724	15' 43.99"	23° 26' 14"	-3 m 15 s
3	96° 39' 45"	-0.24"	97° 14' 41"	23° 16' 12"	1.0165740	15' 43.98"	23° 26' 14"	-3 m 16 s
4	96° 42' 08"	-0.24"	97° 17' 16"	23° 16' 05"	1.0165755	15' 43.98"	23° 26' 14"	-3 m 16 s
5	96° 44' 31"	-0.24"	97° 19' 52"	23° 15' 58"	1.0165771	15' 43.98"	23° 26' 14"	-3 m 17 s
6	96° 46' 54"	-0.25"	97° 22' 27"	23° 15' 51"	1.0165786	15' 43.98"	23° 26' 14"	-3 m 17 s
7	96° 49' 17"	-0.25"	97° 25' 02"	23° 15' 43"	1.0165801	15' 43.98"	23° 26' 14"	-3 m 18 s
8	96° 51' 40"	-0.25"	97° 27' 38"	23° 15' 36"	1.0165816	15' 43.98"	23° 26' 14"	-3 m 18 s
9	96° 54' 03"	-0.25"	97° 30' 13"	23° 15' 28"	1.0165832	15' 43.98"	23° 26' 14"	-3 m 19 s
10	96° 56' 26"	-0.25"	97° 32' 49"	23° 15' 21"	1.0165847	15' 43.97"	23° 26' 14"	-3 m 19 s
11	96° 58' 49"	-0.26"	97° 35' 24"	23° 15' 13"	1.0165862	15' 43.97"	23° 26' 14"	-3 m 20 s
12	97° 01' 12"	-0.26"	97° 37' 60"	23° 15' 06"	1.0165877	15' 43.97"	23° 26' 14"	-3 m 20 s
13	97° 03' 35"	-0.26"	97° 40' 35"	23° 14' 58"	1.0165891	15' 43.97"	23° 26' 14"	-3 m 21 s
14	97° 05' 58"	-0.26"	97° 43' 10"	23° 14' 51"	1.0165906	15' 43.97"	23° 26' 14"	-3 m 21 s
15	97° 08' 21"	-0.26"	97° 45' 46"	23° 14' 43"	1.0165921	15' 43.97"	23° 26' 14"	-3 m 22 s
16	97° 10' 44"	-0.27"	97° 48' 21"	23° 14' 35"	1.0165936	15' 43.97"	23° 26' 14"	-3 m 22 s
17	97° 13' 07"	-0.27"	97° 50' 57"	23° 14' 28"	1.0165950	15' 43.96"	23° 26' 14"	-3 m 23 s
18	97° 15' 30"	-0.27"	97° 53' 32"	23° 14' 20"	1.0165965	15' 43.96"	23° 26' 14"	-3 m 23 s
19	97° 17' 53"	-0.27"	97° 56' 07"	23° 14' 12"	1.0165979	15' 43.96"	23° 26' 14"	-3 m 24 s
20	97° 20' 16"	-0.27"	97° 58' 43"	23° 14' 04"	1.0165994	15' 43.96"	23° 26' 14"	-3 m 24 s
21	97° 22' 39"	-0.27"	98° 01' 18"	23° 13' 56"	1.0166008	15' 43.96"	23° 26' 14"	-3 m 25 s
22	97° 25' 02"	-0.27"	98° 03' 54"	23° 13' 48"	1.0166022	15' 43.96"	23° 26' 14"	-3 m 25 s
23	97° 27' 25"	-0.28"	98° 06' 29"	23° 13' 40"	1.0166037	15' 43.96"	23° 26' 14"	-3 m 26 s
24	97° 29' 48"	-0.28"	98° 09' 04"	23° 13' 32"	1.0166051	15' 43.96"	23° 26' 14"	-3 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	319° 51' 16"	-4° 54' 08"	323° 53' 59"	-19° 30' 21"	0° 58' 19"	15' 53.57"	76° 21' 44"	0.86312
1	320° 25' 43"	-4° 55' 13"	324° 28' 47"	-19° 20' 17"	0° 58' 17"	15' 52.95"	76° 8' 31"	0.85992
2	321° 00' 07"	-4° 56' 17"	325° 03' 28"	-19° 10' 06"	0° 58' 15"	15' 52.32"	75° 55' 29"	0.85670
3	321° 34' 28"	-4° 57' 18"	325° 38' 02"	-18° 59' 50"	0° 58' 12"	15' 51.70"	75° 42' 38"	0.85345
4	322° 08' 47"	-4° 58' 18"	326° 12' 29"	-18° 49' 28"	0° 58' 10"	15' 51.07"	75° 29' 58"	0.85017
5	322° 43' 02"	-4° 59' 16"	326° 46' 48"	-18° 39' 01"	0° 58' 08"	15' 50.44"	75° 17' 29"	0.84687
6	323° 17' 15"	-5° 00' 12"	327° 21' 01"	-18° 28' 29"	0° 58' 06"	15' 49.82"	75° 5' 11"	0.84354
7	323° 51' 25"	-5° 01' 06"	327° 55' 06"	-18° 17' 51"	0° 58' 03"	15' 49.19"	74° 53' 03"	0.84019
8	324° 25' 33"	-5° 01' 59"	328° 29' 04"	-18° 07' 08"	0° 58' 01"	15' 48.56"	74° 41' 07"	0.83681
9	324° 59' 37"	-5° 02' 49"	329° 02' 56"	-17° 56' 20"	0° 57' 59"	15' 47.93"	74° 29' 21"	0.83342
10	325° 33' 39"	-5° 03' 38"	329° 36' 40"	-17° 45' 27"	0° 57' 56"	15' 47.30"	74° 17' 45"	0.83000
11	326° 07' 38"	-5° 04' 25"	330° 10' 17"	-17° 34' 30"	0° 57' 54"	15' 46.67"	74° 6' 20"	0.82655
12	326° 41' 34"	-5° 05' 10"	330° 43' 48"	-17° 23' 27"	0° 57' 52"	15' 46.05"	73° 55' 06"	0.82309
13	327° 15' 28"	-5° 05' 53"	331° 17' 11"	-17° 12' 20"	0° 57' 49"	15' 45.42"	73° 44' 01"	0.81960
14	327° 49' 19"	-5° 06' 34"	331° 50' 28"	-17° 01' 08"	0° 57' 47"	15' 44.79"	73° 33' 07"	0.81609
15	328° 23' 07"	-5° 07' 13"	332° 23' 38"	-16° 49' 52"	0° 57' 45"	15' 44.16"	73° 22' 23"	0.81256
16	328° 56' 52"	-5° 07' 51"	332° 56' 41"	-16° 38' 32"	0° 57' 43"	15' 43.54"	73° 11' 50"	0.80901
17	329° 30' 34"	-5° 08' 27"	333° 29' 38"	-16° 27' 07"	0° 57' 40"	15' 42.91"	73° 1' 26"	0.80544
18	330° 04' 14"	-5° 09' 01"	334° 02' 28"	-16° 15' 38"	0° 57' 38"	15' 42.28"	72° 51' 13"	0.80185
19	330° 37' 51"	-5° 09' 33"	334° 35' 11"	-16° 04' 05"	0° 57' 36"	15' 41.66"	72° 41' 09"	0.79824
20	331° 11' 25"	-5° 10' 03"	335° 07' 48"	-15° 52' 28"	0° 57' 33"	15' 41.03"	72° 31' 15"	0.79462
21	331° 44' 56"	-5° 10' 32"	335° 40' 18"	-15° 40' 48"	0° 57' 31"	15' 40.41"	72° 21' 31"	0.79097
22	332° 18' 25"	-5° 10' 58"	336° 12' 42"	-15° 29' 03"	0° 57' 29"	15' 39.79"	72° 11' 57"	0.78731
23	332° 51' 51"	-5° 11' 23"	336° 44' 59"	-15° 17' 15"	0° 57' 27"	15' 39.17"	72° 2' 32"	0.78362
24	333° 25' 14"	-5° 11' 46"	337° 17' 10"	-15° 05' 23"	0° 57' 24"	15' 38.55"	71° 53' 17"	0.77992

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	97° 29' 48"	-0.28"	98° 09' 04"	23° 13' 32"	1.0166051	15' 43.96"	23° 26' 14"	-3 m 26 s
1	97° 32' 11"	-0.28"	98° 11' 40"	23° 13' 24"	1.0166065	15' 43.95"	23° 26' 14"	-3 m 27 s
2	97° 34' 34"	-0.28"	98° 14' 15"	23° 13' 16"	1.0166079	15' 43.95"	23° 26' 14"	-3 m 27 s
3	97° 36' 57"	-0.28"	98° 16' 50"	23° 13' 08"	1.0166093	15' 43.95"	23° 26' 14"	-3 m 28 s
4	97° 39' 20"	-0.28"	98° 19' 26"	23° 12' 60"	1.0166107	15' 43.95"	23° 26' 14"	-3 m 29 s
5	97° 41' 43"	-0.28"	98° 22' 01"	23° 12' 51"	1.0166121	15' 43.95"	23° 26' 14"	-3 m 29 s
6	97° 44' 06"	-0.28"	98° 24' 36"	23° 12' 43"	1.0166134	15' 43.95"	23° 26' 14"	-3 m 30 s
7	97° 46' 29"	-0.29"	98° 27' 12"	23° 12' 35"	1.0166148	15' 43.95"	23° 26' 14"	-3 m 30 s
8	97° 48' 52"	-0.29"	98° 29' 47"	23° 12' 26"	1.0166162	15' 43.95"	23° 26' 14"	-3 m 31 s
9	97° 51' 15"	-0.29"	98° 32' 22"	23° 12' 18"	1.0166175	15' 43.94"	23° 26' 14"	-3 m 31 s
10	97° 53' 38"	-0.29"	98° 34' 58"	23° 12' 09"	1.0166189	15' 43.94"	23° 26' 14"	-3 m 32 s
11	97° 56' 01"	-0.29"	98° 37' 33"	23° 12' 01"	1.0166202	15' 43.94"	23° 26' 14"	-3 m 32 s
12	97° 58' 24"	-0.29"	98° 40' 08"	23° 11' 52"	1.0166215	15' 43.94"	23° 26' 14"	-3 m 33 s
13	98° 00' 47"	-0.29"	98° 42' 44"	23° 11' 44"	1.0166228	15' 43.94"	23° 26' 14"	-3 m 33 s
14	98° 03' 10"	-0.29"	98° 45' 19"	23° 11' 35"	1.0166242	15' 43.94"	23° 26' 14"	-3 m 33 s
15	98° 05' 33"	-0.29"	98° 47' 54"	23° 11' 27"	1.0166255	15' 43.94"	23° 26' 14"	-3 m 34 s
16	98° 07' 56"	-0.29"	98° 50' 29"	23° 11' 18"	1.0166268	15' 43.94"	23° 26' 14"	-3 m 34 s
17	98° 10' 19"	-0.29"	98° 53' 05"	23° 11' 09"	1.0166281	15' 43.93"	23° 26' 14"	-3 m 35 s
18	98° 12' 42"	-0.29"	98° 55' 40"	23° 11' 00"	1.0166294	15' 43.93"	23° 26' 14"	-3 m 35 s
19	98° 15' 05"	-0.29"	98° 58' 15"	23° 10' 51"	1.0166306	15' 43.93"	23° 26' 14"	-3 m 36 s
20	98° 17' 28"	-0.29"	99° 00' 50"	23° 10' 42"	1.0166319	15' 43.93"	23° 26' 14"	-3 m 36 s
21	98° 19' 51"	-0.29"	99° 03' 26"	23° 10' 34"	1.0166332	15' 43.93"	23° 26' 14"	-3 m 37 s
22	98° 22' 14"	-0.29"	99° 06' 01"	23° 10' 25"	1.0166344	15' 43.93"	23° 26' 14"	-3 m 37 s
23	98° 24' 37"	-0.29"	99° 08' 36"	23° 10' 16"	1.0166357	15' 43.93"	23° 26' 14"	-3 m 38 s
24	98° 26' 60"	-0.29"	99° 11' 11"	23° 10' 07"	1.0166369	15' 43.93"	23° 26' 14"	-3 m 38 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	333° 25' 14"	-5° 11' 46"	337° 17' 10"	-15° 05' 23"	0° 57' 24"	15' 38.55"	71° 53' 17"	0.77992
1	333° 58' 34"	-5° 12' 08"	337° 49' 15"	-14° 53' 27"	0° 57' 22"	15' 37.93"	71° 44' 12"	0.77621
2	334° 31' 52"	-5° 12' 27"	338° 21' 14"	-14° 41' 28"	0° 57' 20"	15' 37.31"	71° 35' 16"	0.77247
3	335° 05' 07"	-5° 12' 45"	338° 53' 06"	-14° 29' 26"	0° 57' 17"	15' 36.70"	71° 26' 30"	0.76873
4	335° 38' 19"	-5° 13' 01"	339° 24' 53"	-14° 17' 20"	0° 57' 15"	15' 36.08"	71° 17' 53"	0.76496
5	336° 11' 28"	-5° 13' 15"	339° 56' 33"	-14° 05' 11"	0° 57' 13"	15' 35.47"	71° 9' 25"	0.76118
6	336° 44' 35"	-5° 13' 28"	340° 28' 07"	-13° 52' 59"	0° 57' 11"	15' 34.86"	71° 1' 07"	0.75738
7	337° 17' 39"	-5° 13' 38"	340° 59' 36"	-13° 40' 44"	0° 57' 08"	15' 34.25"	70° 52' 57"	0.75357
8	337° 50' 40"	-5° 13' 47"	341° 30' 58"	-13° 28' 26"	0° 57' 06"	15' 33.64"	70° 44' 57"	0.74975
9	338° 23' 39"	-5° 13' 54"	342° 02' 15"	-13° 16' 05"	0° 57' 04"	15' 33.03"	70° 37' 07"	0.74591
10	338° 56' 35"	-5° 13' 60"	342° 33' 26"	-13° 03' 42"	0° 57' 02"	15' 32.43"	70° 29' 25"	0.74206
11	339° 29' 28"	-5° 14' 04"	343° 04' 31"	-12° 51' 15"	0° 56' 60"	15' 31.82"	70° 21' 52"	0.73819
12	340° 02' 19"	-5° 14' 06"	343° 35' 31"	-12° 38' 46"	0° 56' 57"	15' 31.22"	70° 14' 29"	0.73431
13	340° 35' 07"	-5° 14' 06"	344° 06' 25"	-12° 26' 15"	0° 56' 55"	15' 30.63"	70° 7' 14"	0.73042
14	341° 07' 52"	-5° 14' 05"	344° 37' 13"	-12° 13' 41"	0° 56' 53"	15' 30.03"	70° 0' 08"	0.72652
15	341° 40' 35"	-5° 14' 01"	345° 07' 57"	-12° 01' 04"	0° 56' 51"	15' 29.44"	69° 53' 11"	0.72260
16	342° 13' 15"	-5° 13' 57"	345° 38' 35"	-11° 48' 25"	0° 56' 49"	15' 28.84"	69° 46' 23"	0.71868
17	342° 45' 52"	-5° 13' 50"	346° 09' 07"	-11° 35' 44"	0° 56' 46"	15' 28.25"	69° 39' 43"	0.71474
18	343° 18' 27"	-5° 13' 42"	346° 39' 35"	-11° 23' 01"	0° 56' 44"	15' 27.67"	69° 33' 12"	0.71079
19	343° 50' 59"	-5° 13' 32"	347° 09' 57"	-11° 10' 16"	0° 56' 42"	15' 27.08"	69° 26' 50"	0.70683
20	344° 23' 29"	-5° 13' 21"	347° 40' 14"	-10° 57' 28"	0° 56' 40"	15' 26.50"	69° 20' 36"	0.70286
21	344° 55' 56"	-5° 13' 07"	348° 10' 26"	-10° 44' 39"	0° 56' 38"	15' 25.92"	69° 14' 31"	0.69888
22	345° 28' 20"	-5° 12' 53"	348° 40' 34"	-10° 31' 48"	0° 56' 36"	15' 25.34"	69° 8' 35"	0.69489
23	346° 00' 42"	-5° 12' 36"	349° 10' 36"	-10° 18' 55"	0° 56' 34"	15' 24.77"	69° 2' 47"	0.69090
24	346° 33' 01"	-5° 12' 18"	349° 40' 34"	-10° 05' 60"	0° 56' 32"	15' 24.20"	68° 57' 07"	0.68689

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	98° 26' 60"	-0.29"	99° 11' 11"	23° 10' 07"	1.0166369	15' 43.93"	23° 26' 14"	-3 m 38 s
1	98° 29' 23"	-0.29"	99° 13' 47"	23° 09' 57"	1.0166382	15' 43.92"	23° 26' 14"	-3 m 39 s
2	98° 31' 46"	-0.29"	99° 16' 22"	23° 09' 48"	1.0166394	15' 43.92"	23° 26' 14"	-3 m 39 s
3	98° 34' 09"	-0.29"	99° 18' 57"	23° 09' 39"	1.0166406	15' 43.92"	23° 26' 14"	-3 m 40 s
4	98° 36' 32"	-0.29"	99° 21' 32"	23° 09' 30"	1.0166418	15' 43.92"	23° 26' 14"	-3 m 40 s
5	98° 38' 55"	-0.29"	99° 24' 07"	23° 09' 21"	1.0166430	15' 43.92"	23° 26' 14"	-3 m 41 s
6	98° 41' 18"	-0.29"	99° 26' 43"	23° 09' 11"	1.0166442	15' 43.92"	23° 26' 14"	-3 m 41 s
7	98° 43' 41"	-0.29"	99° 29' 18"	23° 09' 02"	1.0166454	15' 43.92"	23° 26' 14"	-3 m 42 s
8	98° 46' 04"	-0.29"	99° 31' 53"	23° 08' 53"	1.0166466	15' 43.92"	23° 26' 14"	-3 m 42 s
9	98° 48' 27"	-0.29"	99° 34' 28"	23° 08' 43"	1.0166478	15' 43.92"	23° 26' 14"	-3 m 43 s
10	98° 50' 50"	-0.29"	99° 37' 03"	23° 08' 34"	1.0166490	15' 43.91"	23° 26' 14"	-3 m 43 s
11	98° 53' 13"	-0.29"	99° 39' 39"	23° 08' 24"	1.0166501	15' 43.91"	23° 26' 14"	-3 m 44 s
12	98° 55' 36"	-0.29"	99° 42' 14"	23° 08' 15"	1.0166513	15' 43.91"	23° 26' 14"	-3 m 44 s
13	98° 57' 59"	-0.29"	99° 44' 49"	23° 08' 05"	1.0166524	15' 43.91"	23° 26' 14"	-3 m 45 s
14	99° 00' 22"	-0.29"	99° 47' 24"	23° 07' 55"	1.0166536	15' 43.91"	23° 26' 14"	-3 m 45 s
15	99° 02' 45"	-0.29"	99° 49' 59"	23° 07' 46"	1.0166547	15' 43.91"	23° 26' 14"	-3 m 46 s
16	99° 05' 08"	-0.29"	99° 52' 34"	23° 07' 36"	1.0166558	15' 43.91"	23° 26' 14"	-3 m 46 s
17	99° 07' 31"	-0.29"	99° 55' 09"	23° 07' 26"	1.0166569	15' 43.91"	23° 26' 14"	-3 m 47 s
18	99° 09' 54"	-0.29"	99° 57' 45"	23° 07' 16"	1.0166580	15' 43.91"	23° 26' 14"	-3 m 47 s
19	99° 12' 17"	-0.29"	100° 00' 20"	23° 07' 06"	1.0166591	15' 43.91"	23° 26' 14"	-3 m 48 s
20	99° 14' 40"	-0.29"	100° 02' 55"	23° 06' 57"	1.0166602	15' 43.90"	23° 26' 14"	-3 m 48 s
21	99° 17' 03"	-0.28"	100° 05' 30"	23° 06' 47"	1.0166613	15' 43.90"	23° 26' 14"	-3 m 49 s
22	99° 19' 26"	-0.28"	100° 08' 05"	23° 06' 37"	1.0166624	15' 43.90"	23° 26' 14"	-3 m 49 s
23	99° 21' 49"	-0.28"	100° 10' 40"	23° 06' 27"	1.0166635	15' 43.90"	23° 26' 14"	-3 m 50 s
24	99° 24' 12"	-0.28"	100° 13' 15"	23° 06' 16"	1.0166645	15' 43.90"	23° 26' 14"	-3 m 50 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	346° 33' 01"	-5° 12' 18"	349° 40' 34"	-10° 05' 60"	0° 56' 32"	15' 24.20"	68° 57' 07"	0.68689
1	347° 05' 18"	-5° 11' 58"	350° 10' 27"	-9° 53' 03"	0° 56' 29"	15' 23.63"	68° 51' 36"	0.68287
2	347° 37' 33"	-5° 11' 37"	350° 40' 15"	-9° 40' 05"	0° 56' 27"	15' 23.06"	68° 46' 13"	0.67885
3	348° 09' 44"	-5° 11' 14"	351° 09' 58"	-9° 27' 05"	0° 56' 25"	15' 22.50"	68° 40' 58"	0.67482
4	348° 41' 54"	-5° 10' 49"	351° 39' 38"	-9° 14' 04"	0° 56' 23"	15' 21.94"	68° 35' 52"	0.67078
5	349° 14' 01"	-5° 10' 23"	352° 09' 12"	-9° 01' 01"	0° 56' 21"	15' 21.39"	68° 30' 53"	0.66673
6	349° 46' 05"	-5° 09' 56"	352° 38' 43"	-8° 47' 57"	0° 56' 19"	15' 20.83"	68° 26' 03"	0.66268
7	350° 18' 07"	-5° 09' 26"	353° 08' 09"	-8° 34' 51"	0° 56' 17"	15' 20.28"	68° 21' 21"	0.65862
8	350° 50' 06"	-5° 08' 55"	353° 37' 31"	-8° 21' 44"	0° 56' 15"	15' 19.73"	68° 16' 48"	0.65456
9	351° 22' 04"	-5° 08' 23"	354° 06' 48"	-8° 08' 37"	0° 56' 13"	15' 19.19"	68° 12' 22"	0.65048
10	351° 53' 58"	-5° 07' 49"	354° 36' 02"	-7° 55' 27"	0° 56' 11"	15' 18.65"	68° 8' 04"	0.64641
11	352° 25' 51"	-5° 07' 13"	355° 05' 12"	-7° 42' 17"	0° 56' 09"	15' 18.11"	68° 3' 54"	0.64232
12	352° 57' 41"	-5° 06' 36"	355° 34' 18"	-7° 29' 06"	0° 56' 07"	15' 17.58"	67° 59' 52"	0.63824
13	353° 29' 28"	-5° 05' 58"	356° 03' 19"	-7° 15' 54"	0° 56' 05"	15' 17.05"	67° 55' 58"	0.63414
14	354° 01' 13"	-5° 05' 18"	356° 32' 17"	-7° 02' 41"	0° 56' 03"	15' 16.52"	67° 52' 12"	0.63005
15	354° 32' 56"	-5° 04' 36"	357° 01' 12"	-6° 49' 27"	0° 56' 01"	15' 16.00"	67° 48' 34"	0.62594
16	355° 04' 37"	-5° 03' 53"	357° 30' 03"	-6° 36' 13"	0° 55' 60"	15' 15.48"	67° 45' 03"	0.62184
17	355° 36' 15"	-5° 03' 08"	357° 58' 50"	-6° 22' 57"	0° 55' 58"	15' 14.96"	67° 41' 40"	0.61773
18	356° 07' 51"	-5° 02' 22"	358° 27' 33"	-6° 09' 41"	0° 55' 56"	15' 14.45"	67° 38' 25"	0.61362
19	356° 39' 25"	-5° 01' 35"	358° 56' 14"	-5° 56' 25"	0° 55' 54"	15' 13.94"	67° 35' 18"	0.60950
20	357° 10' 56"	-5° 00' 46"	359° 24' 51"	-5° 43' 07"	0° 55' 52"	15' 13.43"	67° 32' 18"	0.60538
21	357° 42' 26"	-4° 59' 55"	359° 53' 24"	-5° 29' 50"	0° 55' 50"	15' 12.93"	67° 29' 26"	0.60126
22	358° 13' 53"	-4° 59' 03"	0° 21' 55"	-5° 16' 32"	0° 55' 48"	15' 12.43"	67° 26' 41"	0.59714
23	358° 45' 18"	-4° 58' 10"	0° 50' 22"	-5° 03' 13"	0° 55' 47"	15' 11.94"	67° 24' 04"	0.59301
24	359° 16' 41"	-4° 57' 15"	1° 18' 46"	-4° 49' 54"	0° 55' 45"	15' 11.45"	67° 21' 35"	0.58889

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	99° 24' 12"	-0.28"	100° 13' 15"	23° 06' 16"	1.0166645	15' 43.90"	23° 26' 14"	-3 m 50 s
1	99° 26' 35"	-0.28"	100° 15' 50"	23° 06' 06"	1.0166656	15' 43.90"	23° 26' 14"	-3 m 51 s
2	99° 28' 58"	-0.28"	100° 18' 25"	23° 05' 56"	1.0166666	15' 43.90"	23° 26' 14"	-3 m 51 s
3	99° 31' 21"	-0.28"	100° 21' 00"	23° 05' 46"	1.0166677	15' 43.90"	23° 26' 14"	-3 m 52 s
4	99° 33' 44"	-0.28"	100° 23' 35"	23° 05' 36"	1.0166687	15' 43.90"	23° 26' 14"	-3 m 52 s
5	99° 36' 07"	-0.27"	100° 26' 11"	23° 05' 25"	1.0166697	15' 43.90"	23° 26' 14"	-3 m 53 s
6	99° 38' 30"	-0.27"	100° 28' 46"	23° 05' 15"	1.0166707	15' 43.89"	23° 26' 14"	-3 m 53 s
7	99° 40' 53"	-0.27"	100° 31' 21"	23° 05' 05"	1.0166717	15' 43.89"	23° 26' 14"	-3 m 54 s
8	99° 43' 16"	-0.27"	100° 33' 56"	23° 04' 54"	1.0166727	15' 43.89"	23° 26' 14"	-3 m 54 s
9	99° 45' 39"	-0.27"	100° 36' 31"	23° 04' 44"	1.0166737	15' 43.89"	23° 26' 14"	-3 m 55 s
10	99° 48' 02"	-0.27"	100° 39' 06"	23° 04' 33"	1.0166747	15' 43.89"	23° 26' 14"	-3 m 55 s
11	99° 50' 25"	-0.26"	100° 41' 41"	23° 04' 23"	1.0166757	15' 43.89"	23° 26' 14"	-3 m 55 s
12	99° 52' 48"	-0.26"	100° 44' 16"	23° 04' 12"	1.0166766	15' 43.89"	23° 26' 14"	-3 m 56 s
13	99° 55' 11"	-0.26"	100° 46' 51"	23° 04' 02"	1.0166776	15' 43.89"	23° 26' 14"	-3 m 56 s
14	99° 57' 34"	-0.26"	100° 49' 26"	23° 03' 51"	1.0166785	15' 43.89"	23° 26' 14"	-3 m 57 s
15	99° 59' 57"	-0.26"	100° 52' 01"	23° 03' 40"	1.0166795	15' 43.89"	23° 26' 14"	-3 m 57 s
16	100° 02' 20"	-0.26"	100° 54' 36"	23° 03' 30"	1.0166804	15' 43.89"	23° 26' 14"	-3 m 58 s
17	100° 04' 43"	-0.25"	100° 57' 11"	23° 03' 19"	1.0166813	15' 43.88"	23° 26' 14"	-3 m 58 s
18	100° 07' 06"	-0.25"	100° 59' 46"	23° 03' 08"	1.0166823	15' 43.88"	23° 26' 14"	-3 m 59 s
19	100° 09' 29"	-0.25"	101° 02' 21"	23° 02' 57"	1.0166832	15' 43.88"	23° 26' 14"	-3 m 59 s
20	100° 11' 52"	-0.25"	101° 04' 56"	23° 02' 46"	1.0166841	15' 43.88"	23° 26' 14"	-3 m 60 s
21	100° 14' 15"	-0.24"	101° 07' 31"	23° 02' 35"	1.0166850	15' 43.88"	23° 26' 14"	-4 m 00 s
22	100° 16' 38"	-0.24"	101° 10' 06"	23° 02' 24"	1.0166858	15' 43.88"	23° 26' 14"	-4 m 01 s
23	100° 19' 01"	-0.24"	101° 12' 40"	23° 02' 13"	1.0166867	15' 43.88"	23° 26' 14"	-4 m 01 s
24	100° 21' 24"	-0.24"	101° 15' 15"	23° 02' 02"	1.0166876	15' 43.88"	23° 26' 14"	-4 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	359° 16' 41"	-4° 57' 15"	1° 18' 46"	-4° 49' 54"	0° 55' 45"	15' 11.45"	67° 21' 35"	0.58889
1	359° 48' 01"	-4° 56' 19"	1° 47' 07"	-4° 36' 35"	0° 55' 43"	15' 10.96"	67° 19' 13"	0.58476
2	0° 19' 19"	-4° 55' 21"	2° 15' 26"	-4° 23' 15"	0° 55' 41"	15' 10.48"	67° 16' 59"	0.58063
3	0° 50' 36"	-4° 54' 22"	2° 43' 41"	-4° 09' 56"	0° 55' 39"	15' 10.00"	67° 14' 52"	0.57650
4	1° 21' 50"	-4° 53' 22"	3° 11' 54"	-3° 56' 36"	0° 55' 38"	15' 09.53"	67° 12' 52"	0.57237
5	1° 53' 02"	-4° 52' 20"	3° 40' 04"	-3° 43' 16"	0° 55' 36"	15' 09.06"	67° 10' 60"	0.56824
6	2° 24' 12"	-4° 51' 17"	4° 08' 11"	-3° 29' 56"	0° 55' 34"	15' 08.59"	67° 9' 15"	0.56411
7	2° 55' 20"	-4° 50' 12"	4° 36' 16"	-3° 16' 36"	0° 55' 33"	15' 08.13"	67° 7' 37"	0.55997
8	3° 26' 26"	-4° 49' 07"	5° 04' 18"	-3° 03' 16"	0° 55' 31"	15' 07.67"	67° 6' 07"	0.55584
9	3° 57' 30"	-4° 47' 59"	5° 32' 18"	-2° 49' 56"	0° 55' 29"	15' 07.21"	67° 4' 44"	0.55171
10	4° 28' 32"	-4° 46' 51"	6° 00' 16"	-2° 36' 36"	0° 55' 28"	15' 06.76"	67° 3' 28"	0.54758
11	4° 59' 32"	-4° 45' 41"	6° 28' 11"	-2° 23' 17"	0° 55' 26"	15' 06.32"	67° 2' 20"	0.54346
12	5° 30' 30"	-4° 44' 30"	6° 56' 04"	-2° 09' 57"	0° 55' 24"	15' 05.88"	67° 1' 19"	0.53933
13	6° 01' 26"	-4° 43' 17"	7° 23' 55"	-1° 56' 38"	0° 55' 23"	15' 05.44"	67° 0' 25"	0.53520
14	6° 32' 21"	-4° 42' 03"	7° 51' 44"	-1° 43' 19"	0° 55' 21"	15' 05.01"	66° 59' 38"	0.53108
15	7° 03' 13"	-4° 40' 48"	8° 19' 31"	-1° 30' 01"	0° 55' 20"	15' 04.58"	66° 58' 58"	0.52696
16	7° 34' 03"	-4° 39' 32"	8° 47' 16"	-1° 16' 43"	0° 55' 18"	15' 04.15"	66° 58' 25"	0.52284
17	8° 04' 52"	-4° 38' 14"	9° 14' 59"	-1° 03' 25"	0° 55' 16"	15' 03.73"	66° 57' 60"	0.51872
18	8° 35' 39"	-4° 36' 55"	9° 42' 41"	0°-50' 08"	0° 55' 15"	15' 03.32"	66° 57' 41"	0.51461
19	9° 06' 24"	-4° 35' 35"	10° 10' 20"	0°-36' 52"	0° 55' 13"	15' 02.91"	66° 57' 30"	0.51050
20	9° 37' 07"	-4° 34' 14"	10° 37' 58"	0°-23' 36"	0° 55' 12"	15' 02.50"	66° 57' 26"	0.50639
21	10° 07' 48"	-4° 32' 51"	11° 05' 35"	0°-10' 21"	0° 55' 10"	15' 02.10"	66° 57' 28"	0.50229
22	10° 38' 28"	-4° 31' 27"	11° 33' 09"	0° 02' 54"	0° 55' 09"	15' 01.70"	66° 57' 38"	0.49819
23	11° 09' 06"	-4° 30' 02"	12° 00' 43"	0° 16' 08"	0° 55' 08"	15' 01.30"	66° 57' 55"	0.49409
24	11° 39' 42"	-4° 28' 36"	12° 28' 15"	0° 29' 21"	0° 55' 06"	15' 00.91"	66° 58' 18"	0.49000

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	100° 21' 24"	-0.24"	101° 15' 15"	23° 02' 02"	1.0166876	15' 43.88"	23° 26' 14"	-4 m 02 s
1	100° 23' 47"	-0.24"	101° 17' 50"	23° 01' 51"	1.0166884	15' 43.88"	23° 26' 14"	-4 m 02 s
2	100° 26' 10"	-0.23"	101° 20' 25"	23° 01' 40"	1.0166893	15' 43.88"	23° 26' 14"	-4 m 03 s
3	100° 28' 33"	-0.23"	101° 23' 00"	23° 01' 29"	1.0166901	15' 43.88"	23° 26' 14"	-4 m 03 s
4	100° 30' 56"	-0.23"	101° 25' 35"	23° 01' 17"	1.0166910	15' 43.88"	23° 26' 14"	-4 m 04 s
5	100° 33' 19"	-0.23"	101° 28' 10"	23° 01' 06"	1.0166918	15' 43.88"	23° 26' 14"	-4 m 04 s
6	100° 35' 42"	-0.22"	101° 30' 45"	23° 00' 55"	1.0166926	15' 43.87"	23° 26' 14"	-4 m 04 s
7	100° 38' 05"	-0.22"	101° 33' 20"	23° 00' 43"	1.0166934	15' 43.87"	23° 26' 14"	-4 m 05 s
8	100° 40' 28"	-0.22"	101° 35' 55"	23° 00' 32"	1.0166942	15' 43.87"	23° 26' 14"	-4 m 05 s
9	100° 42' 51"	-0.21"	101° 38' 30"	23° 00' 21"	1.0166950	15' 43.87"	23° 26' 14"	-4 m 06 s
10	100° 45' 14"	-0.21"	101° 41' 04"	23° 00' 09"	1.0166958	15' 43.87"	23° 26' 14"	-4 m 06 s
11	100° 47' 37"	-0.21"	101° 43' 39"	22° 59' 58"	1.0166966	15' 43.87"	23° 26' 14"	-4 m 07 s
12	100° 50' 00"	-0.21"	101° 46' 14"	22° 59' 46"	1.0166973	15' 43.87"	23° 26' 14"	-4 m 07 s
13	100° 52' 23"	-0.20"	101° 48' 49"	22° 59' 34"	1.0166981	15' 43.87"	23° 26' 14"	-4 m 08 s
14	100° 54' 46"	-0.20"	101° 51' 24"	22° 59' 23"	1.0166988	15' 43.87"	23° 26' 14"	-4 m 08 s
15	100° 57' 09"	-0.20"	101° 53' 59"	22° 59' 11"	1.0166996	15' 43.87"	23° 26' 14"	-4 m 09 s
16	100° 59' 32"	-0.19"	101° 56' 33"	22° 58' 59"	1.0167003	15' 43.87"	23° 26' 14"	-4 m 09 s
17	101° 01' 55"	-0.19"	101° 59' 08"	22° 58' 47"	1.0167010	15' 43.87"	23° 26' 14"	-4 m 10 s
18	101° 04' 18"	-0.19"	102° 01' 43"	22° 58' 36"	1.0167017	15' 43.87"	23° 26' 14"	-4 m 10 s
19	101° 06' 41"	-0.18"	102° 04' 18"	22° 58' 24"	1.0167024	15' 43.87"	23° 26' 14"	-4 m 11 s
20	101° 09' 04"	-0.18"	102° 06' 53"	22° 58' 12"	1.0167031	15' 43.86"	23° 26' 14"	-4 m 11 s
21	101° 11' 27"	-0.18"	102° 09' 27"	22° 57' 60"	1.0167038	15' 43.86"	23° 26' 14"	-4 m 11 s
22	101° 13' 50"	-0.17"	102° 12' 02"	22° 57' 48"	1.0167045	15' 43.86"	23° 26' 14"	-4 m 12 s
23	101° 16' 13"	-0.17"	102° 14' 37"	22° 57' 36"	1.0167052	15' 43.86"	23° 26' 14"	-4 m 12 s
24	101° 18' 36"	-0.17"	102° 17' 12"	22° 57' 24"	1.0167058	15' 43.86"	23° 26' 14"	-4 m 13 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	11° 39' 42"	-4° 28' 36"	12° 28' 15"	0° 29' 21"	0° 55' 06"	15' 00.91"	66° 58' 18"	0.49000
1	12° 10' 16"	-4° 27' 09"	12° 55' 46"	0° 42' 34"	0° 55' 05"	15' 00.53"	66° 58' 49"	0.48591
2	12° 40' 49"	-4° 25' 40"	13° 23' 15"	0° 55' 45"	0° 55' 03"	15' 00.15"	66° 59' 27"	0.48183
3	13° 11' 20"	-4° 24' 10"	13° 50' 44"	1° 08' 56"	0° 55' 02"	14' 59.77"	67° 0' 11"	0.47775
4	13° 41' 50"	-4° 22' 39"	14° 18' 11"	1° 22' 06"	0° 55' 01"	14' 59.40"	67° 1' 03"	0.47368
5	14° 12' 18"	-4° 21' 07"	14° 45' 37"	1° 35' 14"	0° 54' 59"	14' 59.03"	67° 2' 01"	0.46961
6	14° 42' 44"	-4° 19' 34"	15° 13' 02"	1° 48' 22"	0° 54' 58"	14' 58.67"	67° 3' 06"	0.46555
7	15° 13' 09"	-4° 17' 59"	15° 40' 27"	2° 01' 29"	0° 54' 57"	14' 58.31"	67° 4' 18"	0.46149
8	15° 43' 32"	-4° 16' 24"	16° 07' 50"	2° 14' 35"	0° 54' 55"	14' 57.96"	67° 5' 37"	0.45744
9	16° 13' 54"	-4° 14' 47"	16° 35' 13"	2° 27' 39"	0° 54' 54"	14' 57.61"	67° 7' 03"	0.45340
10	16° 44' 14"	-4° 13' 09"	17° 02' 35"	2° 40' 43"	0° 54' 53"	14' 57.27"	67° 8' 36"	0.44936
11	17° 14' 33"	-4° 11' 30"	17° 29' 56"	2° 53' 45"	0° 54' 51"	14' 56.93"	67° 10' 16"	0.44533
12	17° 44' 50"	-4° 09' 50"	17° 57' 17"	3° 06' 46"	0° 54' 50"	14' 56.59"	67° 12' 02"	0.44130
13	18° 15' 06"	-4° 08' 09"	18° 24' 38"	3° 19' 46"	0° 54' 49"	14' 56.26"	67° 13' 55"	0.43728
14	18° 45' 20"	-4° 06' 27"	18° 51' 57"	3° 32' 44"	0° 54' 48"	14' 55.94"	67° 15' 55"	0.43327
15	19° 15' 33"	-4° 04' 44"	19° 19' 17"	3° 45' 41"	0° 54' 47"	14' 55.62"	67° 18' 02"	0.42927
16	19° 45' 45"	-4° 02' 59"	19° 46' 36"	3° 58' 37"	0° 54' 46"	14' 55.30"	67° 20' 16"	0.42527
17	20° 15' 55"	-4° 01' 14"	20° 13' 55"	4° 11' 31"	0° 54' 44"	14' 54.99"	67° 22' 36"	0.42128
18	20° 46' 04"	-3° 59' 27"	20° 41' 14"	4° 24' 24"	0° 54' 43"	14' 54.68"	67° 25' 04"	0.41730
19	21° 16' 12"	-3° 57' 40"	21° 08' 32"	4° 37' 15"	0° 54' 42"	14' 54.38"	67° 27' 38"	0.41333
20	21° 46' 18"	-3° 55' 52"	21° 35' 51"	4° 50' 05"	0° 54' 41"	14' 54.08"	67° 30' 19"	0.40937
21	22° 16' 23"	-3° 54' 02"	22° 03' 10"	5° 02' 53"	0° 54' 40"	14' 53.79"	67° 33' 06"	0.40541
22	22° 46' 27"	-3° 52' 12"	22° 30' 28"	5° 15' 40"	0° 54' 39"	14' 53.50"	67° 36' 01"	0.40147
23	23° 16' 30"	-3° 50' 20"	22° 57' 47"	5° 28' 24"	0° 54' 38"	14' 53.22"	67° 39' 02"	0.39753
24	23° 46' 31"	-3° 48' 28"	23° 25' 06"	5° 41' 08"	0° 54' 37"	14' 52.94"	67° 42' 10"	0.39360

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	101° 18' 36"	-0.17"	102° 17' 12"	22° 57' 24"	1.0167058	15' 43.86"	23° 26' 14"	-4 m 13 s
1	101° 20' 59"	-0.16"	102° 19' 47"	22° 57' 12"	1.0167065	15' 43.86"	23° 26' 14"	-4 m 13 s
2	101° 23' 22"	-0.16"	102° 22' 21"	22° 56' 59"	1.0167071	15' 43.86"	23° 26' 14"	-4 m 14 s
3	101° 25' 45"	-0.16"	102° 24' 56"	22° 56' 47"	1.0167078	15' 43.86"	23° 26' 14"	-4 m 14 s
4	101° 28' 08"	-0.15"	102° 27' 31"	22° 56' 35"	1.0167084	15' 43.86"	23° 26' 14"	-4 m 15 s
5	101° 30' 31"	-0.15"	102° 30' 05"	22° 56' 23"	1.0167090	15' 43.86"	23° 26' 14"	-4 m 15 s
6	101° 32' 54"	-0.15"	102° 32' 40"	22° 56' 10"	1.0167096	15' 43.86"	23° 26' 14"	-4 m 16 s
7	101° 35' 17"	-0.14"	102° 35' 15"	22° 55' 58"	1.0167102	15' 43.86"	23° 26' 14"	-4 m 16 s
8	101° 37' 40"	-0.14"	102° 37' 50"	22° 55' 46"	1.0167108	15' 43.86"	23° 26' 14"	-4 m 17 s
9	101° 40' 04"	-0.14"	102° 40' 24"	22° 55' 33"	1.0167114	15' 43.86"	23° 26' 14"	-4 m 17 s
10	101° 42' 27"	-0.13"	102° 42' 59"	22° 55' 21"	1.0167120	15' 43.86"	23° 26' 14"	-4 m 17 s
11	101° 44' 50"	-0.13"	102° 45' 34"	22° 55' 08"	1.0167125	15' 43.86"	23° 26' 14"	-4 m 18 s
12	101° 47' 13"	-0.12"	102° 48' 08"	22° 54' 56"	1.0167131	15' 43.86"	23° 26' 14"	-4 m 18 s
13	101° 49' 36"	-0.12"	102° 50' 43"	22° 54' 43"	1.0167136	15' 43.85"	23° 26' 14"	-4 m 19 s
14	101° 51' 59"	-0.12"	102° 53' 18"	22° 54' 30"	1.0167142	15' 43.85"	23° 26' 14"	-4 m 19 s
15	101° 54' 22"	-0.11"	102° 55' 52"	22° 54' 18"	1.0167147	15' 43.85"	23° 26' 14"	-4 m 20 s
16	101° 56' 45"	-0.11"	102° 58' 27"	22° 54' 05"	1.0167152	15' 43.85"	23° 26' 14"	-4 m 20 s
17	101° 59' 08"	-0.10"	103° 01' 02"	22° 53' 52"	1.0167157	15' 43.85"	23° 26' 14"	-4 m 21 s
18	102° 01' 31"	-0.10"	103° 03' 36"	22° 53' 39"	1.0167162	15' 43.85"	23° 26' 14"	-4 m 21 s
19	102° 03' 54"	-0.10"	103° 06' 11"	22° 53' 26"	1.0167167	15' 43.85"	23° 26' 14"	-4 m 22 s
20	102° 06' 17"	-0.09"	103° 08' 46"	22° 53' 13"	1.0167172	15' 43.85"	23° 26' 14"	-4 m 22 s
21	102° 08' 40"	-0.09"	103° 11' 20"	22° 53' 00"	1.0167177	15' 43.85"	23° 26' 14"	-4 m 22 s
22	102° 11' 03"	-0.08"	103° 13' 55"	22° 52' 47"	1.0167181	15' 43.85"	23° 26' 14"	-4 m 23 s
23	102° 13' 26"	-0.08"	103° 16' 29"	22° 52' 34"	1.0167186	15' 43.85"	23° 26' 14"	-4 m 23 s
24	102° 15' 49"	-0.07"	103° 19' 04"	22° 52' 21"	1.0167190	15' 43.85"	23° 26' 14"	-4 m 24 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	23° 46' 31"	-3° 48' 28"	23° 25' 06"	5° 41' 08"	0° 54' 37"	14' 52.94"	67° 42' 10"	0.39360
1	24° 16' 31"	-3° 46' 35"	23° 52' 25"	5° 53' 49"	0° 54' 36"	14' 52.66"	67° 45' 25"	0.38968
2	24° 46' 30"	-3° 44' 40"	24° 19' 45"	6° 06' 29"	0° 54' 35"	14' 52.39"	67° 48' 47"	0.38577
3	25° 16' 28"	-3° 42' 45"	24° 47' 04"	6° 19' 07"	0° 54' 34"	14' 52.13"	67° 52' 15"	0.38187
4	25° 46' 25"	-3° 40' 49"	25° 14' 25"	6° 31' 43"	0° 54' 33"	14' 51.87"	67° 55' 50"	0.37798
5	26° 16' 21"	-3° 38' 51"	25° 41' 46"	6° 44' 17"	0° 54' 32"	14' 51.61"	67° 59' 32"	0.37410
6	26° 46' 15"	-3° 36' 53"	26° 09' 07"	6° 56' 49"	0° 54' 31"	14' 51.36"	68° 3' 21"	0.37023
7	27° 16' 09"	-3° 34' 54"	26° 36' 29"	7° 09' 19"	0° 54' 30"	14' 51.12"	68° 7' 16"	0.36637
8	27° 46' 01"	-3° 32' 54"	27° 03' 51"	7° 21' 48"	0° 54' 29"	14' 50.87"	68° 11' 18"	0.36252
9	28° 15' 53"	-3° 30' 53"	27° 31' 15"	7° 34' 14"	0° 54' 28"	14' 50.64"	68° 15' 28"	0.35868
10	28° 45' 43"	-3° 28' 52"	27° 58' 39"	7° 46' 38"	0° 54' 28"	14' 50.40"	68° 19' 43"	0.35486
11	29° 15' 33"	-3° 26' 49"	28° 26' 04"	7° 59' 00"	0° 54' 27"	14' 50.18"	68° 24' 06"	0.35104
12	29° 45' 21"	-3° 24' 46"	28° 53' 30"	8° 11' 20"	0° 54' 26"	14' 49.95"	68° 28' 35"	0.34724
13	30° 15' 09"	-3° 22' 41"	29° 20' 57"	8° 23' 38"	0° 54' 25"	14' 49.73"	68° 33' 12"	0.34344
14	30° 44' 56"	-3° 20' 36"	29° 48' 25"	8° 35' 53"	0° 54' 24"	14' 49.52"	68° 37' 55"	0.33966
15	31° 14' 42"	-3° 18' 30"	30° 15' 54"	8° 48' 06"	0° 54' 24"	14' 49.31"	68° 42' 45"	0.33589
16	31° 44' 27"	-3° 16' 23"	30° 43' 24"	9° 00' 17"	0° 54' 23"	14' 49.11"	68° 47' 41"	0.33213
17	32° 14' 11"	-3° 14' 16"	31° 10' 55"	9° 12' 26"	0° 54' 22"	14' 48.91"	68° 52' 45"	0.32839
18	32° 43' 54"	-3° 12' 07"	31° 38' 27"	9° 24' 32"	0° 54' 21"	14' 48.71"	68° 57' 55"	0.32466
19	33° 13' 37"	-3° 09' 58"	32° 06' 01"	9° 36' 36"	0° 54' 21"	14' 48.52"	69° 3' 13"	0.32094
20	33° 43' 18"	-3° 07' 48"	32° 33' 36"	9° 48' 37"	0° 54' 20"	14' 48.33"	69° 8' 37"	0.31723
21	34° 12' 59"	-3° 05' 37"	33° 01' 13"	10° 00' 36"	0° 54' 19"	14' 48.15"	69° 14' 08"	0.31354
22	34° 42' 40"	-3° 03' 25"	33° 28' 51"	10° 12' 32"	0° 54' 19"	14' 47.98"	69° 19' 46"	0.30986
23	35° 12' 19"	-3° 01' 13"	33° 56' 31"	10° 24' 26"	0° 54' 18"	14' 47.80"	69° 25' 31"	0.30619
24	35° 41' 58"	-2° 58' 59"	34° 24' 12"	10° 36' 17"	0° 54' 17"	14' 47.64"	69° 31' 22"	0.30253

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	102° 15' 49"	-0.07"	103° 19' 04"	22° 52' 21"	1.0167190	15' 43.85"	23° 26' 14"	-4 m 24 s
1	102° 18' 12"	-0.07"	103° 21' 38"	22° 52' 08"	1.0167195	15' 43.85"	23° 26' 14"	-4 m 24 s
2	102° 20' 35"	-0.07"	103° 24' 13"	22° 51' 55"	1.0167199	15' 43.85"	23° 26' 14"	-4 m 25 s
3	102° 22' 58"	-0.06"	103° 26' 48"	22° 51' 42"	1.0167203	15' 43.85"	23° 26' 14"	-4 m 25 s
4	102° 25' 21"	-0.06"	103° 29' 22"	22° 51' 29"	1.0167207	15' 43.85"	23° 26' 14"	-4 m 26 s
5	102° 27' 44"	-0.05"	103° 31' 57"	22° 51' 15"	1.0167211	15' 43.85"	23° 26' 14"	-4 m 26 s
6	102° 30' 07"	-0.05"	103° 34' 31"	22° 51' 02"	1.0167215	15' 43.85"	23° 26' 14"	-4 m 26 s
7	102° 32' 30"	-0.04"	103° 37' 06"	22° 50' 49"	1.0167219	15' 43.85"	23° 26' 14"	-4 m 27 s
8	102° 34' 53"	-0.04"	103° 39' 40"	22° 50' 35"	1.0167223	15' 43.85"	23° 26' 14"	-4 m 27 s
9	102° 37' 16"	-0.03"	103° 42' 15"	22° 50' 22"	1.0167226	15' 43.85"	23° 26' 14"	-4 m 28 s
10	102° 39' 39"	-0.03"	103° 44' 49"	22° 50' 08"	1.0167230	15' 43.85"	23° 26' 14"	-4 m 28 s
11	102° 42' 02"	-0.02"	103° 47' 24"	22° 49' 55"	1.0167233	15' 43.85"	23° 26' 14"	-4 m 29 s
12	102° 44' 25"	-0.02"	103° 49' 58"	22° 49' 41"	1.0167237	15' 43.85"	23° 26' 14"	-4 m 29 s
13	102° 46' 48"	-0.02"	103° 52' 33"	22° 49' 28"	1.0167240	15' 43.85"	23° 26' 14"	-4 m 30 s
14	102° 49' 11"	-0.01"	103° 55' 07"	22° 49' 14"	1.0167243	15' 43.84"	23° 26' 14"	-4 m 30 s
15	102° 51' 34"	-0.01"	103° 57' 42"	22° 49' 00"	1.0167246	15' 43.84"	23° 26' 14"	-4 m 30 s
16	102° 53' 57"	-0.00"	104° 00' 16"	22° 48' 46"	1.0167249	15' 43.84"	23° 26' 14"	-4 m 31 s
17	102° 56' 20"	0.00"	104° 02' 51"	22° 48' 33"	1.0167252	15' 43.84"	23° 26' 14"	-4 m 31 s
18	102° 58' 43"	0.01"	104° 05' 25"	22° 48' 19"	1.0167255	15' 43.84"	23° 26' 14"	-4 m 32 s
19	103° 01' 06"	0.01"	104° 07' 59"	22° 48' 05"	1.0167258	15' 43.84"	23° 26' 14"	-4 m 32 s
20	103° 03' 30"	0.02"	104° 10' 34"	22° 47' 51"	1.0167260	15' 43.84"	23° 26' 14"	-4 m 33 s
21	103° 05' 53"	0.02"	104° 13' 08"	22° 47' 37"	1.0167263	15' 43.84"	23° 26' 14"	-4 m 33 s
22	103° 08' 16"	0.03"	104° 15' 43"	22° 47' 23"	1.0167265	15' 43.84"	23° 26' 14"	-4 m 33 s
23	103° 10' 39"	0.03"	104° 18' 17"	22° 47' 09"	1.0167267	15' 43.84"	23° 26' 14"	-4 m 34 s
24	103° 13' 02"	0.04"	104° 20' 52"	22° 46' 55"	1.0167270	15' 43.84"	23° 26' 14"	-4 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	35° 41' 58"	-2° 58' 59"	34° 24' 12"	10° 36' 17"	0° 54' 17"	14' 47.64"	69° 31' 22"	0.30253
1	36° 11' 36"	-2° 56' 45"	34° 51' 55"	10° 48' 06"	0° 54' 17"	14' 47.47"	69° 37' 21"	0.29889
2	36° 41' 14"	-2° 54' 31"	35° 19' 39"	10° 59' 52"	0° 54' 16"	14' 47.31"	69° 43' 26"	0.29527
3	37° 10' 51"	-2° 52' 15"	35° 47' 25"	11° 11' 35"	0° 54' 16"	14' 47.16"	69° 49' 39"	0.29165
4	37° 40' 27"	-2° 49' 59"	36° 15' 13"	11° 23' 15"	0° 54' 15"	14' 47.01"	69° 55' 58"	0.28805
5	38° 10' 03"	-2° 47' 42"	36° 43' 03"	11° 34' 53"	0° 54' 15"	14' 46.86"	70° 2' 25"	0.28447
6	38° 39' 38"	-2° 45' 25"	37° 10' 55"	11° 46' 27"	0° 54' 14"	14' 46.72"	70° 8' 58"	0.28090
7	39° 09' 12"	-2° 43' 07"	37° 38' 48"	11° 57' 59"	0° 54' 14"	14' 46.59"	70° 15' 39"	0.27735
8	39° 38' 46"	-2° 40' 48"	38° 06' 44"	12° 09' 28"	0° 54' 13"	14' 46.45"	70° 22' 26"	0.27381
9	40° 08' 20"	-2° 38' 28"	38° 34' 42"	12° 20' 54"	0° 54' 13"	14' 46.33"	70° 29' 21"	0.27028
10	40° 37' 53"	-2° 36' 08"	39° 02' 41"	12° 32' 16"	0° 54' 12"	14' 46.20"	70° 36' 22"	0.26677
11	41° 07' 25"	-2° 33' 47"	39° 30' 43"	12° 43' 36"	0° 54' 12"	14' 46.09"	70° 43' 31"	0.26328
12	41° 36' 58"	-2° 31' 25"	39° 58' 47"	12° 54' 53"	0° 54' 11"	14' 45.97"	70° 50' 47"	0.25980
13	42° 06' 29"	-2° 29' 03"	40° 26' 53"	13° 06' 07"	0° 54' 11"	14' 45.86"	70° 58' 09"	0.25634
14	42° 36' 01"	-2° 26' 40"	40° 55' 02"	13° 17' 17"	0° 54' 10"	14' 45.76"	71° 5' 39"	0.25289
15	43° 05' 31"	-2° 24' 17"	41° 23' 13"	13° 28' 24"	0° 54' 10"	14' 45.66"	71° 13' 17"	0.24946
16	43° 35' 02"	-2° 21' 53"	41° 51' 26"	13° 39' 28"	0° 54' 10"	14' 45.56"	71° 21' 01"	0.24604
17	44° 04' 32"	-2° 19' 28"	42° 19' 42"	13° 50' 29"	0° 54' 09"	14' 45.47"	71° 28' 52"	0.24264
18	44° 34' 02"	-2° 17' 03"	42° 47' 60"	14° 01' 26"	0° 54' 09"	14' 45.38"	71° 36' 51"	0.23926
19	45° 03' 32"	-2° 14' 37"	43° 16' 20"	14° 12' 20"	0° 54' 09"	14' 45.29"	71° 44' 57"	0.23590
20	45° 33' 01"	-2° 12' 11"	43° 44' 43"	14° 23' 11"	0° 54' 08"	14' 45.22"	71° 53' 11"	0.23255
21	46° 02' 30"	-2° 09' 44"	44° 13' 09"	14° 33' 58"	0° 54' 08"	14' 45.14"	72° 1' 31"	0.22922
22	46° 31' 59"	-2° 07' 16"	44° 41' 38"	14° 44' 42"	0° 54' 08"	14' 45.07"	72° 9' 59"	0.22591
23	47° 01' 27"	-2° 04' 48"	45° 10' 09"	14° 55' 22"	0° 54' 08"	14' 45.00"	72° 18' 35"	0.22261
24	47° 30' 55"	-2° 02' 19"	45° 38' 42"	15° 05' 58"	0° 54' 07"	14' 44.94"	72° 27' 17"	0.21933

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	103° 13' 02"	0.04"	104° 20' 52"	22° 46' 55"	1.0167270	15' 43.84"	23° 26' 14"	-4 m 34 s
1	103° 15' 25"	0.04"	104° 23' 26"	22° 46' 41"	1.0167272	15' 43.84"	23° 26' 14"	-4 m 35 s
2	103° 17' 48"	0.05"	104° 26' 00"	22° 46' 27"	1.0167274	15' 43.84"	23° 26' 14"	-4 m 35 s
3	103° 20' 11"	0.05"	104° 28' 35"	22° 46' 13"	1.0167276	15' 43.84"	23° 26' 14"	-4 m 36 s
4	103° 22' 34"	0.06"	104° 31' 09"	22° 45' 58"	1.0167278	15' 43.84"	23° 26' 14"	-4 m 36 s
5	103° 24' 57"	0.06"	104° 33' 43"	22° 45' 44"	1.0167279	15' 43.84"	23° 26' 14"	-4 m 36 s
6	103° 27' 20"	0.07"	104° 36' 18"	22° 45' 30"	1.0167281	15' 43.84"	23° 26' 14"	-4 m 37 s
7	103° 29' 43"	0.07"	104° 38' 52"	22° 45' 15"	1.0167283	15' 43.84"	23° 26' 14"	-4 m 37 s
8	103° 32' 06"	0.08"	104° 41' 26"	22° 45' 01"	1.0167284	15' 43.84"	23° 26' 14"	-4 m 38 s
9	103° 34' 29"	0.08"	104° 44' 01"	22° 44' 46"	1.0167285	15' 43.84"	23° 26' 14"	-4 m 38 s
10	103° 36' 52"	0.09"	104° 46' 35"	22° 44' 32"	1.0167287	15' 43.84"	23° 26' 14"	-4 m 39 s
11	103° 39' 15"	0.09"	104° 49' 09"	22° 44' 17"	1.0167288	15' 43.84"	23° 26' 14"	-4 m 39 s
12	103° 41' 38"	0.10"	104° 51' 44"	22° 44' 03"	1.0167289	15' 43.84"	23° 26' 14"	-4 m 39 s
13	103° 44' 01"	0.10"	104° 54' 18"	22° 43' 48"	1.0167290	15' 43.84"	23° 26' 14"	-4 m 40 s
14	103° 46' 24"	0.11"	104° 56' 52"	22° 43' 34"	1.0167291	15' 43.84"	23° 26' 14"	-4 m 40 s
15	103° 48' 47"	0.11"	104° 59' 26"	22° 43' 19"	1.0167292	15' 43.84"	23° 26' 14"	-4 m 41 s
16	103° 51' 10"	0.12"	105° 02' 01"	22° 43' 04"	1.0167292	15' 43.84"	23° 26' 14"	-4 m 41 s
17	103° 53' 33"	0.13"	105° 04' 35"	22° 42' 49"	1.0167293	15' 43.84"	23° 26' 14"	-4 m 42 s
18	103° 55' 56"	0.13"	105° 07' 09"	22° 42' 35"	1.0167293	15' 43.84"	23° 26' 14"	-4 m 42 s
19	103° 58' 19"	0.14"	105° 09' 43"	22° 42' 20"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 42 s
20	104° 00' 42"	0.14"	105° 12' 18"	22° 42' 05"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 43 s
21	104° 03' 06"	0.15"	105° 14' 52"	22° 41' 50"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 43 s
22	104° 05' 29"	0.15"	105° 17' 26"	22° 41' 35"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 44 s
23	104° 07' 52"	0.16"	105° 20' 00"	22° 41' 20"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 44 s
24	104° 10' 15"	0.16"	105° 22' 34"	22° 41' 05"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 45 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	47° 30' 55"	-2° 02' 19"	45° 38' 42"	15° 05' 58"	0° 54' 07"	14' 44.94"	72° 27' 17"	0.21933
1	48° 00' 24"	-1° 59' 50"	46° 07' 19"	15° 16' 31"	0° 54' 07"	14' 44.88"	72° 36' 07"	0.21607
2	48° 29' 51"	-1° 57' 21"	46° 35' 58"	15° 26' 60"	0° 54' 07"	14' 44.83"	72° 45' 05"	0.21283
3	48° 59' 19"	-1° 54' 51"	47° 04' 40"	15° 37' 25"	0° 54' 07"	14' 44.78"	72° 54' 10"	0.20960
4	49° 28' 47"	-1° 52' 20"	47° 33' 25"	15° 47' 47"	0° 54' 07"	14' 44.73"	73° 3' 23"	0.20639
5	49° 58' 15"	-1° 49' 49"	48° 02' 13"	15° 58' 05"	0° 54' 07"	14' 44.69"	73° 12' 43"	0.20321
6	50° 27' 42"	-1° 47' 17"	48° 31' 04"	16° 08' 19"	0° 54' 06"	14' 44.65"	73° 22' 10"	0.20004
7	50° 57' 09"	-1° 44' 45"	48° 59' 58"	16° 18' 29"	0° 54' 06"	14' 44.62"	73° 31' 46"	0.19689
8	51° 26' 37"	-1° 42' 13"	49° 28' 55"	16° 28' 35"	0° 54' 06"	14' 44.59"	73° 41' 29"	0.19375
9	51° 56' 04"	-1° 39' 40"	49° 57' 55"	16° 38' 38"	0° 54' 06"	14' 44.57"	73° 51' 20"	0.19064
10	52° 25' 31"	-1° 37' 06"	50° 26' 57"	16° 48' 36"	0° 54' 06"	14' 44.55"	74° 1' 18"	0.18755
11	52° 54' 58"	-1° 34' 33"	50° 56' 04"	16° 58' 30"	0° 54' 06"	14' 44.53"	74° 11' 24"	0.18447
12	53° 24' 26"	-1° 31' 58"	51° 25' 13"	17° 08' 20"	0° 54' 06"	14' 44.52"	74° 21' 38"	0.18142
13	53° 53' 53"	-1° 29' 24"	51° 54' 25"	17° 18' 06"	0° 54' 06"	14' 44.51"	74° 32' 00"	0.17838
14	54° 23' 20"	-1° 26' 49"	52° 23' 41"	17° 27' 47"	0° 54' 06"	14' 44.50"	74° 42' 30"	0.17537
15	54° 52' 48"	-1° 24' 13"	52° 52' 60"	17° 37' 25"	0° 54' 06"	14' 44.50"	74° 53' 08"	0.17238
16	55° 22' 15"	-1° 21' 38"	53° 22' 22"	17° 46' 58"	0° 54' 06"	14' 44.50"	75° 3' 54"	0.16940
17	55° 51' 43"	-1° 19' 01"	53° 51' 48"	17° 56' 27"	0° 54' 06"	14' 44.51"	75° 14' 48"	0.16645
18	56° 21' 11"	-1° 16' 25"	54° 21' 16"	18° 05' 51"	0° 54' 06"	14' 44.52"	75° 25' 50"	0.16351
19	56° 50' 39"	-1° 13' 48"	54° 50' 49"	18° 15' 11"	0° 54' 06"	14' 44.53"	75° 36' 60"	0.16060
20	57° 20' 07"	-1° 11' 11"	55° 20' 24"	18° 24' 26"	0° 54' 06"	14' 44.55"	75° 48' 18"	0.15771
21	57° 49' 35"	-1° 08' 34"	55° 50' 03"	18° 33' 37"	0° 54' 06"	14' 44.57"	75° 59' 45"	0.15484
22	58° 19' 03"	-1° 05' 56"	56° 19' 45"	18° 42' 44"	0° 54' 06"	14' 44.60"	76° 11' 20"	0.15199
23	58° 48' 32"	-1° 03' 18"	56° 49' 31"	18° 51' 45"	0° 54' 06"	14' 44.63"	76° 23' 03"	0.14916
24	59° 18' 01"	-1° 00' 39"	57° 19' 21"	19° 00' 42"	0° 54' 06"	14' 44.66"	76° 34' 55"	0.14635

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	104° 10' 15"	0.16"	105° 22' 34"	22° 41' 05"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 45 s
1	104° 12' 38"	0.17"	105° 25' 08"	22° 40' 50"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 45 s
2	104° 15' 01"	0.17"	105° 27' 43"	22° 40' 35"	1.0167294	15' 43.84"	23° 26' 14"	-4 m 45 s
3	104° 17' 24"	0.18"	105° 30' 17"	22° 40' 19"	1.0167293	15' 43.84"	23° 26' 14"	-4 m 46 s
4	104° 19' 47"	0.18"	105° 32' 51"	22° 40' 04"	1.0167293	15' 43.84"	23° 26' 14"	-4 m 46 s
5	104° 22' 10"	0.19"	105° 35' 25"	22° 39' 49"	1.0167292	15' 43.84"	23° 26' 14"	-4 m 47 s
6	104° 24' 33"	0.19"	105° 37' 59"	22° 39' 34"	1.0167292	15' 43.84"	23° 26' 14"	-4 m 47 s
7	104° 26' 56"	0.20"	105° 40' 33"	22° 39' 18"	1.0167291	15' 43.84"	23° 26' 14"	-4 m 47 s
8	104° 29' 19"	0.21"	105° 43' 07"	22° 39' 03"	1.0167290	15' 43.84"	23° 26' 14"	-4 m 48 s
9	104° 31' 42"	0.21"	105° 45' 42"	22° 38' 47"	1.0167289	15' 43.84"	23° 26' 14"	-4 m 48 s
10	104° 34' 05"	0.22"	105° 48' 16"	22° 38' 32"	1.0167288	15' 43.84"	23° 26' 14"	-4 m 49 s
11	104° 36' 28"	0.22"	105° 50' 50"	22° 38' 16"	1.0167287	15' 43.84"	23° 26' 14"	-4 m 49 s
12	104° 38' 51"	0.23"	105° 53' 24"	22° 38' 01"	1.0167285	15' 43.84"	23° 26' 14"	-4 m 50 s
13	104° 41' 14"	0.23"	105° 55' 58"	22° 37' 45"	1.0167284	15' 43.84"	23° 26' 14"	-4 m 50 s
14	104° 43' 37"	0.24"	105° 58' 32"	22° 37' 30"	1.0167283	15' 43.84"	23° 26' 14"	-4 m 50 s
15	104° 46' 00"	0.24"	106° 01' 06"	22° 37' 14"	1.0167281	15' 43.84"	23° 26' 14"	-4 m 51 s
16	104° 48' 23"	0.25"	106° 03' 40"	22° 36' 58"	1.0167279	15' 43.84"	23° 26' 14"	-4 m 51 s
17	104° 50' 46"	0.25"	106° 06' 14"	22° 36' 43"	1.0167277	15' 43.84"	23° 26' 14"	-4 m 52 s
18	104° 53' 10"	0.26"	106° 08' 48"	22° 36' 27"	1.0167276	15' 43.84"	23° 26' 14"	-4 m 52 s
19	104° 55' 33"	0.26"	106° 11' 22"	22° 36' 11"	1.0167274	15' 43.84"	23° 26' 14"	-4 m 52 s
20	104° 57' 56"	0.27"	106° 13' 56"	22° 35' 55"	1.0167272	15' 43.84"	23° 26' 14"	-4 m 53 s
21	105° 00' 19"	0.28"	106° 16' 30"	22° 35' 39"	1.0167269	15' 43.84"	23° 26' 14"	-4 m 53 s
22	105° 02' 42"	0.28"	106° 19' 04"	22° 35' 23"	1.0167267	15' 43.84"	23° 26' 14"	-4 m 54 s
23	105° 05' 05"	0.29"	106° 21' 38"	22° 35' 07"	1.0167265	15' 43.84"	23° 26' 14"	-4 m 54 s
24	105° 07' 28"	0.29"	106° 24' 12"	22° 34' 51"	1.0167262	15' 43.84"	23° 26' 14"	-4 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	59° 18' 01"	-1° 00' 39"	57° 19' 21"	19° 00' 42"	0° 54' 06"	14' 44.66"	76° 34' 55"	0.14635
1	59° 47' 30"	0°-58' 01"	57° 49' 13"	19° 09' 35"	0° 54' 07"	14' 44.70"	76° 46' 56"	0.14357
2	60° 16' 59"	0°-55' 22"	58° 19' 10"	19° 18' 22"	0° 54' 07"	14' 44.74"	76° 59' 05"	0.14081
3	60° 46' 29"	0°-52' 42"	58° 49' 10"	19° 27' 05"	0° 54' 07"	14' 44.79"	77° 11' 23"	0.13806
4	61° 15' 59"	0°-50' 03"	59° 19' 13"	19° 35' 43"	0° 54' 07"	14' 44.83"	77° 23' 50"	0.13535
5	61° 45' 29"	0°-47' 23"	59° 49' 20"	19° 44' 16"	0° 54' 07"	14' 44.88"	77° 36' 25"	0.13265
6	62° 14' 60"	0°-44' 43"	60° 19' 31"	19° 52' 44"	0° 54' 07"	14' 44.94"	77° 49' 10"	0.12998
7	62° 44' 31"	0°-42' 03"	60° 49' 45"	20° 01' 07"	0° 54' 08"	14' 45.00"	78° 2' 03"	0.12733
8	63° 14' 02"	0°-39' 23"	61° 20' 03"	20° 09' 25"	0° 54' 08"	14' 45.06"	78° 15' 06"	0.12470
9	63° 43' 33"	0°-36' 42"	61° 50' 24"	20° 17' 38"	0° 54' 08"	14' 45.13"	78° 28' 18"	0.12209
10	64° 13' 06"	0°-34' 01"	62° 20' 49"	20° 25' 46"	0° 54' 08"	14' 45.20"	78° 41' 39"	0.11951
11	64° 42' 38"	0°-31' 20"	62° 51' 18"	20° 33' 49"	0° 54' 09"	14' 45.27"	78° 55' 10"	0.11695
12	65° 12' 11"	0°-28' 39"	63° 21' 50"	20° 41' 46"	0° 54' 09"	14' 45.35"	79° 8' 51"	0.11442
13	65° 41' 44"	0°-25' 58"	63° 52' 26"	20° 49' 38"	0° 54' 09"	14' 45.43"	79° 22' 41"	0.11191
14	66° 11' 18"	0°-23' 17"	64° 23' 06"	20° 57' 25"	0° 54' 10"	14' 45.51"	79° 36' 41"	0.10942
15	66° 40' 52"	0°-20' 35"	64° 53' 50"	21° 05' 07"	0° 54' 10"	14' 45.59"	79° 50' 51"	0.10695
16	67° 10' 27"	0°-17' 53"	65° 24' 37"	21° 12' 43"	0° 54' 10"	14' 45.68"	80° 5' 11"	0.10451
17	67° 40' 02"	0°-15' 12"	65° 55' 28"	21° 20' 13"	0° 54' 11"	14' 45.78"	80° 19' 41"	0.10210
18	68° 09' 38"	0°-12' 30"	66° 26' 22"	21° 27' 38"	0° 54' 11"	14' 45.87"	80° 34' 22"	0.09971
19	68° 39' 14"	0° -9' 50"	66° 57' 21"	21° 34' 55"	0° 54' 11"	14' 45.97"	80° 49' 10"	0.09734
20	69° 08' 51"	0° -7' 08"	67° 28' 23"	21° 42' 09"	0° 54' 12"	14' 46.08"	81° 4' 12"	0.09500
21	69° 38' 28"	0° -4' 26"	67° 59' 28"	21° 49' 17"	0° 54' 12"	14' 46.18"	81° 19' 25"	0.09269
22	70° 08' 06"	0° -1' 44"	68° 30' 38"	21° 56' 20"	0° 54' 12"	14' 46.29"	81° 34' 50"	0.09039
23	70° 37' 45"	0° 00' 58"	69° 01' 51"	22° 03' 16"	0° 54' 13"	14' 46.41"	81° 50' 25"	0.08813
24	71° 07' 24"	0° 03' 41"	69° 33' 07"	22° 10' 07"	0° 54' 13"	14' 46.52"	82° 6' 12"	0.08589

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	105° 07' 28"	0.29"	106° 24' 12"	22° 34' 51"	1.0167262	15' 43.84"	23° 26' 14"	-4 m 54 s
1	105° 09' 51"	0.30"	106° 26' 46"	22° 34' 35"	1.0167260	15' 43.84"	23° 26' 14"	-4 m 55 s
2	105° 12' 14"	0.30"	106° 29' 20"	22° 34' 19"	1.0167257	15' 43.84"	23° 26' 14"	-4 m 55 s
3	105° 14' 37"	0.31"	106° 31' 54"	22° 34' 03"	1.0167254	15' 43.84"	23° 26' 14"	-4 m 56 s
4	105° 17' 00"	0.31"	106° 34' 28"	22° 33' 47"	1.0167251	15' 43.84"	23° 26' 14"	-4 m 56 s
5	105° 19' 23"	0.32"	106° 37' 02"	22° 33' 30"	1.0167248	15' 43.84"	23° 26' 14"	-4 m 56 s
6	105° 21' 46"	0.32"	106° 39' 35"	22° 33' 14"	1.0167245	15' 43.84"	23° 26' 14"	-4 m 57 s
7	105° 24' 09"	0.33"	106° 42' 09"	22° 32' 58"	1.0167242	15' 43.84"	23° 26' 14"	-4 m 57 s
8	105° 26' 32"	0.33"	106° 44' 43"	22° 32' 41"	1.0167239	15' 43.85"	23° 26' 14"	-4 m 58 s
9	105° 28' 55"	0.34"	106° 47' 17"	22° 32' 25"	1.0167235	15' 43.85"	23° 26' 14"	-4 m 58 s
10	105° 31' 18"	0.35"	106° 49' 51"	22° 32' 08"	1.0167232	15' 43.85"	23° 26' 14"	-4 m 58 s
11	105° 33' 41"	0.35"	106° 52' 25"	22° 31' 52"	1.0167228	15' 43.85"	23° 26' 14"	-4 m 59 s
12	105° 36' 05"	0.36"	106° 54' 59"	22° 31' 35"	1.0167225	15' 43.85"	23° 26' 14"	-4 m 59 s
13	105° 38' 28"	0.36"	106° 57' 33"	22° 31' 19"	1.0167221	15' 43.85"	23° 26' 14"	-4 m 60 s
14	105° 40' 51"	0.37"	107° 00' 06"	22° 31' 02"	1.0167217	15' 43.85"	23° 26' 14"	-5 m 00 s
15	105° 43' 14"	0.37"	107° 02' 40"	22° 30' 46"	1.0167213	15' 43.85"	23° 26' 14"	-5 m 00 s
16	105° 45' 37"	0.38"	107° 05' 14"	22° 30' 29"	1.0167209	15' 43.85"	23° 26' 14"	-5 m 01 s
17	105° 47' 60"	0.38"	107° 07' 48"	22° 30' 12"	1.0167205	15' 43.85"	23° 26' 14"	-5 m 01 s
18	105° 50' 23"	0.39"	107° 10' 22"	22° 29' 55"	1.0167200	15' 43.85"	23° 26' 14"	-5 m 02 s
19	105° 52' 46"	0.39"	107° 12' 55"	22° 29' 39"	1.0167196	15' 43.85"	23° 26' 14"	-5 m 02 s
20	105° 55' 09"	0.40"	107° 15' 29"	22° 29' 22"	1.0167191	15' 43.85"	23° 26' 14"	-5 m 02 s
21	105° 57' 32"	0.40"	107° 18' 03"	22° 29' 05"	1.0167187	15' 43.85"	23° 26' 14"	-5 m 03 s
22	105° 59' 55"	0.41"	107° 20' 37"	22° 28' 48"	1.0167182	15' 43.85"	23° 26' 14"	-5 m 03 s
23	106° 02' 18"	0.41"	107° 23' 10"	22° 28' 31"	1.0167177	15' 43.85"	23° 26' 14"	-5 m 04 s
24	106° 04' 41"	0.42"	107° 25' 44"	22° 28' 14"	1.0167172	15' 43.85"	23° 26' 14"	-5 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	71° 07' 24"	0° 03' 41"	69° 33' 07"	22° 10' 07"	0° 54' 13"	14' 46.52"	82° 6' 12"	0.08589
1	71° 37' 04"	0° 06' 23"	70° 04' 28"	22° 16' 52"	0° 54' 14"	14' 46.64"	82° 22' 12"	0.08367
2	72° 06' 44"	0° 09' 05"	70° 35' 52"	22° 23' 31"	0° 54' 14"	14' 46.76"	82° 38' 23"	0.08148
3	72° 36' 25"	0° 11' 48"	71° 07' 19"	22° 30' 05"	0° 54' 15"	14' 46.89"	82° 54' 46"	0.07932
4	73° 06' 07"	0° 14' 30"	71° 38' 51"	22° 36' 32"	0° 54' 15"	14' 47.02"	83° 11' 22"	0.07718
5	73° 35' 49"	0° 17' 12"	72° 10' 25"	22° 42' 53"	0° 54' 16"	14' 47.15"	83° 28' 11"	0.07507
6	74° 05' 32"	0° 19' 54"	72° 42' 04"	22° 49' 08"	0° 54' 16"	14' 47.28"	83° 45' 14"	0.07299
7	74° 35' 16"	0° 22' 37"	73° 13' 46"	22° 55' 17"	0° 54' 17"	14' 47.42"	84° 2' 30"	0.07093
8	75° 05' 01"	0° 25' 19"	73° 45' 32"	23° 01' 20"	0° 54' 17"	14' 47.56"	84° 19' 59"	0.06890
9	75° 34' 46"	0° 28' 01"	74° 17' 21"	23° 07' 16"	0° 54' 18"	14' 47.70"	84° 37' 44"	0.06690
10	76° 04' 32"	0° 30' 43"	74° 49' 14"	23° 13' 07"	0° 54' 18"	14' 47.85"	84° 55' 43"	0.06492
11	76° 34' 18"	0° 33' 25"	75° 21' 11"	23° 18' 51"	0° 54' 19"	14' 48.00"	85° 13' 57"	0.06297
12	77° 04' 06"	0° 36' 07"	75° 53' 11"	23° 24' 28"	0° 54' 19"	14' 48.15"	85° 32' 27"	0.06104
13	77° 33' 54"	0° 38' 48"	76° 25' 14"	23° 29' 59"	0° 54' 20"	14' 48.30"	85° 51' 13"	0.05915
14	78° 03' 43"	0° 41' 30"	76° 57' 21"	23° 35' 24"	0° 54' 20"	14' 48.46"	86° 10' 15"	0.05728
15	78° 33' 33"	0° 44' 12"	77° 29' 32"	23° 40' 42"	0° 54' 21"	14' 48.62"	86° 29' 35"	0.05544
16	79° 03' 23"	0° 46' 53"	78° 01' 45"	23° 45' 54"	0° 54' 22"	14' 48.78"	86° 49' 13"	0.05363
17	79° 33' 15"	0° 49' 34"	78° 34' 03"	23° 50' 59"	0° 54' 22"	14' 48.95"	87° 9' 10"	0.05184
18	80° 03' 07"	0° 52' 15"	79° 06' 23"	23° 55' 58"	0° 54' 23"	14' 49.12"	87° 29' 26"	0.05009
19	80° 32' 60"	0° 54' 56"	79° 38' 47"	24° 00' 50"	0° 54' 23"	14' 49.29"	87° 50' 01"	0.04836
20	81° 02' 54"	0° 57' 37"	80° 11' 14"	24° 05' 35"	0° 54' 24"	14' 49.46"	88° 10' 58"	0.04666
21	81° 32' 49"	1° 00' 17"	80° 43' 45"	24° 10' 13"	0° 54' 25"	14' 49.64"	88° 32' 17"	0.04499
22	82° 02' 44"	1° 02' 57"	81° 16' 19"	24° 14' 45"	0° 54' 25"	14' 49.82"	88° 53' 58"	0.04335
23	82° 32' 41"	1° 05' 37"	81° 48' 56"	24° 19' 10"	0° 54' 26"	14' 50.00"	89° 16' 04"	0.04173
24	83° 02' 38"	1° 08' 17"	82° 21' 36"	24° 23' 28"	0° 54' 27"	14' 50.18"	89° 38' 34"	0.04015

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	106° 04' 41"	0.42"	107° 25' 44"	22° 28' 14"	1.0167172	15' 43.85"	23° 26' 14"	-5 m 04 s
1	106° 07' 04"	0.42"	107° 28' 18"	22° 27' 57"	1.0167167	15' 43.85"	23° 26' 14"	-5 m 04 s
2	106° 09' 27"	0.43"	107° 30' 51"	22° 27' 40"	1.0167162	15' 43.85"	23° 26' 14"	-5 m 05 s
3	106° 11' 50"	0.44"	107° 33' 25"	22° 27' 23"	1.0167157	15' 43.85"	23° 26' 14"	-5 m 05 s
4	106° 14' 14"	0.44"	107° 35' 59"	22° 27' 05"	1.0167152	15' 43.85"	23° 26' 14"	-5 m 05 s
5	106° 16' 37"	0.45"	107° 38' 33"	22° 26' 48"	1.0167146	15' 43.85"	23° 26' 14"	-5 m 06 s
6	106° 18' 60"	0.45"	107° 41' 06"	22° 26' 31"	1.0167141	15' 43.85"	23° 26' 14"	-5 m 06 s
7	106° 21' 23"	0.46"	107° 43' 40"	22° 26' 14"	1.0167135	15' 43.85"	23° 26' 14"	-5 m 07 s
8	106° 23' 46"	0.46"	107° 46' 13"	22° 25' 56"	1.0167129	15' 43.86"	23° 26' 14"	-5 m 07 s
9	106° 26' 09"	0.47"	107° 48' 47"	22° 25' 39"	1.0167123	15' 43.86"	23° 26' 14"	-5 m 07 s
10	106° 28' 32"	0.47"	107° 51' 21"	22° 25' 21"	1.0167117	15' 43.86"	23° 26' 14"	-5 m 08 s
11	106° 30' 55"	0.48"	107° 53' 54"	22° 25' 04"	1.0167111	15' 43.86"	23° 26' 14"	-5 m 08 s
12	106° 33' 18"	0.48"	107° 56' 28"	22° 24' 46"	1.0167105	15' 43.86"	23° 26' 14"	-5 m 09 s
13	106° 35' 41"	0.49"	107° 59' 02"	22° 24' 29"	1.0167099	15' 43.86"	23° 26' 14"	-5 m 09 s
14	106° 38' 04"	0.49"	108° 01' 35"	22° 24' 11"	1.0167093	15' 43.86"	23° 26' 14"	-5 m 09 s
15	106° 40' 27"	0.50"	108° 04' 09"	22° 23' 54"	1.0167086	15' 43.86"	23° 26' 14"	-5 m 10 s
16	106° 42' 50"	0.50"	108° 06' 42"	22° 23' 36"	1.0167080	15' 43.86"	23° 26' 14"	-5 m 10 s
17	106° 45' 13"	0.51"	108° 09' 16"	22° 23' 18"	1.0167073	15' 43.86"	23° 26' 14"	-5 m 10 s
18	106° 47' 36"	0.51"	108° 11' 49"	22° 23' 01"	1.0167066	15' 43.86"	23° 26' 14"	-5 m 11 s
19	106° 49' 60"	0.52"	108° 14' 23"	22° 22' 43"	1.0167059	15' 43.86"	23° 26' 14"	-5 m 11 s
20	106° 52' 23"	0.52"	108° 16' 56"	22° 22' 25"	1.0167052	15' 43.86"	23° 26' 14"	-5 m 12 s
21	106° 54' 46"	0.52"	108° 19' 30"	22° 22' 07"	1.0167045	15' 43.86"	23° 26' 14"	-5 m 12 s
22	106° 57' 09"	0.53"	108° 22' 03"	22° 21' 49"	1.0167038	15' 43.86"	23° 26' 14"	-5 m 12 s
23	106° 59' 32"	0.53"	108° 24' 37"	22° 21' 31"	1.0167031	15' 43.86"	23° 26' 14"	-5 m 13 s
24	107° 01' 55"	0.54"	108° 27' 10"	22° 21' 13"	1.0167023	15' 43.87"	23° 26' 14"	-5 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	83° 02' 38"	1° 08' 17"	82° 21' 36"	24° 23' 28"	0° 54' 27"	14' 50.18"	89° 38' 34"	0.04015
1	83° 32' 37"	1° 10' 57"	82° 54' 19"	24° 27' 39"	0° 54' 27"	14' 50.37"	90° 1' 31"	0.03859
2	84° 02' 36"	1° 13' 36"	83° 27' 06"	24° 31' 43"	0° 54' 28"	14' 50.56"	90° 24' 55"	0.03707
3	84° 32' 36"	1° 16' 15"	83° 59' 55"	24° 35' 40"	0° 54' 29"	14' 50.75"	90° 48' 48"	0.03557
4	85° 02' 38"	1° 18' 54"	84° 32' 47"	24° 39' 30"	0° 54' 30"	14' 50.94"	91° 13' 12"	0.03410
5	85° 32' 40"	1° 21' 32"	85° 05' 43"	24° 43' 13"	0° 54' 30"	14' 51.14"	91° 38' 08"	0.03267
6	86° 02' 43"	1° 24' 10"	85° 38' 41"	24° 46' 49"	0° 54' 31"	14' 51.34"	92° 3' 39"	0.03126
7	86° 32' 47"	1° 26' 48"	86° 11' 42"	24° 50' 18"	0° 54' 32"	14' 51.54"	92° 29' 46"	0.02988
8	87° 02' 52"	1° 29' 25"	86° 44' 46"	24° 53' 39"	0° 54' 32"	14' 51.74"	92° 56' 31"	0.02854
9	87° 32' 58"	1° 32' 02"	87° 17' 53"	24° 56' 54"	0° 54' 33"	14' 51.95"	93° 23' 58"	0.02722
10	88° 03' 05"	1° 34' 39"	87° 51' 03"	25° 00' 01"	0° 54' 34"	14' 52.16"	93° 52' 09"	0.02593
11	88° 33' 13"	1° 37' 15"	88° 24' 15"	25° 03' 01"	0° 54' 35"	14' 52.37"	94° 21' 07"	0.02468
12	89° 03' 23"	1° 39' 51"	88° 57' 30"	25° 05' 53"	0° 54' 36"	14' 52.58"	94° 50' 56"	0.02345
13	89° 33' 33"	1° 42' 27"	89° 30' 47"	25° 08' 38"	0° 54' 36"	14' 52.80"	95° 21' 38"	0.02226
14	90° 03' 44"	1° 45' 02"	90° 04' 07"	25° 11' 16"	0° 54' 37"	14' 53.01"	95° 53' 19"	0.02110
15	90° 33' 56"	1° 47' 37"	90° 37' 30"	25° 13' 47"	0° 54' 38"	14' 53.23"	96° 26' 03"	0.01996
16	91° 04' 09"	1° 50' 11"	91° 10' 55"	25° 16' 10"	0° 54' 39"	14' 53.45"	96° 59' 55"	0.01886
17	91° 34' 24"	1° 52' 45"	91° 44' 22"	25° 18' 25"	0° 54' 40"	14' 53.68"	97° 35' 01"	0.01779
18	92° 04' 39"	1° 55' 19"	92° 17' 51"	25° 20' 33"	0° 54' 40"	14' 53.90"	98° 11' 27"	0.01675
19	92° 34' 56"	1° 57' 52"	92° 51' 23"	25° 22' 34"	0° 54' 41"	14' 54.13"	98° 49' 21"	0.01575
20	93° 05' 13"	2° 00' 24"	93° 24' 57"	25° 24' 26"	0° 54' 42"	14' 54.36"	99° 28' 51"	0.01477
21	93° 35' 32"	2° 02' 56"	93° 58' 33"	25° 26' 12"	0° 54' 43"	14' 54.59"	100° 10' 06"	0.01383
22	94° 05' 52"	2° 05' 27"	94° 32' 12"	25° 27' 49"	0° 54' 44"	14' 54.83"	100° 53' 18"	0.01292
23	94° 36' 13"	2° 07' 58"	95° 05' 52"	25° 29' 20"	0° 54' 45"	14' 55.06"	101° 38' 37"	0.01204
24	95° 06' 35"	2° 10' 29"	95° 39' 34"	25° 30' 42"	0° 54' 45"	14' 55.30"	102° 26' 19"	0.01119

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	107° 01' 55"	0.54"	108° 27' 10"	22° 21' 13"	1.0167023	15' 43.87"	23° 26' 14"	-5 m 13 s
1	107° 04' 18"	0.54"	108° 29' 44"	22° 20' 55"	1.0167016	15' 43.87"	23° 26' 14"	-5 m 13 s
2	107° 06' 41"	0.55"	108° 32' 17"	22° 20' 37"	1.0167008	15' 43.87"	23° 26' 14"	-5 m 14 s
3	107° 09' 04"	0.55"	108° 34' 51"	22° 20' 19"	1.0167000	15' 43.87"	23° 26' 14"	-5 m 14 s
4	107° 11' 27"	0.56"	108° 37' 24"	22° 20' 01"	1.0166993	15' 43.87"	23° 26' 14"	-5 m 15 s
5	107° 13' 50"	0.56"	108° 39' 58"	22° 19' 43"	1.0166985	15' 43.87"	23° 26' 14"	-5 m 15 s
6	107° 16' 13"	0.57"	108° 42' 31"	22° 19' 25"	1.0166977	15' 43.87"	23° 26' 14"	-5 m 15 s
7	107° 18' 36"	0.57"	108° 45' 04"	22° 19' 06"	1.0166969	15' 43.87"	23° 26' 14"	-5 m 16 s
8	107° 20' 59"	0.58"	108° 47' 38"	22° 18' 48"	1.0166960	15' 43.87"	23° 26' 14"	-5 m 16 s
9	107° 23' 23"	0.58"	108° 50' 11"	22° 18' 30"	1.0166952	15' 43.87"	23° 26' 14"	-5 m 16 s
10	107° 25' 46"	0.58"	108° 52' 45"	22° 18' 11"	1.0166943	15' 43.87"	23° 26' 14"	-5 m 17 s
11	107° 28' 09"	0.59"	108° 55' 18"	22° 17' 53"	1.0166935	15' 43.87"	23° 26' 14"	-5 m 17 s
12	107° 30' 32"	0.59"	108° 57' 51"	22° 17' 34"	1.0166926	15' 43.87"	23° 26' 14"	-5 m 17 s
13	107° 32' 55"	0.60"	109° 00' 25"	22° 17' 16"	1.0166917	15' 43.88"	23° 26' 14"	-5 m 18 s
14	107° 35' 18"	0.60"	109° 02' 58"	22° 16' 57"	1.0166909	15' 43.88"	23° 26' 14"	-5 m 18 s
15	107° 37' 41"	0.61"	109° 05' 31"	22° 16' 39"	1.0166900	15' 43.88"	23° 26' 14"	-5 m 19 s
16	107° 40' 04"	0.61"	109° 08' 05"	22° 16' 20"	1.0166891	15' 43.88"	23° 26' 14"	-5 m 19 s
17	107° 42' 27"	0.61"	109° 10' 38"	22° 16' 01"	1.0166881	15' 43.88"	23° 26' 14"	-5 m 19 s
18	107° 44' 50"	0.62"	109° 13' 11"	22° 15' 43"	1.0166872	15' 43.88"	23° 26' 14"	-5 m 20 s
19	107° 47' 13"	0.62"	109° 15' 44"	22° 15' 24"	1.0166863	15' 43.88"	23° 26' 14"	-5 m 20 s
20	107° 49' 36"	0.63"	109° 18' 18"	22° 15' 05"	1.0166853	15' 43.88"	23° 26' 14"	-5 m 20 s
21	107° 51' 59"	0.63"	109° 20' 51"	22° 14' 46"	1.0166844	15' 43.88"	23° 26' 14"	-5 m 21 s
22	107° 54' 23"	0.64"	109° 23' 24"	22° 14' 27"	1.0166834	15' 43.88"	23° 26' 14"	-5 m 21 s
23	107° 56' 46"	0.64"	109° 25' 57"	22° 14' 09"	1.0166824	15' 43.88"	23° 26' 14"	-5 m 21 s
24	107° 59' 09"	0.64"	109° 28' 31"	22° 13' 50"	1.0166814	15' 43.88"	23° 26' 14"	-5 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	95° 06' 35"	2° 10' 29"	95° 39' 34"	25° 30' 42"	0° 54' 45"	14' 55.30"	102° 26' 19"	0.01119
1	95° 36' 58"	2° 12' 59"	96° 13' 18"	25° 31' 57"	0° 54' 46"	14' 55.54"	103° 16' 38"	0.01038
2	96° 07' 23"	2° 15' 28"	96° 47' 04"	25° 33' 04"	0° 54' 47"	14' 55.78"	104° 9' 54"	0.00959
3	96° 37' 48"	2° 17' 57"	97° 20' 51"	25° 34' 03"	0° 54' 48"	14' 56.02"	105° 6' 27"	0.00884
4	97° 08' 15"	2° 20' 25"	97° 54' 41"	25° 34' 54"	0° 54' 49"	14' 56.27"	106° 6' 43"	0.00813
5	97° 38' 43"	2° 22' 53"	98° 28' 31"	25° 35' 38"	0° 54' 50"	14' 56.51"	107° 11' 11"	0.00744
6	98° 09' 12"	2° 25' 20"	99° 02' 24"	25° 36' 14"	0° 54' 51"	14' 56.76"	108° 20' 26"	0.00679
7	98° 39' 42"	2° 27' 46"	99° 36' 18"	25° 36' 42"	0° 54' 52"	14' 57.01"	109° 33' 07"	0.00617
8	99° 10' 13"	2° 30' 12"	100° 10' 13"	25° 37' 03"	0° 54' 53"	14' 57.27"	110° 56' 03"	0.00559
9	99° 40' 46"	2° 32' 37"	100° 44' 10"	25° 37' 15"	0° 54' 54"	14' 57.52"	112° 24' 13"	0.00503
10	100° 11' 19"	2° 35' 01"	101° 18' 08"	25° 37' 20"	0° 54' 55"	14' 57.78"	114° 0' 44"	0.00451
11	100° 41' 54"	2° 37' 25"	101° 52' 07"	25° 37' 17"	0° 54' 56"	14' 58.03"	115° 47' 01"	0.00403
12	101° 12' 31"	2° 39' 48"	102° 26' 07"	25° 37' 05"	0° 54' 56"	14' 58.29"	117° 44' 46"	0.00357
13	101° 43' 08"	2° 42' 11"	103° 00' 09"	25° 36' 46"	0° 54' 57"	14' 58.56"	119° 56' 01"	0.00315
14	102° 13' 47"	2° 44' 33"	103° 34' 11"	25° 36' 20"	0° 54' 58"	14' 58.82"	122° 23' 17"	0.00277
15	102° 44' 26"	2° 46' 54"	104° 08' 15"	25° 35' 45"	0° 54' 59"	14' 59.08"	125° 9' 37"	0.00242
16	103° 15' 07"	2° 49' 14"	104° 42' 19"	25° 35' 02"	0° 55' 00"	14' 59.35"	128° 18' 40"	0.00210
17	103° 45' 50"	2° 51' 33"	105° 16' 24"	25° 34' 11"	0° 55' 01"	14' 59.62"	131° 54' 51"	0.00181
18	104° 16' 33"	2° 53' 52"	105° 50' 30"	25° 33' 12"	0° 55' 02"	14' 59.89"	136° 3' 15"	0.00156
19	104° 47' 18"	2° 56' 10"	106° 24' 36"	25° 32' 06"	0° 55' 03"	15' 00.16"	140° 49' 28"	0.00135
20	105° 18' 04"	2° 58' 27"	106° 58' 43"	25° 30' 51"	0° 55' 04"	15' 00.43"	146° 19' 08"	0.00116
21	105° 48' 52"	3° 00' 44"	107° 32' 51"	25° 29' 29"	0° 55' 05"	15' 00.70"	152° 36' 55"	0.00102
22	106° 19' 40"	3° 02' 59"	108° 06' 59"	25° 27' 58"	0° 55' 06"	15' 00.98"	159° 44' 38"	0.00090
23	106° 50' 30"	3° 05' 14"	108° 41' 07"	25° 26' 20"	0° 55' 07"	15' 01.25"	167° 38' 59"	0.00082
24	107° 21' 21"	3° 07' 28"	109° 15' 15"	25° 24' 33"	0° 55' 08"	15' 01.53"	176° 9' 25"	0.00078

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	107° 59' 09"	0.64"	109° 28' 31"	22° 13' 50"	1.0166814	15' 43.88"	23° 26' 14"	-5 m 22 s
1	108° 01' 32"	0.65"	109° 31' 04"	22° 13' 31"	1.0166804	15' 43.89"	23° 26' 14"	-5 m 22 s
2	108° 03' 55"	0.65"	109° 33' 37"	22° 13' 12"	1.0166794	15' 43.89"	23° 26' 14"	-5 m 22 s
3	108° 06' 18"	0.65"	109° 36' 10"	22° 12' 52"	1.0166784	15' 43.89"	23° 26' 14"	-5 m 23 s
4	108° 08' 41"	0.66"	109° 38' 43"	22° 12' 33"	1.0166773	15' 43.89"	23° 26' 14"	-5 m 23 s
5	108° 11' 04"	0.66"	109° 41' 16"	22° 12' 14"	1.0166763	15' 43.89"	23° 26' 14"	-5 m 23 s
6	108° 13' 27"	0.67"	109° 43' 50"	22° 11' 55"	1.0166752	15' 43.89"	23° 26' 14"	-5 m 24 s
7	108° 15' 50"	0.67"	109° 46' 23"	22° 11' 36"	1.0166742	15' 43.89"	23° 26' 14"	-5 m 24 s
8	108° 18' 13"	0.67"	109° 48' 56"	22° 11' 17"	1.0166731	15' 43.89"	23° 26' 14"	-5 m 25 s
9	108° 20' 36"	0.68"	109° 51' 29"	22° 10' 57"	1.0166720	15' 43.89"	23° 26' 14"	-5 m 25 s
10	108° 22' 59"	0.68"	109° 54' 02"	22° 10' 38"	1.0166709	15' 43.89"	23° 26' 14"	-5 m 25 s
11	108° 25' 23"	0.68"	109° 56' 35"	22° 10' 18"	1.0166698	15' 43.90"	23° 26' 14"	-5 m 26 s
12	108° 27' 46"	0.69"	109° 59' 08"	22° 09' 59"	1.0166687	15' 43.90"	23° 26' 14"	-5 m 26 s
13	108° 30' 09"	0.69"	110° 01' 41"	22° 09' 40"	1.0166676	15' 43.90"	23° 26' 14"	-5 m 26 s
14	108° 32' 32"	0.69"	110° 04' 14"	22° 09' 20"	1.0166664	15' 43.90"	23° 26' 14"	-5 m 27 s
15	108° 34' 55"	0.70"	110° 06' 47"	22° 09' 01"	1.0166653	15' 43.90"	23° 26' 14"	-5 m 27 s
16	108° 37' 18"	0.70"	110° 09' 20"	22° 08' 41"	1.0166641	15' 43.90"	23° 26' 14"	-5 m 27 s
17	108° 39' 41"	0.70"	110° 11' 53"	22° 08' 21"	1.0166629	15' 43.90"	23° 26' 14"	-5 m 28 s
18	108° 42' 04"	0.71"	110° 14' 26"	22° 08' 02"	1.0166617	15' 43.90"	23° 26' 14"	-5 m 28 s
19	108° 44' 27"	0.71"	110° 16' 59"	22° 07' 42"	1.0166606	15' 43.90"	23° 26' 14"	-5 m 28 s
20	108° 46' 50"	0.71"	110° 19' 32"	22° 07' 22"	1.0166594	15' 43.91"	23° 26' 14"	-5 m 29 s
21	108° 49' 13"	0.72"	110° 22' 05"	22° 07' 02"	1.0166581	15' 43.91"	23° 26' 14"	-5 m 29 s
22	108° 51' 36"	0.72"	110° 24' 38"	22° 06' 43"	1.0166569	15' 43.91"	23° 26' 14"	-5 m 29 s
23	108° 53' 60"	0.72"	110° 27' 11"	22° 06' 23"	1.0166557	15' 43.91"	23° 26' 14"	-5 m 30 s
24	108° 56' 23"	0.73"	110° 29' 44"	22° 06' 03"	1.0166544	15' 43.91"	23° 26' 14"	-5 m 30 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	107° 21' 21"	3° 07' 28"	109° 15' 15"	25° 24' 33"	0° 55' 08"	15' 01.53"	176° 9' 25"	0.00078
1	107° 52' 14"	3° 09' 41"	109° 49' 24"	25° 22' 39"	0° 55' 09"	15' 01.81"	184° 58' 03"	0.00077
2	108° 23' 07"	3° 11' 54"	110° 23' 33"	25° 20' 36"	0° 55' 10"	15' 02.09"	193° 42' 38"	0.00079
3	108° 54' 02"	3° 14' 05"	110° 57' 42"	25° 18' 26"	0° 55' 11"	15' 02.38"	202° 1' 56"	0.00085
4	109° 24' 58"	3° 16' 16"	111° 31' 51"	25° 16' 08"	0° 55' 13"	15' 02.66"	209° 40' 28"	0.00094
5	109° 55' 56"	3° 18' 26"	112° 06' 00"	25° 13' 41"	0° 55' 14"	15' 02.94"	216° 30' 27"	0.00107
6	110° 26' 55"	3° 20' 34"	112° 40' 09"	25° 11' 07"	0° 55' 15"	15' 03.23"	222° 30' 39"	0.00123
7	110° 57' 55"	3° 22' 42"	113° 14' 18"	25° 08' 25"	0° 55' 16"	15' 03.52"	227° 44' 08"	0.00143
8	111° 28' 57"	3° 24' 49"	113° 48' 26"	25° 05' 35"	0° 55' 17"	15' 03.81"	232° 16' 04"	0.00166
9	111° 59' 59"	3° 26' 55"	114° 22' 35"	25° 02' 37"	0° 55' 18"	15' 04.10"	236° 12' 10"	0.00193
10	112° 31' 03"	3° 29' 00"	114° 56' 42"	24° 59' 31"	0° 55' 19"	15' 04.39"	239° 37' 54"	0.00223
11	113° 02' 09"	3° 31' 04"	115° 30' 50"	24° 56' 17"	0° 55' 20"	15' 04.68"	242° 38' 08"	0.00257
12	113° 33' 16"	3° 33' 08"	116° 04' 56"	24° 52' 55"	0° 55' 21"	15' 04.98"	245° 16' 58"	0.00295
13	114° 04' 24"	3° 35' 10"	116° 39' 02"	24° 49' 25"	0° 55' 22"	15' 05.27"	247° 37' 51"	0.00335
14	114° 35' 33"	3° 37' 11"	117° 13' 08"	24° 45' 48"	0° 55' 23"	15' 05.57"	249° 43' 38"	0.00380
15	115° 06' 44"	3° 39' 11"	117° 47' 13"	24° 42' 02"	0° 55' 24"	15' 05.86"	251° 36' 38"	0.00428
16	115° 37' 56"	3° 41' 10"	118° 21' 17"	24° 38' 09"	0° 55' 25"	15' 06.16"	253° 18' 48"	0.00479
17	116° 09' 09"	3° 43' 08"	118° 55' 20"	24° 34' 07"	0° 55' 26"	15' 06.46"	254° 51' 41"	0.00534
18	116° 40' 24"	3° 45' 05"	119° 29' 22"	24° 29' 58"	0° 55' 28"	15' 06.76"	256° 16' 36"	0.00592
19	117° 11' 40"	3° 47' 01"	120° 03' 23"	24° 25' 42"	0° 55' 29"	15' 07.07"	257° 34' 37"	0.00654
20	117° 42' 58"	3° 48' 56"	120° 37' 23"	24° 21' 17"	0° 55' 30"	15' 07.37"	258° 46' 40"	0.00720
21	118° 14' 16"	3° 50' 50"	121° 11' 22"	24° 16' 45"	0° 55' 31"	15' 07.68"	259° 53' 29"	0.00789
22	118° 45' 37"	3° 52' 43"	121° 45' 20"	24° 12' 05"	0° 55' 32"	15' 07.98"	260° 55' 42"	0.00862
23	119° 16' 58"	3° 54' 35"	122° 19' 17"	24° 07' 17"	0° 55' 33"	15' 08.29"	261° 53' 53"	0.00938
24	119° 48' 21"	3° 56' 25"	122° 53' 13"	24° 02' 21"	0° 55' 34"	15' 08.60"	262° 48' 28"	0.01018

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	108° 56' 23"	0.73"	110° 29' 44"	22° 06' 03"	1.0166544	15' 43.91"	23° 26' 14"	-5 m 30 s
1	108° 58' 46"	0.73"	110° 32' 17"	22° 05' 43"	1.0166532	15' 43.91"	23° 26' 14"	-5 m 30 s
2	109° 01' 09"	0.73"	110° 34' 50"	22° 05' 23"	1.0166519	15' 43.91"	23° 26' 14"	-5 m 31 s
3	109° 03' 32"	0.74"	110° 37' 23"	22° 05' 03"	1.0166506	15' 43.91"	23° 26' 14"	-5 m 31 s
4	109° 05' 55"	0.74"	110° 39' 56"	22° 04' 43"	1.0166493	15' 43.91"	23° 26' 14"	-5 m 31 s
5	109° 08' 18"	0.74"	110° 42' 29"	22° 04' 23"	1.0166480	15' 43.92"	23° 26' 14"	-5 m 32 s
6	109° 10' 41"	0.74"	110° 45' 02"	22° 04' 03"	1.0166467	15' 43.92"	23° 26' 14"	-5 m 32 s
7	109° 13' 04"	0.75"	110° 47' 35"	22° 03' 42"	1.0166454	15' 43.92"	23° 26' 14"	-5 m 32 s
8	109° 15' 27"	0.75"	110° 50' 07"	22° 03' 22"	1.0166441	15' 43.92"	23° 26' 14"	-5 m 33 s
9	109° 17' 50"	0.75"	110° 52' 40"	22° 03' 02"	1.0166427	15' 43.92"	23° 26' 14"	-5 m 33 s
10	109° 20' 14"	0.75"	110° 55' 13"	22° 02' 42"	1.0166414	15' 43.92"	23° 26' 14"	-5 m 33 s
11	109° 22' 37"	0.76"	110° 57' 46"	22° 02' 21"	1.0166400	15' 43.92"	23° 26' 14"	-5 m 34 s
12	109° 24' 60"	0.76"	111° 00' 19"	22° 02' 01"	1.0166387	15' 43.92"	23° 26' 14"	-5 m 34 s
13	109° 27' 23"	0.76"	111° 02' 51"	22° 01' 41"	1.0166373	15' 43.93"	23° 26' 14"	-5 m 34 s
14	109° 29' 46"	0.76"	111° 05' 24"	22° 01' 20"	1.0166359	15' 43.93"	23° 26' 14"	-5 m 35 s
15	109° 32' 09"	0.77"	111° 07' 57"	22° 00' 60"	1.0166345	15' 43.93"	23° 26' 14"	-5 m 35 s
16	109° 34' 32"	0.77"	111° 10' 30"	22° 00' 39"	1.0166331	15' 43.93"	23° 26' 14"	-5 m 35 s
17	109° 36' 55"	0.77"	111° 13' 02"	22° 00' 18"	1.0166316	15' 43.93"	23° 26' 14"	-5 m 36 s
18	109° 39' 18"	0.77"	111° 15' 35"	21° 59' 58"	1.0166302	15' 43.93"	23° 26' 14"	-5 m 36 s
19	109° 41' 41"	0.78"	111° 18' 08"	21° 59' 37"	1.0166288	15' 43.93"	23° 26' 14"	-5 m 36 s
20	109° 44' 04"	0.78"	111° 20' 41"	21° 59' 17"	1.0166273	15' 43.93"	23° 26' 14"	-5 m 37 s
21	109° 46' 27"	0.78"	111° 23' 13"	21° 58' 56"	1.0166258	15' 43.94"	23° 26' 14"	-5 m 37 s
22	109° 48' 51"	0.78"	111° 25' 46"	21° 58' 35"	1.0166244	15' 43.94"	23° 26' 14"	-5 m 37 s
23	109° 51' 14"	0.78"	111° 28' 19"	21° 58' 14"	1.0166229	15' 43.94"	23° 26' 14"	-5 m 38 s
24	109° 53' 37"	0.78"	111° 30' 51"	21° 57' 53"	1.0166214	15' 43.94"	23° 26' 14"	-5 m 38 s

*) for mean equinox of date

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	119° 48' 21"	3° 56' 25"	122° 53' 13"	24° 02' 21"	0° 55' 34"	15' 08.60"	262° 48' 28"	0.01018
1	120° 19' 45"	3° 58' 15"	123° 27' 07"	23° 57' 18"	0° 55' 35"	15' 08.90"	263° 39' 51"	0.01101
2	120° 51' 11"	4° 00' 03"	124° 00' 60"	23° 52' 07"	0° 55' 37"	15' 09.21"	264° 28' 23"	0.01188
3	121° 22' 38"	4° 01' 50"	124° 34' 51"	23° 46' 48"	0° 55' 38"	15' 09.52"	265° 14' 21"	0.01278
4	121° 54' 06"	4° 03' 36"	125° 08' 41"	23° 41' 22"	0° 55' 39"	15' 09.84"	265° 57' 59"	0.01372
5	122° 25' 36"	4° 05' 21"	125° 42' 29"	23° 35' 49"	0° 55' 40"	15' 10.15"	266° 39' 33"	0.01470
6	122° 57' 07"	4° 07' 04"	126° 16' 16"	23° 30' 07"	0° 55' 41"	15' 10.46"	267° 19' 12"	0.01571
7	123° 28' 39"	4° 08' 47"	126° 50' 01"	23° 24' 19"	0° 55' 42"	15' 10.78"	267° 57' 08"	0.01676
8	124° 00' 13"	4° 10' 28"	127° 23' 45"	23° 18' 22"	0° 55' 43"	15' 11.09"	268° 33' 28"	0.01784
9	124° 31' 48"	4° 12' 08"	127° 57' 26"	23° 12' 19"	0° 55' 45"	15' 11.41"	269° 8' 22"	0.01896
10	125° 03' 25"	4° 13' 47"	128° 31' 06"	23° 06' 08"	0° 55' 46"	15' 11.73"	269° 41' 56"	0.02011
11	125° 35' 03"	4° 15' 25"	129° 04' 45"	22° 59' 49"	0° 55' 47"	15' 12.05"	270° 14' 16"	0.02130
12	126° 06' 42"	4° 17' 01"	129° 38' 21"	22° 53' 23"	0° 55' 48"	15' 12.37"	270° 45' 28"	0.02253
13	126° 38' 23"	4° 18' 36"	130° 11' 55"	22° 46' 50"	0° 55' 49"	15' 12.69"	271° 15' 36"	0.02379
14	127° 10' 05"	4° 20' 10"	130° 45' 28"	22° 40' 09"	0° 55' 50"	15' 13.01"	271° 44' 46"	0.02508
15	127° 41' 48"	4° 21' 42"	131° 18' 59"	22° 33' 22"	0° 55' 52"	15' 13.33"	272° 13' 02"	0.02641
16	128° 13' 33"	4° 23' 13"	131° 52' 27"	22° 26' 27"	0° 55' 53"	15' 13.65"	272° 40' 26"	0.02778
17	128° 45' 20"	4° 24' 43"	132° 25' 54"	22° 19' 24"	0° 55' 54"	15' 13.98"	273° 7' 02"	0.02918
18	129° 17' 07"	4° 26' 12"	132° 59' 18"	22° 12' 15"	0° 55' 55"	15' 14.30"	273° 32' 54"	0.03062
19	129° 48' 56"	4° 27' 39"	133° 32' 40"	22° 04' 59"	0° 55' 56"	15' 14.63"	273° 58' 03"	0.03209
20	130° 20' 47"	4° 29' 05"	134° 06' 00"	21° 57' 35"	0° 55' 58"	15' 14.95"	274° 22' 33"	0.03360
21	130° 52' 38"	4° 30' 30"	134° 39' 18"	21° 50' 05"	0° 55' 59"	15' 15.28"	274° 46' 25"	0.03515
22	131° 24' 32"	4° 31' 53"	135° 12' 34"	21° 42' 27"	0° 56' 00"	15' 15.61"	275° 9' 42"	0.03673
23	131° 56' 26"	4° 33' 15"	135° 45' 48"	21° 34' 43"	0° 56' 01"	15' 15.94"	275° 32' 25"	0.03834
24	132° 28' 22"	4° 34' 36"	136° 18' 59"	21° 26' 51"	0° 56' 02"	15' 16.26"	275° 54' 37"	0.03999

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	109° 53' 37"	0.78"	111° 30' 51"	21° 57' 53"	1.0166214	15' 43.94"	23° 26' 14"	-5 m 38 s
1	109° 55' 60"	0.79"	111° 33' 24"	21° 57' 32"	1.0166199	15' 43.94"	23° 26' 14"	-5 m 38 s
2	109° 58' 23"	0.79"	111° 35' 56"	21° 57' 12"	1.0166183	15' 43.94"	23° 26' 14"	-5 m 38 s
3	110° 00' 46"	0.79"	111° 38' 29"	21° 56' 51"	1.0166168	15' 43.94"	23° 26' 14"	-5 m 39 s
4	110° 03' 09"	0.79"	111° 41' 02"	21° 56' 30"	1.0166153	15' 43.95"	23° 26' 14"	-5 m 39 s
5	110° 05' 32"	0.79"	111° 43' 34"	21° 56' 09"	1.0166137	15' 43.95"	23° 26' 14"	-5 m 39 s
6	110° 07' 55"	0.80"	111° 46' 07"	21° 55' 47"	1.0166122	15' 43.95"	23° 26' 14"	-5 m 40 s
7	110° 10' 18"	0.80"	111° 48' 39"	21° 55' 26"	1.0166106	15' 43.95"	23° 26' 14"	-5 m 40 s
8	110° 12' 42"	0.80"	111° 51' 12"	21° 55' 05"	1.0166090	15' 43.95"	23° 26' 14"	-5 m 40 s
9	110° 15' 05"	0.80"	111° 53' 45"	21° 54' 44"	1.0166074	15' 43.95"	23° 26' 14"	-5 m 41 s
10	110° 17' 28"	0.80"	111° 56' 17"	21° 54' 23"	1.0166058	15' 43.95"	23° 26' 14"	-5 m 41 s
11	110° 19' 51"	0.80"	111° 58' 50"	21° 54' 01"	1.0166042	15' 43.96"	23° 26' 14"	-5 m 41 s
12	110° 22' 14"	0.80"	112° 01' 22"	21° 53' 40"	1.0166026	15' 43.96"	23° 26' 14"	-5 m 42 s
13	110° 24' 37"	0.80"	112° 03' 55"	21° 53' 19"	1.0166009	15' 43.96"	23° 26' 14"	-5 m 42 s
14	110° 27' 00"	0.81"	112° 06' 27"	21° 52' 57"	1.0165993	15' 43.96"	23° 26' 14"	-5 m 42 s
15	110° 29' 23"	0.81"	112° 08' 59"	21° 52' 36"	1.0165977	15' 43.96"	23° 26' 14"	-5 m 42 s
16	110° 31' 46"	0.81"	112° 11' 32"	21° 52' 14"	1.0165960	15' 43.96"	23° 26' 14"	-5 m 43 s
17	110° 34' 09"	0.81"	112° 14' 04"	21° 51' 53"	1.0165943	15' 43.97"	23° 26' 14"	-5 m 43 s
18	110° 36' 32"	0.81"	112° 16' 37"	21° 51' 31"	1.0165926	15' 43.97"	23° 26' 14"	-5 m 43 s
19	110° 38' 56"	0.81"	112° 19' 09"	21° 51' 10"	1.0165909	15' 43.97"	23° 26' 14"	-5 m 44 s
20	110° 41' 19"	0.81"	112° 21' 42"	21° 50' 48"	1.0165892	15' 43.97"	23° 26' 14"	-5 m 44 s
21	110° 43' 42"	0.81"	112° 24' 14"	21° 50' 26"	1.0165875	15' 43.97"	23° 26' 14"	-5 m 44 s
22	110° 46' 05"	0.81"	112° 26' 46"	21° 50' 05"	1.0165858	15' 43.97"	23° 26' 14"	-5 m 45 s
23	110° 48' 28"	0.81"	112° 29' 19"	21° 49' 43"	1.0165840	15' 43.98"	23° 26' 14"	-5 m 45 s
24	110° 50' 51"	0.81"	112° 31' 51"	21° 49' 21"	1.0165823	15' 43.98"	23° 26' 14"	-5 m 45 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	132° 28' 22"	4° 34' 36"	136° 18' 59"	21° 26' 51"	0° 56' 02"	15' 16.26"	275° 54' 37"	0.03999
1	133° 00' 19"	4° 35' 55"	136° 52' 08"	21° 18' 53"	0° 56' 04"	15' 16.59"	276° 16' 18"	0.04167
2	133° 32' 18"	4° 37' 13"	137° 25' 15"	21° 10' 48"	0° 56' 05"	15' 16.93"	276° 37' 30"	0.04339
3	134° 04' 18"	4° 38' 29"	137° 58' 19"	21° 02' 36"	0° 56' 06"	15' 17.26"	276° 58' 14"	0.04515
4	134° 36' 20"	4° 39' 44"	138° 31' 21"	20° 54' 17"	0° 56' 07"	15' 17.59"	277° 18' 32"	0.04694
5	135° 08' 23"	4° 40' 58"	139° 04' 21"	20° 45' 52"	0° 56' 09"	15' 17.92"	277° 38' 25"	0.04876
6	135° 40' 27"	4° 42' 10"	139° 37' 18"	20° 37' 20"	0° 56' 10"	15' 18.26"	277° 57' 54"	0.05062
7	136° 12' 33"	4° 43' 20"	140° 10' 13"	20° 28' 42"	0° 56' 11"	15' 18.59"	278° 16' 59"	0.05252
8	136° 44' 40"	4° 44' 30"	140° 43' 05"	20° 19' 56"	0° 56' 12"	15' 18.93"	278° 35' 42"	0.05445
9	137° 16' 48"	4° 45' 37"	141° 15' 55"	20° 11' 05"	0° 56' 13"	15' 19.26"	278° 54' 03"	0.05641
10	137° 48' 58"	4° 46' 44"	141° 48' 43"	20° 02' 07"	0° 56' 15"	15' 19.60"	279° 12' 04"	0.05841
11	138° 21' 10"	4° 47' 49"	142° 21' 28"	19° 53' 02"	0° 56' 16"	15' 19.94"	279° 29' 44"	0.06044
12	138° 53' 22"	4° 48' 52"	142° 54' 10"	19° 43' 52"	0° 56' 17"	15' 20.28"	279° 47' 05"	0.06251
13	139° 25' 36"	4° 49' 54"	143° 26' 51"	19° 34' 34"	0° 56' 18"	15' 20.62"	280° 4' 07"	0.06461
14	139° 57' 52"	4° 50' 54"	143° 59' 28"	19° 25' 11"	0° 56' 20"	15' 20.96"	280° 20' 51"	0.06675
15	140° 30' 09"	4° 51' 53"	144° 32' 04"	19° 15' 41"	0° 56' 21"	15' 21.30"	280° 37' 17"	0.06892
16	141° 02' 27"	4° 52' 50"	145° 04' 36"	19° 06' 06"	0° 56' 22"	15' 21.64"	280° 53' 26"	0.07113
17	141° 34' 47"	4° 53' 46"	145° 37' 06"	18° 56' 24"	0° 56' 23"	15' 21.98"	281° 9' 18"	0.07336
18	142° 07' 08"	4° 54' 41"	146° 09' 34"	18° 46' 36"	0° 56' 25"	15' 22.32"	281° 24' 54"	0.07564
19	142° 39' 30"	4° 55' 33"	146° 41' 60"	18° 36' 42"	0° 56' 26"	15' 22.66"	281° 40' 14"	0.07794
20	143° 11' 54"	4° 56' 25"	147° 14' 22"	18° 26' 42"	0° 56' 27"	15' 23.01"	281° 55' 19"	0.08028
21	143° 44' 19"	4° 57' 14"	147° 46' 43"	18° 16' 36"	0° 56' 28"	15' 23.35"	282° 10' 08"	0.08266
22	144° 16' 46"	4° 58' 02"	148° 19' 00"	18° 06' 24"	0° 56' 30"	15' 23.70"	282° 24' 42"	0.08506
23	144° 49' 14"	4° 58' 49"	148° 51' 16"	17° 56' 07"	0° 56' 31"	15' 24.04"	282° 39' 02"	0.08750
24	145° 21' 43"	4° 59' 34"	149° 23' 29"	17° 45' 44"	0° 56' 32"	15' 24.39"	282° 53' 08"	0.08998

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	110° 50' 51"	0.81"	112° 31' 51"	21° 49' 21"	1.0165823	15' 43.98"	23° 26' 14"	-5 m 45 s
1	110° 53' 14"	0.82"	112° 34' 23"	21° 48' 59"	1.0165805	15' 43.98"	23° 26' 14"	-5 m 45 s
2	110° 55' 37"	0.82"	112° 36' 56"	21° 48' 38"	1.0165788	15' 43.98"	23° 26' 14"	-5 m 46 s
3	110° 58' 00"	0.82"	112° 39' 28"	21° 48' 16"	1.0165770	15' 43.98"	23° 26' 14"	-5 m 46 s
4	111° 00' 23"	0.82"	112° 42' 00"	21° 47' 54"	1.0165752	15' 43.98"	23° 26' 14"	-5 m 46 s
5	111° 02' 47"	0.82"	112° 44' 33"	21° 47' 32"	1.0165734	15' 43.98"	23° 26' 14"	-5 m 47 s
6	111° 05' 10"	0.82"	112° 47' 05"	21° 47' 10"	1.0165716	15' 43.99"	23° 26' 14"	-5 m 47 s
7	111° 07' 33"	0.82"	112° 49' 37"	21° 46' 48"	1.0165698	15' 43.99"	23° 26' 14"	-5 m 47 s
8	111° 09' 56"	0.82"	112° 52' 09"	21° 46' 26"	1.0165679	15' 43.99"	23° 26' 14"	-5 m 48 s
9	111° 12' 19"	0.82"	112° 54' 42"	21° 46' 03"	1.0165661	15' 43.99"	23° 26' 14"	-5 m 48 s
10	111° 14' 42"	0.82"	112° 57' 14"	21° 45' 41"	1.0165643	15' 43.99"	23° 26' 14"	-5 m 48 s
11	111° 17' 05"	0.82"	112° 59' 46"	21° 45' 19"	1.0165624	15' 44.00"	23° 26' 14"	-5 m 48 s
12	111° 19' 28"	0.82"	113° 02' 18"	21° 44' 57"	1.0165605	15' 44.00"	23° 26' 14"	-5 m 49 s
13	111° 21' 51"	0.82"	113° 04' 50"	21° 44' 34"	1.0165586	15' 44.00"	23° 26' 14"	-5 m 49 s
14	111° 24' 14"	0.82"	113° 07' 23"	21° 44' 12"	1.0165568	15' 44.00"	23° 26' 14"	-5 m 49 s
15	111° 26' 37"	0.82"	113° 09' 55"	21° 43' 50"	1.0165549	15' 44.00"	23° 26' 14"	-5 m 50 s
16	111° 29' 01"	0.82"	113° 12' 27"	21° 43' 27"	1.0165529	15' 44.00"	23° 26' 14"	-5 m 50 s
17	111° 31' 24"	0.82"	113° 14' 59"	21° 43' 05"	1.0165510	15' 44.01"	23° 26' 14"	-5 m 50 s
18	111° 33' 47"	0.82"	113° 17' 31"	21° 42' 42"	1.0165491	15' 44.01"	23° 26' 14"	-5 m 50 s
19	111° 36' 10"	0.82"	113° 20' 03"	21° 42' 20"	1.0165472	15' 44.01"	23° 26' 14"	-5 m 51 s
20	111° 38' 33"	0.82"	113° 22' 35"	21° 41' 57"	1.0165452	15' 44.01"	23° 26' 14"	-5 m 51 s
21	111° 40' 56"	0.82"	113° 25' 07"	21° 41' 35"	1.0165432	15' 44.01"	23° 26' 14"	-5 m 51 s
22	111° 43' 19"	0.81"	113° 27' 39"	21° 41' 12"	1.0165413	15' 44.01"	23° 26' 14"	-5 m 51 s
23	111° 45' 42"	0.81"	113° 30' 12"	21° 40' 49"	1.0165393	15' 44.02"	23° 26' 14"	-5 m 52 s
24	111° 48' 05"	0.81"	113° 32' 44"	21° 40' 27"	1.0165373	15' 44.02"	23° 26' 14"	-5 m 52 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 21' 43"	4° 59' 34"	149° 23' 29"	17° 45' 44"	0° 56' 32"	15' 24.39"	282° 53' 08"	0.08998
1	145° 54' 14"	5° 00' 17"	149° 55' 39"	17° 35' 15"	0° 56' 34"	15' 24.73"	283° 6' 60"	0.09248
2	146° 26' 46"	5° 00' 59"	150° 27' 47"	17° 24' 40"	0° 56' 35"	15' 25.08"	283° 20' 38"	0.09502
3	146° 59' 20"	5° 01' 39"	150° 59' 53"	17° 14' 00"	0° 56' 36"	15' 25.43"	283° 34' 02"	0.09760
4	147° 31' 55"	5° 02' 18"	151° 31' 56"	17° 03' 15"	0° 56' 37"	15' 25.78"	283° 47' 14"	0.10020
5	148° 04' 31"	5° 02' 55"	152° 03' 57"	16° 52' 23"	0° 56' 39"	15' 26.13"	284° 0' 12"	0.10284
6	148° 37' 09"	5° 03' 30"	152° 35' 55"	16° 41' 27"	0° 56' 40"	15' 26.48"	284° 12' 58"	0.10551
7	149° 09' 48"	5° 04' 04"	153° 07' 51"	16° 30' 25"	0° 56' 41"	15' 26.83"	284° 25' 31"	0.10821
8	149° 42' 29"	5° 04' 36"	153° 39' 45"	16° 19' 18"	0° 56' 42"	15' 27.18"	284° 37' 52"	0.11095
9	150° 15' 11"	5° 05' 07"	154° 11' 36"	16° 08' 05"	0° 56' 44"	15' 27.53"	284° 50' 00"	0.11372
10	150° 47' 54"	5° 05' 36"	154° 43' 25"	15° 56' 47"	0° 56' 45"	15' 27.88"	285° 1' 57"	0.11651
11	151° 20' 39"	5° 06' 03"	155° 15' 11"	15° 45' 25"	0° 56' 46"	15' 28.23"	285° 13' 41"	0.11935
12	151° 53' 25"	5° 06' 28"	155° 46' 56"	15° 33' 57"	0° 56' 48"	15' 28.59"	285° 25' 14"	0.12221
13	152° 26' 12"	5° 06' 52"	156° 18' 38"	15° 22' 24"	0° 56' 49"	15' 28.94"	285° 36' 35"	0.12510
14	152° 59' 01"	5° 07' 14"	156° 50' 18"	15° 10' 46"	0° 56' 50"	15' 29.29"	285° 47' 45"	0.12803
15	153° 31' 51"	5° 07' 35"	157° 21' 56"	14° 59' 03"	0° 56' 52"	15' 29.65"	285° 58' 43"	0.13098
16	154° 04' 43"	5° 07' 54"	157° 53' 31"	14° 47' 15"	0° 56' 53"	15' 30.00"	286° 9' 30"	0.13397
17	154° 37' 36"	5° 08' 11"	158° 25' 04"	14° 35' 23"	0° 56' 54"	15' 30.36"	286° 20' 07"	0.13699
18	155° 10' 30"	5° 08' 26"	158° 56' 36"	14° 23' 26"	0° 56' 55"	15' 30.72"	286° 30' 32"	0.14004
19	155° 43' 26"	5° 08' 40"	159° 28' 05"	14° 11' 24"	0° 56' 57"	15' 31.07"	286° 40' 46"	0.14312
20	156° 16' 23"	5° 08' 52"	159° 59' 32"	13° 59' 17"	0° 56' 58"	15' 31.43"	286° 50' 49"	0.14623
21	156° 49' 22"	5° 09' 03"	160° 30' 57"	13° 47' 06"	0° 56' 59"	15' 31.79"	287° 0' 42"	0.14937
22	157° 22' 22"	5° 09' 11"	161° 02' 20"	13° 34' 51"	0° 57' 01"	15' 32.15"	287° 10' 24"	0.15253
23	157° 55' 23"	5° 09' 18"	161° 33' 41"	13° 22' 31"	0° 57' 02"	15' 32.51"	287° 19' 55"	0.15573
24	158° 28' 26"	5° 09' 24"	162° 05' 01"	13° 10' 07"	0° 57' 03"	15' 32.86"	287° 29' 16"	0.15896

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	111° 48' 05"	0.81"	113° 32' 44"	21° 40' 27"	1.0165373	15' 44.02"	23° 26' 14"	-5 m 52 s
1	111° 50' 28"	0.81"	113° 35' 16"	21° 40' 04"	1.0165353	15' 44.02"	23° 26' 14"	-5 m 52 s
2	111° 52' 52"	0.81"	113° 37' 48"	21° 39' 41"	1.0165333	15' 44.02"	23° 26' 14"	-5 m 53 s
3	111° 55' 15"	0.81"	113° 40' 20"	21° 39' 18"	1.0165313	15' 44.02"	23° 26' 14"	-5 m 53 s
4	111° 57' 38"	0.81"	113° 42' 52"	21° 38' 55"	1.0165292	15' 44.03"	23° 26' 14"	-5 m 53 s
5	112° 00' 01"	0.81"	113° 45' 24"	21° 38' 33"	1.0165272	15' 44.03"	23° 26' 14"	-5 m 53 s
6	112° 02' 24"	0.81"	113° 47' 55"	21° 38' 10"	1.0165251	15' 44.03"	23° 26' 14"	-5 m 54 s
7	112° 04' 47"	0.81"	113° 50' 27"	21° 37' 47"	1.0165231	15' 44.03"	23° 26' 14"	-5 m 54 s
8	112° 07' 10"	0.81"	113° 52' 59"	21° 37' 24"	1.0165210	15' 44.03"	23° 26' 14"	-5 m 54 s
9	112° 09' 33"	0.81"	113° 55' 31"	21° 37' 01"	1.0165189	15' 44.04"	23° 26' 14"	-5 m 55 s
10	112° 11' 56"	0.80"	113° 58' 03"	21° 36' 37"	1.0165168	15' 44.04"	23° 26' 14"	-5 m 55 s
11	112° 14' 19"	0.80"	114° 00' 35"	21° 36' 14"	1.0165147	15' 44.04"	23° 26' 14"	-5 m 55 s
12	112° 16' 43"	0.80"	114° 03' 07"	21° 35' 51"	1.0165126	15' 44.04"	23° 26' 14"	-5 m 55 s
13	112° 19' 06"	0.80"	114° 05' 39"	21° 35' 28"	1.0165105	15' 44.04"	23° 26' 14"	-5 m 56 s
14	112° 21' 29"	0.80"	114° 08' 11"	21° 35' 05"	1.0165084	15' 44.05"	23° 26' 14"	-5 m 56 s
15	112° 23' 52"	0.80"	114° 10' 42"	21° 34' 41"	1.0165063	15' 44.05"	23° 26' 14"	-5 m 56 s
16	112° 26' 15"	0.80"	114° 13' 14"	21° 34' 18"	1.0165041	15' 44.05"	23° 26' 14"	-5 m 56 s
17	112° 28' 38"	0.79"	114° 15' 46"	21° 33' 55"	1.0165019	15' 44.05"	23° 26' 14"	-5 m 57 s
18	112° 31' 01"	0.79"	114° 18' 18"	21° 33' 31"	1.0164998	15' 44.05"	23° 26' 14"	-5 m 57 s
19	112° 33' 24"	0.79"	114° 20' 50"	21° 33' 08"	1.0164976	15' 44.06"	23° 26' 14"	-5 m 57 s
20	112° 35' 47"	0.79"	114° 23' 21"	21° 32' 44"	1.0164954	15' 44.06"	23° 26' 14"	-5 m 57 s
21	112° 38' 10"	0.79"	114° 25' 53"	21° 32' 21"	1.0164932	15' 44.06"	23° 26' 14"	-5 m 58 s
22	112° 40' 34"	0.79"	114° 28' 25"	21° 31' 57"	1.0164910	15' 44.06"	23° 26' 14"	-5 m 58 s
23	112° 42' 57"	0.78"	114° 30' 57"	21° 31' 34"	1.0164888	15' 44.06"	23° 26' 14"	-5 m 58 s
24	112° 45' 20"	0.78"	114° 33' 28"	21° 31' 10"	1.0164866	15' 44.07"	23° 26' 14"	-5 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	158° 28' 26"	5° 09' 24"	162° 05' 01"	13° 10' 07"	0° 57' 03"	15' 32.86"	287° 29' 16"	0.15896
1	159° 01' 30"	5° 09' 27"	162° 36' 18"	12° 57' 38"	0° 57' 05"	15' 33.22"	287° 38' 27"	0.16222
2	159° 34' 36"	5° 09' 29"	163° 07' 33"	12° 45' 05"	0° 57' 06"	15' 33.58"	287° 47' 27"	0.16551
3	160° 07' 42"	5° 09' 29"	163° 38' 47"	12° 32' 28"	0° 57' 07"	15' 33.95"	287° 56' 17"	0.16882
4	160° 40' 51"	5° 09' 28"	164° 09' 59"	12° 19' 46"	0° 57' 09"	15' 34.31"	288° 4' 57"	0.17217
5	161° 14' 00"	5° 09' 24"	164° 41' 09"	12° 07' 01"	0° 57' 10"	15' 34.67"	288° 13' 27"	0.17554
6	161° 47' 11"	5° 09' 19"	165° 12' 18"	11° 54' 12"	0° 57' 11"	15' 35.03"	288° 21' 47"	0.17895
7	162° 20' 24"	5° 09' 12"	165° 43' 25"	11° 41' 18"	0° 57' 13"	15' 35.39"	288° 29' 57"	0.18238
8	162° 53' 38"	5° 09' 04"	166° 14' 30"	11° 28' 21"	0° 57' 14"	15' 35.75"	288° 37' 57"	0.18583
9	163° 26' 53"	5° 08' 54"	166° 45' 34"	11° 15' 20"	0° 57' 15"	15' 36.12"	288° 45' 47"	0.18932
10	164° 00' 09"	5° 08' 42"	167° 16' 36"	11° 02' 15"	0° 57' 17"	15' 36.48"	288° 53' 27"	0.19283
11	164° 33' 27"	5° 08' 28"	167° 47' 37"	10° 49' 06"	0° 57' 18"	15' 36.85"	289° 0' 57"	0.19637
12	165° 06' 47"	5° 08' 12"	168° 18' 36"	10° 35' 54"	0° 57' 19"	15' 37.21"	289° 8' 18"	0.19994
13	165° 40' 07"	5° 07' 55"	168° 49' 34"	10° 22' 38"	0° 57' 21"	15' 37.57"	289° 15' 28"	0.20354
14	166° 13' 29"	5° 07' 36"	169° 20' 31"	10° 09' 19"	0° 57' 22"	15' 37.94"	289° 22' 30"	0.20716
15	166° 46' 53"	5° 07' 15"	169° 51' 26"	9° 55' 56"	0° 57' 23"	15' 38.31"	289° 29' 21"	0.21080
16	167° 20' 18"	5° 06' 53"	170° 22' 20"	9° 42' 29"	0° 57' 25"	15' 38.67"	289° 36' 03"	0.21448
17	167° 53' 44"	5° 06' 28"	170° 53' 13"	9° 28' 60"	0° 57' 26"	15' 39.04"	289° 42' 35"	0.21818
18	168° 27' 11"	5° 06' 02"	171° 24' 05"	9° 15' 27"	0° 57' 27"	15' 39.40"	289° 48' 58"	0.22190
19	169° 00' 40"	5° 05' 34"	171° 54' 56"	9° 01' 51"	0° 57' 29"	15' 39.77"	289° 55' 12"	0.22565
20	169° 34' 11"	5° 05' 05"	172° 25' 45"	8° 48' 11"	0° 57' 30"	15' 40.14"	290° 1' 16"	0.22943
21	170° 07' 43"	5° 04' 34"	172° 56' 34"	8° 34' 29"	0° 57' 31"	15' 40.51"	290° 7' 10"	0.23323
22	170° 41' 16"	5° 04' 00"	173° 27' 22"	8° 20' 43"	0° 57' 33"	15' 40.87"	290° 12' 55"	0.23705
23	171° 14' 50"	5° 03' 26"	173° 58' 09"	8° 06' 55"	0° 57' 34"	15' 41.24"	290° 18' 31"	0.24090
24	171° 48' 26"	5° 02' 49"	174° 28' 55"	7° 53' 04"	0° 57' 35"	15' 41.61"	290° 23' 57"	0.24478

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	112° 45' 20"	0.78"	114° 33' 28"	21° 31' 10"	1.0164866	15' 44.07"	23° 26' 14"	-5 m 58 s
1	112° 47' 43"	0.78"	114° 36' 00"	21° 30' 46"	1.0164843	15' 44.07"	23° 26' 14"	-5 m 59 s
2	112° 50' 06"	0.78"	114° 38' 32"	21° 30' 23"	1.0164821	15' 44.07"	23° 26' 14"	-5 m 59 s
3	112° 52' 29"	0.78"	114° 41' 03"	21° 29' 59"	1.0164798	15' 44.07"	23° 26' 14"	-5 m 59 s
4	112° 54' 52"	0.77"	114° 43' 35"	21° 29' 35"	1.0164776	15' 44.07"	23° 26' 14"	-5 m 59 s
5	112° 57' 15"	0.77"	114° 46' 07"	21° 29' 11"	1.0164753	15' 44.08"	23° 26' 14"	-5 m 60 s
6	112° 59' 38"	0.77"	114° 48' 38"	21° 28' 47"	1.0164730	15' 44.08"	23° 26' 14"	-5 m 60 s
7	113° 02' 02"	0.77"	114° 51' 10"	21° 28' 23"	1.0164707	15' 44.08"	23° 26' 15"	-6 m 00 s
8	113° 04' 25"	0.77"	114° 53' 42"	21° 27' 60"	1.0164684	15' 44.08"	23° 26' 15"	-6 m 00 s
9	113° 06' 48"	0.76"	114° 56' 13"	21° 27' 36"	1.0164661	15' 44.08"	23° 26' 15"	-6 m 01 s
10	113° 09' 11"	0.76"	114° 58' 45"	21° 27' 12"	1.0164638	15' 44.09"	23° 26' 15"	-6 m 01 s
11	113° 11' 34"	0.76"	115° 01' 16"	21° 26' 47"	1.0164615	15' 44.09"	23° 26' 15"	-6 m 01 s
12	113° 13' 57"	0.76"	115° 03' 48"	21° 26' 23"	1.0164591	15' 44.09"	23° 26' 15"	-6 m 01 s
13	113° 16' 20"	0.75"	115° 06' 19"	21° 25' 59"	1.0164568	15' 44.09"	23° 26' 15"	-6 m 02 s
14	113° 18' 43"	0.75"	115° 08' 51"	21° 25' 35"	1.0164544	15' 44.10"	23° 26' 15"	-6 m 02 s
15	113° 21' 06"	0.75"	115° 11' 22"	21° 25' 11"	1.0164521	15' 44.10"	23° 26' 15"	-6 m 02 s
16	113° 23' 29"	0.75"	115° 13' 54"	21° 24' 47"	1.0164497	15' 44.10"	23° 26' 15"	-6 m 02 s
17	113° 25' 53"	0.74"	115° 16' 25"	21° 24' 22"	1.0164473	15' 44.10"	23° 26' 15"	-6 m 03 s
18	113° 28' 16"	0.74"	115° 18' 57"	21° 23' 58"	1.0164449	15' 44.10"	23° 26' 15"	-6 m 03 s
19	113° 30' 39"	0.74"	115° 21' 28"	21° 23' 34"	1.0164425	15' 44.11"	23° 26' 15"	-6 m 03 s
20	113° 33' 02"	0.73"	115° 23' 60"	21° 23' 09"	1.0164401	15' 44.11"	23° 26' 15"	-6 m 03 s
21	113° 35' 25"	0.73"	115° 26' 31"	21° 22' 45"	1.0164377	15' 44.11"	23° 26' 15"	-6 m 04 s
22	113° 37' 48"	0.73"	115° 29' 03"	21° 22' 20"	1.0164353	15' 44.11"	23° 26' 15"	-6 m 04 s
23	113° 40' 11"	0.73"	115° 31' 34"	21° 21' 56"	1.0164328	15' 44.12"	23° 26' 15"	-6 m 04 s
24	113° 42' 34"	0.72"	115° 34' 05"	21° 21' 31"	1.0164304	15' 44.12"	23° 26' 15"	-6 m 04 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	171° 48' 26"	5° 02' 49"	174° 28' 55"	7° 53' 04"	0° 57' 35"	15' 41.61"	290° 23' 57"	0.24478
1	172° 22' 03"	5° 02' 10"	174° 59' 41"	7° 39' 09"	0° 57' 37"	15' 41.98"	290° 29' 14"	0.24867
2	172° 55' 42"	5° 01' 30"	175° 30' 25"	7° 25' 12"	0° 57' 38"	15' 42.35"	290° 34' 22"	0.25259
3	173° 29' 22"	5° 00' 48"	176° 01' 10"	7° 11' 13"	0° 57' 40"	15' 42.72"	290° 39' 20"	0.25654
4	174° 03' 03"	5° 00' 05"	176° 31' 53"	6° 57' 10"	0° 57' 41"	15' 43.09"	290° 44' 09"	0.26051
5	174° 36' 46"	4° 59' 19"	177° 02' 36"	6° 43' 05"	0° 57' 42"	15' 43.46"	290° 48' 49"	0.26450
6	175° 10' 30"	4° 58' 32"	177° 33' 19"	6° 28' 58"	0° 57' 44"	15' 43.83"	290° 53' 19"	0.26851
7	175° 44' 16"	4° 57' 43"	178° 04' 01"	6° 14' 48"	0° 57' 45"	15' 44.20"	290° 57' 40"	0.27254
8	176° 18' 03"	4° 56' 52"	178° 34' 43"	6° 00' 35"	0° 57' 46"	15' 44.57"	291° 1' 52"	0.27660
9	176° 51' 51"	4° 55' 60"	179° 05' 24"	5° 46' 21"	0° 57' 48"	15' 44.94"	291° 5' 55"	0.28068
10	177° 25' 41"	4° 55' 05"	179° 36' 06"	5° 32' 04"	0° 57' 49"	15' 45.31"	291° 9' 48"	0.28478
11	177° 59' 32"	4° 54' 09"	180° 06' 47"	5° 17' 45"	0° 57' 50"	15' 45.68"	291° 13' 33"	0.28890
12	178° 33' 24"	4° 53' 12"	180° 37' 28"	5° 03' 23"	0° 57' 52"	15' 46.05"	291° 17' 08"	0.29304
13	179° 07' 18"	4° 52' 12"	181° 08' 09"	4° 48' 60"	0° 57' 53"	15' 46.42"	291° 20' 34"	0.29720
14	179° 41' 13"	4° 51' 11"	181° 38' 50"	4° 34' 34"	0° 57' 54"	15' 46.79"	291° 23' 51"	0.30138
15	180° 15' 10"	4° 50' 08"	182° 09' 32"	4° 20' 07"	0° 57' 56"	15' 47.16"	291° 26' 58"	0.30558
16	180° 49' 08"	4° 49' 03"	182° 40' 13"	4° 05' 38"	0° 57' 57"	15' 47.53"	291° 29' 57"	0.30981
17	181° 23' 07"	4° 47' 57"	183° 10' 55"	3° 51' 07"	0° 57' 59"	15' 47.90"	291° 32' 46"	0.31405
18	181° 57' 08"	4° 46' 48"	183° 41' 37"	3° 36' 34"	0° 57' 60"	15' 48.27"	291° 35' 26"	0.31831
19	182° 31' 10"	4° 45' 38"	184° 12' 19"	3° 21' 59"	0° 58' 01"	15' 48.64"	291° 37' 57"	0.32258
20	183° 05' 13"	4° 44' 27"	184° 43' 02"	3° 07' 23"	0° 58' 03"	15' 49.01"	291° 40' 19"	0.32688
21	183° 39' 18"	4° 43' 13"	185° 13' 45"	2° 52' 46"	0° 58' 04"	15' 49.38"	291° 42' 32"	0.33119
22	184° 13' 25"	4° 41' 58"	185° 44' 29"	2° 38' 06"	0° 58' 05"	15' 49.75"	291° 44' 35"	0.33553
23	184° 47' 32"	4° 40' 41"	186° 15' 13"	2° 23' 26"	0° 58' 07"	15' 50.13"	291° 46' 30"	0.33987
24	185° 21' 41"	4° 39' 23"	186° 45' 58"	2° 08' 44"	0° 58' 08"	15' 50.50"	291° 48' 15"	0.34424

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	113° 42' 34"	0.72"	115° 34' 05"	21° 21' 31"	1.0164304	15' 44.12"	23° 26' 15"	-6 m 04 s
1	113° 44' 57"	0.72"	115° 36' 37"	21° 21' 07"	1.0164279	15' 44.12"	23° 26' 15"	-6 m 05 s
2	113° 47' 21"	0.72"	115° 39' 08"	21° 20' 42"	1.0164255	15' 44.12"	23° 26' 15"	-6 m 05 s
3	113° 49' 44"	0.71"	115° 41' 39"	21° 20' 17"	1.0164230	15' 44.12"	23° 26' 15"	-6 m 05 s
4	113° 52' 07"	0.71"	115° 44' 11"	21° 19' 53"	1.0164205	15' 44.13"	23° 26' 15"	-6 m 05 s
5	113° 54' 30"	0.71"	115° 46' 42"	21° 19' 28"	1.0164180	15' 44.13"	23° 26' 15"	-6 m 05 s
6	113° 56' 53"	0.70"	115° 49' 13"	21° 19' 03"	1.0164155	15' 44.13"	23° 26' 15"	-6 m 06 s
7	113° 59' 16"	0.70"	115° 51' 45"	21° 18' 38"	1.0164130	15' 44.13"	23° 26' 15"	-6 m 06 s
8	114° 01' 39"	0.70"	115° 54' 16"	21° 18' 14"	1.0164105	15' 44.14"	23° 26' 15"	-6 m 06 s
9	114° 04' 02"	0.69"	115° 56' 47"	21° 17' 49"	1.0164079	15' 44.14"	23° 26' 15"	-6 m 06 s
10	114° 06' 25"	0.69"	115° 59' 18"	21° 17' 24"	1.0164054	15' 44.14"	23° 26' 15"	-6 m 07 s
11	114° 08' 48"	0.69"	116° 01' 50"	21° 16' 59"	1.0164029	15' 44.14"	23° 26' 15"	-6 m 07 s
12	114° 11' 12"	0.68"	116° 04' 21"	21° 16' 34"	1.0164003	15' 44.15"	23° 26' 15"	-6 m 07 s
13	114° 13' 35"	0.68"	116° 06' 52"	21° 16' 09"	1.0163978	15' 44.15"	23° 26' 15"	-6 m 07 s
14	114° 15' 58"	0.67"	116° 09' 23"	21° 15' 44"	1.0163952	15' 44.15"	23° 26' 15"	-6 m 08 s
15	114° 18' 21"	0.67"	116° 11' 54"	21° 15' 19"	1.0163926	15' 44.15"	23° 26' 15"	-6 m 08 s
16	114° 20' 44"	0.67"	116° 14' 26"	21° 14' 53"	1.0163900	15' 44.16"	23° 26' 15"	-6 m 08 s
17	114° 23' 07"	0.66"	116° 16' 57"	21° 14' 28"	1.0163874	15' 44.16"	23° 26' 15"	-6 m 08 s
18	114° 25' 30"	0.66"	116° 19' 28"	21° 14' 03"	1.0163848	15' 44.16"	23° 26' 15"	-6 m 08 s
19	114° 27' 53"	0.66"	116° 21' 59"	21° 13' 38"	1.0163822	15' 44.16"	23° 26' 15"	-6 m 09 s
20	114° 30' 16"	0.65"	116° 24' 30"	21° 13' 12"	1.0163796	15' 44.16"	23° 26' 15"	-6 m 09 s
21	114° 32' 40"	0.65"	116° 27' 01"	21° 12' 47"	1.0163769	15' 44.17"	23° 26' 15"	-6 m 09 s
22	114° 35' 03"	0.64"	116° 29' 32"	21° 12' 22"	1.0163743	15' 44.17"	23° 26' 15"	-6 m 09 s
23	114° 37' 26"	0.64"	116° 32' 03"	21° 11' 56"	1.0163717	15' 44.17"	23° 26' 15"	-6 m 09 s
24	114° 39' 49"	0.64"	116° 34' 34"	21° 11' 31"	1.0163690	15' 44.17"	23° 26' 15"	-6 m 10 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	185° 21' 41"	4° 39' 23"	186° 45' 58"	2° 08' 44"	0° 58' 08"	15' 50.50"	291° 48' 15"	0.34424
1	185° 55' 52"	4° 38' 02"	187° 16' 44"	1° 54' 01"	0° 58' 09"	15' 50.87"	291° 49' 51"	0.34862
2	186° 30' 03"	4° 36' 40"	187° 47' 31"	1° 39' 17"	0° 58' 11"	15' 51.24"	291° 51' 18"	0.35302
3	187° 04' 16"	4° 35' 17"	188° 18' 18"	1° 24' 31"	0° 58' 12"	15' 51.61"	291° 52' 35"	0.35744
4	187° 38' 31"	4° 33' 51"	188° 49' 07"	1° 09' 45"	0° 58' 14"	15' 51.98"	291° 53' 44"	0.36187
5	188° 12' 47"	4° 32' 24"	189° 19' 56"	0° 54' 57"	0° 58' 15"	15' 52.35"	291° 54' 43"	0.36631
6	188° 47' 04"	4° 30' 55"	189° 50' 47"	0° 40' 09"	0° 58' 16"	15' 52.71"	291° 55' 33"	0.37077
7	189° 21' 23"	4° 29' 25"	190° 21' 39"	0° 25' 19"	0° 58' 18"	15' 53.08"	291° 56' 14"	0.37525
8	189° 55' 43"	4° 27' 53"	190° 52' 32"	0° 10' 29"	0° 58' 19"	15' 53.45"	291° 56' 46"	0.37974
9	190° 30' 04"	4° 26' 19"	191° 23' 27"	0° -4' 22"	0° 58' 20"	15' 53.82"	291° 57' 09"	0.38424
10	191° 04' 27"	4° 24' 43"	191° 54' 22"	0° -19' 13"	0° 58' 22"	15' 54.19"	291° 57' 22"	0.38876
11	191° 38' 51"	4° 23' 06"	192° 25' 20"	0° -34' 05"	0° 58' 23"	15' 54.56"	291° 57' 26"	0.39328
12	192° 13' 16"	4° 21' 27"	192° 56' 18"	0° -48' 58"	0° 58' 24"	15' 54.92"	291° 57' 21"	0.39783
13	192° 47' 43"	4° 19' 47"	193° 27' 19"	-1° 03' 51"	0° 58' 26"	15' 55.29"	291° 57' 06"	0.40238
14	193° 22' 12"	4° 18' 05"	193° 58' 21"	-1° 18' 44"	0° 58' 27"	15' 55.66"	291° 56' 43"	0.40695
15	193° 56' 41"	4° 16' 21"	194° 29' 25"	-1° 33' 38"	0° 58' 28"	15' 56.02"	291° 56' 10"	0.41153
16	194° 31' 12"	4° 14' 36"	195° 00' 31"	-1° 48' 31"	0° 58' 30"	15' 56.39"	291° 55' 27"	0.41612
17	195° 05' 45"	4° 12' 49"	195° 31' 38"	-2° 03' 25"	0° 58' 31"	15' 56.75"	291° 54' 36"	0.42072
18	195° 40' 18"	4° 11' 00"	196° 02' 48"	-2° 18' 19"	0° 58' 32"	15' 57.12"	291° 53' 35"	0.42533
19	196° 14' 54"	4° 09' 10"	196° 33' 59"	-2° 33' 13"	0° 58' 34"	15' 57.48"	291° 52' 25"	0.42995
20	196° 49' 30"	4° 07' 18"	197° 05' 13"	-2° 48' 07"	0° 58' 35"	15' 57.84"	291° 51' 05"	0.43458
21	197° 24' 08"	4° 05' 25"	197° 36' 29"	-3° 03' 01"	0° 58' 36"	15' 58.20"	291° 49' 36"	0.43922
22	197° 58' 47"	4° 03' 30"	198° 07' 47"	-3° 17' 54"	0° 58' 38"	15' 58.57"	291° 47' 58"	0.44386
23	198° 33' 28"	4° 01' 33"	198° 39' 07"	-3° 32' 47"	0° 58' 39"	15' 58.93"	291° 46' 10"	0.44852
24	199° 08' 10"	3° 59' 35"	199° 10' 30"	-3° 47' 40"	0° 58' 40"	15' 59.29"	291° 44' 13"	0.45319

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	114° 39' 49"	0.64"	116° 34' 34"	21° 11' 31"	1.0163690	15' 44.17"	23° 26' 15"	-6 m 10 s
1	114° 42' 12"	0.63"	116° 37' 05"	21° 11' 05"	1.0163663	15' 44.18"	23° 26' 15"	-6 m 10 s
2	114° 44' 35"	0.63"	116° 39' 36"	21° 10' 40"	1.0163637	15' 44.18"	23° 26' 15"	-6 m 10 s
3	114° 46' 58"	0.62"	116° 42' 07"	21° 10' 14"	1.0163610	15' 44.18"	23° 26' 15"	-6 m 10 s
4	114° 49' 21"	0.62"	116° 44' 38"	21° 09' 49"	1.0163583	15' 44.18"	23° 26' 15"	-6 m 11 s
5	114° 51' 44"	0.61"	116° 47' 09"	21° 09' 23"	1.0163556	15' 44.19"	23° 26' 15"	-6 m 11 s
6	114° 54' 07"	0.61"	116° 49' 40"	21° 08' 57"	1.0163529	15' 44.19"	23° 26' 15"	-6 m 11 s
7	114° 56' 31"	0.61"	116° 52' 11"	21° 08' 32"	1.0163502	15' 44.19"	23° 26' 15"	-6 m 11 s
8	114° 58' 54"	0.60"	116° 54' 42"	21° 08' 06"	1.0163475	15' 44.19"	23° 26' 15"	-6 m 11 s
9	115° 01' 17"	0.60"	116° 57' 13"	21° 07' 40"	1.0163447	15' 44.20"	23° 26' 15"	-6 m 12 s
10	115° 03' 40"	0.59"	116° 59' 44"	21° 07' 14"	1.0163420	15' 44.20"	23° 26' 15"	-6 m 12 s
11	115° 06' 03"	0.59"	117° 02' 15"	21° 06' 48"	1.0163393	15' 44.20"	23° 26' 15"	-6 m 12 s
12	115° 08' 26"	0.58"	117° 04' 46"	21° 06' 23"	1.0163365	15' 44.20"	23° 26' 15"	-6 m 12 s
13	115° 10' 49"	0.58"	117° 07' 17"	21° 05' 57"	1.0163337	15' 44.21"	23° 26' 15"	-6 m 12 s
14	115° 13' 12"	0.58"	117° 09' 47"	21° 05' 31"	1.0163310	15' 44.21"	23° 26' 15"	-6 m 13 s
15	115° 15' 35"	0.57"	117° 12' 18"	21° 05' 05"	1.0163282	15' 44.21"	23° 26' 15"	-6 m 13 s
16	115° 17' 59"	0.57"	117° 14' 49"	21° 04' 39"	1.0163254	15' 44.22"	23° 26' 15"	-6 m 13 s
17	115° 20' 22"	0.56"	117° 17' 20"	21° 04' 12"	1.0163226	15' 44.22"	23° 26' 15"	-6 m 13 s
18	115° 22' 45"	0.56"	117° 19' 51"	21° 03' 46"	1.0163198	15' 44.22"	23° 26' 15"	-6 m 13 s
19	115° 25' 08"	0.55"	117° 22' 21"	21° 03' 20"	1.0163170	15' 44.22"	23° 26' 15"	-6 m 14 s
20	115° 27' 31"	0.55"	117° 24' 52"	21° 02' 54"	1.0163142	15' 44.23"	23° 26' 15"	-6 m 14 s
21	115° 29' 54"	0.54"	117° 27' 23"	21° 02' 28"	1.0163114	15' 44.23"	23° 26' 15"	-6 m 14 s
22	115° 32' 17"	0.54"	117° 29' 54"	21° 02' 02"	1.0163085	15' 44.23"	23° 26' 15"	-6 m 14 s
23	115° 34' 40"	0.53"	117° 32' 24"	21° 01' 35"	1.0163057	15' 44.23"	23° 26' 15"	-6 m 14 s
24	115° 37' 03"	0.53"	117° 34' 55"	21° 01' 09"	1.0163028	15' 44.24"	23° 26' 15"	-6 m 15 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	199° 08' 10"	3° 59' 35"	199° 10' 30"	-3° 47' 40"	0° 58' 40"	15' 59.29"	291° 44' 13"	0.45319
1	199° 42' 53"	3° 57' 36"	199° 41' 55"	-4° 02' 32"	0° 58' 42"	15' 59.64"	291° 42' 06"	0.45786
2	200° 17' 38"	3° 55' 35"	200° 13' 23"	-4° 17' 24"	0° 58' 43"	16' 00.00"	291° 39' 50"	0.46254
3	200° 52' 24"	3° 53' 32"	200° 44' 53"	-4° 32' 15"	0° 58' 44"	16' 00.36"	291° 37' 24"	0.46723
4	201° 27' 11"	3° 51' 28"	201° 16' 26"	-4° 47' 05"	0° 58' 46"	16' 00.72"	291° 34' 49"	0.47192
5	202° 02' 00"	3° 49' 22"	201° 48' 02"	-5° 01' 55"	0° 58' 47"	16' 01.07"	291° 32' 05"	0.47662
6	202° 36' 50"	3° 47' 15"	202° 19' 41"	-5° 16' 44"	0° 58' 48"	16' 01.43"	291° 29' 11"	0.48132
7	203° 11' 42"	3° 45' 06"	202° 51' 23"	-5° 31' 31"	0° 58' 49"	16' 01.78"	291° 26' 07"	0.48604
8	203° 46' 34"	3° 42' 56"	203° 23' 07"	-5° 46' 18"	0° 58' 51"	16' 02.13"	291° 22' 53"	0.49075
9	204° 21' 29"	3° 40' 44"	203° 54' 55"	-6° 01' 04"	0° 58' 52"	16' 02.48"	291° 19' 30"	0.49547
10	204° 56' 24"	3° 38' 31"	204° 26' 45"	-6° 15' 48"	0° 58' 53"	16' 02.83"	291° 15' 58"	0.50019
11	205° 31' 21"	3° 36' 17"	204° 58' 39"	-6° 30' 31"	0° 58' 55"	16' 03.18"	291° 12' 16"	0.50492
12	206° 06' 19"	3° 34' 01"	205° 30' 36"	-6° 45' 13"	0° 58' 56"	16' 03.53"	291° 8' 24"	0.50965
13	206° 41' 19"	3° 31' 43"	206° 02' 37"	-6° 59' 53"	0° 58' 57"	16' 03.88"	291° 4' 22"	0.51438
14	207° 16' 20"	3° 29' 24"	206° 34' 41"	-7° 14' 32"	0° 58' 58"	16' 04.22"	291° 0' 10"	0.51912
15	207° 51' 22"	3° 27' 04"	207° 06' 48"	-7° 29' 09"	0° 58' 60"	16' 04.56"	290° 55' 49"	0.52385
16	208° 26' 26"	3° 24' 42"	207° 38' 59"	-7° 43' 44"	0° 59' 01"	16' 04.91"	290° 51' 18"	0.52859
17	209° 01' 31"	3° 22' 19"	208° 11' 14"	-7° 58' 18"	0° 59' 02"	16' 05.25"	290° 46' 38"	0.53333
18	209° 36' 37"	3° 19' 55"	208° 43' 32"	-8° 12' 50"	0° 59' 03"	16' 05.59"	290° 41' 47"	0.53807
19	210° 11' 44"	3° 17' 29"	209° 15' 54"	-8° 27' 20"	0° 59' 05"	16' 05.92"	290° 36' 46"	0.54281
20	210° 46' 53"	3° 15' 02"	209° 48' 19"	-8° 41' 47"	0° 59' 06"	16' 06.26"	290° 31' 36"	0.54755
21	211° 22' 04"	3° 12' 34"	210° 20' 49"	-8° 56' 13"	0° 59' 07"	16' 06.59"	290° 26' 16"	0.55229
22	211° 57' 15"	3° 10' 04"	210° 53' 23"	-9° 10' 36"	0° 59' 08"	16' 06.93"	290° 20' 45"	0.55703
23	212° 32' 28"	3° 07' 33"	211° 26' 00"	-9° 24' 57"	0° 59' 10"	16' 07.26"	290° 15' 05"	0.56176
24	213° 07' 42"	3° 05' 01"	211° 58' 42"	-9° 39' 16"	0° 59' 11"	16' 07.59"	290° 9' 15"	0.56649

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	115° 37' 03"	0.53"	117° 34' 55"	21° 01' 09"	1.0163028	15' 44.24"	23° 26' 15"	-6 m 15 s
1	115° 39' 27"	0.52"	117° 37' 26"	21° 00' 42"	1.0163000	15' 44.24"	23° 26' 15"	-6 m 15 s
2	115° 41' 50"	0.52"	117° 39' 56"	21° 00' 16"	1.0162971	15' 44.24"	23° 26' 15"	-6 m 15 s
3	115° 44' 13"	0.51"	117° 42' 27"	20° 59' 50"	1.0162942	15' 44.24"	23° 26' 15"	-6 m 15 s
4	115° 46' 36"	0.51"	117° 44' 58"	20° 59' 23"	1.0162914	15' 44.25"	23° 26' 15"	-6 m 15 s
5	115° 48' 59"	0.50"	117° 47' 28"	20° 58' 57"	1.0162885	15' 44.25"	23° 26' 15"	-6 m 15 s
6	115° 51' 22"	0.50"	117° 49' 59"	20° 58' 30"	1.0162856	15' 44.25"	23° 26' 14"	-6 m 16 s
7	115° 53' 45"	0.49"	117° 52' 29"	20° 58' 03"	1.0162827	15' 44.25"	23° 26' 14"	-6 m 16 s
8	115° 56' 08"	0.49"	117° 54' 60"	20° 57' 37"	1.0162798	15' 44.26"	23° 26' 14"	-6 m 16 s
9	115° 58' 31"	0.48"	117° 57' 31"	20° 57' 10"	1.0162769	15' 44.26"	23° 26' 14"	-6 m 16 s
10	116° 00' 55"	0.48"	118° 00' 01"	20° 56' 43"	1.0162739	15' 44.26"	23° 26' 14"	-6 m 16 s
11	116° 03' 18"	0.47"	118° 02' 32"	20° 56' 17"	1.0162710	15' 44.27"	23° 26' 14"	-6 m 17 s
12	116° 05' 41"	0.47"	118° 05' 02"	20° 55' 50"	1.0162681	15' 44.27"	23° 26' 14"	-6 m 17 s
13	116° 08' 04"	0.46"	118° 07' 33"	20° 55' 23"	1.0162651	15' 44.27"	23° 26' 14"	-6 m 17 s
14	116° 10' 27"	0.46"	118° 10' 03"	20° 54' 56"	1.0162622	15' 44.27"	23° 26' 14"	-6 m 17 s
15	116° 12' 50"	0.45"	118° 12' 34"	20° 54' 29"	1.0162592	15' 44.28"	23° 26' 14"	-6 m 17 s
16	116° 15' 13"	0.45"	118° 15' 04"	20° 54' 02"	1.0162562	15' 44.28"	23° 26' 14"	-6 m 17 s
17	116° 17' 36"	0.44"	118° 17' 35"	20° 53' 35"	1.0162533	15' 44.28"	23° 26' 14"	-6 m 18 s
18	116° 19' 59"	0.44"	118° 20' 05"	20° 53' 08"	1.0162503	15' 44.29"	23° 26' 14"	-6 m 18 s
19	116° 22' 23"	0.43"	118° 22' 35"	20° 52' 41"	1.0162473	15' 44.29"	23° 26' 14"	-6 m 18 s
20	116° 24' 46"	0.43"	118° 25' 06"	20° 52' 14"	1.0162443	15' 44.29"	23° 26' 14"	-6 m 18 s
21	116° 27' 09"	0.42"	118° 27' 36"	20° 51' 47"	1.0162413	15' 44.29"	23° 26' 14"	-6 m 18 s
22	116° 29' 32"	0.41"	118° 30' 07"	20° 51' 20"	1.0162383	15' 44.30"	23° 26' 14"	-6 m 18 s
23	116° 31' 55"	0.41"	118° 32' 37"	20° 50' 53"	1.0162353	15' 44.30"	23° 26' 14"	-6 m 19 s
24	116° 34' 18"	0.40"	118° 35' 07"	20° 50' 26"	1.0162322	15' 44.30"	23° 26' 14"	-6 m 19 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	213° 07' 42"	3° 05' 01"	211° 58' 42"	-9° 39' 16"	0° 59' 11"	16' 07.59"	290° 9' 15"	0.56649
1	213° 42' 58"	3° 02' 27"	212° 31' 28"	-9° 53' 32"	0° 59' 12"	16' 07.91"	290° 3' 14"	0.57122
2	214° 18' 14"	2° 59' 53"	213° 04' 18"	-10° 07' 46"	0° 59' 13"	16' 08.24"	289° 57' 04"	0.57595
3	214° 53' 33"	2° 57' 17"	213° 37' 12"	-10° 21' 57"	0° 59' 14"	16' 08.56"	289° 50' 43"	0.58067
4	215° 28' 52"	2° 54' 39"	214° 10' 10"	-10° 36' 05"	0° 59' 16"	16' 08.88"	289° 44' 13"	0.58539
5	216° 04' 13"	2° 52' 01"	214° 43' 13"	-10° 50' 10"	0° 59' 17"	16' 09.20"	289° 37' 32"	0.59011
6	216° 39' 34"	2° 49' 21"	215° 16' 21"	-11° 04' 12"	0° 59' 18"	16' 09.52"	289° 30' 41"	0.59482
7	217° 14' 58"	2° 46' 40"	215° 49' 33"	-11° 18' 12"	0° 59' 19"	16' 09.84"	289° 23' 40"	0.59952
8	217° 50' 22"	2° 43' 58"	216° 22' 50"	-11° 32' 08"	0° 59' 20"	16' 10.15"	289° 16' 28"	0.60422
9	218° 25' 48"	2° 41' 15"	216° 56' 11"	-11° 46' 01"	0° 59' 21"	16' 10.46"	289° 9' 06"	0.60891
10	219° 01' 15"	2° 38' 31"	217° 29' 37"	-11° 59' 50"	0° 59' 22"	16' 10.77"	289° 1' 34"	0.61360
11	219° 36' 43"	2° 35' 46"	218° 03' 08"	-12° 13' 36"	0° 59' 24"	16' 11.08"	288° 53' 52"	0.61828
12	220° 12' 13"	2° 32' 59"	218° 36' 43"	-12° 27' 19"	0° 59' 25"	16' 11.38"	288° 45' 59"	0.62295
13	220° 47' 44"	2° 30' 11"	219° 10' 23"	-12° 40' 58"	0° 59' 26"	16' 11.68"	288° 37' 56"	0.62761
14	221° 23' 16"	2° 27' 23"	219° 44' 09"	-12° 54' 33"	0° 59' 27"	16' 11.98"	288° 29' 42"	0.63226
15	221° 58' 49"	2° 24' 33"	220° 17' 59"	-13° 08' 04"	0° 59' 28"	16' 12.28"	288° 21' 18"	0.63690
16	222° 34' 23"	2° 21' 42"	220° 51' 55"	-13° 21' 32"	0° 59' 29"	16' 12.57"	288° 12' 44"	0.64154
17	223° 09' 59"	2° 18' 51"	221° 25' 55"	-13° 34' 55"	0° 59' 30"	16' 12.86"	288° 3' 59"	0.64616
18	223° 45' 36"	2° 15' 58"	222° 00' 01"	-13° 48' 15"	0° 59' 31"	16' 13.15"	287° 55' 03"	0.65078
19	224° 21' 14"	2° 13' 04"	222° 34' 11"	-14° 01' 30"	0° 59' 32"	16' 13.44"	287° 45' 57"	0.65538
20	224° 56' 53"	2° 10' 09"	223° 08' 27"	-14° 14' 41"	0° 59' 33"	16' 13.72"	287° 36' 40"	0.65997
21	225° 32' 34"	2° 07' 14"	223° 42' 49"	-14° 27' 47"	0° 59' 34"	16' 14.00"	287° 27' 12"	0.66455
22	226° 08' 16"	2° 04' 17"	224° 17' 15"	-14° 40' 49"	0° 59' 35"	16' 14.28"	287° 17' 34"	0.66911
23	226° 43' 58"	2° 01' 20"	224° 51' 47"	-14° 53' 47"	0° 59' 36"	16' 14.56"	287° 7' 45"	0.67366
24	227° 19' 42"	1° 58' 22"	225° 26' 25"	-15° 06' 39"	0° 59' 37"	16' 14.83"	286° 57' 46"	0.67820

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	116° 34' 18"	0.40"	118° 35' 07"	20° 50' 26"	1.0162322	15' 44.30"	23° 26' 14"	-6 m 19 s
1	116° 36' 41"	0.40"	118° 37' 38"	20° 49' 58"	1.0162292	15' 44.30"	23° 26' 14"	-6 m 19 s
2	116° 39' 04"	0.39"	118° 40' 08"	20° 49' 31"	1.0162262	15' 44.31"	23° 26' 14"	-6 m 19 s
3	116° 41' 28"	0.39"	118° 42' 38"	20° 49' 04"	1.0162231	15' 44.31"	23° 26' 14"	-6 m 19 s
4	116° 43' 51"	0.38"	118° 45' 08"	20° 48' 36"	1.0162201	15' 44.31"	23° 26' 14"	-6 m 19 s
5	116° 46' 14"	0.38"	118° 47' 39"	20° 48' 09"	1.0162170	15' 44.32"	23° 26' 14"	-6 m 20 s
6	116° 48' 37"	0.37"	118° 50' 09"	20° 47' 41"	1.0162139	15' 44.32"	23° 26' 14"	-6 m 20 s
7	116° 50' 60"	0.37"	118° 52' 39"	20° 47' 14"	1.0162109	15' 44.32"	23° 26' 14"	-6 m 20 s
8	116° 53' 23"	0.36"	118° 55' 09"	20° 46' 46"	1.0162078	15' 44.32"	23° 26' 14"	-6 m 20 s
9	116° 55' 46"	0.35"	118° 57' 40"	20° 46' 19"	1.0162047	15' 44.33"	23° 26' 14"	-6 m 20 s
10	116° 58' 09"	0.35"	119° 00' 10"	20° 45' 51"	1.0162016	15' 44.33"	23° 26' 14"	-6 m 20 s
11	117° 00' 32"	0.34"	119° 02' 40"	20° 45' 24"	1.0161985	15' 44.33"	23° 26' 14"	-6 m 21 s
12	117° 02' 56"	0.34"	119° 05' 10"	20° 44' 56"	1.0161954	15' 44.34"	23° 26' 14"	-6 m 21 s
13	117° 05' 19"	0.33"	119° 07' 40"	20° 44' 28"	1.0161923	15' 44.34"	23° 26' 14"	-6 m 21 s
14	117° 07' 42"	0.33"	119° 10' 11"	20° 44' 01"	1.0161891	15' 44.34"	23° 26' 14"	-6 m 21 s
15	117° 10' 05"	0.32"	119° 12' 41"	20° 43' 33"	1.0161860	15' 44.34"	23° 26' 14"	-6 m 21 s
16	117° 12' 28"	0.32"	119° 15' 11"	20° 43' 05"	1.0161829	15' 44.35"	23° 26' 14"	-6 m 21 s
17	117° 14' 51"	0.31"	119° 17' 41"	20° 42' 37"	1.0161797	15' 44.35"	23° 26' 14"	-6 m 22 s
18	117° 17' 14"	0.30"	119° 20' 11"	20° 42' 09"	1.0161766	15' 44.35"	23° 26' 14"	-6 m 22 s
19	117° 19' 37"	0.30"	119° 22' 41"	20° 41' 41"	1.0161734	15' 44.36"	23° 26' 14"	-6 m 22 s
20	117° 22' 01"	0.29"	119° 25' 11"	20° 41' 13"	1.0161703	15' 44.36"	23° 26' 14"	-6 m 22 s
21	117° 24' 24"	0.29"	119° 27' 41"	20° 40' 45"	1.0161671	15' 44.36"	23° 26' 14"	-6 m 22 s
22	117° 26' 47"	0.28"	119° 30' 11"	20° 40' 17"	1.0161639	15' 44.37"	23° 26' 14"	-6 m 22 s
23	117° 29' 10"	0.28"	119° 32' 41"	20° 39' 49"	1.0161607	15' 44.37"	23° 26' 14"	-6 m 22 s
24	117° 31' 33"	0.27"	119° 35' 11"	20° 39' 21"	1.0161576	15' 44.37"	23° 26' 14"	-6 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	227° 19' 42"	1° 58' 22"	225° 26' 25"	-15° 06' 39"	0° 59' 37"	16' 14.83"	286° 57' 46"	0.67820
1	227° 55' 28"	1° 55' 22"	226° 01' 07"	-15° 19' 27"	0° 59' 38"	16' 15.10"	286° 47' 35"	0.68273
2	228° 31' 14"	1° 52' 22"	226° 35' 56"	-15° 32' 10"	0° 59' 39"	16' 15.36"	286° 37' 14"	0.68724
3	229° 07' 01"	1° 49' 21"	227° 10' 50"	-15° 44' 48"	0° 59' 40"	16' 15.62"	286° 26' 42"	0.69173
4	229° 42' 50"	1° 46' 20"	227° 45' 49"	-15° 57' 20"	0° 59' 41"	16' 15.88"	286° 15' 59"	0.69621
5	230° 18' 40"	1° 43' 17"	228° 20' 54"	-16° 09' 48"	0° 59' 42"	16' 16.14"	286° 5' 05"	0.70068
6	230° 54' 31"	1° 40' 14"	228° 56' 04"	-16° 22' 10"	0° 59' 43"	16' 16.39"	285° 54' 01"	0.70512
7	231° 30' 23"	1° 37' 10"	229° 31' 21"	-16° 34' 26"	0° 59' 44"	16' 16.64"	285° 42' 45"	0.70955
8	232° 06' 16"	1° 34' 05"	230° 06' 43"	-16° 46' 37"	0° 59' 45"	16' 16.88"	285° 31' 18"	0.71397
9	232° 42' 10"	1° 30' 60"	230° 42' 10"	-16° 58' 43"	0° 59' 46"	16' 17.13"	285° 19' 41"	0.71836
10	233° 18' 05"	1° 27' 54"	231° 17' 44"	-17° 10' 43"	0° 59' 47"	16' 17.36"	285° 7' 52"	0.72274
11	233° 54' 01"	1° 24' 47"	231° 53' 23"	-17° 22' 36"	0° 59' 48"	16' 17.60"	284° 55' 52"	0.72709
12	234° 29' 59"	1° 21' 39"	232° 29' 07"	-17° 34' 24"	0° 59' 48"	16' 17.83"	284° 43' 41"	0.73143
13	235° 05' 57"	1° 18' 31"	233° 04' 58"	-17° 46' 06"	0° 59' 49"	16' 18.06"	284° 31' 19"	0.73575
14	235° 41' 57"	1° 15' 23"	233° 40' 54"	-17° 57' 42"	0° 59' 50"	16' 18.28"	284° 18' 46"	0.74005
15	236° 17' 57"	1° 12' 13"	234° 16' 57"	-18° 09' 11"	0° 59' 51"	16' 18.50"	284° 6' 02"	0.74432
16	236° 53' 58"	1° 09' 04"	234° 53' 05"	-18° 20' 34"	0° 59' 52"	16' 18.71"	283° 53' 06"	0.74858
17	237° 30' 01"	1° 05' 53"	235° 29' 19"	-18° 31' 50"	0° 59' 52"	16' 18.93"	283° 39' 59"	0.75281
18	238° 06' 04"	1° 02' 42"	236° 05' 38"	-18° 43' 00"	0° 59' 53"	16' 19.13"	283° 26' 41"	0.75702
19	238° 42' 05"	0° 59' 31"	236° 42' 00"	-18° 54' 02"	0° 59' 54"	16' 19.34"	283° 13' 13"	0.76121
20	239° 18' 11"	0° 56' 20"	237° 18' 32"	-19° 04' 58"	0° 59' 55"	16' 19.54"	282° 59' 32"	0.76537
21	239° 54' 17"	0° 53' 07"	237° 55' 09"	-19° 15' 48"	0° 59' 55"	16' 19.73"	282° 45' 40"	0.76951
22	240° 30' 24"	0° 49' 54"	238° 31' 52"	-19° 26' 30"	0° 59' 56"	16' 19.92"	282° 31' 36"	0.77363
23	241° 06' 32"	0° 46' 41"	239° 08' 41"	-19° 37' 05"	0° 59' 57"	16' 20.11"	282° 17' 21"	0.77772
24	241° 42' 41"	0° 43' 28"	239° 45' 35"	-19° 47' 33"	0° 59' 57"	16' 20.29"	282° 2' 54"	0.78179

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	117° 31' 33"	0.27"	119° 35' 11"	20° 39' 21"	1.0161576	15' 44.37"	23° 26' 14"	-6 m 23 s
1	117° 33' 56"	0.26"	119° 37' 41"	20° 38' 53"	1.0161544	15' 44.37"	23° 26' 14"	-6 m 23 s
2	117° 36' 19"	0.26"	119° 40' 11"	20° 38' 25"	1.0161512	15' 44.38"	23° 26' 14"	-6 m 23 s
3	117° 38' 42"	0.25"	119° 42' 41"	20° 37' 57"	1.0161480	15' 44.38"	23° 26' 14"	-6 m 23 s
4	117° 41' 06"	0.25"	119° 45' 11"	20° 37' 29"	1.0161447	15' 44.38"	23° 26' 14"	-6 m 23 s
5	117° 43' 29"	0.24"	119° 47' 41"	20° 37' 00"	1.0161415	15' 44.39"	23° 26' 14"	-6 m 23 s
6	117° 45' 52"	0.24"	119° 50' 11"	20° 36' 32"	1.0161383	15' 44.39"	23° 26' 14"	-6 m 23 s
7	117° 48' 15"	0.23"	119° 52' 41"	20° 36' 04"	1.0161351	15' 44.39"	23° 26' 14"	-6 m 24 s
8	117° 50' 38"	0.22"	119° 55' 10"	20° 35' 35"	1.0161318	15' 44.40"	23° 26' 14"	-6 m 24 s
9	117° 53' 01"	0.22"	119° 57' 40"	20° 35' 07"	1.0161286	15' 44.40"	23° 26' 14"	-6 m 24 s
10	117° 55' 24"	0.21"	120° 00' 10"	20° 34' 38"	1.0161253	15' 44.40"	23° 26' 14"	-6 m 24 s
11	117° 57' 47"	0.21"	120° 02' 40"	20° 34' 10"	1.0161221	15' 44.40"	23° 26' 14"	-6 m 24 s
12	118° 00' 11"	0.20"	120° 05' 10"	20° 33' 41"	1.0161188	15' 44.41"	23° 26' 14"	-6 m 24 s
13	118° 02' 34"	0.20"	120° 07' 40"	20° 33' 13"	1.0161155	15' 44.41"	23° 26' 14"	-6 m 24 s
14	118° 04' 57"	0.19"	120° 10' 09"	20° 32' 44"	1.0161123	15' 44.41"	23° 26' 14"	-6 m 25 s
15	118° 07' 20"	0.18"	120° 12' 39"	20° 32' 16"	1.0161090	15' 44.42"	23° 26' 14"	-6 m 25 s
16	118° 09' 43"	0.18"	120° 15' 09"	20° 31' 47"	1.0161057	15' 44.42"	23° 26' 14"	-6 m 25 s
17	118° 12' 06"	0.17"	120° 17' 39"	20° 31' 18"	1.0161024	15' 44.42"	23° 26' 14"	-6 m 25 s
18	118° 14' 29"	0.17"	120° 20' 08"	20° 30' 49"	1.0160991	15' 44.43"	23° 26' 14"	-6 m 25 s
19	118° 16' 52"	0.16"	120° 22' 38"	20° 30' 21"	1.0160958	15' 44.43"	23° 26' 14"	-6 m 25 s
20	118° 19' 16"	0.16"	120° 25' 08"	20° 29' 52"	1.0160925	15' 44.43"	23° 26' 14"	-6 m 25 s
21	118° 21' 39"	0.15"	120° 27' 37"	20° 29' 23"	1.0160892	15' 44.43"	23° 26' 14"	-6 m 25 s
22	118° 24' 02"	0.14"	120° 30' 07"	20° 28' 54"	1.0160858	15' 44.44"	23° 26' 14"	-6 m 26 s
23	118° 26' 25"	0.14"	120° 32' 37"	20° 28' 25"	1.0160825	15' 44.44"	23° 26' 14"	-6 m 26 s
24	118° 28' 48"	0.13"	120° 35' 06"	20° 27' 56"	1.0160792	15' 44.44"	23° 26' 14"	-6 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	241° 42' 41"	0° 43' 28"	239° 45' 35"	-19° 47' 33"	0° 59' 57"	16' 20.29"	282° 2' 54"	0.78179
1	242° 18' 51"	0° 40' 14"	240° 22' 36"	-19° 57' 54"	0° 59' 58"	16' 20.47"	281° 48' 16"	0.78583
2	242° 55' 02"	0° 36' 60"	240° 59' 42"	-20° 08' 07"	0° 59' 59"	16' 20.65"	281° 33' 26"	0.78985
3	243° 31' 14"	0° 33' 45"	241° 36' 54"	-20° 18' 13"	0° 59' 59"	16' 20.81"	281° 18' 25"	0.79384
4	244° 07' 26"	0° 30' 30"	242° 14' 11"	-20° 28' 11"	0° 59' 60"	16' 20.98"	281° 3' 12"	0.79780
5	244° 43' 39"	0° 27' 15"	242° 51' 35"	-20° 38' 01"	1° 00' 01"	16' 21.14"	280° 47' 47"	0.80174
6	245° 19' 53"	0° 23' 60"	243° 29' 04"	-20° 47' 44"	1° 00' 01"	16' 21.29"	280° 32' 10"	0.80565
7	245° 56' 08"	0° 20' 44"	244° 06' 39"	-20° 57' 18"	1° 00' 02"	16' 21.44"	280° 16' 22"	0.80952
8	246° 32' 24"	0° 17' 29"	244° 44' 19"	-21° 06' 45"	1° 00' 02"	16' 21.59"	280° 0' 22"	0.81337
9	247° 08' 41"	0° 14' 13"	245° 22' 05"	-21° 16' 03"	1° 00' 03"	16' 21.73"	279° 44' 10"	0.81720
10	247° 44' 58"	0° 10' 57"	245° 59' 56"	-21° 25' 13"	1° 00' 03"	16' 21.87"	279° 27' 46"	0.82099
11	248° 21' 16"	0° 07' 40"	246° 37' 53"	-21° 34' 15"	1° 00' 04"	16' 22.00"	279° 11' 09"	0.82475
12	248° 57' 34"	0° 04' 24"	247° 15' 56"	-21° 43' 08"	1° 00' 04"	16' 22.12"	278° 54' 21"	0.82848
13	249° 33' 54"	0° 01' 08"	247° 54' 04"	-21° 51' 52"	1° 00' 05"	16' 22.24"	278° 37' 21"	0.83218
14	250° 10' 14"	0° -2' 09"	248° 32' 17"	-22° 00' 28"	1° 00' 05"	16' 22.36"	278° 20' 08"	0.83585
15	250° 46' 34"	0° -5' 25"	249° 10' 35"	-22° 08' 56"	1° 00' 05"	16' 22.47"	278° 2' 43"	0.83948
16	251° 22' 56"	0° -8' 42"	249° 48' 59"	-22° 17' 14"	1° 00' 06"	16' 22.58"	277° 45' 06"	0.84309
17	251° 59' 18"	0° -11' 58"	250° 27' 28"	-22° 25' 24"	1° 00' 06"	16' 22.68"	277° 27' 16"	0.84666
18	252° 35' 40"	0° -15' 15"	251° 06' 02"	-22° 33' 24"	1° 00' 07"	16' 22.77"	277° 9' 14"	0.85020
19	253° 12' 03"	0° -18' 31"	251° 44' 41"	-22° 41' 16"	1° 00' 07"	16' 22.86"	276° 50' 59"	0.85370
20	253° 48' 27"	0° -21' 47"	252° 23' 25"	-22° 48' 58"	1° 00' 07"	16' 22.95"	276° 32' 31"	0.85717
21	254° 24' 51"	0° -25' 03"	253° 02' 14"	-22° 56' 31"	1° 00' 07"	16' 23.03"	276° 13' 51"	0.86061
22	255° 01' 16"	0° -28' 19"	253° 41' 08"	-23° 03' 54"	1° 00' 08"	16' 23.10"	275° 54' 57"	0.86401
23	255° 37' 41"	0° -31' 35"	254° 20' 06"	-23° 11' 08"	1° 00' 08"	16' 23.17"	275° 35' 50"	0.86738
24	256° 14' 07"	0° -34' 51"	254° 59' 09"	-23° 18' 13"	1° 00' 08"	16' 23.23"	275° 16' 30"	0.87071

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	118° 28' 48"	0.13"	120° 35' 06"	20° 27' 56"	1.0160792	15' 44.44"	23° 26' 14"	-6 m 26 s
1	118° 31' 11"	0.13"	120° 37' 36"	20° 27' 27"	1.0160758	15' 44.45"	23° 26' 14"	-6 m 26 s
2	118° 33' 34"	0.12"	120° 40' 06"	20° 26' 58"	1.0160725	15' 44.45"	23° 26' 14"	-6 m 26 s
3	118° 35' 58"	0.12"	120° 42' 35"	20° 26' 29"	1.0160691	15' 44.45"	23° 26' 14"	-6 m 26 s
4	118° 38' 21"	0.11"	120° 45' 05"	20° 26' 00"	1.0160658	15' 44.46"	23° 26' 14"	-6 m 26 s
5	118° 40' 44"	0.11"	120° 47' 34"	20° 25' 31"	1.0160624	15' 44.46"	23° 26' 14"	-6 m 26 s
6	118° 43' 07"	0.10"	120° 50' 04"	20° 25' 02"	1.0160590	15' 44.46"	23° 26' 14"	-6 m 26 s
7	118° 45' 30"	0.09"	120° 52' 33"	20° 24' 33"	1.0160557	15' 44.47"	23° 26' 14"	-6 m 27 s
8	118° 47' 53"	0.09"	120° 55' 03"	20° 24' 03"	1.0160523	15' 44.47"	23° 26' 14"	-6 m 27 s
9	118° 50' 16"	0.08"	120° 57' 32"	20° 23' 34"	1.0160489	15' 44.47"	23° 26' 14"	-6 m 27 s
10	118° 52' 40"	0.08"	121° 00' 02"	20° 23' 05"	1.0160455	15' 44.48"	23° 26' 14"	-6 m 27 s
11	118° 55' 03"	0.07"	121° 02' 31"	20° 22' 35"	1.0160421	15' 44.48"	23° 26' 14"	-6 m 27 s
12	118° 57' 26"	0.07"	121° 05' 01"	20° 22' 06"	1.0160387	15' 44.48"	23° 26' 14"	-6 m 27 s
13	118° 59' 49"	0.06"	121° 07' 30"	20° 21' 37"	1.0160353	15' 44.48"	23° 26' 14"	-6 m 27 s
14	119° 02' 12"	0.06"	121° 09' 60"	20° 21' 07"	1.0160318	15' 44.49"	23° 26' 14"	-6 m 27 s
15	119° 04' 35"	0.05"	121° 12' 29"	20° 20' 38"	1.0160284	15' 44.49"	23° 26' 14"	-6 m 27 s
16	119° 06' 58"	0.04"	121° 14' 58"	20° 20' 08"	1.0160250	15' 44.49"	23° 26' 14"	-6 m 28 s
17	119° 09' 22"	0.04"	121° 17' 28"	20° 19' 39"	1.0160216	15' 44.50"	23° 26' 14"	-6 m 28 s
18	119° 11' 45"	0.03"	121° 19' 57"	20° 19' 09"	1.0160181	15' 44.50"	23° 26' 14"	-6 m 28 s
19	119° 14' 08"	0.03"	121° 22' 26"	20° 18' 39"	1.0160147	15' 44.50"	23° 26' 14"	-6 m 28 s
20	119° 16' 31"	0.02"	121° 24' 56"	20° 18' 10"	1.0160112	15' 44.51"	23° 26' 14"	-6 m 28 s
21	119° 18' 54"	0.02"	121° 27' 25"	20° 17' 40"	1.0160078	15' 44.51"	23° 26' 14"	-6 m 28 s
22	119° 21' 17"	0.01"	121° 29' 54"	20° 17' 10"	1.0160043	15' 44.51"	23° 26' 14"	-6 m 28 s
23	119° 23' 40"	0.01"	121° 32' 24"	20° 16' 40"	1.0160008	15' 44.52"	23° 26' 14"	-6 m 28 s
24	119° 26' 04"	0.00"	121° 34' 53"	20° 16' 11"	1.0159974	15' 44.52"	23° 26' 14"	-6 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	256° 14' 07"	0°-34' 51"	254° 59' 09"	-23° 18' 13"	1° 00' 08"	16' 23.23"	275° 16' 30"	0.87071
1	256° 50' 33"	0°-38' 06"	255° 38' 17"	-23° 25' 08"	1° 00' 08"	16' 23.29"	274° 56' 56"	0.87400
2	257° 26' 60"	0°-41' 21"	256° 17' 29"	-23° 31' 53"	1° 00' 09"	16' 23.34"	274° 37' 09"	0.87726
3	258° 03' 27"	0°-44' 36"	256° 56' 45"	-23° 38' 29"	1° 00' 09"	16' 23.38"	274° 17' 08"	0.88048
4	258° 39' 54"	0°-47' 51"	257° 36' 06"	-23° 44' 54"	1° 00' 09"	16' 23.42"	273° 56' 53"	0.88367
5	259° 16' 22"	0°-51' 05"	258° 15' 31"	-23° 51' 10"	1° 00' 09"	16' 23.46"	273° 36' 24"	0.88682
6	259° 52' 50"	0°-54' 19"	258° 55' 00"	-23° 57' 15"	1° 00' 09"	16' 23.49"	273° 15' 41"	0.88992
7	260° 29' 19"	0°-57' 33"	259° 34' 33"	-24° 03' 11"	1° 00' 09"	16' 23.51"	272° 54' 42"	0.89300
8	261° 05' 47"	-1° 00' 46"	260° 14' 10"	-24° 08' 56"	1° 00' 09"	16' 23.53"	272° 33' 29"	0.89603
9	261° 42' 16"	-1° 03' 59"	260° 53' 51"	-24° 14' 31"	1° 00' 09"	16' 23.54"	272° 12' 01"	0.89902
10	262° 18' 46"	-1° 07' 12"	261° 33' 35"	-24° 19' 56"	1° 00' 09"	16' 23.54"	271° 50' 17"	0.90198
11	262° 55' 15"	-1° 10' 24"	262° 13' 23"	-24° 25' 11"	1° 00' 09"	16' 23.54"	271° 28' 17"	0.90489
12	263° 31' 45"	-1° 13' 35"	262° 53' 14"	-24° 30' 15"	1° 00' 09"	16' 23.54"	271° 6' 01"	0.90777
13	264° 08' 15"	-1° 16' 46"	263° 33' 08"	-24° 35' 09"	1° 00' 09"	16' 23.53"	270° 43' 28"	0.91060
14	264° 44' 45"	-1° 19' 57"	264° 13' 06"	-24° 39' 52"	1° 00' 09"	16' 23.51"	270° 20' 38"	0.91340
15	265° 21' 15"	-1° 23' 06"	264° 53' 06"	-24° 44' 24"	1° 00' 09"	16' 23.48"	269° 57' 31"	0.91615
16	265° 57' 46"	-1° 26' 16"	265° 33' 10"	-24° 48' 46"	1° 00' 09"	16' 23.45"	269° 34' 05"	0.91886
17	266° 34' 16"	-1° 29' 25"	266° 13' 16"	-24° 52' 57"	1° 00' 09"	16' 23.42"	269° 10' 21"	0.92154
18	267° 10' 47"	-1° 32' 33"	266° 53' 25"	-24° 56' 57"	1° 00' 09"	16' 23.37"	268° 46' 18"	0.92417
19	267° 47' 17"	-1° 35' 40"	267° 33' 36"	-25° 00' 47"	1° 00' 09"	16' 23.33"	268° 21' 55"	0.92675
20	268° 23' 48"	-1° 38' 47"	268° 13' 50"	-25° 04' 26"	1° 00' 08"	16' 23.27"	267° 57' 11"	0.92930
21	269° 00' 19"	-1° 41' 53"	268° 54' 06"	-25° 07' 54"	1° 00' 08"	16' 23.21"	267° 32' 06"	0.93180
22	269° 36' 49"	-1° 44' 58"	269° 34' 24"	-25° 11' 11"	1° 00' 08"	16' 23.14"	267° 6' 39"	0.93426
23	270° 13' 20"	-1° 48' 03"	270° 14' 44"	-25° 14' 17"	1° 00' 08"	16' 23.07"	266° 40' 49"	0.93668
24	270° 49' 50"	-1° 51' 07"	270° 55' 05"	-25° 17' 12"	1° 00' 07"	16' 22.99"	266° 14' 35"	0.93905

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	119° 26' 04"	0.00"	121° 34' 53"	20° 16' 11"	1.0159974	15' 44.52"	23° 26' 14"	-6 m 28 s
1	119° 28' 27"	-0.00"	121° 37' 22"	20° 15' 41"	1.0159939	15' 44.52"	23° 26' 14"	-6 m 28 s
2	119° 30' 50"	-0.01"	121° 39' 51"	20° 15' 11"	1.0159904	15' 44.53"	23° 26' 14"	-6 m 29 s
3	119° 33' 13"	-0.01"	121° 42' 21"	20° 14' 41"	1.0159869	15' 44.53"	23° 26' 14"	-6 m 29 s
4	119° 35' 36"	-0.02"	121° 44' 50"	20° 14' 11"	1.0159834	15' 44.53"	23° 26' 14"	-6 m 29 s
5	119° 37' 59"	-0.03"	121° 47' 19"	20° 13' 41"	1.0159799	15' 44.54"	23° 26' 14"	-6 m 29 s
6	119° 40' 22"	-0.03"	121° 49' 48"	20° 13' 11"	1.0159764	15' 44.54"	23° 26' 14"	-6 m 29 s
7	119° 42' 46"	-0.04"	121° 52' 17"	20° 12' 41"	1.0159729	15' 44.54"	23° 26' 14"	-6 m 29 s
8	119° 45' 09"	-0.04"	121° 54' 46"	20° 12' 11"	1.0159694	15' 44.55"	23° 26' 14"	-6 m 29 s
9	119° 47' 32"	-0.05"	121° 57' 16"	20° 11' 41"	1.0159658	15' 44.55"	23° 26' 14"	-6 m 29 s
10	119° 49' 55"	-0.05"	121° 59' 45"	20° 11' 11"	1.0159623	15' 44.55"	23° 26' 14"	-6 m 29 s
11	119° 52' 18"	-0.06"	122° 02' 14"	20° 10' 40"	1.0159588	15' 44.56"	23° 26' 14"	-6 m 29 s
12	119° 54' 41"	-0.06"	122° 04' 43"	20° 10' 10"	1.0159552	15' 44.56"	23° 26' 14"	-6 m 29 s
13	119° 57' 05"	-0.07"	122° 07' 12"	20° 09' 40"	1.0159517	15' 44.56"	23° 26' 14"	-6 m 30 s
14	119° 59' 28"	-0.07"	122° 09' 41"	20° 09' 10"	1.0159481	15' 44.57"	23° 26' 14"	-6 m 30 s
15	120° 01' 51"	-0.08"	122° 12' 10"	20° 08' 39"	1.0159446	15' 44.57"	23° 26' 14"	-6 m 30 s
16	120° 04' 14"	-0.08"	122° 14' 39"	20° 08' 09"	1.0159410	15' 44.57"	23° 26' 14"	-6 m 30 s
17	120° 06' 37"	-0.09"	122° 17' 08"	20° 07' 39"	1.0159374	15' 44.58"	23° 26' 14"	-6 m 30 s
18	120° 09' 00"	-0.09"	122° 19' 37"	20° 07' 08"	1.0159339	15' 44.58"	23° 26' 14"	-6 m 30 s
19	120° 11' 24"	-0.10"	122° 22' 06"	20° 06' 38"	1.0159303	15' 44.58"	23° 26' 14"	-6 m 30 s
20	120° 13' 47"	-0.10"	122° 24' 35"	20° 06' 07"	1.0159267	15' 44.59"	23° 26' 14"	-6 m 30 s
21	120° 16' 10"	-0.11"	122° 27' 04"	20° 05' 37"	1.0159231	15' 44.59"	23° 26' 14"	-6 m 30 s
22	120° 18' 33"	-0.11"	122° 29' 33"	20° 05' 06"	1.0159195	15' 44.59"	23° 26' 14"	-6 m 30 s
23	120° 20' 56"	-0.12"	122° 32' 02"	20° 04' 35"	1.0159159	15' 44.60"	23° 26' 14"	-6 m 30 s
24	120° 23' 19"	-0.12"	122° 34' 31"	20° 04' 05"	1.0159123	15' 44.60"	23° 26' 14"	-6 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	270° 49' 50"	-1° 51' 07"	270° 55' 05"	-25° 17' 12"	1° 00' 07"	16' 22.99"	266° 14' 35"	0.93905
1	271° 26' 20"	-1° 54' 10"	271° 35' 28"	-25° 19' 56"	1° 00' 07"	16' 22.91"	265° 47' 55"	0.94138
2	272° 02' 51"	-1° 57' 12"	272° 15' 53"	-25° 22' 29"	1° 00' 07"	16' 22.82"	265° 20' 49"	0.94366
3	272° 39' 21"	-2° 00' 14"	272° 56' 19"	-25° 24' 50"	1° 00' 06"	16' 22.72"	264° 53' 16"	0.94591
4	273° 15' 50"	-2° 03' 14"	273° 36' 46"	-25° 27' 01"	1° 00' 06"	16' 22.61"	264° 25' 13"	0.94810
5	273° 52' 20"	-2° 06' 14"	274° 17' 15"	-25° 29' 01"	1° 00' 06"	16' 22.50"	263° 56' 40"	0.95026
6	274° 28' 49"	-2° 09' 13"	274° 57' 44"	-25° 30' 49"	1° 00' 05"	16' 22.39"	263° 27' 35"	0.95236
7	275° 05' 18"	-2° 12' 10"	275° 38' 13"	-25° 32' 27"	1° 00' 05"	16' 22.27"	262° 57' 55"	0.95443
8	275° 41' 47"	-2° 15' 07"	276° 18' 44"	-25° 33' 53"	1° 00' 04"	16' 22.14"	262° 27' 39"	0.95644
9	276° 18' 16"	-2° 18' 03"	276° 59' 14"	-25° 35' 08"	1° 00' 04"	16' 22.00"	261° 56' 45"	0.95841
10	276° 54' 44"	-2° 20' 58"	277° 39' 45"	-25° 36' 11"	1° 00' 03"	16' 21.86"	261° 25' 09"	0.96034
11	277° 31' 11"	-2° 23' 52"	278° 20' 16"	-25° 37' 04"	1° 00' 03"	16' 21.71"	260° 52' 50"	0.96222
12	278° 07' 39"	-2° 26' 45"	279° 00' 47"	-25° 37' 45"	1° 00' 02"	16' 21.56"	260° 19' 44"	0.96406
13	278° 44' 05"	-2° 29' 37"	279° 41' 18"	-25° 38' 16"	1° 00' 01"	16' 21.40"	259° 45' 48"	0.96585
14	279° 20' 32"	-2° 32' 28"	280° 21' 48"	-25° 38' 34"	1° 00' 01"	16' 21.23"	259° 10' 58"	0.96759
15	279° 56' 58"	-2° 35' 17"	281° 02' 17"	-25° 38' 42"	1° 00' 00"	16' 21.06"	258° 35' 10"	0.96928
16	280° 33' 23"	-2° 38' 06"	281° 42' 46"	-25° 38' 39"	0° 59' 60"	16' 20.88"	257° 58' 19"	0.97093
17	281° 09' 48"	-2° 40' 53"	282° 23' 14"	-25° 38' 24"	0° 59' 59"	16' 20.70"	257° 20' 21"	0.97254
18	281° 46' 12"	-2° 43' 39"	283° 03' 41"	-25° 37' 59"	0° 59' 58"	16' 20.51"	256° 41' 09"	0.97409
19	282° 22' 36"	-2° 46' 25"	283° 44' 07"	-25° 37' 22"	0° 59' 57"	16' 20.31"	256° 0' 37"	0.97560
20	282° 58' 59"	-2° 49' 08"	284° 24' 31"	-25° 36' 34"	0° 59' 57"	16' 20.11"	255° 18' 37"	0.97706
21	283° 35' 21"	-2° 51' 51"	285° 04' 54"	-25° 35' 35"	0° 59' 56"	16' 19.90"	254° 35' 02"	0.97848
22	284° 11' 43"	-2° 54' 33"	285° 45' 15"	-25° 34' 24"	0° 59' 55"	16' 19.68"	253° 49' 42"	0.97984
23	284° 48' 04"	-2° 57' 13"	286° 25' 34"	-25° 33' 03"	0° 59' 54"	16' 19.46"	253° 2' 26"	0.98116
24	285° 24' 24"	-2° 59' 52"	287° 05' 51"	-25° 31' 31"	0° 59' 54"	16' 19.23"	252° 13' 03"	0.98244

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblivity	Equation Of Time
0	120° 23' 19"	-0.12"	122° 34' 31"	20° 04' 05"	1.0159123	15' 44.60"	23° 26' 14"	-6 m 30 s
1	120° 25' 43"	-0.12"	122° 36' 60"	20° 03' 34"	1.0159087	15' 44.60"	23° 26' 14"	-6 m 31 s
2	120° 28' 06"	-0.13"	122° 39' 28"	20° 03' 03"	1.0159051	15' 44.61"	23° 26' 14"	-6 m 31 s
3	120° 30' 29"	-0.13"	122° 41' 57"	20° 02' 33"	1.0159015	15' 44.61"	23° 26' 14"	-6 m 31 s
4	120° 32' 52"	-0.14"	122° 44' 26"	20° 02' 02"	1.0158978	15' 44.61"	23° 26' 14"	-6 m 31 s
5	120° 35' 15"	-0.14"	122° 46' 55"	20° 01' 31"	1.0158942	15' 44.62"	23° 26' 14"	-6 m 31 s
6	120° 37' 38"	-0.15"	122° 49' 24"	20° 01' 00"	1.0158906	15' 44.62"	23° 26' 14"	-6 m 31 s
7	120° 40' 02"	-0.15"	122° 51' 53"	20° 00' 29"	1.0158869	15' 44.62"	23° 26' 14"	-6 m 31 s
8	120° 42' 25"	-0.16"	122° 54' 21"	19° 59' 58"	1.0158833	15' 44.63"	23° 26' 14"	-6 m 31 s
9	120° 44' 48"	-0.16"	122° 56' 50"	19° 59' 27"	1.0158796	15' 44.63"	23° 26' 14"	-6 m 31 s
10	120° 47' 11"	-0.17"	122° 59' 19"	19° 58' 56"	1.0158760	15' 44.63"	23° 26' 14"	-6 m 31 s
11	120° 49' 34"	-0.17"	123° 01' 48"	19° 58' 25"	1.0158723	15' 44.64"	23° 26' 14"	-6 m 31 s
12	120° 51' 57"	-0.17"	123° 04' 16"	19° 57' 54"	1.0158686	15' 44.64"	23° 26' 14"	-6 m 31 s
13	120° 54' 21"	-0.18"	123° 06' 45"	19° 57' 23"	1.0158650	15' 44.64"	23° 26' 14"	-6 m 31 s
14	120° 56' 44"	-0.18"	123° 09' 14"	19° 56' 52"	1.0158613	15' 44.65"	23° 26' 14"	-6 m 31 s
15	120° 59' 07"	-0.19"	123° 11' 42"	19° 56' 21"	1.0158576	15' 44.65"	23° 26' 14"	-6 m 31 s
16	121° 01' 30"	-0.19"	123° 14' 11"	19° 55' 50"	1.0158539	15' 44.65"	23° 26' 15"	-6 m 31 s
17	121° 03' 53"	-0.20"	123° 16' 40"	19° 55' 18"	1.0158502	15' 44.66"	23° 26' 15"	-6 m 32 s
18	121° 06' 17"	-0.20"	123° 19' 08"	19° 54' 47"	1.0158465	15' 44.66"	23° 26' 15"	-6 m 32 s
19	121° 08' 40"	-0.20"	123° 21' 37"	19° 54' 16"	1.0158428	15' 44.66"	23° 26' 15"	-6 m 32 s
20	121° 11' 03"	-0.21"	123° 24' 05"	19° 53' 45"	1.0158391	15' 44.67"	23° 26' 15"	-6 m 32 s
21	121° 13' 26"	-0.21"	123° 26' 34"	19° 53' 13"	1.0158354	15' 44.67"	23° 26' 15"	-6 m 32 s
22	121° 15' 49"	-0.22"	123° 29' 03"	19° 52' 42"	1.0158317	15' 44.67"	23° 26' 15"	-6 m 32 s
23	121° 18' 12"	-0.22"	123° 31' 31"	19° 52' 10"	1.0158279	15' 44.68"	23° 26' 15"	-6 m 32 s
24	121° 20' 36"	-0.22"	123° 33' 60"	19° 51' 39"	1.0158242	15' 44.68"	23° 26' 15"	-6 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	285° 24' 24"	-2° 59' 52"	287° 05' 51"	-25° 31' 31"	0° 59' 54"	16' 19.23"	252° 13' 03"	0.98244
1	286° 00' 43"	-3° 02' 29"	287° 46' 06"	-25° 29' 48"	0° 59' 53"	16' 19.00"	251° 21' 19"	0.98366
2	286° 37' 02"	-3° 05' 05"	288° 26' 19"	-25° 27' 54"	0° 59' 52"	16' 18.76"	250° 26' 58"	0.98484
3	287° 13' 20"	-3° 07' 40"	289° 06' 30"	-25° 25' 48"	0° 59' 51"	16' 18.52"	249° 29' 41"	0.98597
4	287° 49' 37"	-3° 10' 14"	289° 46' 37"	-25° 23' 33"	0° 59' 50"	16' 18.26"	248° 29' 09"	0.98705
5	288° 25' 53"	-3° 12' 46"	290° 26' 42"	-25° 21' 06"	0° 59' 49"	16' 18.01"	247° 24' 57"	0.98808
6	289° 02' 08"	-3° 15' 17"	291° 06' 44"	-25° 18' 28"	0° 59' 48"	16' 17.74"	246° 16' 36"	0.98907
7	289° 38' 22"	-3° 17' 47"	291° 46' 43"	-25° 15' 40"	0° 59' 47"	16' 17.47"	245° 3' 34"	0.99001
8	290° 14' 35"	-3° 20' 15"	292° 26' 39"	-25° 12' 41"	0° 59' 46"	16' 17.20"	243° 45' 12"	0.99090
9	290° 50' 47"	-3° 22' 41"	293° 06' 32"	-25° 09' 31"	0° 59' 45"	16' 16.92"	242° 20' 44"	0.99174
10	291° 26' 58"	-3° 25' 07"	293° 46' 21"	-25° 06' 11"	0° 59' 44"	16' 16.63"	240° 49' 16"	0.99254
11	292° 03' 08"	-3° 27' 30"	294° 26' 06"	-25° 02' 40"	0° 59' 43"	16' 16.34"	239° 9' 44"	0.99329
12	292° 39' 17"	-3° 29' 53"	295° 05' 48"	-24° 58' 59"	0° 59' 42"	16' 16.04"	237° 20' 51"	0.99399
13	293° 15' 25"	-3° 32' 13"	295° 45' 26"	-24° 55' 08"	0° 59' 41"	16' 15.74"	235° 21' 04"	0.99464
14	293° 51' 32"	-3° 34' 33"	296° 25' 00"	-24° 51' 06"	0° 59' 40"	16' 15.43"	233° 8' 34"	0.99524
15	294° 27' 38"	-3° 36' 50"	297° 04' 30"	-24° 46' 54"	0° 59' 38"	16' 15.11"	230° 41' 08"	0.99580
16	295° 03' 42"	-3° 39' 06"	297° 43' 56"	-24° 42' 31"	0° 59' 37"	16' 14.79"	227° 56' 08"	0.99630
17	295° 39' 45"	-3° 41' 21"	298° 23' 17"	-24° 37' 59"	0° 59' 36"	16' 14.46"	224° 50' 28"	0.99677
18	296° 15' 47"	-3° 43' 34"	299° 02' 33"	-24° 33' 16"	0° 59' 35"	16' 14.13"	221° 20' 27"	0.99718
19	296° 51' 48"	-3° 45' 46"	299° 41' 46"	-24° 28' 24"	0° 59' 34"	16' 13.80"	217° 22' 00"	0.99754
20	297° 27' 47"	-3° 47' 55"	300° 20' 53"	-24° 23' 21"	0° 59' 32"	16' 13.45"	212° 50' 39"	0.99786
21	298° 03' 45"	-3° 50' 04"	300° 59' 56"	-24° 18' 09"	0° 59' 31"	16' 13.11"	207° 42' 01"	0.99813
22	298° 39' 42"	-3° 52' 10"	301° 38' 53"	-24° 12' 47"	0° 59' 30"	16' 12.75"	201° 52' 32"	0.99835
23	299° 15' 37"	-3° 54' 15"	302° 17' 46"	-24° 07' 15"	0° 59' 28"	16' 12.39"	195° 20' 41"	0.99853
24	299° 51' 31"	-3° 56' 19"	302° 56' 34"	-24° 01' 34"	0° 59' 27"	16' 12.03"	188° 8' 34"	0.99866

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	121° 20' 36"	-0.22"	123° 33' 60"	19° 51' 39"	1.0158242	15' 44.68"	23° 26' 15"	-6 m 32 s
1	121° 22' 59"	-0.23"	123° 36' 28"	19° 51' 07"	1.0158205	15' 44.68"	23° 26' 15"	-6 m 32 s
2	121° 25' 22"	-0.23"	123° 38' 57"	19° 50' 36"	1.0158167	15' 44.69"	23° 26' 15"	-6 m 32 s
3	121° 27' 45"	-0.24"	123° 41' 25"	19° 50' 04"	1.0158130	15' 44.69"	23° 26' 15"	-6 m 32 s
4	121° 30' 08"	-0.24"	123° 43' 54"	19° 49' 33"	1.0158092	15' 44.70"	23° 26' 15"	-6 m 32 s
5	121° 32' 32"	-0.24"	123° 46' 22"	19° 49' 01"	1.0158055	15' 44.70"	23° 26' 15"	-6 m 32 s
6	121° 34' 55"	-0.25"	123° 48' 50"	19° 48' 29"	1.0158017	15' 44.70"	23° 26' 15"	-6 m 32 s
7	121° 37' 18"	-0.25"	123° 51' 19"	19° 47' 58"	1.0157979	15' 44.71"	23° 26' 15"	-6 m 32 s
8	121° 39' 41"	-0.25"	123° 53' 47"	19° 47' 26"	1.0157941	15' 44.71"	23° 26' 15"	-6 m 32 s
9	121° 42' 04"	-0.26"	123° 56' 16"	19° 46' 54"	1.0157904	15' 44.71"	23° 26' 15"	-6 m 32 s
10	121° 44' 28"	-0.26"	123° 58' 44"	19° 46' 22"	1.0157866	15' 44.72"	23° 26' 15"	-6 m 32 s
11	121° 46' 51"	-0.26"	124° 01' 12"	19° 45' 50"	1.0157828	15' 44.72"	23° 26' 15"	-6 m 32 s
12	121° 49' 14"	-0.27"	124° 03' 41"	19° 45' 18"	1.0157790	15' 44.72"	23° 26' 15"	-6 m 32 s
13	121° 51' 37"	-0.27"	124° 06' 09"	19° 44' 47"	1.0157752	15' 44.73"	23° 26' 15"	-6 m 32 s
14	121° 54' 00"	-0.27"	124° 08' 37"	19° 44' 15"	1.0157714	15' 44.73"	23° 26' 15"	-6 m 32 s
15	121° 56' 24"	-0.28"	124° 11' 06"	19° 43' 43"	1.0157676	15' 44.73"	23° 26' 15"	-6 m 33 s
16	121° 58' 47"	-0.28"	124° 13' 34"	19° 43' 11"	1.0157637	15' 44.74"	23° 26' 15"	-6 m 33 s
17	122° 01' 10"	-0.28"	124° 16' 02"	19° 42' 39"	1.0157599	15' 44.74"	23° 26' 15"	-6 m 33 s
18	122° 03' 33"	-0.29"	124° 18' 31"	19° 42' 06"	1.0157561	15' 44.74"	23° 26' 15"	-6 m 33 s
19	122° 05' 56"	-0.29"	124° 20' 59"	19° 41' 34"	1.0157523	15' 44.75"	23° 26' 15"	-6 m 33 s
20	122° 08' 20"	-0.29"	124° 23' 27"	19° 41' 02"	1.0157484	15' 44.75"	23° 26' 15"	-6 m 33 s
21	122° 10' 43"	-0.30"	124° 25' 55"	19° 40' 30"	1.0157446	15' 44.76"	23° 26' 15"	-6 m 33 s
22	122° 13' 06"	-0.30"	124° 28' 23"	19° 39' 58"	1.0157407	15' 44.76"	23° 26' 15"	-6 m 33 s
23	122° 15' 29"	-0.30"	124° 30' 52"	19° 39' 25"	1.0157369	15' 44.76"	23° 26' 15"	-6 m 33 s
24	122° 17' 53"	-0.31"	124° 33' 20"	19° 38' 53"	1.0157330	15' 44.77"	23° 26' 15"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	299° 51' 31"	-3° 56' 19"	302° 56' 34"	-24° 01' 34"	0° 59' 27"	16' 12.03"	188° 8' 34"	0.99866
1	300° 27' 23"	-3° 58' 21"	303° 35' 16"	-23° 55' 43"	0° 59' 26"	16' 11.66"	180° 23' 19"	0.99874
2	301° 03' 14"	-4° 00' 21"	304° 13' 53"	-23° 49' 43"	0° 59' 24"	16' 11.29"	172° 17' 39"	0.99877
3	301° 39' 04"	-4° 02' 19"	304° 52' 25"	-23° 43' 34"	0° 59' 23"	16' 10.91"	164° 8' 18"	0.99876
4	302° 14' 51"	-4° 04' 16"	305° 30' 51"	-23° 37' 15"	0° 59' 22"	16' 10.53"	156° 12' 50"	0.99870
5	302° 50' 38"	-4° 06' 11"	306° 09' 11"	-23° 30' 47"	0° 59' 20"	16' 10.14"	148° 45' 57"	0.99860
6	303° 26' 23"	-4° 08' 04"	306° 47' 26"	-23° 24' 10"	0° 59' 19"	16' 09.74"	141° 57' 12"	0.99844
7	304° 02' 06"	-4° 09' 56"	307° 25' 35"	-23° 17' 24"	0° 59' 17"	16' 09.35"	135° 50' 40"	0.99825
8	304° 37' 48"	-4° 11' 46"	308° 03' 38"	-23° 10' 29"	0° 59' 16"	16' 08.94"	130° 26' 09"	0.99800
9	305° 13' 28"	-4° 13' 34"	308° 41' 36"	-23° 03' 25"	0° 59' 14"	16' 08.54"	125° 40' 47"	0.99771
10	305° 49' 06"	-4° 15' 20"	309° 19' 27"	-22° 56' 13"	0° 59' 13"	16' 08.12"	121° 30' 24"	0.99737
11	306° 24' 42"	-4° 17' 05"	309° 57' 12"	-22° 48' 52"	0° 59' 11"	16' 07.71"	117° 50' 32"	0.99699
12	307° 00' 17"	-4° 18' 48"	310° 34' 52"	-22° 41' 23"	0° 59' 10"	16' 07.29"	114° 36' 52"	0.99656
13	307° 35' 51"	-4° 20' 29"	311° 12' 25"	-22° 33' 45"	0° 59' 08"	16' 06.86"	111° 45' 33"	0.99609
14	308° 11' 22"	-4° 22' 08"	311° 49' 52"	-22° 25' 59"	0° 59' 07"	16' 06.43"	109° 13' 15"	0.99557
15	308° 46' 52"	-4° 23' 46"	312° 27' 12"	-22° 18' 04"	0° 59' 05"	16' 06.00"	106° 57' 08"	0.99501
16	309° 22' 19"	-4° 25' 21"	313° 04' 27"	-22° 10' 02"	0° 59' 03"	16' 05.56"	104° 54' 49"	0.99440
17	309° 57' 45"	-4° 26' 55"	313° 41' 35"	-22° 01' 51"	0° 59' 02"	16' 05.12"	103° 4' 19"	0.99374
18	310° 33' 10"	-4° 28' 28"	314° 18' 36"	-21° 53' 33"	0° 59' 00"	16' 04.67"	101° 23' 58"	0.99305
19	311° 08' 32"	-4° 29' 58"	314° 55' 31"	-21° 45' 07"	0° 58' 58"	16' 04.22"	99° 52' 23"	0.99230
20	311° 43' 52"	-4° 31' 27"	315° 32' 20"	-21° 36' 33"	0° 58' 57"	16' 03.76"	98° 28' 26"	0.99152
21	312° 19' 11"	-4° 32' 53"	316° 09' 02"	-21° 27' 52"	0° 58' 55"	16' 03.31"	97° 11' 06"	0.99069
22	312° 54' 27"	-4° 34' 18"	316° 45' 37"	-21° 19' 03"	0° 58' 53"	16' 02.84"	95° 59' 37"	0.98981
23	313° 29' 42"	-4° 35' 41"	317° 22' 06"	-21° 10' 06"	0° 58' 52"	16' 02.38"	94° 53' 14"	0.98890
24	314° 04' 54"	-4° 37' 02"	317° 58' 28"	-21° 01' 03"	0° 58' 50"	16' 01.91"	93° 51' 25"	0.98794

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	122° 17' 53"	-0.31"	124° 33' 20"	19° 38' 53"	1.0157330	15' 44.77"	23° 26' 15"	-6 m 33 s
1	122° 20' 16"	-0.31"	124° 35' 48"	19° 38' 21"	1.0157292	15' 44.77"	23° 26' 15"	-6 m 33 s
2	122° 22' 39"	-0.31"	124° 38' 16"	19° 37' 48"	1.0157253	15' 44.77"	23° 26' 15"	-6 m 33 s
3	122° 25' 02"	-0.31"	124° 40' 44"	19° 37' 16"	1.0157214	15' 44.78"	23° 26' 15"	-6 m 33 s
4	122° 27' 25"	-0.32"	124° 43' 12"	19° 36' 44"	1.0157175	15' 44.78"	23° 26' 15"	-6 m 33 s
5	122° 29' 49"	-0.32"	124° 45' 40"	19° 36' 11"	1.0157136	15' 44.78"	23° 26' 15"	-6 m 33 s
6	122° 32' 12"	-0.32"	124° 48' 08"	19° 35' 39"	1.0157097	15' 44.79"	23° 26' 15"	-6 m 33 s
7	122° 34' 35"	-0.32"	124° 50' 36"	19° 35' 06"	1.0157058	15' 44.79"	23° 26' 15"	-6 m 33 s
8	122° 36' 58"	-0.33"	124° 53' 04"	19° 34' 34"	1.0157019	15' 44.79"	23° 26' 15"	-6 m 33 s
9	122° 39' 22"	-0.33"	124° 55' 33"	19° 34' 01"	1.0156980	15' 44.80"	23° 26' 15"	-6 m 33 s
10	122° 41' 45"	-0.33"	124° 58' 01"	19° 33' 28"	1.0156941	15' 44.80"	23° 26' 15"	-6 m 33 s
11	122° 44' 08"	-0.33"	125° 00' 29"	19° 32' 56"	1.0156902	15' 44.81"	23° 26' 15"	-6 m 33 s
12	122° 46' 31"	-0.34"	125° 02' 56"	19° 32' 23"	1.0156863	15' 44.81"	23° 26' 15"	-6 m 33 s
13	122° 48' 54"	-0.34"	125° 05' 24"	19° 31' 50"	1.0156823	15' 44.81"	23° 26' 15"	-6 m 33 s
14	122° 51' 18"	-0.34"	125° 07' 52"	19° 31' 17"	1.0156784	15' 44.82"	23° 26' 15"	-6 m 33 s
15	122° 53' 41"	-0.34"	125° 10' 20"	19° 30' 45"	1.0156745	15' 44.82"	23° 26' 15"	-6 m 33 s
16	122° 56' 04"	-0.34"	125° 12' 48"	19° 30' 12"	1.0156705	15' 44.82"	23° 26' 15"	-6 m 33 s
17	122° 58' 27"	-0.35"	125° 15' 16"	19° 29' 39"	1.0156666	15' 44.83"	23° 26' 15"	-6 m 33 s
18	123° 00' 51"	-0.35"	125° 17' 44"	19° 29' 06"	1.0156626	15' 44.83"	23° 26' 15"	-6 m 33 s
19	123° 03' 14"	-0.35"	125° 20' 12"	19° 28' 33"	1.0156586	15' 44.84"	23° 26' 15"	-6 m 33 s
20	123° 05' 37"	-0.35"	125° 22' 40"	19° 28' 00"	1.0156547	15' 44.84"	23° 26' 15"	-6 m 33 s
21	123° 08' 00"	-0.35"	125° 25' 08"	19° 27' 27"	1.0156507	15' 44.84"	23° 26' 15"	-6 m 33 s
22	123° 10' 24"	-0.36"	125° 27' 35"	19° 26' 54"	1.0156467	15' 44.85"	23° 26' 15"	-6 m 33 s
23	123° 12' 47"	-0.36"	125° 30' 03"	19° 26' 21"	1.0156427	15' 44.85"	23° 26' 15"	-6 m 33 s
24	123° 15' 10"	-0.36"	125° 32' 31"	19° 25' 48"	1.0156387	15' 44.85"	23° 26' 15"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	314° 04' 54"	-4° 37' 02"	317° 58' 28"	-21° 01' 03"	0° 58' 50"	16' 01.91"	93° 51' 25"	0.98794
1	314° 40' 05"	-4° 38' 22"	318° 34' 44"	-20° 51' 52"	0° 58' 48"	16' 01.44"	92° 53' 37"	0.98693
2	315° 15' 14"	-4° 39' 39"	319° 10' 53"	-20° 42' 34"	0° 58' 46"	16' 00.96"	91° 59' 25"	0.98589
3	315° 50' 20"	-4° 40' 55"	319° 46' 55"	-20° 33' 09"	0° 58' 45"	16' 00.48"	91° 8' 27"	0.98480
4	316° 25' 25"	-4° 42' 09"	320° 22' 51"	-20° 23' 38"	0° 58' 43"	15' 60.00"	90° 20' 24"	0.98367
5	317° 00' 27"	-4° 43' 21"	320° 58' 40"	-20° 13' 59"	0° 58' 41"	15' 59.51"	89° 34' 58"	0.98250
6	317° 35' 27"	-4° 44' 31"	321° 34' 22"	-20° 04' 14"	0° 58' 39"	15' 59.02"	88° 51' 55"	0.98128
7	318° 10' 26"	-4° 45' 40"	322° 09' 57"	-19° 54' 23"	0° 58' 38"	15' 58.53"	88° 11' 02"	0.98003
8	318° 45' 22"	-4° 46' 46"	322° 45' 26"	-19° 44' 25"	0° 58' 36"	15' 58.03"	87° 32' 08"	0.97873
9	319° 20' 16"	-4° 47' 51"	323° 20' 48"	-19° 34' 20"	0° 58' 34"	15' 57.53"	86° 55' 02"	0.97740
10	319° 55' 08"	-4° 48' 53"	323° 56' 03"	-19° 24' 10"	0° 58' 32"	15' 57.03"	86° 19' 37"	0.97602
11	320° 29' 57"	-4° 49' 54"	324° 31' 11"	-19° 13' 53"	0° 58' 30"	15' 56.53"	85° 45' 44"	0.97460
12	321° 04' 45"	-4° 50' 53"	325° 06' 13"	-19° 03' 30"	0° 58' 28"	15' 56.02"	85° 13' 16"	0.97314
13	321° 39' 30"	-4° 51' 51"	325° 41' 08"	-18° 53' 02"	0° 58' 26"	15' 55.51"	84° 42' 07"	0.97165
14	322° 14' 13"	-4° 52' 46"	326° 15' 56"	-18° 42' 27"	0° 58' 25"	15' 55.00"	84° 12' 11"	0.97011
15	322° 48' 54"	-4° 53' 39"	326° 50' 38"	-18° 31' 47"	0° 58' 23"	15' 54.48"	83° 43' 24"	0.96853
16	323° 23' 32"	-4° 54' 31"	327° 25' 12"	-18° 21' 01"	0° 58' 21"	15' 53.97"	83° 15' 41"	0.96692
17	323° 58' 08"	-4° 55' 21"	327° 59' 41"	-18° 10' 10"	0° 58' 19"	15' 53.45"	82° 48' 57"	0.96526
18	324° 32' 42"	-4° 56' 08"	328° 34' 02"	-17° 59' 13"	0° 58' 17"	15' 52.93"	82° 23' 09"	0.96357
19	325° 07' 14"	-4° 56' 54"	329° 08' 17"	-17° 48' 11"	0° 58' 15"	15' 52.40"	81° 58' 15"	0.96184
20	325° 41' 43"	-4° 57' 39"	329° 42' 25"	-17° 37' 04"	0° 58' 13"	15' 51.88"	81° 34' 10"	0.96008
21	326° 16' 10"	-4° 58' 21"	330° 16' 27"	-17° 25' 52"	0° 58' 11"	15' 51.35"	81° 10' 51"	0.95827
22	326° 50' 35"	-4° 59' 01"	330° 50' 22"	-17° 14' 35"	0° 58' 09"	15' 50.82"	80° 48' 17"	0.95643
23	327° 24' 57"	-4° 59' 40"	331° 24' 11"	-17° 03' 12"	0° 58' 07"	15' 50.29"	80° 26' 26"	0.95455
24	327° 59' 17"	-5° 00' 17"	331° 57' 53"	-16° 51' 45"	0° 58' 05"	15' 49.75"	80° 5' 14"	0.95264

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	123° 15' 10"	-0.36"	125° 32' 31"	19° 25' 48"	1.0156387	15' 44.85"	23° 26' 15"	-6 m 33 s
1	123° 17' 33"	-0.36"	125° 34' 59"	19° 25' 15"	1.0156348	15' 44.86"	23° 26' 15"	-6 m 33 s
2	123° 19' 57"	-0.36"	125° 37' 27"	19° 24' 42"	1.0156307	15' 44.86"	23° 26' 15"	-6 m 33 s
3	123° 22' 20"	-0.36"	125° 39' 54"	19° 24' 08"	1.0156267	15' 44.86"	23° 26' 15"	-6 m 33 s
4	123° 24' 43"	-0.37"	125° 42' 22"	19° 23' 35"	1.0156227	15' 44.87"	23° 26' 15"	-6 m 33 s
5	123° 27' 06"	-0.37"	125° 44' 50"	19° 23' 02"	1.0156187	15' 44.87"	23° 26' 15"	-6 m 33 s
6	123° 29' 30"	-0.37"	125° 47' 17"	19° 22' 29"	1.0156147	15' 44.88"	23° 26' 15"	-6 m 33 s
7	123° 31' 53"	-0.37"	125° 49' 45"	19° 21' 55"	1.0156107	15' 44.88"	23° 26' 15"	-6 m 33 s
8	123° 34' 16"	-0.37"	125° 52' 13"	19° 21' 22"	1.0156066	15' 44.88"	23° 26' 15"	-6 m 33 s
9	123° 36' 39"	-0.37"	125° 54' 40"	19° 20' 49"	1.0156026	15' 44.89"	23° 26' 15"	-6 m 33 s
10	123° 39' 03"	-0.37"	125° 57' 08"	19° 20' 15"	1.0155985	15' 44.89"	23° 26' 15"	-6 m 33 s
11	123° 41' 26"	-0.38"	125° 59' 36"	19° 19' 42"	1.0155945	15' 44.89"	23° 26' 15"	-6 m 33 s
12	123° 43' 49"	-0.38"	126° 02' 03"	19° 19' 08"	1.0155904	15' 44.90"	23° 26' 15"	-6 m 33 s
13	123° 46' 13"	-0.38"	126° 04' 31"	19° 18' 35"	1.0155864	15' 44.90"	23° 26' 15"	-6 m 33 s
14	123° 48' 36"	-0.38"	126° 06' 58"	19° 18' 01"	1.0155823	15' 44.91"	23° 26' 15"	-6 m 33 s
15	123° 50' 59"	-0.38"	126° 09' 26"	19° 17' 27"	1.0155782	15' 44.91"	23° 26' 15"	-6 m 33 s
16	123° 53' 22"	-0.38"	126° 11' 54"	19° 16' 54"	1.0155741	15' 44.91"	23° 26' 15"	-6 m 33 s
17	123° 55' 46"	-0.38"	126° 14' 21"	19° 16' 20"	1.0155700	15' 44.92"	23° 26' 15"	-6 m 33 s
18	123° 58' 09"	-0.38"	126° 16' 49"	19° 15' 46"	1.0155660	15' 44.92"	23° 26' 15"	-6 m 33 s
19	124° 00' 32"	-0.38"	126° 19' 16"	19° 15' 13"	1.0155619	15' 44.93"	23° 26' 15"	-6 m 33 s
20	124° 02' 55"	-0.38"	126° 21' 44"	19° 14' 39"	1.0155577	15' 44.93"	23° 26' 15"	-6 m 33 s
21	124° 05' 19"	-0.38"	126° 24' 11"	19° 14' 05"	1.0155536	15' 44.93"	23° 26' 15"	-6 m 33 s
22	124° 07' 42"	-0.38"	126° 26' 39"	19° 13' 31"	1.0155495	15' 44.94"	23° 26' 15"	-6 m 33 s
23	124° 10' 05"	-0.38"	126° 29' 06"	19° 12' 57"	1.0155454	15' 44.94"	23° 26' 15"	-6 m 33 s
24	124° 12' 29"	-0.39"	126° 31' 33"	19° 12' 23"	1.0155413	15' 44.94"	23° 26' 15"	-6 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	327° 59' 17"	-5° 00' 17"	331° 57' 53"	-16° 51' 45"	0° 58' 05"	15' 49.75"	80° 5' 14"	0.95264
1	328° 33' 35"	-5° 00' 51"	332° 31' 28"	-16° 40' 14"	0° 58' 03"	15' 49.22"	79° 44' 40"	0.95068
2	329° 07' 50"	-5° 01' 24"	333° 04' 57"	-16° 28' 38"	0° 58' 01"	15' 48.68"	79° 24' 42"	0.94870
3	329° 42' 03"	-5° 01' 56"	333° 38' 20"	-16° 16' 57"	0° 57' 59"	15' 48.14"	79° 5' 18"	0.94668
4	330° 16' 13"	-5° 02' 25"	334° 11' 36"	-16° 05' 12"	0° 57' 57"	15' 47.60"	78° 46' 28"	0.94462
5	330° 50' 22"	-5° 02' 53"	334° 44' 46"	-15° 53' 22"	0° 57' 55"	15' 47.06"	78° 28' 09"	0.94253
6	331° 24' 27"	-5° 03' 18"	335° 17' 50"	-15° 41' 29"	0° 57' 53"	15' 46.52"	78° 10' 21"	0.94040
7	331° 58' 30"	-5° 03' 42"	335° 50' 47"	-15° 29' 31"	0° 57' 51"	15' 45.98"	77° 53' 01"	0.93824
8	332° 32' 31"	-5° 04' 04"	336° 23' 39"	-15° 17' 29"	0° 57' 49"	15' 45.43"	77° 36' 09"	0.93604
9	333° 06' 29"	-5° 04' 24"	336° 56' 24"	-15° 05' 24"	0° 57' 47"	15' 44.89"	77° 19' 45"	0.93382
10	333° 40' 25"	-5° 04' 43"	337° 29' 02"	-14° 53' 14"	0° 57' 45"	15' 44.34"	77° 3' 46"	0.93156
11	334° 14' 19"	-5° 04' 59"	338° 01' 35"	-14° 41' 01"	0° 57' 43"	15' 43.79"	76° 48' 12"	0.92926
12	334° 48' 10"	-5° 05' 14"	338° 34' 02"	-14° 28' 44"	0° 57' 41"	15' 43.24"	76° 33' 02"	0.92694
13	335° 21' 58"	-5° 05' 27"	339° 06' 23"	-14° 16' 24"	0° 57' 39"	15' 42.70"	76° 18' 15"	0.92458
14	335° 55' 44"	-5° 05' 38"	339° 38' 38"	-14° 04' 00"	0° 57' 37"	15' 42.15"	76° 3' 51"	0.92219
15	336° 29' 28"	-5° 05' 48"	340° 10' 47"	-13° 51' 33"	0° 57' 35"	15' 41.60"	75° 49' 49"	0.91976
16	337° 03' 09"	-5° 05' 55"	340° 42' 50"	-13° 39' 03"	0° 57' 33"	15' 41.05"	75° 36' 07"	0.91731
17	337° 36' 47"	-5° 06' 01"	341° 14' 47"	-13° 26' 29"	0° 57' 31"	15' 40.50"	75° 22' 47"	0.91483
18	338° 10' 23"	-5° 06' 05"	341° 46' 39"	-13° 13' 52"	0° 57' 29"	15' 39.94"	75° 9' 46"	0.91231
19	338° 43' 57"	-5° 06' 08"	342° 18' 25"	-13° 01' 13"	0° 57' 27"	15' 39.39"	74° 57' 05"	0.90977
20	339° 17' 28"	-5° 06' 08"	342° 50' 05"	-12° 48' 30"	0° 57' 25"	15' 38.84"	74° 44' 42"	0.90719
21	339° 50' 56"	-5° 06' 07"	343° 21' 40"	-12° 35' 44"	0° 57' 23"	15' 38.29"	74° 32' 38"	0.90459
22	340° 24' 23"	-5° 06' 04"	343° 53' 09"	-12° 22' 56"	0° 57' 21"	15' 37.74"	74° 20' 52"	0.90196
23	340° 57' 46"	-5° 05' 59"	344° 24' 32"	-12° 10' 05"	0° 57' 19"	15' 37.19"	74° 9' 24"	0.89930
24	341° 31' 07"	-5° 05' 53"	344° 55' 51"	-11° 57' 12"	0° 57' 17"	15' 36.63"	73° 58' 12"	0.89661

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	124° 12' 29"	-0.39"	126° 31' 33"	19° 12' 23"	1.0155413	15' 44.94"	23° 26' 15"	-6 m 33 s
1	124° 14' 52"	-0.39"	126° 34' 01"	19° 11' 50"	1.0155371	15' 44.95"	23° 26' 15"	-6 m 33 s
2	124° 17' 15"	-0.39"	126° 36' 28"	19° 11' 16"	1.0155330	15' 44.95"	23° 26' 15"	-6 m 33 s
3	124° 19' 38"	-0.39"	126° 38' 56"	19° 10' 42"	1.0155289	15' 44.96"	23° 26' 15"	-6 m 33 s
4	124° 22' 02"	-0.39"	126° 41' 23"	19° 10' 08"	1.0155247	15' 44.96"	23° 26' 15"	-6 m 33 s
5	124° 24' 25"	-0.39"	126° 43' 50"	19° 09' 33"	1.0155206	15' 44.96"	23° 26' 15"	-6 m 33 s
6	124° 26' 48"	-0.39"	126° 46' 18"	19° 08' 59"	1.0155164	15' 44.97"	23° 26' 15"	-6 m 33 s
7	124° 29' 12"	-0.39"	126° 48' 45"	19° 08' 25"	1.0155122	15' 44.97"	23° 26' 15"	-6 m 33 s
8	124° 31' 35"	-0.39"	126° 51' 12"	19° 07' 51"	1.0155080	15' 44.98"	23° 26' 15"	-6 m 33 s
9	124° 33' 58"	-0.39"	126° 53' 40"	19° 07' 17"	1.0155039	15' 44.98"	23° 26' 15"	-6 m 32 s
10	124° 36' 21"	-0.39"	126° 56' 07"	19° 06' 43"	1.0154997	15' 44.98"	23° 26' 15"	-6 m 32 s
11	124° 38' 45"	-0.39"	126° 58' 34"	19° 06' 08"	1.0154955	15' 44.99"	23° 26' 15"	-6 m 32 s
12	124° 41' 08"	-0.39"	127° 01' 01"	19° 05' 34"	1.0154913	15' 44.99"	23° 26' 15"	-6 m 32 s
13	124° 43' 31"	-0.39"	127° 03' 28"	19° 04' 60"	1.0154871	15' 44.99"	23° 26' 15"	-6 m 32 s
14	124° 45' 55"	-0.39"	127° 05' 56"	19° 04' 25"	1.0154829	15' 45.00"	23° 26' 15"	-6 m 32 s
15	124° 48' 18"	-0.39"	127° 08' 23"	19° 03' 51"	1.0154787	15' 45.00"	23° 26' 15"	-6 m 32 s
16	124° 50' 41"	-0.39"	127° 10' 50"	19° 03' 17"	1.0154744	15' 45.01"	23° 26' 15"	-6 m 32 s
17	124° 53' 05"	-0.38"	127° 13' 17"	19° 02' 42"	1.0154702	15' 45.01"	23° 26' 15"	-6 m 32 s
18	124° 55' 28"	-0.38"	127° 15' 44"	19° 02' 08"	1.0154660	15' 45.01"	23° 26' 15"	-6 m 32 s
19	124° 57' 51"	-0.38"	127° 18' 12"	19° 01' 33"	1.0154617	15' 45.02"	23° 26' 15"	-6 m 32 s
20	125° 00' 15"	-0.38"	127° 20' 39"	19° 00' 59"	1.0154575	15' 45.02"	23° 26' 15"	-6 m 32 s
21	125° 02' 38"	-0.38"	127° 23' 06"	19° 00' 24"	1.0154532	15' 45.03"	23° 26' 15"	-6 m 32 s
22	125° 05' 01"	-0.38"	127° 25' 33"	18° 59' 49"	1.0154490	15' 45.03"	23° 26' 15"	-6 m 32 s
23	125° 07' 24"	-0.38"	127° 27' 60"	18° 59' 15"	1.0154447	15' 45.03"	23° 26' 15"	-6 m 32 s
24	125° 09' 48"	-0.38"	127° 30' 27"	18° 58' 40"	1.0154404	15' 45.04"	23° 26' 15"	-6 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	341° 31' 07"	-5° 05' 53"	344° 55' 51"	-11° 57' 12"	0° 57' 17"	15' 36.63"	73° 58' 12"	0.89661
1	342° 04' 26"	-5° 05' 45"	345° 27' 04"	-11° 44' 16"	0° 57' 15"	15' 36.08"	73° 47' 17"	0.89389
2	342° 37' 42"	-5° 05' 35"	345° 58' 12"	-11° 31' 17"	0° 57' 13"	15' 35.53"	73° 36' 39"	0.89114
3	343° 10' 55"	-5° 05' 23"	346° 29' 14"	-11° 18' 17"	0° 57' 11"	15' 34.98"	73° 26' 16"	0.88837
4	343° 44' 06"	-5° 05' 10"	347° 00' 12"	-11° 05' 14"	0° 57' 09"	15' 34.43"	73° 16' 09"	0.88557
5	344° 17' 14"	-5° 04' 55"	347° 31' 04"	-10° 52' 08"	0° 57' 07"	15' 33.88"	73° 6' 17"	0.88274
6	344° 50' 20"	-5° 04' 38"	348° 01' 51"	-10° 39' 01"	0° 57' 05"	15' 33.33"	72° 56' 40"	0.87989
7	345° 23' 24"	-5° 04' 20"	348° 32' 33"	-10° 25' 52"	0° 57' 03"	15' 32.79"	72° 47' 18"	0.87701
8	345° 56' 25"	-5° 04' 00"	349° 03' 11"	-10° 12' 40"	0° 57' 01"	15' 32.24"	72° 38' 10"	0.87410
9	346° 29' 23"	-5° 03' 38"	349° 33' 43"	-9° 59' 27"	0° 56' 59"	15' 31.69"	72° 29' 17"	0.87117
10	347° 02' 19"	-5° 03' 15"	350° 04' 11"	-9° 46' 12"	0° 56' 57"	15' 31.15"	72° 20' 37"	0.86822
11	347° 35' 12"	-5° 02' 50"	350° 34' 34"	-9° 32' 56"	0° 56' 55"	15' 30.60"	72° 12' 10"	0.86524
12	348° 08' 03"	-5° 02' 23"	351° 04' 53"	-9° 19' 37"	0° 56' 53"	15' 30.06"	72° 3' 58"	0.86223
13	348° 40' 52"	-5° 01' 55"	351° 35' 06"	-9° 06' 17"	0° 56' 51"	15' 29.51"	71° 55' 58"	0.85920
14	349° 13' 38"	-5° 01' 25"	352° 05' 16"	-8° 52' 56"	0° 56' 49"	15' 28.97"	71° 48' 11"	0.85615
15	349° 46' 21"	-5° 00' 54"	352° 35' 21"	-8° 39' 33"	0° 56' 47"	15' 28.43"	71° 40' 37"	0.85308
16	350° 19' 02"	-5° 00' 21"	353° 05' 21"	-8° 26' 09"	0° 56' 45"	15' 27.89"	71° 33' 16"	0.84998
17	350° 51' 40"	-4° 59' 46"	353° 35' 17"	-8° 12' 43"	0° 56' 43"	15' 27.36"	71° 26' 06"	0.84686
18	351° 24' 16"	-4° 59' 10"	354° 05' 09"	-7° 59' 17"	0° 56' 41"	15' 26.82"	71° 19' 09"	0.84371
19	351° 56' 50"	-4° 58' 32"	354° 34' 57"	-7° 45' 49"	0° 56' 39"	15' 26.29"	71° 12' 24"	0.84055
20	352° 29' 21"	-4° 57' 53"	355° 04' 41"	-7° 32' 20"	0° 56' 37"	15' 25.75"	71° 5' 51"	0.83736
21	353° 01' 49"	-4° 57' 12"	355° 34' 20"	-7° 18' 50"	0° 56' 35"	15' 25.22"	70° 59' 30"	0.83415
22	353° 34' 16"	-4° 56' 29"	356° 03' 56"	-7° 05' 19"	0° 56' 33"	15' 24.69"	70° 53' 19"	0.83092
23	354° 06' 39"	-4° 55' 45"	356° 33' 28"	-6° 51' 47"	0° 56' 31"	15' 24.16"	70° 47' 21"	0.82767
24	354° 39' 01"	-4° 54' 60"	357° 02' 56"	-6° 38' 14"	0° 56' 30"	15' 23.64"	70° 41' 33"	0.82440

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	125° 09' 48"	-0.38"	127° 30' 27"	18° 58' 40"	1.0154404	15' 45.04"	23° 26' 15"	-6 m 32 s
1	125° 12' 11"	-0.38"	127° 32' 54"	18° 58' 05"	1.0154362	15' 45.04"	23° 26' 15"	-6 m 32 s
2	125° 14' 34"	-0.38"	127° 35' 21"	18° 57' 30"	1.0154319	15' 45.05"	23° 26' 15"	-6 m 32 s
3	125° 16' 58"	-0.38"	127° 37' 48"	18° 56' 56"	1.0154276	15' 45.05"	23° 26' 15"	-6 m 32 s
4	125° 19' 21"	-0.38"	127° 40' 15"	18° 56' 21"	1.0154233	15' 45.05"	23° 26' 15"	-6 m 32 s
5	125° 21' 44"	-0.38"	127° 42' 42"	18° 55' 46"	1.0154190	15' 45.06"	23° 26' 15"	-6 m 32 s
6	125° 24' 08"	-0.37"	127° 45' 09"	18° 55' 11"	1.0154147	15' 45.06"	23° 26' 15"	-6 m 32 s
7	125° 26' 31"	-0.37"	127° 47' 36"	18° 54' 36"	1.0154104	15' 45.07"	23° 26' 15"	-6 m 31 s
8	125° 28' 54"	-0.37"	127° 50' 03"	18° 54' 01"	1.0154060	15' 45.07"	23° 26' 15"	-6 m 31 s
9	125° 31' 18"	-0.37"	127° 52' 30"	18° 53' 26"	1.0154017	15' 45.07"	23° 26' 15"	-6 m 31 s
10	125° 33' 41"	-0.37"	127° 54' 57"	18° 52' 51"	1.0153974	15' 45.08"	23° 26' 15"	-6 m 31 s
11	125° 36' 04"	-0.37"	127° 57' 24"	18° 52' 16"	1.0153930	15' 45.08"	23° 26' 15"	-6 m 31 s
12	125° 38' 28"	-0.37"	127° 59' 50"	18° 51' 41"	1.0153887	15' 45.09"	23° 26' 15"	-6 m 31 s
13	125° 40' 51"	-0.36"	128° 02' 17"	18° 51' 06"	1.0153843	15' 45.09"	23° 26' 15"	-6 m 31 s
14	125° 43' 14"	-0.36"	128° 04' 44"	18° 50' 31"	1.0153800	15' 45.09"	23° 26' 15"	-6 m 31 s
15	125° 45' 38"	-0.36"	128° 07' 11"	18° 49' 56"	1.0153756	15' 45.10"	23° 26' 15"	-6 m 31 s
16	125° 48' 01"	-0.36"	128° 09' 38"	18° 49' 21"	1.0153712	15' 45.10"	23° 26' 15"	-6 m 31 s
17	125° 50' 25"	-0.36"	128° 12' 04"	18° 48' 45"	1.0153669	15' 45.11"	23° 26' 15"	-6 m 31 s
18	125° 52' 48"	-0.36"	128° 14' 31"	18° 48' 10"	1.0153625	15' 45.11"	23° 26' 15"	-6 m 31 s
19	125° 55' 11"	-0.35"	128° 16' 58"	18° 47' 35"	1.0153581	15' 45.11"	23° 26' 15"	-6 m 31 s
20	125° 57' 35"	-0.35"	128° 19' 25"	18° 46' 59"	1.0153537	15' 45.12"	23° 26' 15"	-6 m 31 s
21	125° 59' 58"	-0.35"	128° 21' 52"	18° 46' 24"	1.0153493	15' 45.12"	23° 26' 15"	-6 m 31 s
22	126° 02' 21"	-0.35"	128° 24' 18"	18° 45' 49"	1.0153449	15' 45.13"	23° 26' 15"	-6 m 30 s
23	126° 04' 45"	-0.35"	128° 26' 45"	18° 45' 13"	1.0153405	15' 45.13"	23° 26' 15"	-6 m 30 s
24	126° 07' 08"	-0.34"	128° 29' 12"	18° 44' 38"	1.0153360	15' 45.14"	23° 26' 15"	-6 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	354° 39' 01"	-4° 54' 60"	357° 02' 56"	-6° 38' 14"	0° 56' 30"	15' 23.64"	70° 41' 33"	0.82440
1	355° 11' 19"	-4° 54' 13"	357° 32' 20"	-6° 24' 41"	0° 56' 28"	15' 23.11"	70° 35' 56"	0.82111
2	355° 43' 36"	-4° 53' 24"	358° 01' 40"	-6° 11' 07"	0° 56' 26"	15' 22.59"	70° 30' 31"	0.81780
3	356° 15' 50"	-4° 52' 34"	358° 30' 57"	-5° 57' 32"	0° 56' 24"	15' 22.07"	70° 25' 16"	0.81447
4	356° 48' 01"	-4° 51' 43"	359° 00' 10"	-5° 43' 57"	0° 56' 22"	15' 21.55"	70° 20' 12"	0.81112
5	357° 20' 10"	-4° 50' 50"	359° 29' 20"	-5° 30' 21"	0° 56' 20"	15' 21.04"	70° 15' 18"	0.80775
6	357° 52' 17"	-4° 49' 55"	359° 58' 26"	-5° 16' 44"	0° 56' 18"	15' 20.52"	70° 10' 35"	0.80436
7	358° 24' 22"	-4° 48' 59"	0° 27' 29"	-5° 03' 08"	0° 56' 16"	15' 20.01"	70° 6' 02"	0.80096
8	358° 56' 24"	-4° 48' 02"	0° 56' 29"	-4° 49' 31"	0° 56' 14"	15' 19.50"	70° 1' 39"	0.79753
9	359° 28' 23"	-4° 47' 03"	1° 25' 25"	-4° 35' 53"	0° 56' 12"	15' 19.00"	69° 57' 26"	0.79409
10	0° 00' 21"	-4° 46' 03"	1° 54' 19"	-4° 22' 16"	0° 56' 11"	15' 18.49"	69° 53' 23"	0.79064
11	0° 32' 16"	-4° 45' 01"	2° 23' 09"	-4° 08' 38"	0° 56' 09"	15' 17.99"	69° 49' 31"	0.78716
12	1° 04' 08"	-4° 43' 58"	2° 51' 56"	-3° 55' 00"	0° 56' 07"	15' 17.49"	69° 45' 47"	0.78367
13	1° 35' 59"	-4° 42' 54"	3° 20' 40"	-3° 41' 22"	0° 56' 05"	15' 17.00"	69° 42' 14"	0.78016
14	2° 07' 47"	-4° 41' 48"	3° 49' 22"	-3° 27' 45"	0° 56' 03"	15' 16.50"	69° 38' 50"	0.77664
15	2° 39' 32"	-4° 40' 41"	4° 18' 00"	-3° 14' 07"	0° 56' 02"	15' 16.01"	69° 35' 36"	0.77310
16	3° 11' 16"	-4° 39' 32"	4° 46' 36"	-3° 00' 29"	0° 55' 60"	15' 15.52"	69° 32' 31"	0.76955
17	3° 42' 57"	-4° 38' 22"	5° 15' 09"	-2° 46' 52"	0° 55' 58"	15' 15.04"	69° 29' 35"	0.76598
18	4° 14' 36"	-4° 37' 11"	5° 43' 40"	-2° 33' 14"	0° 55' 56"	15' 14.56"	69° 26' 48"	0.76239
19	4° 46' 13"	-4° 35' 58"	6° 12' 08"	-2° 19' 37"	0° 55' 54"	15' 14.08"	69° 24' 11"	0.75879
20	5° 17' 47"	-4° 34' 44"	6° 40' 34"	-2° 06' 01"	0° 55' 53"	15' 13.60"	69° 21' 43"	0.75518
21	5° 49' 20"	-4° 33' 29"	7° 08' 57"	-1° 52' 25"	0° 55' 51"	15' 13.13"	69° 19' 24"	0.75155
22	6° 20' 50"	-4° 32' 12"	7° 37' 18"	-1° 38' 49"	0° 55' 49"	15' 12.66"	69° 17' 13"	0.74791
23	6° 52' 18"	-4° 30' 55"	8° 05' 36"	-1° 25' 13"	0° 55' 47"	15' 12.19"	69° 15' 12"	0.74426
24	7° 23' 43"	-4° 29' 36"	8° 33' 53"	-1° 11' 39"	0° 55' 46"	15' 11.72"	69° 13' 19"	0.74059

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	126° 07' 08"	-0.34"	128° 29' 12"	18° 44' 38"	1.0153360	15' 45.14"	23° 26' 15"	-6 m 30 s
1	126° 09' 31"	-0.34"	128° 31' 38"	18° 44' 02"	1.0153316	15' 45.14"	23° 26' 15"	-6 m 30 s
2	126° 11' 55"	-0.34"	128° 34' 05"	18° 43' 27"	1.0153272	15' 45.14"	23° 26' 15"	-6 m 30 s
3	126° 14' 18"	-0.34"	128° 36' 32"	18° 42' 51"	1.0153227	15' 45.15"	23° 26' 15"	-6 m 30 s
4	126° 16' 41"	-0.34"	128° 38' 58"	18° 42' 15"	1.0153183	15' 45.15"	23° 26' 15"	-6 m 30 s
5	126° 19' 05"	-0.33"	128° 41' 25"	18° 41' 40"	1.0153138	15' 45.16"	23° 26' 15"	-6 m 30 s
6	126° 21' 28"	-0.33"	128° 43' 51"	18° 41' 04"	1.0153093	15' 45.16"	23° 26' 15"	-6 m 30 s
7	126° 23' 52"	-0.33"	128° 46' 18"	18° 40' 29"	1.0153049	15' 45.16"	23° 26' 15"	-6 m 30 s
8	126° 26' 15"	-0.33"	128° 48' 45"	18° 39' 53"	1.0153004	15' 45.17"	23° 26' 15"	-6 m 30 s
9	126° 28' 38"	-0.32"	128° 51' 11"	18° 39' 17"	1.0152959	15' 45.17"	23° 26' 15"	-6 m 30 s
10	126° 31' 02"	-0.32"	128° 53' 38"	18° 38' 41"	1.0152914	15' 45.18"	23° 26' 15"	-6 m 29 s
11	126° 33' 25"	-0.32"	128° 56' 04"	18° 38' 05"	1.0152869	15' 45.18"	23° 26' 15"	-6 m 29 s
12	126° 35' 49"	-0.32"	128° 58' 31"	18° 37' 30"	1.0152824	15' 45.19"	23° 26' 15"	-6 m 29 s
13	126° 38' 12"	-0.31"	129° 00' 57"	18° 36' 54"	1.0152779	15' 45.19"	23° 26' 15"	-6 m 29 s
14	126° 40' 35"	-0.31"	129° 03' 24"	18° 36' 18"	1.0152734	15' 45.19"	23° 26' 15"	-6 m 29 s
15	126° 42' 59"	-0.31"	129° 05' 50"	18° 35' 42"	1.0152689	15' 45.20"	23° 26' 15"	-6 m 29 s
16	126° 45' 22"	-0.31"	129° 08' 17"	18° 35' 06"	1.0152643	15' 45.20"	23° 26' 15"	-6 m 29 s
17	126° 47' 45"	-0.30"	129° 10' 43"	18° 34' 30"	1.0152598	15' 45.21"	23° 26' 15"	-6 m 29 s
18	126° 50' 09"	-0.30"	129° 13' 09"	18° 33' 54"	1.0152552	15' 45.21"	23° 26' 15"	-6 m 29 s
19	126° 52' 32"	-0.30"	129° 15' 36"	18° 33' 18"	1.0152507	15' 45.21"	23° 26' 15"	-6 m 29 s
20	126° 54' 56"	-0.29"	129° 18' 02"	18° 32' 42"	1.0152461	15' 45.22"	23° 26' 15"	-6 m 29 s
21	126° 57' 19"	-0.29"	129° 20' 28"	18° 32' 05"	1.0152416	15' 45.22"	23° 26' 15"	-6 m 28 s
22	126° 59' 42"	-0.29"	129° 22' 55"	18° 31' 29"	1.0152370	15' 45.23"	23° 26' 15"	-6 m 28 s
23	127° 02' 06"	-0.28"	129° 25' 21"	18° 30' 53"	1.0152324	15' 45.23"	23° 26' 15"	-6 m 28 s
24	127° 04' 29"	-0.28"	129° 27' 47"	18° 30' 17"	1.0152278	15' 45.24"	23° 26' 15"	-6 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	7° 23' 43"	-4° 29' 36"	8° 33' 53"	-1° 11' 39"	0° 55' 46"	15' 11.72"	69° 13' 19"	0.74059
1	7° 55' 07"	-4° 28' 15"	9° 02' 07"	0°-58' 04"	0° 55' 44"	15' 11.26"	69° 11' 36"	0.73691
2	8° 26' 28"	-4° 26' 53"	9° 30' 19"	0°-44' 31"	0° 55' 42"	15' 10.80"	69° 10' 00"	0.73322
3	8° 57' 48"	-4° 25' 31"	9° 58' 29"	0°-30' 58"	0° 55' 41"	15' 10.35"	69° 8' 34"	0.72951
4	9° 29' 05"	-4° 24' 06"	10° 26' 38"	0°-17' 26"	0° 55' 39"	15' 09.90"	69° 7' 16"	0.72580
5	10° 00' 20"	-4° 22' 41"	10° 54' 44"	0° -3' 54"	0° 55' 37"	15' 09.45"	69° 6' 06"	0.72207
6	10° 31' 33"	-4° 21' 14"	11° 22' 49"	0° 09' 37"	0° 55' 36"	15' 09.01"	69° 5' 05"	0.71833
7	11° 02' 44"	-4° 19' 47"	11° 50' 52"	0° 23' 06"	0° 55' 34"	15' 08.57"	69° 4' 12"	0.71458
8	11° 33' 53"	-4° 18' 18"	12° 18' 53"	0° 36' 35"	0° 55' 33"	15' 08.13"	69° 3' 28"	0.71082
9	12° 04' 60"	-4° 16' 48"	12° 46' 53"	0° 50' 03"	0° 55' 31"	15' 07.70"	69° 2' 51"	0.70705
10	12° 36' 05"	-4° 15' 16"	13° 14' 52"	1° 03' 30"	0° 55' 29"	15' 07.27"	69° 2' 23"	0.70326
11	13° 07' 08"	-4° 13' 44"	13° 42' 48"	1° 16' 56"	0° 55' 28"	15' 06.84"	69° 2' 04"	0.69947
12	13° 38' 08"	-4° 12' 10"	14° 10' 44"	1° 30' 20"	0° 55' 26"	15' 06.42"	69° 1' 52"	0.69567
13	14° 09' 07"	-4° 10' 35"	14° 38' 38"	1° 43' 44"	0° 55' 25"	15' 06.00"	69° 1' 48"	0.69186
14	14° 40' 04"	-4° 08' 59"	15° 06' 31"	1° 57' 06"	0° 55' 23"	15' 05.58"	69° 1' 52"	0.68804
15	15° 10' 59"	-4° 07' 22"	15° 34' 23"	2° 10' 27"	0° 55' 22"	15' 05.17"	69° 2' 05"	0.68421
16	15° 41' 53"	-4° 05' 44"	16° 02' 13"	2° 23' 47"	0° 55' 20"	15' 04.77"	69° 2' 25"	0.68037
17	16° 12' 44"	-4° 04' 05"	16° 30' 03"	2° 37' 06"	0° 55' 19"	15' 04.36"	69° 2' 53"	0.67652
18	16° 43' 33"	-4° 02' 25"	16° 57' 51"	2° 50' 23"	0° 55' 17"	15' 03.96"	69° 3' 29"	0.67267
19	17° 14' 21"	-4° 00' 43"	17° 25' 39"	3° 03' 39"	0° 55' 16"	15' 03.57"	69° 4' 13"	0.66881
20	17° 45' 07"	-3° 59' 01"	17° 53' 26"	3° 16' 53"	0° 55' 14"	15' 03.18"	69° 5' 05"	0.66494
21	18° 15' 51"	-3° 57' 17"	18° 21' 12"	3° 30' 06"	0° 55' 13"	15' 02.79"	69° 6' 04"	0.66106
22	18° 46' 33"	-3° 55' 32"	18° 48' 57"	3° 43' 17"	0° 55' 12"	15' 02.40"	69° 7' 11"	0.65717
23	19° 17' 13"	-3° 53' 47"	19° 16' 42"	3° 56' 27"	0° 55' 10"	15' 02.02"	69° 8' 26"	0.65328
24	19° 47' 52"	-3° 52' 00"	19° 44' 26"	4° 09' 35"	0° 55' 09"	15' 01.65"	69° 9' 48"	0.64938

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	127° 04' 29"	-0.28"	129° 27' 47"	18° 30' 17"	1.0152278	15' 45.24"	23° 26' 15"	-6 m 28 s
1	127° 06' 53"	-0.28"	129° 30' 14"	18° 29' 41"	1.0152232	15' 45.24"	23° 26' 15"	-6 m 28 s
2	127° 09' 16"	-0.28"	129° 32' 40"	18° 29' 04"	1.0152186	15' 45.24"	23° 26' 15"	-6 m 28 s
3	127° 11' 39"	-0.27"	129° 35' 06"	18° 28' 28"	1.0152140	15' 45.25"	23° 26' 15"	-6 m 28 s
4	127° 14' 03"	-0.27"	129° 37' 33"	18° 27' 52"	1.0152094	15' 45.25"	23° 26' 15"	-6 m 28 s
5	127° 16' 26"	-0.27"	129° 39' 59"	18° 27' 15"	1.0152048	15' 45.26"	23° 26' 15"	-6 m 28 s
6	127° 18' 50"	-0.26"	129° 42' 25"	18° 26' 39"	1.0152002	15' 45.26"	23° 26' 15"	-6 m 28 s
7	127° 21' 13"	-0.26"	129° 44' 51"	18° 26' 02"	1.0151955	15' 45.27"	23° 26' 15"	-6 m 27 s
8	127° 23' 37"	-0.26"	129° 47' 17"	18° 25' 26"	1.0151909	15' 45.27"	23° 26' 15"	-6 m 27 s
9	127° 25' 60"	-0.25"	129° 49' 44"	18° 24' 49"	1.0151862	15' 45.27"	23° 26' 15"	-6 m 27 s
10	127° 28' 23"	-0.25"	129° 52' 10"	18° 24' 13"	1.0151816	15' 45.28"	23° 26' 15"	-6 m 27 s
11	127° 30' 47"	-0.24"	129° 54' 36"	18° 23' 36"	1.0151769	15' 45.28"	23° 26' 15"	-6 m 27 s
12	127° 33' 10"	-0.24"	129° 57' 02"	18° 22' 60"	1.0151722	15' 45.29"	23° 26' 15"	-6 m 27 s
13	127° 35' 34"	-0.24"	129° 59' 28"	18° 22' 23"	1.0151676	15' 45.29"	23° 26' 15"	-6 m 27 s
14	127° 37' 57"	-0.23"	130° 01' 54"	18° 21' 46"	1.0151629	15' 45.30"	23° 26' 15"	-6 m 27 s
15	127° 40' 21"	-0.23"	130° 04' 20"	18° 21' 10"	1.0151582	15' 45.30"	23° 26' 15"	-6 m 27 s
16	127° 42' 44"	-0.23"	130° 06' 46"	18° 20' 33"	1.0151535	15' 45.31"	23° 26' 15"	-6 m 26 s
17	127° 45' 07"	-0.22"	130° 09' 13"	18° 19' 56"	1.0151488	15' 45.31"	23° 26' 15"	-6 m 26 s
18	127° 47' 31"	-0.22"	130° 11' 39"	18° 19' 19"	1.0151441	15' 45.31"	23° 26' 15"	-6 m 26 s
19	127° 49' 54"	-0.21"	130° 14' 05"	18° 18' 42"	1.0151393	15' 45.32"	23° 26' 15"	-6 m 26 s
20	127° 52' 18"	-0.21"	130° 16' 31"	18° 18' 06"	1.0151346	15' 45.32"	23° 26' 15"	-6 m 26 s
21	127° 54' 41"	-0.21"	130° 18' 57"	18° 17' 29"	1.0151299	15' 45.33"	23° 26' 15"	-6 m 26 s
22	127° 57' 05"	-0.20"	130° 21' 23"	18° 16' 52"	1.0151251	15' 45.33"	23° 26' 15"	-6 m 26 s
23	127° 59' 28"	-0.20"	130° 23' 49"	18° 16' 15"	1.0151204	15' 45.34"	23° 26' 15"	-6 m 26 s
24	128° 01' 51"	-0.19"	130° 26' 14"	18° 15' 38"	1.0151156	15' 45.34"	23° 26' 15"	-6 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	19° 47' 52"	-3° 52' 00"	19° 44' 26"	4° 09' 35"	0° 55' 09"	15' 01.65"	69° 9' 48"	0.64938
1	20° 18' 28"	-3° 50' 13"	20° 12' 09"	4° 22' 42"	0° 55' 07"	15' 01.28"	69° 11' 18"	0.64548
2	20° 49' 04"	-3° 48' 24"	20° 39' 52"	4° 35' 47"	0° 55' 06"	15' 00.91"	69° 12' 55"	0.64157
3	21° 19' 37"	-3° 46' 34"	21° 07' 35"	4° 48' 50"	0° 55' 05"	15' 00.55"	69° 14' 40"	0.63765
4	21° 50' 09"	-3° 44' 44"	21° 35' 17"	5° 01' 51"	0° 55' 03"	15' 00.19"	69° 16' 33"	0.63373
5	22° 20' 39"	-3° 42' 52"	22° 02' 59"	5° 14' 50"	0° 55' 02"	14' 59.84"	69° 18' 33"	0.62980
6	22° 51' 07"	-3° 40' 59"	22° 30' 41"	5° 27' 48"	0° 55' 01"	14' 59.49"	69° 20' 40"	0.62587
7	23° 21' 34"	-3° 39' 06"	22° 58' 22"	5° 40' 44"	0° 54' 60"	14' 59.14"	69° 22' 55"	0.62193
8	23° 51' 59"	-3° 37' 11"	23° 26' 04"	5° 53' 37"	0° 54' 58"	14' 58.80"	69° 25' 17"	0.61799
9	24° 22' 23"	-3° 35' 16"	23° 53' 45"	6° 06' 29"	0° 54' 57"	14' 58.46"	69° 27' 47"	0.61404
10	24° 52' 45"	-3° 33' 20"	24° 21' 27"	6° 19' 19"	0° 54' 56"	14' 58.13"	69° 30' 24"	0.61009
11	25° 23' 06"	-3° 31' 22"	24° 49' 08"	6° 32' 07"	0° 54' 55"	14' 57.80"	69° 33' 08"	0.60613
12	25° 53' 25"	-3° 29' 24"	25° 16' 50"	6° 44' 53"	0° 54' 53"	14' 57.48"	69° 35' 60"	0.60217
13	26° 23' 42"	-3° 27' 25"	25° 44' 32"	6° 57' 36"	0° 54' 52"	14' 57.16"	69° 38' 59"	0.59821
14	26° 53' 59"	-3° 25' 25"	26° 12' 14"	7° 10' 17"	0° 54' 51"	14' 56.84"	69° 42' 05"	0.59424
15	27° 24' 13"	-3° 23' 24"	26° 39' 57"	7° 22' 57"	0° 54' 50"	14' 56.53"	69° 45' 18"	0.59027
16	27° 54' 26"	-3° 21' 23"	27° 07' 40"	7° 35' 33"	0° 54' 49"	14' 56.23"	69° 48' 39"	0.58630
17	28° 24' 38"	-3° 19' 20"	27° 35' 23"	7° 48' 08"	0° 54' 48"	14' 55.93"	69° 52' 07"	0.58232
18	28° 54' 49"	-3° 17' 17"	28° 03' 07"	8° 00' 40"	0° 54' 47"	14' 55.63"	69° 55' 41"	0.57835
19	29° 24' 58"	-3° 15' 13"	28° 30' 51"	8° 13' 10"	0° 54' 46"	14' 55.34"	69° 59' 24"	0.57437
20	29° 55' 06"	-3° 13' 08"	28° 58' 36"	8° 25' 38"	0° 54' 45"	14' 55.05"	70° 3' 13"	0.57038
21	30° 25' 12"	-3° 11' 02"	29° 26' 22"	8° 38' 03"	0° 54' 44"	14' 54.77"	70° 7' 09"	0.56640
22	30° 55' 17"	-3° 08' 55"	29° 54' 09"	8° 50' 25"	0° 54' 43"	14' 54.49"	70° 11' 13"	0.56242
23	31° 25' 21"	-3° 06' 48"	30° 21' 56"	9° 02' 46"	0° 54' 42"	14' 54.22"	70° 15' 23"	0.55843
24	31° 55' 24"	-3° 04' 40"	30° 49' 44"	9° 15' 03"	0° 54' 41"	14' 53.95"	70° 19' 41"	0.55444

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	128° 01' 51"	-0.19"	130° 26' 14"	18° 15' 38"	1.0151156	15' 45.34"	23° 26' 15"	-6 m 25 s
1	128° 04' 15"	-0.19"	130° 28' 40"	18° 15' 01"	1.0151109	15' 45.35"	23° 26' 15"	-6 m 25 s
2	128° 06' 38"	-0.19"	130° 31' 06"	18° 14' 24"	1.0151061	15' 45.35"	23° 26' 15"	-6 m 25 s
3	128° 09' 02"	-0.18"	130° 33' 32"	18° 13' 47"	1.0151013	15' 45.35"	23° 26' 15"	-6 m 25 s
4	128° 11' 25"	-0.18"	130° 35' 58"	18° 13' 10"	1.0150965	15' 45.36"	23° 26' 15"	-6 m 25 s
5	128° 13' 49"	-0.17"	130° 38' 24"	18° 12' 32"	1.0150917	15' 45.36"	23° 26' 15"	-6 m 25 s
6	128° 16' 12"	-0.17"	130° 40' 50"	18° 11' 55"	1.0150869	15' 45.37"	23° 26' 15"	-6 m 25 s
7	128° 18' 36"	-0.17"	130° 43' 16"	18° 11' 18"	1.0150821	15' 45.37"	23° 26' 15"	-6 m 25 s
8	128° 20' 59"	-0.16"	130° 45' 42"	18° 10' 41"	1.0150773	15' 45.38"	23° 26' 15"	-6 m 24 s
9	128° 23' 23"	-0.16"	130° 48' 07"	18° 10' 04"	1.0150725	15' 45.38"	23° 26' 15"	-6 m 24 s
10	128° 25' 46"	-0.15"	130° 50' 33"	18° 09' 26"	1.0150676	15' 45.39"	23° 26' 15"	-6 m 24 s
11	128° 28' 10"	-0.15"	130° 52' 59"	18° 08' 49"	1.0150628	15' 45.39"	23° 26' 15"	-6 m 24 s
12	128° 30' 33"	-0.14"	130° 55' 25"	18° 08' 12"	1.0150580	15' 45.39"	23° 26' 15"	-6 m 24 s
13	128° 32' 57"	-0.14"	130° 57' 50"	18° 07' 34"	1.0150531	15' 45.40"	23° 26' 15"	-6 m 24 s
14	128° 35' 20"	-0.13"	131° 00' 16"	18° 06' 57"	1.0150482	15' 45.40"	23° 26' 15"	-6 m 24 s
15	128° 37' 43"	-0.13"	131° 02' 42"	18° 06' 19"	1.0150434	15' 45.41"	23° 26' 15"	-6 m 23 s
16	128° 40' 07"	-0.13"	131° 05' 08"	18° 05' 42"	1.0150385	15' 45.41"	23° 26' 15"	-6 m 23 s
17	128° 42' 30"	-0.12"	131° 07' 33"	18° 05' 04"	1.0150336	15' 45.42"	23° 26' 15"	-6 m 23 s
18	128° 44' 54"	-0.12"	131° 09' 59"	18° 04' 27"	1.0150287	15' 45.42"	23° 26' 15"	-6 m 23 s
19	128° 47' 17"	-0.11"	131° 12' 25"	18° 03' 49"	1.0150238	15' 45.43"	23° 26' 15"	-6 m 23 s
20	128° 49' 41"	-0.11"	131° 14' 50"	18° 03' 12"	1.0150189	15' 45.43"	23° 26' 15"	-6 m 23 s
21	128° 52' 04"	-0.10"	131° 17' 16"	18° 02' 34"	1.0150140	15' 45.44"	23° 26' 15"	-6 m 23 s
22	128° 54' 28"	-0.10"	131° 19' 42"	18° 01' 56"	1.0150091	15' 45.44"	23° 26' 15"	-6 m 22 s
23	128° 56' 51"	-0.09"	131° 22' 07"	18° 01' 19"	1.0150041	15' 45.44"	23° 26' 15"	-6 m 22 s
24	128° 59' 15"	-0.09"	131° 24' 33"	18° 00' 41"	1.0149992	15' 45.45"	23° 26' 15"	-6 m 22 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	31° 55' 24"	-3° 04' 40"	30° 49' 44"	9° 15' 03"	0° 54' 41"	14' 53.95"	70° 19' 41"	0.55444
1	32° 25' 25"	-3° 02' 31"	31° 17' 33"	9° 27' 18"	0° 54' 40"	14' 53.68"	70° 24' 06"	0.55045
2	32° 55' 25"	-3° 00' 21"	31° 45' 23"	9° 39' 30"	0° 54' 39"	14' 53.42"	70° 28' 37"	0.54646
3	33° 25' 24"	-2° 58' 11"	32° 13' 14"	9° 51' 40"	0° 54' 38"	14' 53.17"	70° 33' 16"	0.54247
4	33° 55' 22"	-2° 55' 60"	32° 41' 07"	10° 03' 47"	0° 54' 37"	14' 52.92"	70° 38' 02"	0.53848
5	34° 25' 19"	-2° 53' 48"	33° 08' 60"	10° 15' 51"	0° 54' 36"	14' 52.67"	70° 42' 55"	0.53449
6	34° 55' 14"	-2° 51' 35"	33° 36' 54"	10° 27' 53"	0° 54' 35"	14' 52.43"	70° 47' 55"	0.53050
7	35° 25' 09"	-2° 49' 22"	34° 04' 50"	10° 39' 51"	0° 54' 34"	14' 52.19"	70° 53' 02"	0.52651
8	35° 55' 02"	-2° 47' 08"	34° 32' 47"	10° 51' 47"	0° 54' 33"	14' 51.96"	70° 58' 15"	0.52252
9	36° 24' 55"	-2° 44' 53"	35° 00' 46"	11° 03' 40"	0° 54' 32"	14' 51.74"	71° 3' 36"	0.51854
10	36° 54' 46"	-2° 42' 38"	35° 28' 45"	11° 15' 30"	0° 54' 32"	14' 51.52"	71° 9' 04"	0.51455
11	37° 24' 37"	-2° 40' 22"	35° 56' 47"	11° 27' 17"	0° 54' 31"	14' 51.30"	71° 14' 39"	0.51056
12	37° 54' 26"	-2° 38' 05"	36° 24' 49"	11° 39' 01"	0° 54' 30"	14' 51.09"	71° 20' 20"	0.50658
13	38° 24' 14"	-2° 35' 48"	36° 52' 54"	11° 50' 41"	0° 54' 29"	14' 50.88"	71° 26' 09"	0.50259
14	38° 54' 02"	-2° 33' 30"	37° 20' 60"	12° 02' 19"	0° 54' 29"	14' 50.68"	71° 32' 04"	0.49861
15	39° 23' 48"	-2° 31' 11"	37° 49' 07"	12° 13' 54"	0° 54' 28"	14' 50.48"	71° 38' 07"	0.49463
16	39° 53' 34"	-2° 28' 52"	38° 17' 17"	12° 25' 25"	0° 54' 27"	14' 50.29"	71° 44' 16"	0.49065
17	40° 23' 19"	-2° 26' 32"	38° 45' 28"	12° 36' 54"	0° 54' 26"	14' 50.10"	71° 50' 32"	0.48668
18	40° 53' 03"	-2° 24' 12"	39° 13' 41"	12° 48' 19"	0° 54' 26"	14' 49.92"	71° 56' 56"	0.48271
19	41° 22' 46"	-2° 21' 51"	39° 41' 56"	12° 59' 41"	0° 54' 25"	14' 49.74"	72° 3' 26"	0.47874
20	41° 52' 29"	-2° 19' 29"	40° 10' 12"	13° 10' 59"	0° 54' 24"	14' 49.56"	72° 10' 03"	0.47477
21	42° 22' 10"	-2° 17' 07"	40° 38' 31"	13° 22' 14"	0° 54' 24"	14' 49.39"	72° 16' 46"	0.47081
22	42° 51' 51"	-2° 14' 44"	41° 06' 52"	13° 33' 26"	0° 54' 23"	14' 49.23"	72° 23' 37"	0.46685
23	43° 21' 31"	-2° 12' 21"	41° 35' 15"	13° 44' 34"	0° 54' 23"	14' 49.07"	72° 30' 35"	0.46289
24	43° 51' 11"	-2° 09' 57"	42° 03' 40"	13° 55' 39"	0° 54' 22"	14' 48.92"	72° 37' 39"	0.45894

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	128° 59' 15"	-0.09"	131° 24' 33"	18° 00' 41"	1.0149992	15' 45.45"	23° 26' 15"	-6 m 22 s
1	129° 01' 38"	-0.08"	131° 26' 58"	18° 00' 03"	1.0149943	15' 45.45"	23° 26' 15"	-6 m 22 s
2	129° 04' 02"	-0.08"	131° 29' 24"	17° 59' 25"	1.0149893	15' 45.46"	23° 26' 15"	-6 m 22 s
3	129° 06' 25"	-0.07"	131° 31' 49"	17° 58' 47"	1.0149843	15' 45.46"	23° 26' 15"	-6 m 22 s
4	129° 08' 49"	-0.07"	131° 34' 15"	17° 58' 10"	1.0149794	15' 45.47"	23° 26' 15"	-6 m 21 s
5	129° 11' 12"	-0.06"	131° 36' 40"	17° 57' 32"	1.0149744	15' 45.47"	23° 26' 15"	-6 m 21 s
6	129° 13' 36"	-0.06"	131° 39' 06"	17° 56' 54"	1.0149694	15' 45.48"	23° 26' 15"	-6 m 21 s
7	129° 15' 59"	-0.05"	131° 41' 31"	17° 56' 16"	1.0149644	15' 45.48"	23° 26' 15"	-6 m 21 s
8	129° 18' 23"	-0.05"	131° 43' 57"	17° 55' 38"	1.0149594	15' 45.49"	23° 26' 15"	-6 m 21 s
9	129° 20' 46"	-0.04"	131° 46' 22"	17° 54' 60"	1.0149544	15' 45.49"	23° 26' 15"	-6 m 21 s
10	129° 23' 10"	-0.04"	131° 48' 48"	17° 54' 22"	1.0149494	15' 45.50"	23° 26' 15"	-6 m 21 s
11	129° 25' 33"	-0.03"	131° 51' 13"	17° 53' 44"	1.0149444	15' 45.50"	23° 26' 15"	-6 m 20 s
12	129° 27' 57"	-0.03"	131° 53' 38"	17° 53' 06"	1.0149394	15' 45.50"	23° 26' 15"	-6 m 20 s
13	129° 30' 20"	-0.02"	131° 56' 04"	17° 52' 27"	1.0149343	15' 45.51"	23° 26' 15"	-6 m 20 s
14	129° 32' 44"	-0.02"	131° 58' 29"	17° 51' 49"	1.0149293	15' 45.51"	23° 26' 15"	-6 m 20 s
15	129° 35' 07"	-0.01"	132° 00' 55"	17° 51' 11"	1.0149242	15' 45.52"	23° 26' 15"	-6 m 20 s
16	129° 37' 31"	-0.01"	132° 03' 20"	17° 50' 33"	1.0149191	15' 45.52"	23° 26' 15"	-6 m 20 s
17	129° 39' 55"	-0.00"	132° 05' 45"	17° 49' 55"	1.0149141	15' 45.53"	23° 26' 15"	-6 m 19 s
18	129° 42' 18"	0.00"	132° 08' 11"	17° 49' 16"	1.0149090	15' 45.53"	23° 26' 15"	-6 m 19 s
19	129° 44' 42"	0.01"	132° 10' 36"	17° 48' 38"	1.0149039	15' 45.54"	23° 26' 15"	-6 m 19 s
20	129° 47' 05"	0.01"	132° 13' 01"	17° 47' 60"	1.0148988	15' 45.54"	23° 26' 15"	-6 m 19 s
21	129° 49' 29"	0.02"	132° 15' 26"	17° 47' 21"	1.0148937	15' 45.55"	23° 26' 15"	-6 m 19 s
22	129° 51' 52"	0.02"	132° 17' 52"	17° 46' 43"	1.0148886	15' 45.55"	23° 26' 15"	-6 m 19 s
23	129° 54' 16"	0.03"	132° 20' 17"	17° 46' 05"	1.0148835	15' 45.56"	23° 26' 15"	-6 m 18 s
24	129° 56' 39"	0.03"	132° 22' 42"	17° 45' 26"	1.0148784	15' 45.56"	23° 26' 15"	-6 m 18 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	43° 51' 11"	-2° 09' 57"	42° 03' 40"	13° 55' 39"	0° 54' 22"	14' 48.92"	72° 37' 39"	0.45894
1	44° 20' 49"	-2° 07' 33"	42° 32' 07"	14° 06' 40"	0° 54' 22"	14' 48.77"	72° 44' 50"	0.45499
2	44° 50' 28"	-2° 05' 08"	43° 00' 36"	14° 17' 38"	0° 54' 21"	14' 48.62"	72° 52' 08"	0.45104
3	45° 20' 05"	-2° 02' 42"	43° 29' 08"	14° 28' 32"	0° 54' 20"	14' 48.49"	72° 59' 33"	0.44710
4	45° 49' 42"	-2° 00' 16"	43° 57' 42"	14° 39' 22"	0° 54' 20"	14' 48.35"	73° 7' 05"	0.44316
5	46° 19' 18"	-1° 57' 50"	44° 26' 18"	14° 50' 09"	0° 54' 20"	14' 48.22"	73° 14' 44"	0.43923
6	46° 48' 54"	-1° 55' 23"	44° 54' 56"	15° 00' 52"	0° 54' 19"	14' 48.10"	73° 22' 30"	0.43531
7	47° 18' 29"	-1° 52' 56"	45° 23' 38"	15° 11' 32"	0° 54' 19"	14' 47.98"	73° 30' 22"	0.43138
8	47° 48' 04"	-1° 50' 28"	45° 52' 21"	15° 22' 07"	0° 54' 18"	14' 47.86"	73° 38' 21"	0.42747
9	48° 17' 38"	-1° 47' 60"	46° 21' 07"	15° 32' 39"	0° 54' 18"	14' 47.75"	73° 46' 27"	0.42356
10	48° 47' 12"	-1° 45' 31"	46° 49' 56"	15° 43' 07"	0° 54' 17"	14' 47.64"	73° 54' 40"	0.41965
11	49° 16' 45"	-1° 43' 02"	47° 18' 47"	15° 53' 31"	0° 54' 17"	14' 47.54"	74° 2' 60"	0.41575
12	49° 46' 18"	-1° 40' 32"	47° 47' 41"	16° 03' 51"	0° 54' 17"	14' 47.45"	74° 11' 27"	0.41186
13	50° 15' 51"	-1° 38' 02"	48° 16' 37"	16° 14' 07"	0° 54' 16"	14' 47.36"	74° 19' 60"	0.40797
14	50° 45' 23"	-1° 35' 32"	48° 45' 36"	16° 24' 19"	0° 54' 16"	14' 47.27"	74° 28' 40"	0.40409
15	51° 14' 55"	-1° 33' 01"	49° 14' 38"	16° 34' 27"	0° 54' 16"	14' 47.19"	74° 37' 27"	0.40022
16	51° 44' 26"	-1° 30' 30"	49° 43' 43"	16° 44' 30"	0° 54' 15"	14' 47.11"	74° 46' 21"	0.39635
17	52° 13' 57"	-1° 27' 59"	50° 12' 51"	16° 54' 30"	0° 54' 15"	14' 47.04"	74° 55' 22"	0.39249
18	52° 43' 28"	-1° 25' 27"	50° 42' 01"	17° 04' 25"	0° 54' 15"	14' 46.97"	75° 4' 29"	0.38864
19	53° 12' 59"	-1° 22' 54"	51° 11' 15"	17° 14' 16"	0° 54' 15"	14' 46.91"	75° 13' 44"	0.38479
20	53° 42' 29"	-1° 20' 22"	51° 40' 31"	17° 24' 03"	0° 54' 15"	14' 46.86"	75° 23' 05"	0.38096
21	54° 11' 59"	-1° 17' 49"	52° 09' 50"	17° 33' 46"	0° 54' 14"	14' 46.80"	75° 32' 33"	0.37713
22	54° 41' 29"	-1° 15' 16"	52° 39' 13"	17° 43' 24"	0° 54' 14"	14' 46.75"	75° 42' 08"	0.37331
23	55° 10' 59"	-1° 12' 42"	53° 08' 38"	17° 52' 58"	0° 54' 14"	14' 46.71"	75° 51' 49"	0.36949
24	55° 40' 29"	-1° 10' 08"	53° 38' 07"	18° 02' 27"	0° 54' 14"	14' 46.67"	76° 1' 38"	0.36569

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	129° 56' 39"	0.03"	132° 22' 42"	17° 45' 26"	1.0148784	15' 45.56"	23° 26' 15"	-6 m 18 s
1	129° 59' 03"	0.04"	132° 25' 07"	17° 44' 48"	1.0148732	15' 45.57"	23° 26' 15"	-6 m 18 s
2	130° 01' 26"	0.04"	132° 27' 32"	17° 44' 09"	1.0148681	15' 45.57"	23° 26' 15"	-6 m 18 s
3	130° 03' 50"	0.05"	132° 29' 58"	17° 43' 31"	1.0148629	15' 45.58"	23° 26' 15"	-6 m 18 s
4	130° 06' 13"	0.05"	132° 32' 23"	17° 42' 52"	1.0148578	15' 45.58"	23° 26' 15"	-6 m 17 s
5	130° 08' 37"	0.06"	132° 34' 48"	17° 42' 13"	1.0148526	15' 45.59"	23° 26' 15"	-6 m 17 s
6	130° 11' 01"	0.06"	132° 37' 13"	17° 41' 35"	1.0148474	15' 45.59"	23° 26' 15"	-6 m 17 s
7	130° 13' 24"	0.07"	132° 39' 38"	17° 40' 56"	1.0148423	15' 45.60"	23° 26' 15"	-6 m 17 s
8	130° 15' 48"	0.07"	132° 42' 03"	17° 40' 17"	1.0148371	15' 45.60"	23° 26' 15"	-6 m 17 s
9	130° 18' 11"	0.08"	132° 44' 28"	17° 39' 39"	1.0148319	15' 45.60"	23° 26' 15"	-6 m 17 s
10	130° 20' 35"	0.09"	132° 46' 53"	17° 38' 60"	1.0148267	15' 45.61"	23° 26' 15"	-6 m 16 s
11	130° 22' 58"	0.09"	132° 49' 18"	17° 38' 21"	1.0148214	15' 45.61"	23° 26' 15"	-6 m 16 s
12	130° 25' 22"	0.10"	132° 51' 43"	17° 37' 42"	1.0148162	15' 45.62"	23° 26' 15"	-6 m 16 s
13	130° 27' 45"	0.10"	132° 54' 08"	17° 37' 03"	1.0148110	15' 45.62"	23° 26' 15"	-6 m 16 s
14	130° 30' 09"	0.11"	132° 56' 33"	17° 36' 24"	1.0148058	15' 45.63"	23° 26' 15"	-6 m 16 s
15	130° 32' 33"	0.11"	132° 58' 58"	17° 35' 46"	1.0148005	15' 45.63"	23° 26' 15"	-6 m 15 s
16	130° 34' 56"	0.12"	133° 01' 23"	17° 35' 07"	1.0147952	15' 45.64"	23° 26' 15"	-6 m 15 s
17	130° 37' 20"	0.12"	133° 03' 48"	17° 34' 28"	1.0147900	15' 45.64"	23° 26' 15"	-6 m 15 s
18	130° 39' 43"	0.13"	133° 06' 13"	17° 33' 49"	1.0147847	15' 45.65"	23° 26' 15"	-6 m 15 s
19	130° 42' 07"	0.13"	133° 08' 38"	17° 33' 10"	1.0147794	15' 45.65"	23° 26' 15"	-6 m 15 s
20	130° 44' 30"	0.14"	133° 11' 03"	17° 32' 31"	1.0147741	15' 45.66"	23° 26' 15"	-6 m 14 s
21	130° 46' 54"	0.14"	133° 13' 28"	17° 31' 51"	1.0147688	15' 45.66"	23° 26' 15"	-6 m 14 s
22	130° 49' 18"	0.15"	133° 15' 53"	17° 31' 12"	1.0147635	15' 45.67"	23° 26' 15"	-6 m 14 s
23	130° 51' 41"	0.15"	133° 18' 18"	17° 30' 33"	1.0147582	15' 45.67"	23° 26' 15"	-6 m 14 s
24	130° 54' 05"	0.16"	133° 20' 43"	17° 29' 54"	1.0147529	15' 45.68"	23° 26' 15"	-6 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	55° 40' 29"	-1° 10' 08"	53° 38' 07"	18° 02' 27"	0° 54' 14"	14' 46.67"	76° 1' 38"	0.36569
1	56° 09' 58"	-1° 07' 34"	54° 07' 38"	18° 11' 52"	0° 54' 14"	14' 46.64"	76° 11' 33"	0.36189
2	56° 39' 28"	-1° 04' 59"	54° 37' 13"	18° 21' 12"	0° 54' 14"	14' 46.61"	76° 21' 35"	0.35810
3	57° 08' 57"	-1° 02' 25"	55° 06' 51"	18° 30' 28"	0° 54' 14"	14' 46.59"	76° 31' 44"	0.35432
4	57° 38' 27"	0°-59' 50"	55° 36' 32"	18° 39' 39"	0° 54' 13"	14' 46.57"	76° 41' 59"	0.35055
5	58° 07' 56"	0°-57' 14"	56° 06' 16"	18° 48' 45"	0° 54' 13"	14' 46.55"	76° 52' 22"	0.34679
6	58° 37' 25"	0°-54' 39"	56° 36' 04"	18° 57' 47"	0° 54' 13"	14' 46.54"	77° 2' 51"	0.34304
7	59° 06' 55"	0°-52' 03"	57° 05' 55"	19° 06' 43"	0° 54' 13"	14' 46.54"	77° 13' 27"	0.33930
8	59° 36' 24"	0°-49' 27"	57° 35' 49"	19° 15' 35"	0° 54' 13"	14' 46.54"	77° 24' 10"	0.33556
9	60° 05' 53"	0°-46' 51"	58° 05' 46"	19° 24' 23"	0° 54' 13"	14' 46.54"	77° 34' 60"	0.33184
10	60° 35' 23"	0°-44' 14"	58° 35' 47"	19° 33' 05"	0° 54' 13"	14' 46.55"	77° 45' 56"	0.32813
11	61° 04' 52"	0°-41' 38"	59° 05' 51"	19° 41' 42"	0° 54' 13"	14' 46.56"	77° 56' 60"	0.32443
12	61° 34' 22"	0°-39' 01"	59° 35' 59"	19° 50' 15"	0° 54' 14"	14' 46.58"	78° 8' 10"	0.32074
13	62° 03' 52"	0°-36' 24"	60° 06' 10"	19° 58' 42"	0° 54' 14"	14' 46.60"	78° 19' 27"	0.31706
14	62° 33' 22"	0°-33' 47"	60° 36' 24"	20° 07' 05"	0° 54' 14"	14' 46.63"	78° 30' 51"	0.31339
15	63° 02' 53"	0°-31' 10"	61° 06' 42"	20° 15' 22"	0° 54' 14"	14' 46.66"	78° 42' 21"	0.30973
16	63° 32' 23"	0°-28' 32"	61° 37' 03"	20° 23' 34"	0° 54' 14"	14' 46.70"	78° 53' 59"	0.30608
17	64° 01' 54"	0°-25' 54"	62° 07' 28"	20° 31' 41"	0° 54' 14"	14' 46.74"	79° 5' 43"	0.30245
18	64° 31' 25"	0°-23' 17"	62° 37' 57"	20° 39' 42"	0° 54' 14"	14' 46.79"	79° 17' 34"	0.29883
19	65° 00' 56"	0°-20' 39"	63° 08' 28"	20° 47' 39"	0° 54' 14"	14' 46.84"	79° 29' 31"	0.29522
20	65° 30' 28"	0°-18' 01"	63° 39' 04"	20° 55' 30"	0° 54' 15"	14' 46.89"	79° 41' 36"	0.29162
21	65° 59' 60"	0°-15' 23"	64° 09' 43"	21° 03' 15"	0° 54' 15"	14' 46.95"	79° 53' 47"	0.28803
22	66° 29' 32"	0°-12' 45"	64° 40' 25"	21° 10' 55"	0° 54' 15"	14' 47.01"	80° 6' 06"	0.28446
23	66° 59' 04"	0°-10' 06"	65° 11' 11"	21° 18' 30"	0° 54' 15"	14' 47.08"	80° 18' 31"	0.28089
24	67° 28' 38"	0° -7' 31"	65° 42' 01"	21° 25' 57"	0° 54' 16"	14' 47.15"	80° 31' 01"	0.27734

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	130° 54' 05"	0.16"	133° 20' 43"	17° 29' 54"	1.0147529	15' 45.68"	23° 26' 15"	-6 m 14 s
1	130° 56' 28"	0.17"	133° 23' 07"	17° 29' 15"	1.0147476	15' 45.68"	23° 26' 15"	-6 m 13 s
2	130° 58' 52"	0.17"	133° 25' 32"	17° 28' 36"	1.0147422	15' 45.69"	23° 26' 15"	-6 m 13 s
3	131° 01' 16"	0.18"	133° 27' 57"	17° 27' 56"	1.0147369	15' 45.69"	23° 26' 15"	-6 m 13 s
4	131° 03' 39"	0.18"	133° 30' 22"	17° 27' 17"	1.0147315	15' 45.70"	23° 26' 15"	-6 m 13 s
5	131° 06' 03"	0.19"	133° 32' 47"	17° 26' 38"	1.0147262	15' 45.70"	23° 26' 15"	-6 m 13 s
6	131° 08' 26"	0.19"	133° 35' 11"	17° 25' 58"	1.0147208	15' 45.71"	23° 26' 15"	-6 m 12 s
7	131° 10' 50"	0.20"	133° 37' 36"	17° 25' 19"	1.0147154	15' 45.71"	23° 26' 15"	-6 m 12 s
8	131° 13' 14"	0.20"	133° 40' 01"	17° 24' 39"	1.0147100	15' 45.72"	23° 26' 15"	-6 m 12 s
9	131° 15' 37"	0.21"	133° 42' 26"	17° 23' 60"	1.0147046	15' 45.72"	23° 26' 15"	-6 m 12 s
10	131° 18' 01"	0.21"	133° 44' 50"	17° 23' 21"	1.0146992	15' 45.73"	23° 26' 15"	-6 m 12 s
11	131° 20' 24"	0.22"	133° 47' 15"	17° 22' 41"	1.0146938	15' 45.73"	23° 26' 15"	-6 m 11 s
12	131° 22' 48"	0.22"	133° 49' 40"	17° 22' 01"	1.0146884	15' 45.74"	23° 26' 15"	-6 m 11 s
13	131° 25' 12"	0.23"	133° 52' 04"	17° 21' 22"	1.0146830	15' 45.74"	23° 26' 15"	-6 m 11 s
14	131° 27' 35"	0.23"	133° 54' 29"	17° 20' 42"	1.0146775	15' 45.75"	23° 26' 15"	-6 m 11 s
15	131° 29' 59"	0.24"	133° 56' 53"	17° 20' 03"	1.0146721	15' 45.75"	23° 26' 15"	-6 m 10 s
16	131° 32' 22"	0.24"	133° 59' 18"	17° 19' 23"	1.0146666	15' 45.76"	23° 26' 15"	-6 m 10 s
17	131° 34' 46"	0.25"	134° 01' 43"	17° 18' 43"	1.0146612	15' 45.76"	23° 26' 15"	-6 m 10 s
18	131° 37' 10"	0.26"	134° 04' 07"	17° 18' 04"	1.0146557	15' 45.77"	23° 26' 15"	-6 m 10 s
19	131° 39' 33"	0.26"	134° 06' 32"	17° 17' 24"	1.0146502	15' 45.77"	23° 26' 15"	-6 m 10 s
20	131° 41' 57"	0.27"	134° 08' 56"	17° 16' 44"	1.0146447	15' 45.78"	23° 26' 15"	-6 m 09 s
21	131° 44' 21"	0.27"	134° 11' 21"	17° 16' 04"	1.0146392	15' 45.78"	23° 26' 15"	-6 m 09 s
22	131° 46' 44"	0.28"	134° 13' 45"	17° 15' 24"	1.0146337	15' 45.79"	23° 26' 15"	-6 m 09 s
23	131° 49' 08"	0.28"	134° 16' 10"	17° 14' 45"	1.0146282	15' 45.79"	23° 26' 15"	-6 m 09 s
24	131° 51' 32"	0.29"	134° 18' 34"	17° 14' 05"	1.0146227	15' 45.80"	23° 26' 15"	-6 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	67° 28' 38"	0° -7' 31"	65° 42' 01"	21° 25' 57"	0° 54' 16"	14' 47.15"	80° 31' 01"	0.27734
1	67° 58' 11"	0° -4' 52"	66° 12' 55"	21° 33' 21"	0° 54' 16"	14' 47.23"	80° 43' 40"	0.27381
2	68° 27' 45"	0° -2' 14"	66° 43' 51"	21° 40' 39"	0° 54' 16"	14' 47.31"	80° 56' 25"	0.27029
3	68° 57' 19"	0° 00' 25"	67° 14' 52"	21° 47' 51"	0° 54' 16"	14' 47.39"	81° 9' 17"	0.26678
4	69° 26' 54"	0° 03' 03"	67° 45' 56"	21° 54' 58"	0° 54' 17"	14' 47.48"	81° 22' 16"	0.26328
5	69° 56' 29"	0° 05' 42"	68° 17' 04"	22° 01' 59"	0° 54' 17"	14' 47.58"	81° 35' 22"	0.25980
6	70° 26' 05"	0° 08' 20"	68° 48' 15"	22° 08' 54"	0° 54' 18"	14' 47.67"	81° 48' 35"	0.25634
7	70° 55' 41"	0° 10' 59"	69° 19' 30"	22° 15' 43"	0° 54' 18"	14' 47.78"	82° 1' 54"	0.25288
8	71° 25' 18"	0° 13' 37"	69° 50' 48"	22° 22' 27"	0° 54' 18"	14' 47.88"	82° 15' 20"	0.24944
9	71° 54' 56"	0° 16' 16"	70° 22' 10"	22° 29' 04"	0° 54' 19"	14' 47.99"	82° 28' 53"	0.24602
10	72° 24' 34"	0° 18' 54"	70° 53' 36"	22° 35' 36"	0° 54' 19"	14' 48.11"	82° 42' 33"	0.24261
11	72° 54' 13"	0° 21' 32"	71° 25' 05"	22° 42' 02"	0° 54' 20"	14' 48.23"	82° 56' 20"	0.23922
12	73° 23' 52"	0° 24' 11"	71° 56' 38"	22° 48' 21"	0° 54' 20"	14' 48.35"	83° 10' 13"	0.23584
13	73° 53' 32"	0° 26' 49"	72° 28' 14"	22° 54' 35"	0° 54' 20"	14' 48.48"	83° 24' 13"	0.23248
14	74° 23' 13"	0° 29' 27"	72° 59' 54"	23° 00' 42"	0° 54' 21"	14' 48.61"	83° 38' 20"	0.22913
15	74° 52' 54"	0° 32' 05"	73° 31' 38"	23° 06' 43"	0° 54' 21"	14' 48.75"	83° 52' 34"	0.22580
16	75° 22' 36"	0° 34' 43"	74° 03' 25"	23° 12' 38"	0° 54' 22"	14' 48.89"	84° 6' 55"	0.22248
17	75° 52' 19"	0° 37' 21"	74° 35' 16"	23° 18' 27"	0° 54' 22"	14' 49.03"	84° 21' 23"	0.21918
18	76° 22' 03"	0° 39' 59"	75° 07' 10"	23° 24' 09"	0° 54' 23"	14' 49.18"	84° 35' 57"	0.21590
19	76° 51' 47"	0° 42' 37"	75° 39' 08"	23° 29' 45"	0° 54' 24"	14' 49.33"	84° 50' 39"	0.21263
20	77° 21' 32"	0° 45' 14"	76° 11' 09"	23° 35' 14"	0° 54' 24"	14' 49.48"	85° 5' 27"	0.20938
21	77° 51' 18"	0° 47' 52"	76° 43' 14"	23° 40' 37"	0° 54' 25"	14' 49.64"	85° 20' 22"	0.20615
22	78° 21' 05"	0° 50' 29"	77° 15' 22"	23° 45' 54"	0° 54' 25"	14' 49.81"	85° 35' 24"	0.20294
23	78° 50' 53"	0° 53' 06"	77° 47' 34"	23° 51' 04"	0° 54' 26"	14' 49.97"	85° 50' 33"	0.19974
24	79° 20' 41"	0° 55' 43"	78° 19' 49"	23° 56' 08"	0° 54' 27"	14' 50.15"	86° 5' 49"	0.19656

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	131° 51' 32"	0.29"	134° 18' 34"	17° 14' 05"	1.0146227	15' 45.80"	23° 26' 15"	-6 m 08 s
1	131° 53' 55"	0.29"	134° 20' 59"	17° 13' 25"	1.0146171	15' 45.81"	23° 26' 15"	-6 m 08 s
2	131° 56' 19"	0.30"	134° 23' 23"	17° 12' 45"	1.0146116	15' 45.81"	23° 26' 15"	-6 m 08 s
3	131° 58' 42"	0.30"	134° 25' 48"	17° 12' 05"	1.0146060	15' 45.82"	23° 26' 15"	-6 m 08 s
4	132° 01' 06"	0.31"	134° 28' 12"	17° 11' 25"	1.0146005	15' 45.82"	23° 26' 15"	-6 m 08 s
5	132° 03' 30"	0.31"	134° 30' 37"	17° 10' 45"	1.0145949	15' 45.83"	23° 26' 15"	-6 m 07 s
6	132° 05' 53"	0.32"	134° 33' 01"	17° 10' 05"	1.0145893	15' 45.83"	23° 26' 15"	-6 m 07 s
7	132° 08' 17"	0.32"	134° 35' 25"	17° 09' 25"	1.0145837	15' 45.84"	23° 26' 15"	-6 m 07 s
8	132° 10' 41"	0.33"	134° 37' 50"	17° 08' 45"	1.0145782	15' 45.84"	23° 26' 15"	-6 m 07 s
9	132° 13' 04"	0.33"	134° 40' 14"	17° 08' 04"	1.0145725	15' 45.85"	23° 26' 15"	-6 m 06 s
10	132° 15' 28"	0.34"	134° 42' 38"	17° 07' 24"	1.0145669	15' 45.85"	23° 26' 15"	-6 m 06 s
11	132° 17' 52"	0.34"	134° 45' 03"	17° 06' 44"	1.0145613	15' 45.86"	23° 26' 15"	-6 m 06 s
12	132° 20' 15"	0.35"	134° 47' 27"	17° 06' 04"	1.0145557	15' 45.86"	23° 26' 15"	-6 m 06 s
13	132° 22' 39"	0.35"	134° 49' 51"	17° 05' 24"	1.0145501	15' 45.87"	23° 26' 15"	-6 m 05 s
14	132° 25' 03"	0.36"	134° 52' 15"	17° 04' 43"	1.0145444	15' 45.87"	23° 26' 15"	-6 m 05 s
15	132° 27' 26"	0.36"	134° 54' 40"	17° 04' 03"	1.0145388	15' 45.88"	23° 26' 15"	-6 m 05 s
16	132° 29' 50"	0.37"	134° 57' 04"	17° 03' 23"	1.0145331	15' 45.88"	23° 26' 15"	-6 m 05 s
17	132° 32' 14"	0.37"	134° 59' 28"	17° 02' 42"	1.0145274	15' 45.89"	23° 26' 15"	-6 m 04 s
18	132° 34' 37"	0.38"	135° 01' 52"	17° 02' 02"	1.0145217	15' 45.89"	23° 26' 15"	-6 m 04 s
19	132° 37' 01"	0.38"	135° 04' 17"	17° 01' 21"	1.0145160	15' 45.90"	23° 26' 15"	-6 m 04 s
20	132° 39' 25"	0.39"	135° 06' 41"	17° 00' 41"	1.0145103	15' 45.90"	23° 26' 15"	-6 m 04 s
21	132° 41' 48"	0.39"	135° 09' 05"	17° 00' 00"	1.0145046	15' 45.91"	23° 26' 15"	-6 m 03 s
22	132° 44' 12"	0.40"	135° 11' 29"	16° 59' 20"	1.0144989	15' 45.92"	23° 26' 15"	-6 m 03 s
23	132° 46' 36"	0.40"	135° 13' 53"	16° 58' 39"	1.0144932	15' 45.92"	23° 26' 15"	-6 m 03 s
24	132° 48' 59"	0.41"	135° 16' 17"	16° 57' 59"	1.0144875	15' 45.93"	23° 26' 15"	-6 m 03 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	79° 20' 41"	0° 55' 43"	78° 19' 49"	23° 56' 08"	0° 54' 27"	14' 50.15"	86° 5' 49"	0.19656
1	79° 50' 31"	0° 58' 20"	78° 52' 08"	24° 01' 05"	0° 54' 27"	14' 50.32"	86° 21' 12"	0.19340
2	80° 20' 21"	1° 00' 56"	79° 24' 30"	24° 05' 55"	0° 54' 28"	14' 50.50"	86° 36' 42"	0.19025
3	80° 50' 12"	1° 03' 32"	79° 56' 55"	24° 10' 38"	0° 54' 29"	14' 50.68"	86° 52' 18"	0.18713
4	81° 20' 04"	1° 06' 08"	80° 29' 24"	24° 15' 15"	0° 54' 29"	14' 50.87"	87° 8' 02"	0.18402
5	81° 49' 57"	1° 08' 44"	81° 01' 56"	24° 19' 45"	0° 54' 30"	14' 51.06"	87° 23' 53"	0.18093
6	82° 19' 51"	1° 11' 20"	81° 34' 31"	24° 24' 08"	0° 54' 31"	14' 51.25"	87° 39' 51"	0.17786
7	82° 49' 47"	1° 13' 55"	82° 07' 10"	24° 28' 25"	0° 54' 31"	14' 51.45"	87° 55' 56"	0.17481
8	83° 19' 43"	1° 16' 30"	82° 39' 51"	24° 32' 34"	0° 54' 32"	14' 51.65"	88° 12' 08"	0.17178
9	83° 49' 40"	1° 19' 05"	83° 12' 36"	24° 36' 36"	0° 54' 33"	14' 51.85"	88° 28' 27"	0.16877
10	84° 19' 38"	1° 21' 39"	83° 45' 24"	24° 40' 32"	0° 54' 34"	14' 52.06"	88° 44' 54"	0.16578
11	84° 49' 37"	1° 24' 14"	84° 18' 16"	24° 44' 20"	0° 54' 34"	14' 52.27"	89° 1' 27"	0.16281
12	85° 19' 38"	1° 26' 47"	84° 51' 10"	24° 48' 02"	0° 54' 35"	14' 52.49"	89° 18' 08"	0.15985
13	85° 49' 39"	1° 29' 21"	85° 24' 07"	24° 51' 36"	0° 54' 36"	14' 52.71"	89° 34' 57"	0.15692
14	86° 19' 42"	1° 31' 54"	85° 57' 08"	24° 55' 03"	0° 54' 37"	14' 52.93"	89° 51' 52"	0.15401
15	86° 49' 45"	1° 34' 27"	86° 30' 11"	24° 58' 23"	0° 54' 38"	14' 53.15"	90° 8' 56"	0.15112
16	87° 19' 50"	1° 36' 59"	87° 03' 18"	25° 01' 36"	0° 54' 38"	14' 53.38"	90° 26' 06"	0.14825
17	87° 49' 56"	1° 39' 32"	87° 36' 27"	25° 04' 41"	0° 54' 39"	14' 53.61"	90° 43' 24"	0.14541
18	88° 20' 03"	1° 42' 03"	88° 09' 39"	25° 07' 40"	0° 54' 40"	14' 53.85"	91° 0' 50"	0.14258
19	88° 50' 11"	1° 44' 35"	88° 42' 54"	25° 10' 31"	0° 54' 41"	14' 54.09"	91° 18' 23"	0.13977
20	89° 20' 21"	1° 47' 05"	89° 16' 12"	25° 13' 14"	0° 54' 42"	14' 54.33"	91° 36' 05"	0.13699
21	89° 50' 32"	1° 49' 36"	89° 49' 32"	25° 15' 50"	0° 54' 43"	14' 54.57"	91° 53' 54"	0.13423
22	90° 20' 44"	1° 52' 06"	90° 22' 55"	25° 18' 19"	0° 54' 44"	14' 54.82"	92° 11' 51"	0.13149
23	90° 50' 57"	1° 54' 36"	90° 56' 21"	25° 20' 40"	0° 54' 45"	14' 55.07"	92° 29' 56"	0.12877
24	91° 21' 11"	1° 57' 05"	91° 29' 49"	25° 22' 54"	0° 54' 46"	14' 55.33"	92° 48' 09"	0.12608

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	132° 48' 59"	0.41"	135° 16' 17"	16° 57' 59"	1.0144875	15' 45.93"	23° 26' 15"	-6 m 03 s
1	132° 51' 23"	0.41"	135° 18' 41"	16° 57' 18"	1.0144817	15' 45.93"	23° 26' 15"	-6 m 02 s
2	132° 53' 47"	0.42"	135° 21' 05"	16° 56' 37"	1.0144760	15' 45.94"	23° 26' 15"	-6 m 02 s
3	132° 56' 10"	0.42"	135° 23' 30"	16° 55' 57"	1.0144702	15' 45.94"	23° 26' 15"	-6 m 02 s
4	132° 58' 34"	0.43"	135° 25' 54"	16° 55' 16"	1.0144644	15' 45.95"	23° 26' 15"	-6 m 02 s
5	133° 00' 58"	0.43"	135° 28' 18"	16° 54' 35"	1.0144587	15' 45.95"	23° 26' 15"	-6 m 01 s
6	133° 03' 21"	0.43"	135° 30' 42"	16° 53' 55"	1.0144529	15' 45.96"	23° 26' 15"	-6 m 01 s
7	133° 05' 45"	0.44"	135° 33' 06"	16° 53' 14"	1.0144471	15' 45.96"	23° 26' 15"	-6 m 01 s
8	133° 08' 09"	0.44"	135° 35' 30"	16° 52' 33"	1.0144413	15' 45.97"	23° 26' 15"	-6 m 01 s
9	133° 10' 33"	0.45"	135° 37' 54"	16° 51' 52"	1.0144355	15' 45.97"	23° 26' 15"	-6 m 00 s
10	133° 12' 56"	0.45"	135° 40' 18"	16° 51' 11"	1.0144296	15' 45.98"	23° 26' 15"	-6 m 00 s
11	133° 15' 20"	0.46"	135° 42' 41"	16° 50' 30"	1.0144238	15' 45.99"	23° 26' 15"	-5 m 60 s
12	133° 17' 44"	0.46"	135° 45' 05"	16° 49' 49"	1.0144180	15' 45.99"	23° 26' 15"	-5 m 60 s
13	133° 20' 07"	0.47"	135° 47' 29"	16° 49' 08"	1.0144121	15' 46.00"	23° 26' 15"	-5 m 59 s
14	133° 22' 31"	0.47"	135° 49' 53"	16° 48' 28"	1.0144063	15' 46.00"	23° 26' 15"	-5 m 59 s
15	133° 24' 55"	0.48"	135° 52' 17"	16° 47' 47"	1.0144004	15' 46.01"	23° 26' 15"	-5 m 59 s
16	133° 27' 19"	0.48"	135° 54' 41"	16° 47' 05"	1.0143945	15' 46.01"	23° 26' 15"	-5 m 58 s
17	133° 29' 42"	0.48"	135° 57' 05"	16° 46' 24"	1.0143886	15' 46.02"	23° 26' 15"	-5 m 58 s
18	133° 32' 06"	0.49"	135° 59' 29"	16° 45' 43"	1.0143827	15' 46.02"	23° 26' 15"	-5 m 58 s
19	133° 34' 30"	0.49"	136° 01' 52"	16° 45' 02"	1.0143768	15' 46.03"	23° 26' 15"	-5 m 58 s
20	133° 36' 53"	0.50"	136° 04' 16"	16° 44' 21"	1.0143709	15' 46.03"	23° 26' 15"	-5 m 57 s
21	133° 39' 17"	0.50"	136° 06' 40"	16° 43' 40"	1.0143650	15' 46.04"	23° 26' 15"	-5 m 57 s
22	133° 41' 41"	0.50"	136° 09' 04"	16° 42' 59"	1.0143591	15' 46.05"	23° 26' 15"	-5 m 57 s
23	133° 44' 05"	0.51"	136° 11' 28"	16° 42' 17"	1.0143531	15' 46.05"	23° 26' 15"	-5 m 57 s
24	133° 46' 28"	0.51"	136° 13' 51"	16° 41' 36"	1.0143472	15' 46.06"	23° 26' 15"	-5 m 56 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	91° 21' 11"	1° 57' 05"	91° 29' 49"	25° 22' 54"	0° 54' 46"	14' 55.33"	92° 48' 09"	0.12608
1	91° 51' 27"	1° 59' 34"	92° 03' 20"	25° 25' 01"	0° 54' 47"	14' 55.58"	93° 6' 31"	0.12341
2	92° 21' 44"	2° 02' 02"	92° 36' 53"	25° 26' 59"	0° 54' 48"	14' 55.84"	93° 25' 01"	0.12076
3	92° 52' 03"	2° 04' 30"	93° 10' 29"	25° 28' 51"	0° 54' 48"	14' 56.11"	93° 43' 39"	0.11814
4	93° 22' 22"	2° 06' 57"	93° 44' 07"	25° 30' 34"	0° 54' 49"	14' 56.37"	94° 2' 27"	0.11554
5	93° 52' 43"	2° 09' 24"	94° 17' 47"	25° 32' 10"	0° 54' 50"	14' 56.64"	94° 21' 23"	0.11296
6	94° 23' 06"	2° 11' 50"	94° 51' 29"	25° 33' 38"	0° 54' 51"	14' 56.91"	94° 40' 28"	0.11040
7	94° 53' 29"	2° 14' 15"	95° 25' 14"	25° 34' 59"	0° 54' 52"	14' 57.19"	94° 59' 42"	0.10788
8	95° 23' 55"	2° 16' 41"	95° 59' 01"	25° 36' 12"	0° 54' 53"	14' 57.47"	95° 19' 05"	0.10537
9	95° 54' 21"	2° 19' 05"	96° 32' 50"	25° 37' 17"	0° 54' 54"	14' 57.75"	95° 38' 38"	0.10289
10	96° 24' 49"	2° 21' 29"	97° 06' 41"	25° 38' 15"	0° 54' 56"	14' 58.03"	95° 58' 21"	0.10043
11	96° 55' 18"	2° 23' 53"	97° 40' 34"	25° 39' 04"	0° 54' 57"	14' 58.31"	96° 18' 14"	0.09800
12	97° 25' 49"	2° 26' 15"	98° 14' 29"	25° 39' 46"	0° 54' 58"	14' 58.60"	96° 38' 17"	0.09560
13	97° 56' 21"	2° 28' 38"	98° 48' 25"	25° 40' 20"	0° 54' 59"	14' 58.89"	96° 58' 31"	0.09322
14	98° 26' 55"	2° 30' 59"	99° 22' 24"	25° 40' 46"	0° 54' 60"	14' 59.19"	97° 18' 56"	0.09086
15	98° 57' 30"	2° 33' 20"	99° 56' 24"	25° 41' 04"	0° 55' 01"	14' 59.48"	97° 39' 31"	0.08854
16	99° 28' 06"	2° 35' 40"	100° 30' 25"	25° 41' 14"	0° 55' 02"	14' 59.78"	98° 0' 18"	0.08623
17	99° 58' 44"	2° 38' 00"	101° 04' 29"	25° 41' 17"	0° 55' 03"	15' 00.08"	98° 21' 17"	0.08396
18	100° 29' 24"	2° 40' 19"	101° 38' 34"	25° 41' 11"	0° 55' 04"	15' 00.39"	98° 42' 28"	0.08171
19	101° 00' 05"	2° 42' 37"	102° 12' 40"	25° 40' 58"	0° 55' 05"	15' 00.69"	99° 3' 52"	0.07948
20	101° 30' 47"	2° 44' 55"	102° 46' 48"	25° 40' 36"	0° 55' 06"	15' 01.00"	99° 25' 29"	0.07729
21	102° 01' 31"	2° 47' 12"	103° 20' 57"	25° 40' 07"	0° 55' 08"	15' 01.31"	99° 47' 19"	0.07512
22	102° 32' 17"	2° 49' 28"	103° 55' 07"	25° 39' 30"	0° 55' 09"	15' 01.62"	100° 9' 23"	0.07298
23	103° 03' 04"	2° 51' 44"	104° 29' 18"	25° 38' 44"	0° 55' 10"	15' 01.94"	100° 31' 42"	0.07086
24	103° 33' 53"	2° 53' 58"	105° 03' 31"	25° 37' 51"	0° 55' 11"	15' 02.25"	100° 54' 16"	0.06878

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	133° 46' 28"	0.51"	136° 13' 51"	16° 41' 36"	1.0143472	15' 46.06"	23° 26' 15"	-5 m 56 s
1	133° 48' 52"	0.52"	136° 16' 15"	16° 40' 55"	1.0143412	15' 46.06"	23° 26' 15"	-5 m 56 s
2	133° 51' 16"	0.52"	136° 18' 39"	16° 40' 14"	1.0143352	15' 46.07"	23° 26' 15"	-5 m 56 s
3	133° 53' 40"	0.52"	136° 21' 03"	16° 39' 32"	1.0143293	15' 46.07"	23° 26' 15"	-5 m 55 s
4	133° 56' 03"	0.53"	136° 23' 26"	16° 38' 51"	1.0143233	15' 46.08"	23° 26' 15"	-5 m 55 s
5	133° 58' 27"	0.53"	136° 25' 50"	16° 38' 09"	1.0143173	15' 46.08"	23° 26' 15"	-5 m 55 s
6	134° 00' 51"	0.54"	136° 28' 14"	16° 37' 28"	1.0143113	15' 46.09"	23° 26' 15"	-5 m 55 s
7	134° 03' 14"	0.54"	136° 30' 37"	16° 36' 46"	1.0143053	15' 46.10"	23° 26' 15"	-5 m 54 s
8	134° 05' 38"	0.54"	136° 33' 01"	16° 36' 05"	1.0142993	15' 46.10"	23° 26' 15"	-5 m 54 s
9	134° 08' 02"	0.55"	136° 35' 24"	16° 35' 23"	1.0142932	15' 46.11"	23° 26' 15"	-5 m 54 s
10	134° 10' 26"	0.55"	136° 37' 48"	16° 34' 42"	1.0142872	15' 46.11"	23° 26' 15"	-5 m 53 s
11	134° 12' 49"	0.56"	136° 40' 12"	16° 34' 00"	1.0142811	15' 46.12"	23° 26' 15"	-5 m 53 s
12	134° 15' 13"	0.56"	136° 42' 35"	16° 33' 19"	1.0142751	15' 46.12"	23° 26' 15"	-5 m 53 s
13	134° 17' 37"	0.56"	136° 44' 59"	16° 32' 37"	1.0142690	15' 46.13"	23° 26' 15"	-5 m 53 s
14	134° 20' 01"	0.57"	136° 47' 22"	16° 31' 55"	1.0142629	15' 46.14"	23° 26' 15"	-5 m 52 s
15	134° 22' 25"	0.57"	136° 49' 46"	16° 31' 14"	1.0142568	15' 46.14"	23° 26' 15"	-5 m 52 s
16	134° 24' 48"	0.57"	136° 52' 09"	16° 30' 32"	1.0142507	15' 46.15"	23° 26' 15"	-5 m 52 s
17	134° 27' 12"	0.58"	136° 54' 33"	16° 29' 50"	1.0142446	15' 46.15"	23° 26' 15"	-5 m 51 s
18	134° 29' 36"	0.58"	136° 56' 56"	16° 29' 09"	1.0142385	15' 46.16"	23° 26' 15"	-5 m 51 s
19	134° 31' 60"	0.58"	136° 59' 20"	16° 28' 27"	1.0142324	15' 46.16"	23° 26' 15"	-5 m 51 s
20	134° 34' 23"	0.59"	137° 01' 43"	16° 27' 45"	1.0142263	15' 46.17"	23° 26' 15"	-5 m 51 s
21	134° 36' 47"	0.59"	137° 04' 06"	16° 27' 03"	1.0142201	15' 46.18"	23° 26' 15"	-5 m 50 s
22	134° 39' 11"	0.59"	137° 06' 30"	16° 26' 21"	1.0142140	15' 46.18"	23° 26' 15"	-5 m 50 s
23	134° 41' 35"	0.60"	137° 08' 53"	16° 25' 39"	1.0142078	15' 46.19"	23° 26' 15"	-5 m 50 s
24	134° 43' 58"	0.60"	137° 11' 17"	16° 24' 57"	1.0142017	15' 46.19"	23° 26' 15"	-5 m 49 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	103° 33' 53"	2° 53' 58"	105° 03' 31"	25° 37' 51"	0° 55' 11"	15' 02.25"	100° 54' 16"	0.06878
1	104° 04' 43"	2° 56' 12"	105° 37' 44"	25° 36' 49"	0° 55' 12"	15' 02.57"	101° 17' 05"	0.06672
2	104° 35' 35"	2° 58' 26"	106° 11' 59"	25° 35' 40"	0° 55' 13"	15' 02.89"	101° 40' 11"	0.06469
3	105° 06' 28"	3° 00' 38"	106° 46' 14"	25° 34' 22"	0° 55' 15"	15' 03.22"	102° 3' 34"	0.06268
4	105° 37' 23"	3° 02' 50"	107° 20' 31"	25° 32' 56"	0° 55' 16"	15' 03.54"	102° 27' 15"	0.06071
5	106° 08' 19"	3° 05' 00"	107° 54' 48"	25° 31' 23"	0° 55' 17"	15' 03.87"	102° 51' 14"	0.05877
6	106° 39' 17"	3° 07' 10"	108° 29' 05"	25° 29' 41"	0° 55' 18"	15' 04.20"	103° 15' 33"	0.05685
7	107° 10' 17"	3° 09' 20"	109° 03' 24"	25° 27' 51"	0° 55' 19"	15' 04.53"	103° 40' 13"	0.05496
8	107° 41' 19"	3° 11' 28"	109° 37' 43"	25° 25' 53"	0° 55' 21"	15' 04.86"	104° 5' 14"	0.05311
9	108° 12' 22"	3° 13' 35"	110° 12' 02"	25° 23' 47"	0° 55' 22"	15' 05.20"	104° 30' 38"	0.05128
10	108° 43' 26"	3° 15' 42"	110° 46' 22"	25° 21' 33"	0° 55' 23"	15' 05.53"	104° 56' 26"	0.04948
11	109° 14' 32"	3° 17' 48"	111° 20' 42"	25° 19' 10"	0° 55' 24"	15' 05.87"	105° 22' 39"	0.04771
12	109° 45' 40"	3° 19' 53"	111° 55' 03"	25° 16' 40"	0° 55' 26"	15' 06.21"	105° 49' 18"	0.04598
13	110° 16' 50"	3° 21' 57"	112° 29' 24"	25° 14' 02"	0° 55' 27"	15' 06.55"	106° 16' 26"	0.04427
14	110° 48' 01"	3° 23' 60"	113° 03' 44"	25° 11' 15"	0° 55' 28"	15' 06.90"	106° 44' 04"	0.04259
15	111° 19' 14"	3° 26' 02"	113° 38' 05"	25° 08' 20"	0° 55' 29"	15' 07.24"	107° 12' 13"	0.04095
16	111° 50' 28"	3° 28' 03"	114° 12' 26"	25° 05' 18"	0° 55' 31"	15' 07.59"	107° 40' 56"	0.03933
17	112° 21' 45"	3° 30' 03"	114° 46' 47"	25° 02' 07"	0° 55' 32"	15' 07.94"	108° 10' 15"	0.03775
18	112° 53' 03"	3° 32' 02"	115° 21' 08"	24° 58' 48"	0° 55' 33"	15' 08.29"	108° 40' 11"	0.03620
19	113° 24' 22"	3° 34' 01"	115° 55' 29"	24° 55' 21"	0° 55' 34"	15' 08.64"	109° 10' 49"	0.03467
20	113° 55' 43"	3° 35' 58"	116° 29' 49"	24° 51' 46"	0° 55' 36"	15' 08.99"	109° 42' 09"	0.03319
21	114° 27' 06"	3° 37' 54"	117° 04' 09"	24° 48' 03"	0° 55' 37"	15' 09.34"	110° 14' 16"	0.03173
22	114° 58' 31"	3° 39' 50"	117° 38' 29"	24° 44' 12"	0° 55' 38"	15' 09.70"	110° 47' 13"	0.03030
23	115° 29' 58"	3° 41' 44"	118° 12' 48"	24° 40' 12"	0° 55' 40"	15' 10.05"	111° 21' 03"	0.02891
24	116° 01' 26"	3° 43' 37"	118° 47' 07"	24° 36' 05"	0° 55' 41"	15' 10.41"	111° 55' 51"	0.02755

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	134° 43' 58"	0.60"	137° 11' 17"	16° 24' 57"	1.0142017	15' 46.19"	23° 26' 15"	-5 m 49 s
1	134° 46' 22"	0.60"	137° 13' 40"	16° 24' 15"	1.0141955	15' 46.20"	23° 26' 15"	-5 m 49 s
2	134° 48' 46"	0.61"	137° 16' 03"	16° 23' 33"	1.0141893	15' 46.20"	23° 26' 15"	-5 m 49 s
3	134° 51' 10"	0.61"	137° 18' 27"	16° 22' 51"	1.0141831	15' 46.21"	23° 26' 15"	-5 m 48 s
4	134° 53' 34"	0.61"	137° 20' 50"	16° 22' 09"	1.0141769	15' 46.22"	23° 26' 15"	-5 m 48 s
5	134° 55' 57"	0.61"	137° 23' 13"	16° 21' 27"	1.0141707	15' 46.22"	23° 26' 15"	-5 m 48 s
6	134° 58' 21"	0.62"	137° 25' 37"	16° 20' 45"	1.0141645	15' 46.23"	23° 26' 15"	-5 m 47 s
7	135° 00' 45"	0.62"	137° 27' 60"	16° 20' 03"	1.0141582	15' 46.23"	23° 26' 15"	-5 m 47 s
8	135° 03' 09"	0.62"	137° 30' 23"	16° 19' 21"	1.0141520	15' 46.24"	23° 26' 15"	-5 m 47 s
9	135° 05' 33"	0.63"	137° 32' 46"	16° 18' 39"	1.0141457	15' 46.24"	23° 26' 15"	-5 m 47 s
10	135° 07' 56"	0.63"	137° 35' 10"	16° 17' 57"	1.0141395	15' 46.25"	23° 26' 15"	-5 m 46 s
11	135° 10' 20"	0.63"	137° 37' 33"	16° 17' 14"	1.0141332	15' 46.26"	23° 26' 15"	-5 m 46 s
12	135° 12' 44"	0.63"	137° 39' 56"	16° 16' 32"	1.0141269	15' 46.26"	23° 26' 15"	-5 m 46 s
13	135° 15' 08"	0.64"	137° 42' 19"	16° 15' 50"	1.0141206	15' 46.27"	23° 26' 15"	-5 m 45 s
14	135° 17' 32"	0.64"	137° 44' 42"	16° 15' 07"	1.0141143	15' 46.27"	23° 26' 15"	-5 m 45 s
15	135° 19' 55"	0.64"	137° 47' 05"	16° 14' 25"	1.0141080	15' 46.28"	23° 26' 15"	-5 m 45 s
16	135° 22' 19"	0.64"	137° 49' 29"	16° 13' 43"	1.0141017	15' 46.29"	23° 26' 15"	-5 m 44 s
17	135° 24' 43"	0.65"	137° 51' 52"	16° 13' 00"	1.0140954	15' 46.29"	23° 26' 15"	-5 m 44 s
18	135° 27' 07"	0.65"	137° 54' 15"	16° 12' 18"	1.0140890	15' 46.30"	23° 26' 15"	-5 m 44 s
19	135° 29' 31"	0.65"	137° 56' 38"	16° 11' 35"	1.0140827	15' 46.30"	23° 26' 15"	-5 m 43 s
20	135° 31' 54"	0.65"	137° 59' 01"	16° 10' 53"	1.0140763	15' 46.31"	23° 26' 15"	-5 m 43 s
21	135° 34' 18"	0.66"	138° 01' 24"	16° 10' 10"	1.0140700	15' 46.32"	23° 26' 15"	-5 m 43 s
22	135° 36' 42"	0.66"	138° 03' 47"	16° 09' 28"	1.0140636	15' 46.32"	23° 26' 15"	-5 m 42 s
23	135° 39' 06"	0.66"	138° 06' 10"	16° 08' 45"	1.0140572	15' 46.33"	23° 26' 15"	-5 m 42 s
24	135° 41' 30"	0.66"	138° 08' 33"	16° 08' 03"	1.0140508	15' 46.33"	23° 26' 15"	-5 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	116° 01' 26"	3° 43' 37"	118° 47' 07"	24° 36' 05"	0° 55' 41"	15' 10.41"	111° 55' 51"	0.02755
1	116° 32' 55"	3° 45' 29"	119° 21' 25"	24° 31' 50"	0° 55' 42"	15' 10.77"	112° 31' 41"	0.02622
2	117° 04' 27"	3° 47' 20"	119° 55' 42"	24° 27' 27"	0° 55' 44"	15' 11.13"	113° 8' 37"	0.02493
3	117° 36' 00"	3° 49' 10"	120° 29' 59"	24° 22' 56"	0° 55' 45"	15' 11.49"	113° 46' 45"	0.02367
4	118° 07' 35"	3° 50' 59"	121° 04' 15"	24° 18' 17"	0° 55' 46"	15' 11.85"	114° 26' 11"	0.02244
5	118° 39' 12"	3° 52' 47"	121° 38' 30"	24° 13' 29"	0° 55' 48"	15' 12.22"	115° 7' 02"	0.02125
6	119° 10' 50"	3° 54' 34"	122° 12' 44"	24° 08' 34"	0° 55' 49"	15' 12.58"	115° 49' 26"	0.02009
7	119° 42' 30"	3° 56' 19"	122° 46' 57"	24° 03' 32"	0° 55' 50"	15' 12.94"	116° 33' 29"	0.01896
8	120° 14' 12"	3° 58' 04"	123° 21' 10"	23° 58' 21"	0° 55' 52"	15' 13.31"	117° 19' 22"	0.01787
9	120° 45' 56"	3° 59' 47"	123° 55' 21"	23° 53' 02"	0° 55' 53"	15' 13.68"	118° 7' 15"	0.01681
10	121° 17' 41"	4° 01' 29"	124° 29' 31"	23° 47' 36"	0° 55' 54"	15' 14.04"	118° 57' 18"	0.01578
11	121° 49' 28"	4° 03' 10"	125° 03' 40"	23° 42' 01"	0° 55' 56"	15' 14.41"	119° 49' 47"	0.01479
12	122° 21' 17"	4° 04' 50"	125° 37' 48"	23° 36' 19"	0° 55' 57"	15' 14.78"	120° 44' 54"	0.01384
13	122° 53' 08"	4° 06' 29"	126° 11' 54"	23° 30' 29"	0° 55' 58"	15' 15.15"	121° 42' 57"	0.01292
14	123° 25' 00"	4° 08' 06"	126° 45' 59"	23° 24' 32"	0° 55' 60"	15' 15.52"	122° 44' 14"	0.01203
15	123° 56' 54"	4° 09' 42"	127° 20' 03"	23° 18' 26"	0° 56' 01"	15' 15.89"	123° 49' 06"	0.01118
16	124° 28' 50"	4° 11' 17"	127° 54' 05"	23° 12' 13"	0° 56' 02"	15' 16.26"	124° 57' 59"	0.01037
17	125° 00' 47"	4° 12' 51"	128° 28' 06"	23° 05' 52"	0° 56' 04"	15' 16.63"	126° 11' 20"	0.00959
18	125° 32' 47"	4° 14' 23"	129° 02' 05"	22° 59' 24"	0° 56' 05"	15' 17.01"	127° 29' 41"	0.00884
19	126° 04' 48"	4° 15' 54"	129° 36' 03"	22° 52' 48"	0° 56' 07"	15' 17.38"	128° 53' 38"	0.00814
20	126° 36' 50"	4° 17' 24"	130° 09' 59"	22° 46' 05"	0° 56' 08"	15' 17.75"	130° 23' 55"	0.00746
21	127° 08' 55"	4° 18' 53"	130° 43' 53"	22° 39' 14"	0° 56' 09"	15' 18.13"	132° 1' 18"	0.00683
22	127° 41' 01"	4° 20' 20"	131° 17' 46"	22° 32' 15"	0° 56' 11"	15' 18.50"	133° 46' 44"	0.00623
23	128° 13' 09"	4° 21' 46"	131° 51' 37"	22° 25' 09"	0° 56' 12"	15' 18.88"	135° 41' 18"	0.00566
24	128° 45' 19"	4° 23' 11"	132° 25' 26"	22° 17' 56"	0° 56' 13"	15' 19.25"	137° 46' 12"	0.00514

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	135° 41' 30"	0.66"	138° 08' 33"	16° 08' 03"	1.0140508	15' 46.33"	23° 26' 15"	-5 m 42 s
1	135° 43' 53"	0.66"	138° 10' 56"	16° 07' 20"	1.0140444	15' 46.34"	23° 26' 15"	-5 m 41 s
2	135° 46' 17"	0.67"	138° 13' 19"	16° 06' 37"	1.0140380	15' 46.35"	23° 26' 15"	-5 m 41 s
3	135° 48' 41"	0.67"	138° 15' 42"	16° 05' 55"	1.0140316	15' 46.35"	23° 26' 15"	-5 m 41 s
4	135° 51' 05"	0.67"	138° 18' 05"	16° 05' 12"	1.0140252	15' 46.36"	23° 26' 15"	-5 m 40 s
5	135° 53' 29"	0.67"	138° 20' 28"	16° 04' 29"	1.0140187	15' 46.36"	23° 26' 15"	-5 m 40 s
6	135° 55' 53"	0.67"	138° 22' 51"	16° 03' 47"	1.0140123	15' 46.37"	23° 26' 15"	-5 m 40 s
7	135° 58' 16"	0.67"	138° 25' 14"	16° 03' 04"	1.0140058	15' 46.38"	23° 26' 15"	-5 m 39 s
8	136° 00' 40"	0.68"	138° 27' 37"	16° 02' 21"	1.0139994	15' 46.38"	23° 26' 15"	-5 m 39 s
9	136° 03' 04"	0.68"	138° 29' 60"	16° 01' 38"	1.0139929	15' 46.39"	23° 26' 15"	-5 m 39 s
10	136° 05' 28"	0.68"	138° 32' 22"	16° 00' 55"	1.0139864	15' 46.39"	23° 26' 15"	-5 m 38 s
11	136° 07' 52"	0.68"	138° 34' 45"	16° 00' 12"	1.0139799	15' 46.40"	23° 26' 15"	-5 m 38 s
12	136° 10' 16"	0.68"	138° 37' 08"	15° 59' 30"	1.0139734	15' 46.41"	23° 26' 15"	-5 m 38 s
13	136° 12' 40"	0.68"	138° 39' 31"	15° 58' 47"	1.0139669	15' 46.41"	23° 26' 15"	-5 m 37 s
14	136° 15' 03"	0.69"	138° 41' 54"	15° 58' 04"	1.0139604	15' 46.42"	23° 26' 15"	-5 m 37 s
15	136° 17' 27"	0.69"	138° 44' 16"	15° 57' 21"	1.0139538	15' 46.42"	23° 26' 15"	-5 m 37 s
16	136° 19' 51"	0.69"	138° 46' 39"	15° 56' 38"	1.0139473	15' 46.43"	23° 26' 15"	-5 m 36 s
17	136° 22' 15"	0.69"	138° 49' 02"	15° 55' 55"	1.0139407	15' 46.44"	23° 26' 15"	-5 m 36 s
18	136° 24' 39"	0.69"	138° 51' 25"	15° 55' 11"	1.0139342	15' 46.44"	23° 26' 15"	-5 m 36 s
19	136° 27' 03"	0.69"	138° 53' 47"	15° 54' 28"	1.0139276	15' 46.45"	23° 26' 15"	-5 m 35 s
20	136° 29' 27"	0.69"	138° 56' 10"	15° 53' 45"	1.0139210	15' 46.45"	23° 26' 15"	-5 m 35 s
21	136° 31' 50"	0.69"	138° 58' 33"	15° 53' 02"	1.0139144	15' 46.46"	23° 26' 15"	-5 m 35 s
22	136° 34' 14"	0.69"	139° 00' 55"	15° 52' 19"	1.0139078	15' 46.47"	23° 26' 15"	-5 m 34 s
23	136° 36' 38"	0.70"	139° 03' 18"	15° 51' 36"	1.0139012	15' 46.47"	23° 26' 15"	-5 m 34 s
24	136° 39' 02"	0.70"	139° 05' 41"	15° 50' 52"	1.0138946	15' 46.48"	23° 26' 15"	-5 m 34 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	128° 45' 19"	4° 23' 11"	132° 25' 26"	22° 17' 56"	0° 56' 13"	15' 19.25"	137° 46' 12"	0.00514
1	129° 17' 30"	4° 24' 34"	132° 59' 13"	22° 10' 35"	0° 56' 15"	15' 19.62"	140° 2' 52"	0.00465
2	129° 49' 43"	4° 25' 56"	133° 32' 59"	22° 03' 07"	0° 56' 16"	15' 20.00"	142° 32' 52"	0.00419
3	130° 21' 58"	4° 27' 17"	134° 06' 42"	21° 55' 31"	0° 56' 18"	15' 20.38"	145° 17' 58"	0.00378
4	130° 54' 15"	4° 28' 36"	134° 40' 24"	21° 47' 49"	0° 56' 19"	15' 20.75"	148° 20' 08"	0.00340
5	131° 26' 33"	4° 29' 54"	135° 14' 03"	21° 39' 59"	0° 56' 20"	15' 21.13"	151° 41' 26"	0.00306
6	131° 58' 53"	4° 31' 11"	135° 47' 41"	21° 32' 02"	0° 56' 22"	15' 21.50"	155° 23' 56"	0.00275
7	132° 31' 15"	4° 32' 26"	136° 21' 16"	21° 23' 57"	0° 56' 23"	15' 21.88"	159° 29' 35"	0.00248
8	133° 03' 38"	4° 33' 39"	136° 54' 49"	21° 15' 46"	0° 56' 24"	15' 22.26"	163° 59' 56"	0.00225
9	133° 36' 03"	4° 34' 52"	137° 28' 20"	21° 07' 27"	0° 56' 26"	15' 22.63"	168° 55' 44"	0.00206
10	134° 08' 30"	4° 36' 02"	138° 01' 50"	20° 59' 02"	0° 56' 27"	15' 23.01"	174° 16' 28"	0.00191
11	134° 40' 59"	4° 37' 12"	138° 35' 17"	20° 50' 29"	0° 56' 29"	15' 23.38"	180° 0' 00"	0.00179
12	135° 13' 29"	4° 38' 20"	139° 08' 41"	20° 41' 50"	0° 56' 30"	15' 23.76"	186° 2' 09"	0.00171
13	135° 46' 01"	4° 39' 26"	139° 42' 04"	20° 33' 04"	0° 56' 31"	15' 24.13"	192° 16' 45"	0.00167
14	136° 18' 35"	4° 40' 31"	140° 15' 24"	20° 24' 11"	0° 56' 33"	15' 24.51"	198° 36' 07"	0.00167
15	136° 51' 10"	4° 41' 35"	140° 48' 42"	20° 15' 11"	0° 56' 34"	15' 24.88"	204° 51' 56"	0.00171
16	137° 23' 47"	4° 42' 37"	141° 21' 58"	20° 06' 04"	0° 56' 35"	15' 25.26"	210° 56' 19"	0.00178
17	137° 56' 26"	4° 43' 38"	141° 55' 12"	19° 56' 51"	0° 56' 37"	15' 25.63"	216° 42' 50"	0.00190
18	138° 29' 06"	4° 44' 37"	142° 28' 23"	19° 47' 31"	0° 56' 38"	15' 26.00"	222° 6' 56"	0.00205
19	139° 01' 49"	4° 45' 34"	143° 01' 32"	19° 38' 04"	0° 56' 40"	15' 26.38"	227° 6' 08"	0.00224
20	139° 34' 32"	4° 46' 30"	143° 34' 38"	19° 28' 31"	0° 56' 41"	15' 26.75"	231° 39' 41"	0.00247
21	140° 07' 18"	4° 47' 25"	144° 07' 42"	19° 18' 51"	0° 56' 42"	15' 27.12"	235° 48' 10"	0.00274
22	140° 40' 05"	4° 48' 18"	144° 40' 44"	19° 09' 05"	0° 56' 44"	15' 27.50"	239° 33' 01"	0.00305
23	141° 12' 53"	4° 49' 09"	145° 13' 44"	18° 59' 13"	0° 56' 45"	15' 27.87"	242° 56' 06"	0.00339
24	141° 45' 44"	4° 49' 59"	145° 46' 41"	18° 49' 14"	0° 56' 46"	15' 28.24"	245° 59' 31"	0.00378

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	136° 39' 02"	0.70"	139° 05' 41"	15° 50' 52"	1.0138946	15' 46.48"	23° 26' 15"	-5 m 34 s
1	136° 41' 26"	0.70"	139° 08' 03"	15° 50' 09"	1.0138880	15' 46.49"	23° 26' 15"	-5 m 33 s
2	136° 43' 50"	0.70"	139° 10' 26"	15° 49' 26"	1.0138813	15' 46.49"	23° 26' 15"	-5 m 33 s
3	136° 46' 14"	0.70"	139° 12' 49"	15° 48' 43"	1.0138747	15' 46.50"	23° 26' 15"	-5 m 33 s
4	136° 48' 37"	0.70"	139° 15' 11"	15° 47' 59"	1.0138680	15' 46.50"	23° 26' 15"	-5 m 32 s
5	136° 51' 01"	0.70"	139° 17' 34"	15° 47' 16"	1.0138614	15' 46.51"	23° 26' 15"	-5 m 32 s
6	136° 53' 25"	0.70"	139° 19' 56"	15° 46' 33"	1.0138547	15' 46.52"	23° 26' 15"	-5 m 32 s
7	136° 55' 49"	0.70"	139° 22' 19"	15° 45' 49"	1.0138480	15' 46.52"	23° 26' 15"	-5 m 31 s
8	136° 58' 13"	0.70"	139° 24' 41"	15° 45' 06"	1.0138413	15' 46.53"	23° 26' 15"	-5 m 31 s
9	137° 00' 37"	0.70"	139° 27' 04"	15° 44' 22"	1.0138346	15' 46.54"	23° 26' 15"	-5 m 30 s
10	137° 03' 01"	0.70"	139° 29' 26"	15° 43' 39"	1.0138279	15' 46.54"	23° 26' 15"	-5 m 30 s
11	137° 05' 25"	0.70"	139° 31' 49"	15° 42' 55"	1.0138212	15' 46.55"	23° 26' 15"	-5 m 30 s
12	137° 07' 49"	0.70"	139° 34' 11"	15° 42' 12"	1.0138145	15' 46.55"	23° 26' 15"	-5 m 29 s
13	137° 10' 12"	0.70"	139° 36' 34"	15° 41' 28"	1.0138077	15' 46.56"	23° 26' 15"	-5 m 29 s
14	137° 12' 36"	0.70"	139° 38' 56"	15° 40' 44"	1.0138010	15' 46.57"	23° 26' 15"	-5 m 29 s
15	137° 15' 00"	0.70"	139° 41' 19"	15° 40' 01"	1.0137942	15' 46.57"	23° 26' 15"	-5 m 28 s
16	137° 17' 24"	0.70"	139° 43' 41"	15° 39' 17"	1.0137875	15' 46.58"	23° 26' 15"	-5 m 28 s
17	137° 19' 48"	0.70"	139° 46' 03"	15° 38' 33"	1.0137807	15' 46.59"	23° 26' 15"	-5 m 28 s
18	137° 22' 12"	0.70"	139° 48' 26"	15° 37' 50"	1.0137739	15' 46.59"	23° 26' 15"	-5 m 27 s
19	137° 24' 36"	0.70"	139° 50' 48"	15° 37' 06"	1.0137671	15' 46.60"	23° 26' 15"	-5 m 27 s
20	137° 26' 60"	0.70"	139° 53' 10"	15° 36' 22"	1.0137603	15' 46.60"	23° 26' 15"	-5 m 26 s
21	137° 29' 24"	0.70"	139° 55' 33"	15° 35' 39"	1.0137535	15' 46.61"	23° 26' 15"	-5 m 26 s
22	137° 31' 48"	0.70"	139° 57' 55"	15° 34' 55"	1.0137467	15' 46.62"	23° 26' 15"	-5 m 26 s
23	137° 34' 11"	0.70"	140° 00' 17"	15° 34' 11"	1.0137398	15' 46.62"	23° 26' 15"	-5 m 25 s
24	137° 36' 35"	0.70"	140° 02' 40"	15° 33' 27"	1.0137330	15' 46.63"	23° 26' 15"	-5 m 25 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	141° 45' 44"	4° 49' 59"	145° 46' 41"	18° 49' 14"	0° 56' 46"	15' 28.24"	245° 59' 31"	0.00378
1	142° 18' 35"	4° 50' 48"	146° 19' 35"	18° 39' 09"	0° 56' 48"	15' 28.61"	248° 45' 20"	0.00420
2	142° 51' 29"	4° 51' 34"	146° 52' 28"	18° 28' 58"	0° 56' 49"	15' 28.98"	251° 15' 32"	0.00467
3	143° 24' 24"	4° 52' 19"	147° 25' 17"	18° 18' 40"	0° 56' 50"	15' 29.35"	253° 31' 55"	0.00517
4	143° 57' 21"	4° 53' 03"	147° 58' 05"	18° 08' 17"	0° 56' 52"	15' 29.72"	255° 36' 06"	0.00571
5	144° 30' 19"	4° 53' 45"	148° 30' 50"	17° 57' 47"	0° 56' 53"	15' 30.08"	257° 29' 32"	0.00630
6	145° 03' 19"	4° 54' 25"	149° 03' 33"	17° 47' 11"	0° 56' 55"	15' 30.45"	259° 13' 28"	0.00692
7	145° 36' 21"	4° 55' 04"	149° 36' 13"	17° 36' 30"	0° 56' 56"	15' 30.82"	260° 48' 59"	0.00758
8	146° 09' 24"	4° 55' 41"	150° 08' 51"	17° 25' 42"	0° 56' 57"	15' 31.18"	262° 17' 03"	0.00828
9	146° 42' 28"	4° 56' 17"	150° 41' 26"	17° 14' 49"	0° 56' 59"	15' 31.55"	263° 38' 29"	0.00902
10	147° 15' 35"	4° 56' 50"	151° 13' 59"	17° 03' 50"	0° 56' 60"	15' 31.91"	264° 54' 02"	0.00980
11	147° 48' 42"	4° 57' 23"	151° 46' 30"	16° 52' 45"	0° 57' 01"	15' 32.28"	266° 4' 17"	0.01062
12	148° 21' 52"	4° 57' 53"	152° 18' 58"	16° 41' 35"	0° 57' 03"	15' 32.64"	267° 9' 48"	0.01148
13	148° 55' 03"	4° 58' 22"	152° 51' 24"	16° 30' 19"	0° 57' 04"	15' 33.00"	268° 11' 04"	0.01238
14	149° 28' 15"	4° 58' 49"	153° 23' 48"	16° 18' 58"	0° 57' 05"	15' 33.36"	269° 8' 30"	0.01331
15	150° 01' 29"	4° 59' 15"	153° 56' 09"	16° 07' 31"	0° 57' 07"	15' 33.72"	270° 2' 27"	0.01429
16	150° 34' 44"	4° 59' 39"	154° 28' 28"	15° 55' 59"	0° 57' 08"	15' 34.08"	270° 53' 15"	0.01531
17	151° 08' 01"	5° 00' 01"	155° 00' 45"	15° 44' 21"	0° 57' 09"	15' 34.43"	271° 41' 11"	0.01637
18	151° 41' 19"	5° 00' 21"	155° 32' 59"	15° 32' 38"	0° 57' 10"	15' 34.79"	272° 26' 29"	0.01747
19	152° 14' 39"	5° 00' 40"	156° 05' 11"	15° 20' 50"	0° 57' 12"	15' 35.15"	273° 9' 23"	0.01860
20	152° 48' 01"	5° 00' 57"	156° 37' 21"	15° 08' 57"	0° 57' 13"	15' 35.50"	273° 50' 06"	0.01978
21	153° 21' 24"	5° 01' 13"	157° 09' 28"	14° 56' 58"	0° 57' 14"	15' 35.85"	274° 28' 47"	0.02100
22	153° 54' 48"	5° 01' 26"	157° 41' 33"	14° 44' 55"	0° 57' 16"	15' 36.21"	275° 5' 36"	0.02225
23	154° 28' 13"	5° 01' 38"	158° 13' 36"	14° 32' 46"	0° 57' 17"	15' 36.56"	275° 40' 41"	0.02355
24	155° 01' 41"	5° 01' 48"	158° 45' 37"	14° 20' 33"	0° 57' 18"	15' 36.91"	276° 14' 10"	0.02488

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	137° 36' 35"	0.70"	140° 02' 40"	15° 33' 27"	1.0137330	15' 46.63"	23° 26' 15"	-5 m 25 s
1	137° 38' 59"	0.70"	140° 05' 02"	15° 32' 43"	1.0137262	15' 46.64"	23° 26' 15"	-5 m 25 s
2	137° 41' 23"	0.70"	140° 07' 24"	15° 31' 59"	1.0137193	15' 46.64"	23° 26' 15"	-5 m 24 s
3	137° 43' 47"	0.70"	140° 09' 46"	15° 31' 15"	1.0137124	15' 46.65"	23° 26' 15"	-5 m 24 s
4	137° 46' 11"	0.70"	140° 12' 09"	15° 30' 31"	1.0137056	15' 46.66"	23° 26' 15"	-5 m 23 s
5	137° 48' 35"	0.70"	140° 14' 31"	15° 29' 47"	1.0136987	15' 46.66"	23° 26' 15"	-5 m 23 s
6	137° 50' 59"	0.70"	140° 16' 53"	15° 29' 03"	1.0136918	15' 46.67"	23° 26' 15"	-5 m 23 s
7	137° 53' 23"	0.70"	140° 19' 15"	15° 28' 19"	1.0136849	15' 46.67"	23° 26' 15"	-5 m 22 s
8	137° 55' 47"	0.69"	140° 21' 37"	15° 27' 35"	1.0136780	15' 46.68"	23° 26' 15"	-5 m 22 s
9	137° 58' 11"	0.69"	140° 23' 59"	15° 26' 51"	1.0136710	15' 46.69"	23° 26' 15"	-5 m 22 s
10	138° 00' 35"	0.69"	140° 26' 22"	15° 26' 07"	1.0136641	15' 46.69"	23° 26' 15"	-5 m 21 s
11	138° 02' 58"	0.69"	140° 28' 44"	15° 25' 23"	1.0136572	15' 46.70"	23° 26' 15"	-5 m 21 s
12	138° 05' 22"	0.69"	140° 31' 06"	15° 24' 39"	1.0136502	15' 46.71"	23° 26' 15"	-5 m 20 s
13	138° 07' 46"	0.69"	140° 33' 28"	15° 23' 54"	1.0136432	15' 46.71"	23° 26' 15"	-5 m 20 s
14	138° 10' 10"	0.69"	140° 35' 50"	15° 23' 10"	1.0136363	15' 46.72"	23° 26' 15"	-5 m 20 s
15	138° 12' 34"	0.69"	140° 38' 12"	15° 22' 26"	1.0136293	15' 46.73"	23° 26' 15"	-5 m 19 s
16	138° 14' 58"	0.69"	140° 40' 34"	15° 21' 42"	1.0136223	15' 46.73"	23° 26' 15"	-5 m 19 s
17	138° 17' 22"	0.68"	140° 42' 56"	15° 20' 57"	1.0136153	15' 46.74"	23° 26' 15"	-5 m 18 s
18	138° 19' 46"	0.68"	140° 45' 18"	15° 20' 13"	1.0136083	15' 46.75"	23° 26' 15"	-5 m 18 s
19	138° 22' 10"	0.68"	140° 47' 40"	15° 19' 29"	1.0136013	15' 46.75"	23° 26' 15"	-5 m 18 s
20	138° 24' 34"	0.68"	140° 50' 02"	15° 18' 44"	1.0135943	15' 46.76"	23° 26' 15"	-5 m 17 s
21	138° 26' 58"	0.68"	140° 52' 24"	15° 17' 60"	1.0135872	15' 46.77"	23° 26' 15"	-5 m 17 s
22	138° 29' 22"	0.68"	140° 54' 46"	15° 17' 16"	1.0135802	15' 46.77"	23° 26' 15"	-5 m 16 s
23	138° 31' 46"	0.68"	140° 57' 08"	15° 16' 31"	1.0135731	15' 46.78"	23° 26' 15"	-5 m 16 s
24	138° 34' 10"	0.67"	140° 59' 30"	15° 15' 47"	1.0135661	15' 46.79"	23° 26' 15"	-5 m 16 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	155° 01' 41"	5° 01' 48"	158° 45' 37"	14° 20' 33"	0° 57' 18"	15' 36.91"	276° 14' 10"	0.02488
1	155° 35' 09"	5° 01' 57"	159° 17' 36"	14° 08' 15"	0° 57' 19"	15' 37.26"	276° 46' 10"	0.02626
2	156° 08' 39"	5° 02' 04"	159° 49' 33"	13° 55' 52"	0° 57' 21"	15' 37.60"	277° 16' 47"	0.02767
3	156° 42' 11"	5° 02' 09"	160° 21' 27"	13° 43' 25"	0° 57' 22"	15' 37.95"	277° 46' 06"	0.02913
4	157° 15' 43"	5° 02' 12"	160° 53' 19"	13° 30' 53"	0° 57' 23"	15' 38.29"	278° 14' 12"	0.03062
5	157° 49' 18"	5° 02' 14"	161° 25' 10"	13° 18' 16"	0° 57' 25"	15' 38.64"	278° 41' 11"	0.03216
6	158° 22' 53"	5° 02' 14"	161° 56' 58"	13° 05' 35"	0° 57' 26"	15' 38.98"	279° 7' 06"	0.03373
7	158° 56' 30"	5° 02' 12"	162° 28' 44"	12° 52' 49"	0° 57' 27"	15' 39.32"	279° 32' 01"	0.03534
8	159° 30' 08"	5° 02' 08"	163° 00' 29"	12° 39' 59"	0° 57' 28"	15' 39.66"	279° 55' 59"	0.03699
9	160° 03' 48"	5° 02' 03"	163° 32' 11"	12° 27' 05"	0° 57' 30"	15' 40.00"	280° 19' 04"	0.03869
10	160° 37' 29"	5° 01' 55"	164° 03' 51"	12° 14' 06"	0° 57' 31"	15' 40.34"	280° 41' 19"	0.04042
11	161° 11' 11"	5° 01' 46"	164° 35' 30"	12° 01' 04"	0° 57' 32"	15' 40.67"	281° 2' 45"	0.04218
12	161° 44' 55"	5° 01' 36"	165° 07' 07"	11° 47' 57"	0° 57' 33"	15' 41.01"	281° 23' 26"	0.04399
13	162° 18' 39"	5° 01' 23"	165° 38' 42"	11° 34' 46"	0° 57' 34"	15' 41.34"	281° 43' 24"	0.04584
14	162° 52' 26"	5° 01' 09"	166° 10' 15"	11° 21' 31"	0° 57' 36"	15' 41.67"	282° 2' 41"	0.04773
15	163° 26' 13"	5° 00' 53"	166° 41' 46"	11° 08' 13"	0° 57' 37"	15' 42.00"	282° 21' 19"	0.04965
16	164° 00' 02"	5° 00' 35"	167° 13' 16"	10° 54' 50"	0° 57' 38"	15' 42.33"	282° 39' 19"	0.05162
17	164° 33' 52"	5° 00' 16"	167° 44' 44"	10° 41' 24"	0° 57' 39"	15' 42.65"	282° 56' 44"	0.05362
18	165° 07' 43"	4° 59' 54"	168° 16' 11"	10° 27' 54"	0° 57' 40"	15' 42.98"	283° 13' 34"	0.05566
19	165° 41' 35"	4° 59' 31"	168° 47' 36"	10° 14' 20"	0° 57' 42"	15' 43.30"	283° 29' 52"	0.05774
20	166° 15' 29"	4° 59' 07"	169° 18' 59"	10° 00' 43"	0° 57' 43"	15' 43.63"	283° 45' 38"	0.05986
21	166° 49' 24"	4° 58' 40"	169° 50' 21"	9° 47' 03"	0° 57' 44"	15' 43.95"	284° 0' 54"	0.06201
22	167° 23' 20"	4° 58' 11"	170° 21' 42"	9° 33' 19"	0° 57' 45"	15' 44.27"	284° 15' 40"	0.06421
23	167° 57' 17"	4° 57' 41"	170° 53' 01"	9° 19' 32"	0° 57' 46"	15' 44.58"	284° 29' 59"	0.06644
24	168° 31' 16"	4° 57' 09"	171° 24' 19"	9° 05' 41"	0° 57' 48"	15' 44.90"	284° 43' 50"	0.06871

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	138° 34' 10"	0.67"	140° 59' 30"	15° 15' 47"	1.0135661	15' 46.79"	23° 26' 15"	-5 m 16 s
1	138° 36' 34"	0.67"	141° 01' 52"	15° 15' 02"	1.0135590	15' 46.79"	23° 26' 15"	-5 m 15 s
2	138° 38' 58"	0.67"	141° 04' 14"	15° 14' 18"	1.0135519	15' 46.80"	23° 26' 15"	-5 m 15 s
3	138° 41' 22"	0.67"	141° 06' 35"	15° 13' 33"	1.0135448	15' 46.81"	23° 26' 15"	-5 m 14 s
4	138° 43' 46"	0.67"	141° 08' 57"	15° 12' 48"	1.0135377	15' 46.81"	23° 26' 15"	-5 m 14 s
5	138° 46' 10"	0.66"	141° 11' 19"	15° 12' 04"	1.0135306	15' 46.82"	23° 26' 15"	-5 m 14 s
6	138° 48' 33"	0.66"	141° 13' 41"	15° 11' 19"	1.0135235	15' 46.83"	23° 26' 15"	-5 m 13 s
7	138° 50' 57"	0.66"	141° 16' 03"	15° 10' 35"	1.0135164	15' 46.83"	23° 26' 15"	-5 m 13 s
8	138° 53' 21"	0.66"	141° 18' 25"	15° 09' 50"	1.0135093	15' 46.84"	23° 26' 15"	-5 m 12 s
9	138° 55' 45"	0.66"	141° 20' 46"	15° 09' 05"	1.0135021	15' 46.85"	23° 26' 15"	-5 m 12 s
10	138° 58' 09"	0.65"	141° 23' 08"	15° 08' 20"	1.0134950	15' 46.85"	23° 26' 15"	-5 m 12 s
11	139° 00' 33"	0.65"	141° 25' 30"	15° 07' 36"	1.0134878	15' 46.86"	23° 26' 15"	-5 m 11 s
12	139° 02' 57"	0.65"	141° 27' 52"	15° 06' 51"	1.0134807	15' 46.87"	23° 26' 15"	-5 m 11 s
13	139° 05' 21"	0.65"	141° 30' 13"	15° 06' 06"	1.0134735	15' 46.87"	23° 26' 15"	-5 m 10 s
14	139° 07' 45"	0.64"	141° 32' 35"	15° 05' 21"	1.0134663	15' 46.88"	23° 26' 15"	-5 m 10 s
15	139° 10' 09"	0.64"	141° 34' 57"	15° 04' 36"	1.0134591	15' 46.89"	23° 26' 15"	-5 m 10 s
16	139° 12' 33"	0.64"	141° 37' 18"	15° 03' 51"	1.0134519	15' 46.89"	23° 26' 15"	-5 m 09 s
17	139° 14' 57"	0.64"	141° 39' 40"	15° 03' 07"	1.0134447	15' 46.90"	23° 26' 15"	-5 m 09 s
18	139° 17' 21"	0.63"	141° 42' 02"	15° 02' 22"	1.0134375	15' 46.91"	23° 26' 15"	-5 m 08 s
19	139° 19' 45"	0.63"	141° 44' 23"	15° 01' 37"	1.0134302	15' 46.91"	23° 26' 15"	-5 m 08 s
20	139° 22' 09"	0.63"	141° 46' 45"	15° 00' 52"	1.0134230	15' 46.92"	23° 26' 15"	-5 m 07 s
21	139° 24' 33"	0.63"	141° 49' 07"	15° 00' 07"	1.0134158	15' 46.93"	23° 26' 15"	-5 m 07 s
22	139° 26' 57"	0.62"	141° 51' 28"	14° 59' 22"	1.0134085	15' 46.93"	23° 26' 15"	-5 m 07 s
23	139° 29' 21"	0.62"	141° 53' 50"	14° 58' 37"	1.0134012	15' 46.94"	23° 26' 15"	-5 m 06 s
24	139° 31' 45"	0.62"	141° 56' 11"	14° 57' 52"	1.0133940	15' 46.95"	23° 26' 15"	-5 m 06 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	168° 31' 16"	4° 57' 09"	171° 24' 19"	9° 05' 41"	0° 57' 48"	15' 44.90"	284° 43' 50"	0.06871
1	169° 05' 16"	4° 56' 36"	171° 55' 35"	8° 51' 48"	0° 57' 49"	15' 45.22"	284° 57' 15"	0.07102
2	169° 39' 16"	4° 56' 00"	172° 26' 50"	8° 37' 51"	0° 57' 50"	15' 45.53"	285° 10' 15"	0.07336
3	170° 13' 18"	4° 55' 23"	172° 58' 04"	8° 23' 51"	0° 57' 51"	15' 45.84"	285° 22' 50"	0.07574
4	170° 47' 22"	4° 54' 44"	173° 29' 17"	8° 09' 48"	0° 57' 52"	15' 46.15"	285° 35' 02"	0.07816
5	171° 21' 26"	4° 54' 03"	174° 00' 29"	7° 55' 42"	0° 57' 53"	15' 46.46"	285° 46' 51"	0.08062
6	171° 55' 31"	4° 53' 20"	174° 31' 39"	7° 41' 34"	0° 57' 54"	15' 46.76"	285° 58' 17"	0.08311
7	172° 29' 38"	4° 52' 36"	175° 02' 49"	7° 27' 22"	0° 57' 55"	15' 47.07"	286° 9' 21"	0.08565
8	173° 03' 45"	4° 51' 50"	175° 33' 58"	7° 13' 08"	0° 57' 57"	15' 47.37"	286° 20' 04"	0.08821
9	173° 37' 54"	4° 51' 02"	176° 05' 06"	6° 58' 52"	0° 57' 58"	15' 47.67"	286° 30' 27"	0.09082
10	174° 12' 03"	4° 50' 12"	176° 36' 13"	6° 44' 33"	0° 57' 59"	15' 47.97"	286° 40' 30"	0.09346
11	174° 46' 14"	4° 49' 21"	177° 07' 19"	6° 30' 11"	0° 57' 60"	15' 48.27"	286° 50' 13"	0.09613
12	175° 20' 26"	4° 48' 28"	177° 38' 24"	6° 15' 47"	0° 58' 01"	15' 48.57"	286° 59' 37"	0.09885
13	175° 54' 39"	4° 47' 33"	178° 09' 29"	6° 01' 21"	0° 58' 02"	15' 48.86"	287° 8' 42"	0.10159
14	176° 28' 53"	4° 46' 36"	178° 40' 33"	5° 46' 52"	0° 58' 03"	15' 49.16"	287° 17' 29"	0.10438
15	177° 03' 08"	4° 45' 38"	179° 11' 36"	5° 32' 21"	0° 58' 04"	15' 49.45"	287° 25' 58"	0.10720
16	177° 37' 24"	4° 44' 37"	179° 42' 39"	5° 17' 48"	0° 58' 05"	15' 49.74"	287° 34' 10"	0.11005
17	178° 11' 41"	4° 43' 35"	180° 13' 42"	5° 03' 13"	0° 58' 06"	15' 50.02"	287° 42' 04"	0.11294
18	178° 45' 59"	4° 42' 32"	180° 44' 44"	4° 48' 36"	0° 58' 07"	15' 50.31"	287° 49' 42"	0.11587
19	179° 20' 18"	4° 41' 26"	181° 15' 45"	4° 33' 58"	0° 58' 08"	15' 50.60"	287° 57' 03"	0.11882
20	179° 54' 37"	4° 40' 19"	181° 46' 47"	4° 19' 17"	0° 58' 09"	15' 50.88"	288° 4' 08"	0.12182
21	180° 28' 58"	4° 39' 10"	182° 17' 48"	4° 04' 35"	0° 58' 11"	15' 51.16"	288° 10' 57"	0.12484
22	181° 03' 20"	4° 37' 60"	182° 48' 49"	3° 49' 51"	0° 58' 12"	15' 51.44"	288° 17' 31"	0.12791
23	181° 37' 43"	4° 36' 47"	183° 19' 50"	3° 35' 05"	0° 58' 13"	15' 51.72"	288° 23' 49"	0.13100
24	182° 12' 06"	4° 35' 33"	183° 50' 50"	3° 20' 18"	0° 58' 14"	15' 51.99"	288° 29' 52"	0.13413

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	139° 31' 45"	0.62"	141° 56' 11"	14° 57' 52"	1.0133940	15' 46.95"	23° 26' 15"	-5 m 06 s
1	139° 34' 09"	0.61"	141° 58' 33"	14° 57' 06"	1.0133867	15' 46.95"	23° 26' 15"	-5 m 05 s
2	139° 36' 33"	0.61"	142° 00' 54"	14° 56' 21"	1.0133794	15' 46.96"	23° 26' 15"	-5 m 05 s
3	139° 38' 57"	0.61"	142° 03' 16"	14° 55' 36"	1.0133721	15' 46.97"	23° 26' 15"	-5 m 05 s
4	139° 41' 21"	0.61"	142° 05' 37"	14° 54' 51"	1.0133648	15' 46.97"	23° 26' 15"	-5 m 04 s
5	139° 43' 45"	0.60"	142° 07' 59"	14° 54' 06"	1.0133575	15' 46.98"	23° 26' 15"	-5 m 04 s
6	139° 46' 09"	0.60"	142° 10' 20"	14° 53' 21"	1.0133501	15' 46.99"	23° 26' 15"	-5 m 03 s
7	139° 48' 33"	0.60"	142° 12' 42"	14° 52' 35"	1.0133428	15' 46.99"	23° 26' 15"	-5 m 03 s
8	139° 50' 57"	0.59"	142° 15' 03"	14° 51' 50"	1.0133355	15' 47.00"	23° 26' 15"	-5 m 02 s
9	139° 53' 21"	0.59"	142° 17' 25"	14° 51' 05"	1.0133281	15' 47.01"	23° 26' 15"	-5 m 02 s
10	139° 55' 45"	0.59"	142° 19' 46"	14° 50' 19"	1.0133208	15' 47.02"	23° 26' 15"	-5 m 02 s
11	139° 58' 09"	0.58"	142° 22' 07"	14° 49' 34"	1.0133134	15' 47.02"	23° 26' 15"	-5 m 01 s
12	140° 00' 33"	0.58"	142° 24' 29"	14° 48' 49"	1.0133060	15' 47.03"	23° 26' 15"	-5 m 01 s
13	140° 02' 57"	0.58"	142° 26' 50"	14° 48' 03"	1.0132986	15' 47.04"	23° 26' 15"	-5 m 00 s
14	140° 05' 21"	0.57"	142° 29' 11"	14° 47' 18"	1.0132912	15' 47.04"	23° 26' 15"	-4 m 60 s
15	140° 07' 45"	0.57"	142° 31' 33"	14° 46' 32"	1.0132838	15' 47.05"	23° 26' 15"	-4 m 59 s
16	140° 10' 09"	0.56"	142° 33' 54"	14° 45' 47"	1.0132764	15' 47.06"	23° 26' 15"	-4 m 59 s
17	140° 12' 33"	0.56"	142° 36' 15"	14° 45' 01"	1.0132690	15' 47.06"	23° 26' 15"	-4 m 58 s
18	140° 14' 57"	0.56"	142° 38' 37"	14° 44' 16"	1.0132616	15' 47.07"	23° 26' 15"	-4 m 58 s
19	140° 17' 21"	0.55"	142° 40' 58"	14° 43' 30"	1.0132541	15' 47.08"	23° 26' 15"	-4 m 58 s
20	140° 19' 45"	0.55"	142° 43' 19"	14° 42' 45"	1.0132467	15' 47.08"	23° 26' 15"	-4 m 57 s
21	140° 22' 09"	0.55"	142° 45' 40"	14° 41' 59"	1.0132393	15' 47.09"	23° 26' 15"	-4 m 57 s
22	140° 24' 33"	0.54"	142° 48' 02"	14° 41' 13"	1.0132318	15' 47.10"	23° 26' 15"	-4 m 56 s
23	140° 26' 57"	0.54"	142° 50' 23"	14° 40' 28"	1.0132243	15' 47.11"	23° 26' 15"	-4 m 56 s
24	140° 29' 21"	0.53"	142° 52' 44"	14° 39' 42"	1.0132169	15' 47.11"	23° 26' 15"	-4 m 55 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	182° 12' 06"	4° 35' 33"	183° 50' 50"	3° 20' 18"	0° 58' 14"	15' 51.99"	288° 29' 52"	0.13413
1	182° 46' 31"	4° 34' 18"	184° 21' 51"	3° 05' 30"	0° 58' 15"	15' 52.26"	288° 35' 40"	0.13729
2	183° 20' 56"	4° 33' 00"	184° 52' 52"	2° 50' 40"	0° 58' 16"	15' 52.54"	288° 41' 14"	0.14049
3	183° 55' 23"	4° 31' 41"	185° 23' 53"	2° 35' 48"	0° 58' 17"	15' 52.81"	288° 46' 33"	0.14372
4	184° 29' 50"	4° 30' 20"	185° 54' 54"	2° 20' 56"	0° 58' 18"	15' 53.08"	288° 51' 37"	0.14698
5	185° 04' 18"	4° 28' 58"	186° 25' 55"	2° 06' 03"	0° 58' 19"	15' 53.34"	288° 56' 28"	0.15027
6	185° 38' 47"	4° 27' 34"	186° 56' 57"	1° 51' 08"	0° 58' 19"	15' 53.61"	289° 1' 05"	0.15359
7	186° 13' 17"	4° 26' 08"	187° 27' 59"	1° 36' 12"	0° 58' 20"	15' 53.87"	289° 5' 28"	0.15695
8	186° 47' 48"	4° 24' 41"	187° 59' 01"	1° 21' 16"	0° 58' 21"	15' 54.13"	289° 9' 37"	0.16034
9	187° 22' 19"	4° 23' 11"	188° 30' 04"	1° 06' 19"	0° 58' 22"	15' 54.39"	289° 13' 33"	0.16376
10	187° 56' 52"	4° 21' 41"	189° 01' 08"	0° 51' 20"	0° 58' 23"	15' 54.65"	289° 17' 16"	0.16721
11	188° 31' 25"	4° 20' 08"	189° 32' 12"	0° 36' 22"	0° 58' 24"	15' 54.90"	289° 20' 46"	0.17069
12	189° 05' 59"	4° 18' 34"	190° 03' 16"	0° 21' 22"	0° 58' 25"	15' 55.16"	289° 24' 02"	0.17420
13	189° 40' 34"	4° 16' 58"	190° 34' 22"	0° 06' 22"	0° 58' 26"	15' 55.41"	289° 27' 06"	0.17774
14	190° 15' 09"	4° 15' 21"	191° 05' 28"	0° -8' 38"	0° 58' 27"	15' 55.66"	289° 29' 57"	0.18131
15	190° 49' 46"	4° 13' 42"	191° 36' 35"	0° -23' 39"	0° 58' 28"	15' 55.91"	289° 32' 36"	0.18491
16	191° 24' 23"	4° 12' 02"	192° 07' 44"	0° -38' 40"	0° 58' 29"	15' 56.16"	289° 35' 02"	0.18854
17	191° 59' 01"	4° 10' 20"	192° 38' 53"	0° -53' 41"	0° 58' 30"	15' 56.40"	289° 37' 15"	0.19220
18	192° 33' 40"	4° 08' 36"	193° 10' 03"	-1° 08' 43"	0° 58' 31"	15' 56.64"	289° 39' 16"	0.19589
19	193° 08' 19"	4° 06' 51"	193° 41' 14"	-1° 23' 44"	0° 58' 32"	15' 56.89"	289° 41' 06"	0.19961
20	193° 42' 59"	4° 05' 04"	194° 12' 27"	-1° 38' 46"	0° 58' 32"	15' 57.13"	289° 42' 43"	0.20335
21	194° 17' 40"	4° 03' 16"	194° 43' 41"	-1° 53' 47"	0° 58' 33"	15' 57.36"	289° 44' 08"	0.20712
22	194° 52' 22"	4° 01' 26"	195° 14' 56"	-2° 08' 48"	0° 58' 34"	15' 57.60"	289° 45' 21"	0.21092
23	195° 27' 04"	3° 59' 34"	195° 46' 12"	-2° 23' 49"	0° 58' 35"	15' 57.83"	289° 46' 22"	0.21475
24	196° 01' 48"	3° 57' 41"	196° 17' 30"	-2° 38' 50"	0° 58' 36"	15' 58.07"	289° 47' 11"	0.21861

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	140° 29' 21"	0.53"	142° 52' 44"	14° 39' 42"	1.0132169	15' 47.11"	23° 26' 15"	-4 m 55 s
1	140° 31' 46"	0.53"	142° 55' 05"	14° 38' 56"	1.0132094	15' 47.12"	23° 26' 15"	-4 m 55 s
2	140° 34' 10"	0.53"	142° 57' 26"	14° 38' 11"	1.0132019	15' 47.13"	23° 26' 15"	-4 m 54 s
3	140° 36' 34"	0.52"	142° 59' 48"	14° 37' 25"	1.0131944	15' 47.13"	23° 26' 15"	-4 m 54 s
4	140° 38' 58"	0.52"	143° 02' 09"	14° 36' 39"	1.0131869	15' 47.14"	23° 26' 15"	-4 m 54 s
5	140° 41' 22"	0.51"	143° 04' 30"	14° 35' 53"	1.0131794	15' 47.15"	23° 26' 15"	-4 m 53 s
6	140° 43' 46"	0.51"	143° 06' 51"	14° 35' 08"	1.0131718	15' 47.15"	23° 26' 15"	-4 m 53 s
7	140° 46' 10"	0.51"	143° 09' 12"	14° 34' 22"	1.0131643	15' 47.16"	23° 26' 15"	-4 m 52 s
8	140° 48' 34"	0.50"	143° 11' 33"	14° 33' 36"	1.0131568	15' 47.17"	23° 26' 15"	-4 m 52 s
9	140° 50' 58"	0.50"	143° 13' 54"	14° 32' 50"	1.0131492	15' 47.18"	23° 26' 15"	-4 m 51 s
10	140° 53' 22"	0.49"	143° 16' 15"	14° 32' 04"	1.0131417	15' 47.18"	23° 26' 15"	-4 m 51 s
11	140° 55' 46"	0.49"	143° 18' 36"	14° 31' 18"	1.0131341	15' 47.19"	23° 26' 15"	-4 m 50 s
12	140° 58' 10"	0.48"	143° 20' 57"	14° 30' 32"	1.0131265	15' 47.20"	23° 26' 15"	-4 m 50 s
13	141° 00' 34"	0.48"	143° 23' 18"	14° 29' 46"	1.0131189	15' 47.20"	23° 26' 15"	-4 m 50 s
14	141° 02' 58"	0.48"	143° 25' 39"	14° 29' 00"	1.0131114	15' 47.21"	23° 26' 15"	-4 m 49 s
15	141° 05' 22"	0.47"	143° 28' 00"	14° 28' 14"	1.0131038	15' 47.22"	23° 26' 15"	-4 m 49 s
16	141° 07' 46"	0.47"	143° 30' 21"	14° 27' 28"	1.0130962	15' 47.22"	23° 26' 15"	-4 m 48 s
17	141° 10' 10"	0.46"	143° 32' 42"	14° 26' 42"	1.0130885	15' 47.23"	23° 26' 15"	-4 m 48 s
18	141° 12' 34"	0.46"	143° 35' 03"	14° 25' 56"	1.0130809	15' 47.24"	23° 26' 15"	-4 m 47 s
19	141° 14' 58"	0.45"	143° 37' 24"	14° 25' 10"	1.0130733	15' 47.25"	23° 26' 15"	-4 m 47 s
20	141° 17' 22"	0.45"	143° 39' 45"	14° 24' 24"	1.0130657	15' 47.25"	23° 26' 15"	-4 m 46 s
21	141° 19' 47"	0.44"	143° 42' 06"	14° 23' 38"	1.0130580	15' 47.26"	23° 26' 15"	-4 m 46 s
22	141° 22' 11"	0.44"	143° 44' 27"	14° 22' 51"	1.0130504	15' 47.27"	23° 26' 15"	-4 m 45 s
23	141° 24' 35"	0.43"	143° 46' 48"	14° 22' 05"	1.0130427	15' 47.27"	23° 26' 15"	-4 m 45 s
24	141° 26' 59"	0.43"	143° 49' 08"	14° 21' 19"	1.0130350	15' 47.28"	23° 26' 15"	-4 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	196° 01' 48"	3° 57' 41"	196° 17' 30"	-2° 38' 50"	0° 58' 36"	15' 58.07"	289° 47' 11"	0.21861
1	196° 36' 31"	3° 55' 47"	196° 48' 50"	-2° 53' 50"	0° 58' 37"	15' 58.30"	289° 47' 49"	0.22249
2	197° 11' 16"	3° 53' 51"	197° 20' 11"	-3° 08' 50"	0° 58' 38"	15' 58.52"	289° 48' 15"	0.22639
3	197° 46' 01"	3° 51' 53"	197° 51' 34"	-3° 23' 49"	0° 58' 38"	15' 58.75"	289° 48' 30"	0.23033
4	198° 20' 47"	3° 49' 55"	198° 22' 58"	-3° 38' 48"	0° 58' 39"	15' 58.98"	289° 48' 33"	0.23428
5	198° 55' 34"	3° 47' 54"	198° 54' 25"	-3° 53' 46"	0° 58' 40"	15' 59.20"	289° 48' 24"	0.23827
6	199° 30' 21"	3° 45' 52"	199° 25' 53"	-4° 08' 43"	0° 58' 41"	15' 59.42"	289° 48' 05"	0.24227
7	200° 05' 09"	3° 43' 49"	199° 57' 23"	-4° 23' 39"	0° 58' 42"	15' 59.64"	289° 47' 34"	0.24631
8	200° 39' 57"	3° 41' 44"	200° 28' 55"	-4° 38' 34"	0° 58' 42"	15' 59.86"	289° 46' 51"	0.25036
9	201° 14' 46"	3° 39' 38"	201° 00' 29"	-4° 53' 28"	0° 58' 43"	16' 00.07"	289° 45' 58"	0.25444
10	201° 49' 36"	3° 37' 31"	201° 32' 05"	-5° 08' 21"	0° 58' 44"	16' 00.29"	289° 44' 53"	0.25855
11	202° 24' 27"	3° 35' 22"	202° 03' 44"	-5° 23' 13"	0° 58' 45"	16' 00.50"	289° 43' 38"	0.26268
12	202° 59' 18"	3° 33' 11"	202° 35' 25"	-5° 38' 04"	0° 58' 46"	16' 00.71"	289° 42' 11"	0.26683
13	203° 34' 09"	3° 30' 59"	203° 07' 08"	-5° 52' 53"	0° 58' 46"	16' 00.92"	289° 40' 33"	0.27100
14	204° 09' 02"	3° 28' 46"	203° 38' 53"	-6° 07' 40"	0° 58' 47"	16' 01.12"	289° 38' 44"	0.27519
15	204° 43' 55"	3° 26' 32"	204° 10' 41"	-6° 22' 27"	0° 58' 48"	16' 01.33"	289° 36' 44"	0.27941
16	205° 18' 48"	3° 24' 16"	204° 42' 32"	-6° 37' 11"	0° 58' 49"	16' 01.53"	289° 34' 33"	0.28365
17	205° 53' 42"	3° 21' 59"	205° 14' 25"	-6° 51' 54"	0° 58' 49"	16' 01.73"	289° 32' 12"	0.28790
18	206° 28' 37"	3° 19' 41"	205° 46' 20"	-7° 06' 35"	0° 58' 50"	16' 01.93"	289° 29' 39"	0.29218
19	207° 03' 32"	3° 17' 21"	206° 18' 19"	-7° 21' 14"	0° 58' 51"	16' 02.13"	289° 26' 56"	0.29648
20	207° 38' 28"	3° 15' 00"	206° 50' 20"	-7° 35' 52"	0° 58' 51"	16' 02.32"	289° 24' 02"	0.30080
21	208° 13' 24"	3° 12' 38"	207° 22' 24"	-7° 50' 27"	0° 58' 52"	16' 02.51"	289° 20' 58"	0.30514
22	208° 48' 21"	3° 10' 14"	207° 54' 31"	-8° 05' 00"	0° 58' 53"	16' 02.71"	289° 17' 42"	0.30950
23	209° 23' 19"	3° 07' 50"	208° 26' 41"	-8° 19' 31"	0° 58' 54"	16' 02.89"	289° 14' 16"	0.31387
24	209° 58' 17"	3° 05' 24"	208° 58' 54"	-8° 33' 60"	0° 58' 54"	16' 03.08"	289° 10' 39"	0.31827

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	141° 26' 59"	0.43"	143° 49' 08"	14° 21' 19"	1.0130350	15' 47.28"	23° 26' 15"	-4 m 44 s
1	141° 29' 23"	0.42"	143° 51' 29"	14° 20' 33"	1.0130274	15' 47.29"	23° 26' 15"	-4 m 44 s
2	141° 31' 47"	0.42"	143° 53' 50"	14° 19' 46"	1.0130197	15' 47.30"	23° 26' 15"	-4 m 43 s
3	141° 34' 11"	0.41"	143° 56' 11"	14° 18' 60"	1.0130120	15' 47.30"	23° 26' 15"	-4 m 43 s
4	141° 36' 35"	0.41"	143° 58' 32"	14° 18' 14"	1.0130043	15' 47.31"	23° 26' 15"	-4 m 43 s
5	141° 38' 59"	0.40"	144° 00' 52"	14° 17' 27"	1.0129966	15' 47.32"	23° 26' 15"	-4 m 42 s
6	141° 41' 23"	0.40"	144° 03' 13"	14° 16' 41"	1.0129889	15' 47.33"	23° 26' 15"	-4 m 42 s
7	141° 43' 47"	0.39"	144° 05' 34"	14° 15' 54"	1.0129812	15' 47.33"	23° 26' 15"	-4 m 41 s
8	141° 46' 11"	0.39"	144° 07' 55"	14° 15' 08"	1.0129735	15' 47.34"	23° 26' 15"	-4 m 41 s
9	141° 48' 35"	0.38"	144° 10' 15"	14° 14' 22"	1.0129657	15' 47.35"	23° 26' 15"	-4 m 40 s
10	141° 50' 60"	0.38"	144° 12' 36"	14° 13' 35"	1.0129580	15' 47.35"	23° 26' 15"	-4 m 40 s
11	141° 53' 24"	0.37"	144° 14' 57"	14° 12' 49"	1.0129502	15' 47.36"	23° 26' 15"	-4 m 39 s
12	141° 55' 48"	0.37"	144° 17' 17"	14° 12' 02"	1.0129425	15' 47.37"	23° 26' 15"	-4 m 39 s
13	141° 58' 12"	0.36"	144° 19' 38"	14° 11' 16"	1.0129347	15' 47.38"	23° 26' 15"	-4 m 38 s
14	142° 00' 36"	0.36"	144° 21' 59"	14° 10' 29"	1.0129270	15' 47.38"	23° 26' 15"	-4 m 38 s
15	142° 03' 00"	0.35"	144° 24' 19"	14° 09' 42"	1.0129192	15' 47.39"	23° 26' 15"	-4 m 37 s
16	142° 05' 24"	0.35"	144° 26' 40"	14° 08' 56"	1.0129114	15' 47.40"	23° 26' 15"	-4 m 37 s
17	142° 07' 48"	0.34"	144° 29' 01"	14° 08' 09"	1.0129036	15' 47.41"	23° 26' 15"	-4 m 36 s
18	142° 10' 12"	0.34"	144° 31' 21"	14° 07' 22"	1.0128958	15' 47.41"	23° 26' 15"	-4 m 36 s
19	142° 12' 36"	0.33"	144° 33' 42"	14° 06' 36"	1.0128880	15' 47.42"	23° 26' 15"	-4 m 35 s
20	142° 15' 01"	0.33"	144° 36' 02"	14° 05' 49"	1.0128802	15' 47.43"	23° 26' 15"	-4 m 35 s
21	142° 17' 25"	0.32"	144° 38' 23"	14° 05' 02"	1.0128724	15' 47.43"	23° 26' 15"	-4 m 34 s
22	142° 19' 49"	0.32"	144° 40' 43"	14° 04' 16"	1.0128646	15' 47.44"	23° 26' 15"	-4 m 34 s
23	142° 22' 13"	0.31"	144° 43' 04"	14° 03' 29"	1.0128567	15' 47.45"	23° 26' 15"	-4 m 33 s
24	142° 24' 37"	0.31"	144° 45' 24"	14° 02' 42"	1.0128489	15' 47.46"	23° 26' 15"	-4 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	209° 58' 17"	3° 05' 24"	208° 58' 54"	-8° 33' 60"	0° 58' 54"	16' 03.08"	289° 10' 39"	0.31827
1	210° 33' 16"	3° 02' 56"	209° 31' 10"	-8° 48' 26"	0° 58' 55"	16' 03.27"	289° 6' 52"	0.32268
2	211° 08' 15"	3° 00' 28"	210° 03' 29"	-9° 02' 50"	0° 58' 56"	16' 03.45"	289° 2' 54"	0.32711
3	211° 43' 15"	2° 57' 59"	210° 35' 52"	-9° 17' 11"	0° 58' 56"	16' 03.63"	288° 58' 45"	0.33156
4	212° 18' 15"	2° 55' 28"	211° 08' 18"	-9° 31' 30"	0° 58' 57"	16' 03.81"	288° 54' 26"	0.33602
5	212° 53' 16"	2° 52' 56"	211° 40' 47"	-9° 45' 46"	0° 58' 58"	16' 03.99"	288° 49' 56"	0.34050
6	213° 28' 17"	2° 50' 23"	212° 13' 19"	-9° 59' 59"	0° 58' 58"	16' 04.17"	288° 45' 16"	0.34499
7	214° 03' 19"	2° 47' 49"	212° 45' 55"	-10° 14' 09"	0° 58' 59"	16' 04.34"	288° 40' 25"	0.34951
8	214° 38' 21"	2° 45' 14"	213° 18' 35"	-10° 28' 16"	0° 58' 60"	16' 04.51"	288° 35' 24"	0.35403
9	215° 13' 24"	2° 42' 38"	213° 51' 18"	-10° 42' 21"	0° 59' 00"	16' 04.69"	288° 30' 12"	0.35857
10	215° 48' 27"	2° 40' 00"	214° 24' 05"	-10° 56' 22"	0° 59' 01"	16' 04.85"	288° 24' 50"	0.36313
11	216° 23' 31"	2° 37' 22"	214° 56' 55"	-11° 10' 20"	0° 59' 01"	16' 05.02"	288° 19' 17"	0.36770
12	216° 58' 36"	2° 34' 42"	215° 29' 49"	-11° 24' 14"	0° 59' 02"	16' 05.19"	288° 13' 34"	0.37228
13	217° 33' 41"	2° 32' 02"	216° 02' 47"	-11° 38' 05"	0° 59' 03"	16' 05.35"	288° 7' 40"	0.37687
14	218° 08' 46"	2° 29' 20"	216° 35' 49"	-11° 51' 53"	0° 59' 03"	16' 05.51"	288° 1' 37"	0.38148
15	218° 43' 52"	2° 26' 38"	217° 08' 55"	-12° 05' 37"	0° 59' 04"	16' 05.67"	287° 55' 22"	0.38610
16	219° 18' 58"	2° 23' 55"	217° 42' 05"	-12° 19' 17"	0° 59' 04"	16' 05.82"	287° 48' 58"	0.39073
17	219° 54' 05"	2° 21' 10"	218° 15' 19"	-12° 32' 54"	0° 59' 05"	16' 05.98"	287° 42' 23"	0.39537
18	220° 29' 12"	2° 18' 25"	218° 48' 37"	-12° 46' 26"	0° 59' 05"	16' 06.13"	287° 35' 38"	0.40003
19	221° 04' 20"	2° 15' 39"	219° 21' 59"	-12° 59' 55"	0° 59' 06"	16' 06.28"	287° 28' 42"	0.40469
20	221° 39' 28"	2° 12' 52"	219° 55' 25"	-13° 13' 20"	0° 59' 07"	16' 06.43"	287° 21' 36"	0.40937
21	222° 14' 36"	2° 10' 04"	220° 28' 55"	-13° 26' 41"	0° 59' 07"	16' 06.58"	287° 14' 20"	0.41405
22	222° 49' 46"	2° 07' 15"	221° 02' 30"	-13° 39' 57"	0° 59' 08"	16' 06.72"	287° 6' 54"	0.41874
23	223° 24' 55"	2° 04' 25"	221° 36' 09"	-13° 53' 09"	0° 59' 08"	16' 06.87"	286° 59' 17"	0.42344
24	224° 00' 05"	2° 01' 34"	222° 09' 53"	-14° 06' 17"	0° 59' 09"	16' 07.01"	286° 51' 30"	0.42815

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	142° 24' 37"	0.31"	144° 45' 24"	14° 02' 42"	1.0128489	15' 47.46"	23° 26' 15"	-4 m 33 s
1	142° 27' 01"	0.30"	144° 47' 45"	14° 01' 55"	1.0128411	15' 47.46"	23° 26' 15"	-4 m 32 s
2	142° 29' 25"	0.30"	144° 50' 05"	14° 01' 08"	1.0128332	15' 47.47"	23° 26' 15"	-4 m 32 s
3	142° 31' 49"	0.29"	144° 52' 26"	14° 00' 21"	1.0128253	15' 47.48"	23° 26' 15"	-4 m 31 s
4	142° 34' 13"	0.28"	144° 54' 46"	13° 59' 34"	1.0128175	15' 47.49"	23° 26' 15"	-4 m 31 s
5	142° 36' 38"	0.28"	144° 57' 07"	13° 58' 48"	1.0128096	15' 47.49"	23° 26' 15"	-4 m 30 s
6	142° 39' 02"	0.27"	144° 59' 27"	13° 58' 01"	1.0128017	15' 47.50"	23° 26' 15"	-4 m 30 s
7	142° 41' 26"	0.27"	145° 01' 47"	13° 57' 14"	1.0127938	15' 47.51"	23° 26' 15"	-4 m 29 s
8	142° 43' 50"	0.26"	145° 04' 08"	13° 56' 27"	1.0127860	15' 47.52"	23° 26' 15"	-4 m 29 s
9	142° 46' 14"	0.26"	145° 06' 28"	13° 55' 40"	1.0127781	15' 47.52"	23° 26' 15"	-4 m 28 s
10	142° 48' 38"	0.25"	145° 08' 49"	13° 54' 53"	1.0127701	15' 47.53"	23° 26' 15"	-4 m 28 s
11	142° 51' 02"	0.25"	145° 11' 09"	13° 54' 06"	1.0127622	15' 47.54"	23° 26' 15"	-4 m 27 s
12	142° 53' 26"	0.24"	145° 13' 29"	13° 53' 18"	1.0127543	15' 47.54"	23° 26' 15"	-4 m 27 s
13	142° 55' 51"	0.23"	145° 15' 50"	13° 52' 31"	1.0127464	15' 47.55"	23° 26' 15"	-4 m 26 s
14	142° 58' 15"	0.23"	145° 18' 10"	13° 51' 44"	1.0127385	15' 47.56"	23° 26' 15"	-4 m 26 s
15	143° 00' 39"	0.22"	145° 20' 30"	13° 50' 57"	1.0127305	15' 47.57"	23° 26' 15"	-4 m 25 s
16	143° 03' 03"	0.22"	145° 22' 50"	13° 50' 10"	1.0127226	15' 47.57"	23° 26' 15"	-4 m 25 s
17	143° 05' 27"	0.21"	145° 25' 11"	13° 49' 23"	1.0127146	15' 47.58"	23° 26' 15"	-4 m 24 s
18	143° 07' 51"	0.21"	145° 27' 31"	13° 48' 35"	1.0127067	15' 47.59"	23° 26' 15"	-4 m 24 s
19	143° 10' 15"	0.20"	145° 29' 51"	13° 47' 48"	1.0126987	15' 47.60"	23° 26' 15"	-4 m 23 s
20	143° 12' 39"	0.20"	145° 32' 11"	13° 47' 01"	1.0126907	15' 47.60"	23° 26' 15"	-4 m 23 s
21	143° 15' 04"	0.19"	145° 34' 32"	13° 46' 14"	1.0126828	15' 47.61"	23° 26' 15"	-4 m 22 s
22	143° 17' 28"	0.18"	145° 36' 52"	13° 45' 26"	1.0126748	15' 47.62"	23° 26' 15"	-4 m 22 s
23	143° 19' 52"	0.18"	145° 39' 12"	13° 44' 39"	1.0126668	15' 47.63"	23° 26' 15"	-4 m 21 s
24	143° 22' 16"	0.17"	145° 41' 32"	13° 43' 52"	1.0126588	15' 47.63"	23° 26' 15"	-4 m 21 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	224° 00' 05"	2° 01' 34"	222° 09' 53"	-14° 06' 17"	0° 59' 09"	16' 07.01"	286° 51' 30"	0.42815
1	224° 35' 15"	1° 58' 43"	222° 43' 40"	-14° 19' 20"	0° 59' 09"	16' 07.15"	286° 43' 33"	0.43287
2	225° 10' 26"	1° 55' 51"	223° 17' 33"	-14° 32' 19"	0° 59' 10"	16' 07.28"	286° 35' 26"	0.43759
3	225° 45' 38"	1° 52' 58"	223° 51' 30"	-14° 45' 13"	0° 59' 10"	16' 07.42"	286° 27' 08"	0.44233
4	226° 20' 49"	1° 50' 04"	224° 25' 31"	-14° 58' 02"	0° 59' 11"	16' 07.55"	286° 18' 41"	0.44706
5	226° 56' 01"	1° 47' 10"	224° 59' 37"	-15° 10' 46"	0° 59' 11"	16' 07.68"	286° 10' 03"	0.45181
6	227° 31' 14"	1° 44' 15"	225° 33' 48"	-15° 23' 26"	0° 59' 12"	16' 07.81"	286° 1' 15"	0.45656
7	228° 06' 27"	1° 41' 19"	226° 08' 03"	-15° 36' 00"	0° 59' 12"	16' 07.94"	285° 52' 17"	0.46131
8	228° 41' 40"	1° 38' 22"	226° 42' 23"	-15° 48' 29"	0° 59' 13"	16' 08.06"	285° 43' 09"	0.46607
9	229° 16' 54"	1° 35' 25"	227° 16' 48"	-16° 00' 53"	0° 59' 13"	16' 08.18"	285° 33' 51"	0.47084
10	229° 52' 08"	1° 32' 27"	227° 51' 17"	-16° 13' 12"	0° 59' 13"	16' 08.30"	285° 24' 22"	0.47560
11	230° 27' 23"	1° 29' 29"	228° 25' 51"	-16° 25' 25"	0° 59' 14"	16' 08.42"	285° 14' 44"	0.48038
12	231° 02' 38"	1° 26' 30"	229° 00' 30"	-16° 37' 33"	0° 59' 14"	16' 08.54"	285° 4' 56"	0.48515
13	231° 37' 54"	1° 23' 30"	229° 35' 14"	-16° 49' 35"	0° 59' 15"	16' 08.65"	284° 54' 57"	0.48993
14	232° 13' 09"	1° 20' 30"	230° 10' 03"	-17° 01' 32"	0° 59' 15"	16' 08.76"	284° 44' 49"	0.49470
15	232° 48' 26"	1° 17' 29"	230° 44' 57"	-17° 13' 23"	0° 59' 16"	16' 08.87"	284° 34' 31"	0.49948
16	233° 23' 42"	1° 14' 28"	231° 19' 55"	-17° 25' 08"	0° 59' 16"	16' 08.98"	284° 24' 02"	0.50426
17	233° 58' 59"	1° 11' 26"	231° 54' 59"	-17° 36' 46"	0° 59' 16"	16' 09.08"	284° 13' 24"	0.50905
18	234° 34' 17"	1° 08' 24"	232° 30' 07"	-17° 48' 19"	0° 59' 17"	16' 09.19"	284° 2' 36"	0.51383
19	235° 09' 34"	1° 05' 21"	233° 05' 21"	-17° 59' 46"	0° 59' 17"	16' 09.29"	283° 51' 38"	0.51861
20	235° 44' 53"	1° 02' 18"	233° 40' 40"	-18° 11' 07"	0° 59' 17"	16' 09.38"	283° 40' 31"	0.52339
21	236° 20' 11"	0° 59' 14"	234° 16' 03"	-18° 22' 21"	0° 59' 18"	16' 09.48"	283° 29' 13"	0.52817
22	236° 55' 30"	0° 56' 10"	234° 51' 32"	-18° 33' 29"	0° 59' 18"	16' 09.57"	283° 17' 46"	0.53295
23	237° 30' 49"	0° 53' 05"	235° 27' 05"	-18° 44' 30"	0° 59' 18"	16' 09.66"	283° 6' 09"	0.53772
24	238° 06' 09"	0° 50' 00"	236° 02' 44"	-18° 55' 24"	0° 59' 19"	16' 09.75"	282° 54' 22"	0.54249

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	143° 22' 16"	0.17"	145° 41' 32"	13° 43' 52"	1.0126588	15' 47.63"	23° 26' 15"	-4 m 21 s
1	143° 24' 40"	0.17"	145° 43' 52"	13° 43' 04"	1.0126508	15' 47.64"	23° 26' 15"	-4 m 20 s
2	143° 27' 04"	0.16"	145° 46' 12"	13° 42' 17"	1.0126428	15' 47.65"	23° 26' 15"	-4 m 20 s
3	143° 29' 29"	0.16"	145° 48' 32"	13° 41' 29"	1.0126348	15' 47.66"	23° 26' 15"	-4 m 19 s
4	143° 31' 53"	0.15"	145° 50' 53"	13° 40' 42"	1.0126268	15' 47.66"	23° 26' 15"	-4 m 19 s
5	143° 34' 17"	0.14"	145° 53' 13"	13° 39' 55"	1.0126187	15' 47.67"	23° 26' 15"	-4 m 18 s
6	143° 36' 41"	0.14"	145° 55' 33"	13° 39' 07"	1.0126107	15' 47.68"	23° 26' 15"	-4 m 18 s
7	143° 39' 05"	0.13"	145° 57' 53"	13° 38' 20"	1.0126027	15' 47.69"	23° 26' 15"	-4 m 17 s
8	143° 41' 29"	0.13"	146° 00' 13"	13° 37' 32"	1.0125946	15' 47.69"	23° 26' 15"	-4 m 17 s
9	143° 43' 53"	0.12"	146° 02' 33"	13° 36' 44"	1.0125866	15' 47.70"	23° 26' 15"	-4 m 16 s
10	143° 46' 18"	0.12"	146° 04' 53"	13° 35' 57"	1.0125785	15' 47.71"	23° 26' 15"	-4 m 16 s
11	143° 48' 42"	0.11"	146° 07' 13"	13° 35' 09"	1.0125705	15' 47.72"	23° 26' 15"	-4 m 15 s
12	143° 51' 06"	0.10"	146° 09' 33"	13° 34' 22"	1.0125624	15' 47.72"	23° 26' 15"	-4 m 15 s
13	143° 53' 30"	0.10"	146° 11' 53"	13° 33' 34"	1.0125543	15' 47.73"	23° 26' 15"	-4 m 14 s
14	143° 55' 54"	0.09"	146° 14' 13"	13° 32' 46"	1.0125462	15' 47.74"	23° 26' 15"	-4 m 14 s
15	143° 58' 18"	0.09"	146° 16' 33"	13° 31' 59"	1.0125382	15' 47.75"	23° 26' 15"	-4 m 13 s
16	144° 00' 43"	0.08"	146° 18' 53"	13° 31' 11"	1.0125301	15' 47.75"	23° 26' 15"	-4 m 13 s
17	144° 03' 07"	0.07"	146° 21' 13"	13° 30' 23"	1.0125220	15' 47.76"	23° 26' 15"	-4 m 12 s
18	144° 05' 31"	0.07"	146° 23' 33"	13° 29' 35"	1.0125139	15' 47.77"	23° 26' 15"	-4 m 12 s
19	144° 07' 55"	0.06"	146° 25' 52"	13° 28' 48"	1.0125058	15' 47.78"	23° 26' 15"	-4 m 11 s
20	144° 10' 19"	0.06"	146° 28' 12"	13° 27' 60"	1.0124977	15' 47.78"	23° 26' 15"	-4 m 10 s
21	144° 12' 44"	0.05"	146° 30' 32"	13° 27' 12"	1.0124895	15' 47.79"	23° 26' 15"	-4 m 10 s
22	144° 15' 08"	0.05"	146° 32' 52"	13° 26' 24"	1.0124814	15' 47.80"	23° 26' 15"	-4 m 09 s
23	144° 17' 32"	0.04"	146° 35' 12"	13° 25' 36"	1.0124733	15' 47.81"	23° 26' 15"	-4 m 09 s
24	144° 19' 56"	0.03"	146° 37' 32"	13° 24' 48"	1.0124652	15' 47.82"	23° 26' 15"	-4 m 08 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	238° 06' 09"	0° 50' 00"	236° 02' 44"	-18° 55' 24"	0° 59' 19"	16' 09.75"	282° 54' 22"	0.54249
1	238° 41' 29"	0° 46' 55"	236° 38' 28"	-19° 06' 12"	0° 59' 19"	16' 09.84"	282° 42' 26"	0.54726
2	239° 16' 49"	0° 43' 50"	237° 14' 16"	-19° 16' 54"	0° 59' 19"	16' 09.92"	282° 30' 19"	0.55203
3	239° 52' 10"	0° 40' 44"	237° 50' 10"	-19° 27' 28"	0° 59' 20"	16' 10.01"	282° 18' 04"	0.55679
4	240° 27' 31"	0° 37' 38"	238° 26' 09"	-19° 37' 55"	0° 59' 20"	16' 10.09"	282° 5' 38"	0.56155
5	241° 02' 52"	0° 34' 31"	239° 02' 13"	-19° 48' 15"	0° 59' 20"	16' 10.16"	281° 53' 04"	0.56630
6	241° 38' 13"	0° 31' 25"	239° 38' 22"	-19° 58' 29"	0° 59' 21"	16' 10.24"	281° 40' 19"	0.57105
7	242° 13' 35"	0° 28' 18"	240° 14' 36"	-20° 08' 34"	0° 59' 21"	16' 10.31"	281° 27' 25"	0.57579
8	242° 48' 54"	0° 25' 11"	240° 50' 51"	-20° 18' 32"	0° 59' 21"	16' 10.38"	281° 14' 24"	0.58052
9	243° 24' 17"	0° 22' 04"	241° 27' 15"	-20° 28' 23"	0° 59' 21"	16' 10.45"	281° 1' 11"	0.58525
10	243° 59' 39"	0° 18' 56"	242° 03' 44"	-20° 38' 07"	0° 59' 22"	16' 10.51"	280° 47' 49"	0.58997
11	244° 35' 03"	0° 15' 49"	242° 40' 18"	-20° 47' 43"	0° 59' 22"	16' 10.57"	280° 34' 18"	0.59468
12	245° 10' 26"	0° 12' 41"	243° 16' 57"	-20° 57' 11"	0° 59' 22"	16' 10.63"	280° 20' 37"	0.59939
13	245° 45' 50"	0° 09' 33"	243° 53' 41"	-21° 06' 32"	0° 59' 22"	16' 10.69"	280° 6' 48"	0.60408
14	246° 21' 14"	0° 06' 26"	244° 30' 30"	-21° 15' 44"	0° 59' 22"	16' 10.75"	279° 52' 49"	0.60877
15	246° 56' 39"	0° 03' 18"	245° 07' 24"	-21° 24' 49"	0° 59' 23"	16' 10.80"	279° 38' 41"	0.61345
16	247° 32' 03"	0° 00' 10"	245° 44' 22"	-21° 33' 46"	0° 59' 23"	16' 10.85"	279° 24' 24"	0.61812
17	248° 07' 28"	0° -2' 58"	246° 21' 26"	-21° 42' 35"	0° 59' 23"	16' 10.90"	279° 9' 58"	0.62278
18	248° 42' 54"	0° -6' 06"	246° 58' 34"	-21° 51' 15"	0° 59' 23"	16' 10.94"	278° 55' 23"	0.62742
19	249° 18' 19"	0° -9' 14"	247° 35' 47"	-21° 59' 47"	0° 59' 23"	16' 10.98"	278° 40' 39"	0.63206
20	249° 53' 45"	0° -12' 22"	248° 13' 04"	-22° 08' 11"	0° 59' 23"	16' 11.02"	278° 25' 47"	0.63668
21	250° 29' 11"	0° -15' 30"	248° 50' 27"	-22° 16' 27"	0° 59' 24"	16' 11.06"	278° 10' 45"	0.64129
22	251° 04' 37"	0° -18' 38"	249° 27' 54"	-22° 24' 33"	0° 59' 24"	16' 11.09"	277° 55' 35"	0.64589
23	251° 40' 04"	0° -21' 46"	250° 05' 25"	-22° 32' 32"	0° 59' 24"	16' 11.12"	277° 40' 16"	0.65048
24	252° 15' 31"	0° -24' 53"	250° 43' 01"	-22° 40' 21"	0° 59' 24"	16' 11.15"	277° 24' 49"	0.65505

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	144° 19' 56"	0.03"	146° 37' 32"	13° 24' 48"	1.0124652	15' 47.82"	23° 26' 15"	-4 m 08 s
1	144° 22' 20"	0.03"	146° 39' 52"	13° 24' 01"	1.0124570	15' 47.82"	23° 26' 15"	-4 m 08 s
2	144° 24' 44"	0.02"	146° 42' 11"	13° 23' 13"	1.0124489	15' 47.83"	23° 26' 15"	-4 m 07 s
3	144° 27' 09"	0.02"	146° 44' 31"	13° 22' 25"	1.0124407	15' 47.84"	23° 26' 15"	-4 m 07 s
4	144° 29' 33"	0.01"	146° 46' 51"	13° 21' 37"	1.0124326	15' 47.85"	23° 26' 15"	-4 m 06 s
5	144° 31' 57"	0.01"	146° 49' 11"	13° 20' 49"	1.0124244	15' 47.85"	23° 26' 15"	-4 m 06 s
6	144° 34' 21"	0.00"	146° 51' 30"	13° 20' 01"	1.0124162	15' 47.86"	23° 26' 15"	-4 m 05 s
7	144° 36' 45"	-0.01"	146° 53' 50"	13° 19' 13"	1.0124081	15' 47.87"	23° 26' 15"	-4 m 05 s
8	144° 39' 10"	-0.01"	146° 56' 10"	13° 18' 25"	1.0123999	15' 47.88"	23° 26' 15"	-4 m 04 s
9	144° 41' 34"	-0.02"	146° 58' 30"	13° 17' 36"	1.0123917	15' 47.88"	23° 26' 15"	-4 m 04 s
10	144° 43' 58"	-0.02"	147° 00' 49"	13° 16' 48"	1.0123835	15' 47.89"	23° 26' 15"	-4 m 03 s
11	144° 46' 22"	-0.03"	147° 03' 09"	13° 16' 00"	1.0123753	15' 47.90"	23° 26' 15"	-4 m 02 s
12	144° 48' 47"	-0.03"	147° 05' 29"	13° 15' 12"	1.0123671	15' 47.91"	23° 26' 15"	-4 m 02 s
13	144° 51' 11"	-0.04"	147° 07' 48"	13° 14' 24"	1.0123589	15' 47.91"	23° 26' 15"	-4 m 01 s
14	144° 53' 35"	-0.05"	147° 10' 08"	13° 13' 36"	1.0123507	15' 47.92"	23° 26' 15"	-4 m 01 s
15	144° 55' 59"	-0.05"	147° 12' 27"	13° 12' 47"	1.0123425	15' 47.93"	23° 26' 15"	-4 m 00 s
16	144° 58' 23"	-0.06"	147° 14' 47"	13° 11' 59"	1.0123343	15' 47.94"	23° 26' 15"	-3 m 60 s
17	145° 00' 48"	-0.06"	147° 17' 07"	13° 11' 11"	1.0123261	15' 47.95"	23° 26' 15"	-3 m 59 s
18	145° 03' 12"	-0.07"	147° 19' 26"	13° 10' 23"	1.0123179	15' 47.95"	23° 26' 15"	-3 m 59 s
19	145° 05' 36"	-0.07"	147° 21' 46"	13° 09' 34"	1.0123096	15' 47.96"	23° 26' 15"	-3 m 58 s
20	145° 08' 00"	-0.08"	147° 24' 05"	13° 08' 46"	1.0123014	15' 47.97"	23° 26' 15"	-3 m 57 s
21	145° 10' 24"	-0.08"	147° 26' 25"	13° 07' 58"	1.0122931	15' 47.98"	23° 26' 15"	-3 m 57 s
22	145° 12' 49"	-0.09"	147° 28' 44"	13° 07' 09"	1.0122849	15' 47.98"	23° 26' 15"	-3 m 56 s
23	145° 15' 13"	-0.10"	147° 31' 04"	13° 06' 21"	1.0122767	15' 47.99"	23° 26' 15"	-3 m 56 s
24	145° 17' 37"	-0.10"	147° 33' 23"	13° 05' 33"	1.0122684	15' 48.00"	23° 26' 15"	-3 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	252° 15' 31"	0°-24' 53"	250° 43' 01"	-22° 40' 21"	0° 59' 24"	16' 11.15"	277° 24' 49"	0.65505
1	252° 50' 58"	0°-28' 01"	251° 20' 42"	-22° 48' 02"	0° 59' 24"	16' 11.17"	277° 9' 13"	0.65961
2	253° 26' 25"	0°-31' 08"	251° 58' 27"	-22° 55' 34"	0° 59' 24"	16' 11.20"	276° 53' 29"	0.66415
3	254° 01' 53"	0°-34' 15"	252° 36' 16"	-23° 02' 57"	0° 59' 24"	16' 11.22"	276° 37' 36"	0.66868
4	254° 37' 20"	0°-37' 22"	253° 14' 10"	-23° 10' 11"	0° 59' 24"	16' 11.23"	276° 21' 35"	0.67320
5	255° 12' 48"	0°-40' 28"	253° 52' 08"	-23° 17' 16"	0° 59' 24"	16' 11.25"	276° 5' 26"	0.67769
6	255° 48' 16"	0°-43' 35"	254° 30' 10"	-23° 24' 12"	0° 59' 24"	16' 11.26"	275° 49' 08"	0.68217
7	256° 23' 45"	0°-46' 41"	255° 08' 16"	-23° 30' 59"	0° 59' 24"	16' 11.27"	275° 32' 43"	0.68664
8	256° 59' 13"	0°-49' 46"	255° 46' 26"	-23° 37' 36"	0° 59' 24"	16' 11.27"	275° 16' 09"	0.69108
9	257° 34' 42"	0°-52' 52"	256° 24' 40"	-23° 44' 05"	0° 59' 24"	16' 11.27"	274° 59' 27"	0.69551
10	258° 10' 11"	0°-55' 57"	257° 02' 58"	-23° 50' 23"	0° 59' 24"	16' 11.27"	274° 42' 38"	0.69993
11	258° 45' 40"	0°-59' 02"	257° 41' 20"	-23° 56' 32"	0° 59' 24"	16' 11.27"	274° 25' 40"	0.70432
12	259° 21' 09"	-1° 02' 06"	258° 19' 46"	-24° 02' 32"	0° 59' 24"	16' 11.26"	274° 8' 35"	0.70869
13	259° 56' 38"	-1° 05' 10"	258° 58' 15"	-24° 08' 22"	0° 59' 24"	16' 11.25"	273° 51' 22"	0.71305
14	260° 32' 08"	-1° 08' 14"	259° 36' 48"	-24° 14' 03"	0° 59' 24"	16' 11.24"	273° 34' 02"	0.71738
15	261° 07' 37"	-1° 11' 17"	260° 15' 24"	-24° 19' 33"	0° 59' 24"	16' 11.23"	273° 16' 34"	0.72170
16	261° 43' 07"	-1° 14' 19"	260° 54' 03"	-24° 24' 54"	0° 59' 24"	16' 11.21"	272° 58' 59"	0.72599
17	262° 18' 37"	-1° 17' 22"	261° 32' 46"	-24° 30' 05"	0° 59' 24"	16' 11.19"	272° 41' 16"	0.73026
18	262° 54' 07"	-1° 20' 23"	262° 11' 32"	-24° 35' 07"	0° 59' 24"	16' 11.16"	272° 23' 26"	0.73452
19	263° 29' 37"	-1° 23' 24"	262° 50' 21"	-24° 39' 58"	0° 59' 24"	16' 11.13"	272° 5' 28"	0.73874
20	264° 05' 07"	-1° 26' 25"	263° 29' 13"	-24° 44' 39"	0° 59' 24"	16' 11.10"	271° 47' 24"	0.74295
21	264° 40' 37"	-1° 29' 25"	264° 08' 08"	-24° 49' 10"	0° 59' 24"	16' 11.07"	271° 29' 12"	0.74714
22	265° 16' 08"	-1° 32' 24"	264° 47' 06"	-24° 53' 31"	0° 59' 23"	16' 11.03"	271° 10' 54"	0.75130
23	265° 51' 38"	-1° 35' 23"	265° 26' 06"	-24° 57' 42"	0° 59' 23"	16' 10.99"	270° 52' 28"	0.75543
24	266° 27' 08"	-1° 38' 21"	266° 05' 09"	-25° 01' 43"	0° 59' 23"	16' 10.94"	270° 33' 56"	0.75955

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	145° 17' 37"	-0.10"	147° 33' 23"	13° 05' 33"	1.0122684	15' 48.00"	23° 26' 15"	-3 m 55 s
1	145° 20' 01"	-0.11"	147° 35' 43"	13° 04' 44"	1.0122601	15' 48.01"	23° 26' 15"	-3 m 55 s
2	145° 22' 26"	-0.11"	147° 38' 02"	13° 03' 56"	1.0122519	15' 48.02"	23° 26' 15"	-3 m 54 s
3	145° 24' 50"	-0.12"	147° 40' 22"	13° 03' 07"	1.0122436	15' 48.02"	23° 26' 15"	-3 m 54 s
4	145° 27' 14"	-0.12"	147° 42' 41"	13° 02' 19"	1.0122353	15' 48.03"	23° 26' 15"	-3 m 53 s
5	145° 29' 38"	-0.13"	147° 45' 01"	13° 01' 30"	1.0122270	15' 48.04"	23° 26' 15"	-3 m 53 s
6	145° 32' 03"	-0.13"	147° 47' 20"	13° 00' 42"	1.0122188	15' 48.05"	23° 26' 15"	-3 m 52 s
7	145° 34' 27"	-0.14"	147° 49' 40"	12° 59' 53"	1.0122105	15' 48.05"	23° 26' 15"	-3 m 51 s
8	145° 36' 51"	-0.14"	147° 51' 59"	12° 59' 05"	1.0122022	15' 48.06"	23° 26' 15"	-3 m 51 s
9	145° 39' 15"	-0.15"	147° 54' 18"	12° 58' 16"	1.0121939	15' 48.07"	23° 26' 15"	-3 m 50 s
10	145° 41' 40"	-0.15"	147° 56' 38"	12° 57' 27"	1.0121856	15' 48.08"	23° 26' 15"	-3 m 50 s
11	145° 44' 04"	-0.16"	147° 58' 57"	12° 56' 39"	1.0121773	15' 48.08"	23° 26' 15"	-3 m 49 s
12	145° 46' 28"	-0.16"	148° 01' 16"	12° 55' 50"	1.0121690	15' 48.09"	23° 26' 15"	-3 m 49 s
13	145° 48' 52"	-0.17"	148° 03' 36"	12° 55' 01"	1.0121606	15' 48.10"	23° 26' 15"	-3 m 48 s
14	145° 51' 17"	-0.18"	148° 05' 55"	12° 54' 13"	1.0121523	15' 48.11"	23° 26' 15"	-3 m 47 s
15	145° 53' 41"	-0.18"	148° 08' 14"	12° 53' 24"	1.0121440	15' 48.12"	23° 26' 15"	-3 m 47 s
16	145° 56' 05"	-0.19"	148° 10' 34"	12° 52' 35"	1.0121357	15' 48.12"	23° 26' 15"	-3 m 46 s
17	145° 58' 29"	-0.19"	148° 12' 53"	12° 51' 46"	1.0121273	15' 48.13"	23° 26' 15"	-3 m 46 s
18	146° 00' 54"	-0.20"	148° 15' 12"	12° 50' 58"	1.0121190	15' 48.14"	23° 26' 15"	-3 m 45 s
19	146° 03' 18"	-0.20"	148° 17' 31"	12° 50' 09"	1.0121107	15' 48.15"	23° 26' 15"	-3 m 45 s
20	146° 05' 42"	-0.21"	148° 19' 51"	12° 49' 20"	1.0121023	15' 48.16"	23° 26' 15"	-3 m 44 s
21	146° 08' 06"	-0.21"	148° 22' 10"	12° 48' 31"	1.0120940	15' 48.16"	23° 26' 15"	-3 m 43 s
22	146° 10' 31"	-0.22"	148° 24' 29"	12° 47' 42"	1.0120856	15' 48.17"	23° 26' 15"	-3 m 43 s
23	146° 12' 55"	-0.22"	148° 26' 48"	12° 46' 53"	1.0120772	15' 48.18"	23° 26' 15"	-3 m 42 s
24	146° 15' 19"	-0.23"	148° 29' 07"	12° 46' 04"	1.0120689	15' 48.19"	23° 26' 15"	-3 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	266° 27' 08"	-1° 38' 21"	266° 05' 09"	-25° 01' 43"	0° 59' 23"	16' 10.94"	270° 33' 56"	0.75955
1	267° 02' 39"	-1° 41' 19"	266° 44' 14"	-25° 05' 34"	0° 59' 23"	16' 10.90"	270° 15' 17"	0.76364
2	267° 38' 09"	-1° 44' 16"	267° 23' 21"	-25° 09' 14"	0° 59' 23"	16' 10.85"	269° 56' 31"	0.76770
3	268° 13' 40"	-1° 47' 12"	268° 02' 31"	-25° 12' 44"	0° 59' 23"	16' 10.79"	269° 37' 38"	0.77174
4	268° 49' 10"	-1° 50' 08"	268° 41' 43"	-25° 16' 03"	0° 59' 22"	16' 10.73"	269° 18' 39"	0.77576
5	269° 24' 41"	-1° 53' 02"	269° 20' 57"	-25° 19' 13"	0° 59' 22"	16' 10.67"	268° 59' 33"	0.77974
6	270° 00' 11"	-1° 55' 56"	270° 00' 13"	-25° 22' 11"	0° 59' 22"	16' 10.61"	268° 40' 21"	0.78370
7	270° 35' 42"	-1° 58' 50"	270° 39' 30"	-25° 24' 60"	0° 59' 22"	16' 10.54"	268° 21' 02"	0.78764
8	271° 11' 12"	-2° 01' 42"	271° 18' 49"	-25° 27' 38"	0° 59' 21"	16' 10.47"	268° 1' 37"	0.79155
9	271° 46' 43"	-2° 04' 34"	271° 58' 09"	-25° 30' 05"	0° 59' 21"	16' 10.40"	267° 42' 06"	0.79543
10	272° 22' 13"	-2° 07' 24"	272° 37' 31"	-25° 32' 22"	0° 59' 21"	16' 10.32"	267° 22' 29"	0.79928
11	272° 57' 43"	-2° 10' 14"	273° 16' 54"	-25° 34' 28"	0° 59' 21"	16' 10.24"	267° 2' 45"	0.80310
12	273° 33' 13"	-2° 13' 04"	273° 56' 18"	-25° 36' 24"	0° 59' 20"	16' 10.15"	266° 42' 55"	0.80690
13	274° 08' 43"	-2° 15' 52"	274° 35' 43"	-25° 38' 09"	0° 59' 20"	16' 10.06"	266° 22' 59"	0.81066
14	274° 44' 13"	-2° 18' 39"	275° 15' 09"	-25° 39' 43"	0° 59' 20"	16' 09.97"	266° 2' 57"	0.81440
15	275° 19' 43"	-2° 21' 25"	275° 54' 36"	-25° 41' 07"	0° 59' 19"	16' 09.88"	265° 42' 49"	0.81811
16	275° 55' 13"	-2° 24' 11"	276° 34' 03"	-25° 42' 21"	0° 59' 19"	16' 09.78"	265° 22' 35"	0.82178
17	276° 30' 42"	-2° 26' 55"	277° 13' 30"	-25° 43' 23"	0° 59' 18"	16' 09.68"	265° 2' 14"	0.82543
18	277° 06' 12"	-2° 29' 39"	277° 52' 58"	-25° 44' 15"	0° 59' 18"	16' 09.57"	264° 41' 48"	0.82904
19	277° 41' 41"	-2° 32' 21"	278° 32' 26"	-25° 44' 56"	0° 59' 18"	16' 09.46"	264° 21' 16"	0.83263
20	278° 17' 10"	-2° 35' 03"	279° 11' 54"	-25° 45' 27"	0° 59' 17"	16' 09.35"	264° 0' 37"	0.83618
21	278° 52' 39"	-2° 37' 43"	279° 51' 22"	-25° 45' 47"	0° 59' 17"	16' 09.23"	263° 39' 53"	0.83970
22	279° 28' 07"	-2° 40' 23"	280° 30' 50"	-25° 45' 56"	0° 59' 16"	16' 09.11"	263° 19' 03"	0.84319
23	280° 03' 36"	-2° 43' 01"	281° 10' 17"	-25° 45' 55"	0° 59' 16"	16' 08.99"	262° 58' 06"	0.84665
24	280° 39' 04"	-2° 45' 38"	281° 49' 44"	-25° 45' 43"	0° 59' 15"	16' 08.86"	262° 37' 03"	0.85007

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	146° 15' 19"	-0.23"	148° 29' 07"	12° 46' 04"	1.0120689	15' 48.19"	23° 26' 15"	-3 m 42 s
1	146° 17' 44"	-0.23"	148° 31' 27"	12° 45' 15"	1.0120605	15' 48.19"	23° 26' 15"	-3 m 41 s
2	146° 20' 08"	-0.24"	148° 33' 46"	12° 44' 26"	1.0120521	15' 48.20"	23° 26' 15"	-3 m 41 s
3	146° 22' 32"	-0.24"	148° 36' 05"	12° 43' 37"	1.0120438	15' 48.21"	23° 26' 15"	-3 m 40 s
4	146° 24' 56"	-0.25"	148° 38' 24"	12° 42' 48"	1.0120354	15' 48.22"	23° 26' 15"	-3 m 39 s
5	146° 27' 21"	-0.25"	148° 40' 43"	12° 41' 59"	1.0120270	15' 48.23"	23° 26' 15"	-3 m 39 s
6	146° 29' 45"	-0.26"	148° 43' 02"	12° 41' 10"	1.0120186	15' 48.23"	23° 26' 15"	-3 m 38 s
7	146° 32' 09"	-0.26"	148° 45' 21"	12° 40' 21"	1.0120102	15' 48.24"	23° 26' 15"	-3 m 38 s
8	146° 34' 34"	-0.26"	148° 47' 40"	12° 39' 32"	1.0120018	15' 48.25"	23° 26' 15"	-3 m 37 s
9	146° 36' 58"	-0.27"	148° 49' 59"	12° 38' 43"	1.0119934	15' 48.26"	23° 26' 15"	-3 m 37 s
10	146° 39' 22"	-0.27"	148° 52' 18"	12° 37' 54"	1.0119850	15' 48.27"	23° 26' 15"	-3 m 36 s
11	146° 41' 46"	-0.28"	148° 54' 38"	12° 37' 05"	1.0119766	15' 48.27"	23° 26' 15"	-3 m 35 s
12	146° 44' 11"	-0.28"	148° 56' 57"	12° 36' 16"	1.0119682	15' 48.28"	23° 26' 15"	-3 m 35 s
13	146° 46' 35"	-0.29"	148° 59' 16"	12° 35' 27"	1.0119598	15' 48.29"	23° 26' 15"	-3 m 34 s
14	146° 48' 59"	-0.29"	149° 01' 35"	12° 34' 37"	1.0119514	15' 48.30"	23° 26' 15"	-3 m 34 s
15	146° 51' 24"	-0.30"	149° 03' 54"	12° 33' 48"	1.0119429	15' 48.30"	23° 26' 15"	-3 m 33 s
16	146° 53' 48"	-0.30"	149° 06' 12"	12° 32' 59"	1.0119345	15' 48.31"	23° 26' 15"	-3 m 32 s
17	146° 56' 12"	-0.31"	149° 08' 31"	12° 32' 10"	1.0119261	15' 48.32"	23° 26' 15"	-3 m 32 s
18	146° 58' 37"	-0.31"	149° 10' 50"	12° 31' 20"	1.0119176	15' 48.33"	23° 26' 15"	-3 m 31 s
19	147° 01' 01"	-0.31"	149° 13' 09"	12° 30' 31"	1.0119092	15' 48.34"	23° 26' 15"	-3 m 31 s
20	147° 03' 25"	-0.32"	149° 15' 28"	12° 29' 42"	1.0119008	15' 48.34"	23° 26' 15"	-3 m 30 s
21	147° 05' 49"	-0.32"	149° 17' 47"	12° 28' 52"	1.0118923	15' 48.35"	23° 26' 15"	-3 m 29 s
22	147° 08' 14"	-0.33"	149° 20' 06"	12° 28' 03"	1.0118839	15' 48.36"	23° 26' 15"	-3 m 29 s
23	147° 10' 38"	-0.33"	149° 22' 25"	12° 27' 14"	1.0118754	15' 48.37"	23° 26' 15"	-3 m 28 s
24	147° 13' 02"	-0.34"	149° 24' 44"	12° 26' 24"	1.0118670	15' 48.38"	23° 26' 15"	-3 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	280° 39' 04"	-2° 45' 38"	281° 49' 44"	-25° 45' 43"	0° 59' 15"	16' 08.86"	262° 37' 03"	0.85007
1	281° 14' 32"	-2° 48' 14"	282° 29' 10"	-25° 45' 20"	0° 59' 15"	16' 08.73"	262° 15' 55"	0.85346
2	281° 49' 60"	-2° 50' 50"	283° 08' 35"	-25° 44' 47"	0° 59' 15"	16' 08.60"	261° 54' 40"	0.85682
3	282° 25' 27"	-2° 53' 23"	283° 47' 59"	-25° 44' 03"	0° 59' 14"	16' 08.46"	261° 33' 18"	0.86014
4	283° 00' 54"	-2° 55' 56"	284° 27' 23"	-25° 43' 09"	0° 59' 13"	16' 08.32"	261° 11' 51"	0.86343
5	283° 36' 21"	-2° 58' 28"	285° 06' 45"	-25° 42' 04"	0° 59' 13"	16' 08.17"	260° 50' 16"	0.86669
6	284° 11' 47"	-3° 00' 58"	285° 46' 06"	-25° 40' 48"	0° 59' 12"	16' 08.02"	260° 28' 35"	0.86991
7	284° 47' 13"	-3° 03' 27"	286° 25' 25"	-25° 39' 22"	0° 59' 12"	16' 07.87"	260° 6' 48"	0.87309
8	285° 22' 39"	-3° 05' 55"	287° 04' 43"	-25° 37' 45"	0° 59' 11"	16' 07.71"	259° 44' 53"	0.87624
9	285° 58' 04"	-3° 08' 22"	287° 43' 59"	-25° 35' 58"	0° 59' 11"	16' 07.55"	259° 22' 52"	0.87935
10	286° 33' 29"	-3° 10' 47"	288° 23' 13"	-25° 34' 00"	0° 59' 10"	16' 07.39"	259° 0' 43"	0.88243
11	287° 08' 53"	-3° 13' 11"	289° 02' 25"	-25° 31' 52"	0° 59' 09"	16' 07.22"	258° 38' 27"	0.88547
12	287° 44' 17"	-3° 15' 34"	289° 41' 35"	-25° 29' 33"	0° 59' 09"	16' 07.05"	258° 16' 04"	0.88848
13	288° 19' 41"	-3° 17' 56"	290° 20' 43"	-25° 27' 04"	0° 59' 08"	16' 06.87"	257° 53' 32"	0.89145
14	288° 55' 04"	-3° 20' 16"	290° 59' 49"	-25° 24' 25"	0° 59' 08"	16' 06.69"	257° 30' 52"	0.89438
15	289° 30' 27"	-3° 22' 35"	291° 38' 52"	-25° 21' 36"	0° 59' 07"	16' 06.51"	257° 8' 04"	0.89728
16	290° 05' 49"	-3° 24' 53"	292° 17' 52"	-25° 18' 36"	0° 59' 06"	16' 06.32"	256° 45' 07"	0.90013
17	290° 41' 10"	-3° 27' 09"	292° 56' 49"	-25° 15' 26"	0° 59' 05"	16' 06.13"	256° 22' 01"	0.90295
18	291° 16' 31"	-3° 29' 24"	293° 35' 44"	-25° 12' 06"	0° 59' 05"	16' 05.94"	255° 58' 46"	0.90574
19	291° 51' 52"	-3° 31' 37"	294° 14' 36"	-25° 08' 36"	0° 59' 04"	16' 05.74"	255° 35' 21"	0.90848
20	292° 27' 12"	-3° 33' 49"	294° 53' 25"	-25° 04' 55"	0° 59' 03"	16' 05.54"	255° 11' 45"	0.91119
21	293° 02' 31"	-3° 35' 60"	295° 32' 10"	-25° 01' 05"	0° 59' 03"	16' 05.33"	254° 47' 59"	0.91385
22	293° 37' 50"	-3° 38' 09"	296° 10' 52"	-24° 57' 04"	0° 59' 02"	16' 05.12"	254° 24' 01"	0.91648
23	294° 13' 08"	-3° 40' 17"	296° 49' 31"	-24° 52' 54"	0° 59' 01"	16' 04.91"	253° 59' 51"	0.91907
24	294° 48' 26"	-3° 42' 23"	297° 28' 06"	-24° 48' 34"	0° 59' 00"	16' 04.69"	253° 35' 29"	0.92162

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblivity	Equation Of Time
0	147° 13' 02"	-0.34"	149° 24' 44"	12° 26' 24"	1.0118670	15' 48.38"	23° 26' 15"	-3 m 28 s
1	147° 15' 27"	-0.34"	149° 27' 03"	12° 25' 35"	1.0118585	15' 48.38"	23° 26' 15"	-3 m 27 s
2	147° 17' 51"	-0.34"	149° 29' 21"	12° 24' 45"	1.0118500	15' 48.39"	23° 26' 15"	-3 m 27 s
3	147° 20' 15"	-0.35"	149° 31' 40"	12° 23' 56"	1.0118416	15' 48.40"	23° 26' 15"	-3 m 26 s
4	147° 22' 40"	-0.35"	149° 33' 59"	12° 23' 06"	1.0118331	15' 48.41"	23° 26' 15"	-3 m 25 s
5	147° 25' 04"	-0.36"	149° 36' 18"	12° 22' 17"	1.0118246	15' 48.42"	23° 26' 15"	-3 m 25 s
6	147° 27' 28"	-0.36"	149° 38' 37"	12° 21' 27"	1.0118161	15' 48.42"	23° 26' 15"	-3 m 24 s
7	147° 29' 53"	-0.36"	149° 40' 56"	12° 20' 38"	1.0118076	15' 48.43"	23° 26' 15"	-3 m 24 s
8	147° 32' 17"	-0.37"	149° 43' 14"	12° 19' 48"	1.0117992	15' 48.44"	23° 26' 15"	-3 m 23 s
9	147° 34' 41"	-0.37"	149° 45' 33"	12° 18' 59"	1.0117907	15' 48.45"	23° 26' 15"	-3 m 22 s
10	147° 37' 06"	-0.38"	149° 47' 52"	12° 18' 09"	1.0117822	15' 48.46"	23° 26' 15"	-3 m 22 s
11	147° 39' 30"	-0.38"	149° 50' 11"	12° 17' 19"	1.0117737	15' 48.46"	23° 26' 15"	-3 m 21 s
12	147° 41' 54"	-0.38"	149° 52' 29"	12° 16' 30"	1.0117652	15' 48.47"	23° 26' 15"	-3 m 20 s
13	147° 44' 19"	-0.39"	149° 54' 48"	12° 15' 40"	1.0117567	15' 48.48"	23° 26' 15"	-3 m 20 s
14	147° 46' 43"	-0.39"	149° 57' 07"	12° 14' 50"	1.0117481	15' 48.49"	23° 26' 15"	-3 m 19 s
15	147° 49' 08"	-0.39"	149° 59' 25"	12° 14' 01"	1.0117396	15' 48.50"	23° 26' 15"	-3 m 19 s
16	147° 51' 32"	-0.40"	150° 01' 44"	12° 13' 11"	1.0117311	15' 48.50"	23° 26' 15"	-3 m 18 s
17	147° 53' 56"	-0.40"	150° 04' 03"	12° 12' 21"	1.0117226	15' 48.51"	23° 26' 15"	-3 m 17 s
18	147° 56' 21"	-0.40"	150° 06' 21"	12° 11' 31"	1.0117141	15' 48.52"	23° 26' 15"	-3 m 17 s
19	147° 58' 45"	-0.41"	150° 08' 40"	12° 10' 42"	1.0117055	15' 48.53"	23° 26' 15"	-3 m 16 s
20	148° 01' 09"	-0.41"	150° 10' 59"	12° 09' 52"	1.0116970	15' 48.53"	23° 26' 15"	-3 m 16 s
21	148° 03' 34"	-0.41"	150° 13' 17"	12° 09' 02"	1.0116885	15' 48.54"	23° 26' 15"	-3 m 15 s
22	148° 05' 58"	-0.42"	150° 15' 36"	12° 08' 12"	1.0116799	15' 48.55"	23° 26' 15"	-3 m 14 s
23	148° 08' 22"	-0.42"	150° 17' 54"	12° 07' 22"	1.0116714	15' 48.56"	23° 26' 15"	-3 m 14 s
24	148° 10' 47"	-0.42"	150° 20' 13"	12° 06' 32"	1.0116629	15' 48.57"	23° 26' 15"	-3 m 13 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	294° 48' 26"	-3° 42' 23"	297° 28' 06"	-24° 48' 34"	0° 59' 00"	16' 04.69"	253° 35' 29"	0.92162
1	295° 23' 43"	-3° 44' 28"	298° 06' 38"	-24° 44' 04"	0° 58' 59"	16' 04.47"	253° 10' 54"	0.92413
2	295° 58' 59"	-3° 46' 31"	298° 45' 06"	-24° 39' 24"	0° 58' 59"	16' 04.25"	252° 46' 05"	0.92660
3	296° 34' 15"	-3° 48' 33"	299° 23' 30"	-24° 34' 35"	0° 58' 58"	16' 04.02"	252° 21' 01"	0.92903
4	297° 09' 30"	-3° 50' 33"	300° 01' 49"	-24° 29' 36"	0° 58' 57"	16' 03.79"	251° 55' 41"	0.93142
5	297° 44' 44"	-3° 52' 32"	300° 40' 05"	-24° 24' 28"	0° 58' 56"	16' 03.55"	251° 30' 05"	0.93377
6	298° 19' 57"	-3° 54' 29"	301° 18' 17"	-24° 19' 10"	0° 58' 55"	16' 03.32"	251° 4' 12"	0.93608
7	298° 55' 10"	-3° 56' 25"	301° 56' 25"	-24° 13' 42"	0° 58' 54"	16' 03.07"	250° 37' 60"	0.93835
8	299° 30' 21"	-3° 58' 19"	302° 34' 28"	-24° 08' 05"	0° 58' 53"	16' 02.83"	250° 11' 28"	0.94058
9	300° 05' 32"	-4° 00' 12"	303° 12' 27"	-24° 02' 19"	0° 58' 52"	16' 02.58"	249° 44' 36"	0.94277
10	300° 40' 43"	-4° 02' 03"	303° 50' 21"	-23° 56' 24"	0° 58' 51"	16' 02.32"	249° 17' 20"	0.94492
11	301° 15' 52"	-4° 03' 52"	304° 28' 10"	-23° 50' 20"	0° 58' 51"	16' 02.07"	248° 49' 41"	0.94702
12	301° 51' 00"	-4° 05' 40"	305° 05' 55"	-23° 44' 06"	0° 58' 50"	16' 01.80"	248° 21' 37"	0.94909
13	302° 26' 08"	-4° 07' 26"	305° 43' 36"	-23° 37' 44"	0° 58' 49"	16' 01.54"	247° 53' 05"	0.95111
14	303° 01' 15"	-4° 09' 11"	306° 21' 11"	-23° 31' 13"	0° 58' 48"	16' 01.27"	247° 24' 04"	0.95309
15	303° 36' 21"	-4° 10' 54"	306° 58' 41"	-23° 24' 32"	0° 58' 47"	16' 01.00"	246° 54' 32"	0.95503
16	304° 11' 25"	-4° 12' 35"	307° 36' 07"	-23° 17' 43"	0° 58' 46"	16' 00.72"	246° 24' 26"	0.95693
17	304° 46' 29"	-4° 14' 15"	308° 13' 27"	-23° 10' 46"	0° 58' 45"	16' 00.44"	245° 53' 44"	0.95878
18	305° 21' 32"	-4° 15' 53"	308° 50' 42"	-23° 03' 40"	0° 58' 44"	16' 00.16"	245° 22' 23"	0.96060
19	305° 56' 34"	-4° 17' 29"	309° 27' 53"	-22° 56' 25"	0° 58' 42"	15' 59.88"	244° 50' 20"	0.96237
20	306° 31' 35"	-4° 19' 04"	310° 04' 57"	-22° 49' 02"	0° 58' 41"	15' 59.59"	244° 17' 33"	0.96410
21	307° 06' 35"	-4° 20' 37"	310° 41' 57"	-22° 41' 31"	0° 58' 40"	15' 59.29"	243° 43' 56"	0.96579
22	307° 41' 34"	-4° 22' 08"	311° 18' 51"	-22° 33' 51"	0° 58' 39"	15' 59.00"	243° 9' 27"	0.96743
23	308° 16' 32"	-4° 23' 38"	311° 55' 40"	-22° 26' 03"	0° 58' 38"	15' 58.70"	242° 34' 02"	0.96903
24	308° 51' 29"	-4° 25' 06"	312° 32' 23"	-22° 18' 07"	0° 58' 37"	15' 58.39"	241° 57' 34"	0.97059

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	148° 10' 47"	-0.42"	150° 20' 13"	12° 06' 32"	1.0116629	15' 48.57"	23° 26' 15"	-3 m 13 s
1	148° 13' 11"	-0.43"	150° 22' 31"	12° 05' 42"	1.0116543	15' 48.58"	23° 26' 15"	-3 m 13 s
2	148° 15' 36"	-0.43"	150° 24' 50"	12° 04' 52"	1.0116458	15' 48.58"	23° 26' 15"	-3 m 12 s
3	148° 17' 60"	-0.43"	150° 27' 09"	12° 04' 02"	1.0116372	15' 48.59"	23° 26' 15"	-3 m 11 s
4	148° 20' 24"	-0.44"	150° 29' 27"	12° 03' 12"	1.0116286	15' 48.60"	23° 26' 15"	-3 m 11 s
5	148° 22' 49"	-0.44"	150° 31' 46"	12° 02' 22"	1.0116201	15' 48.61"	23° 26' 15"	-3 m 10 s
6	148° 25' 13"	-0.44"	150° 34' 04"	12° 01' 32"	1.0116115	15' 48.62"	23° 26' 15"	-3 m 09 s
7	148° 27' 38"	-0.44"	150° 36' 23"	12° 00' 42"	1.0116029	15' 48.62"	23° 26' 15"	-3 m 09 s
8	148° 30' 02"	-0.45"	150° 38' 41"	11° 59' 52"	1.0115944	15' 48.63"	23° 26' 15"	-3 m 08 s
9	148° 32' 26"	-0.45"	150° 40' 59"	11° 59' 02"	1.0115858	15' 48.64"	23° 26' 15"	-3 m 08 s
10	148° 34' 51"	-0.45"	150° 43' 18"	11° 58' 12"	1.0115772	15' 48.65"	23° 26' 15"	-3 m 07 s
11	148° 37' 15"	-0.46"	150° 45' 36"	11° 57' 22"	1.0115686	15' 48.66"	23° 26' 15"	-3 m 06 s
12	148° 39' 40"	-0.46"	150° 47' 55"	11° 56' 32"	1.0115601	15' 48.66"	23° 26' 15"	-3 m 06 s
13	148° 42' 04"	-0.46"	150° 50' 13"	11° 55' 42"	1.0115515	15' 48.67"	23° 26' 15"	-3 m 05 s
14	148° 44' 28"	-0.46"	150° 52' 32"	11° 54' 52"	1.0115429	15' 48.68"	23° 26' 15"	-3 m 05 s
15	148° 46' 53"	-0.47"	150° 54' 50"	11° 54' 02"	1.0115343	15' 48.69"	23° 26' 15"	-3 m 04 s
16	148° 49' 17"	-0.47"	150° 57' 08"	11° 53' 11"	1.0115257	15' 48.70"	23° 26' 15"	-3 m 03 s
17	148° 51' 42"	-0.47"	150° 59' 27"	11° 52' 21"	1.0115171	15' 48.70"	23° 26' 15"	-3 m 03 s
18	148° 54' 06"	-0.47"	151° 01' 45"	11° 51' 31"	1.0115085	15' 48.71"	23° 26' 15"	-3 m 02 s
19	148° 56' 30"	-0.47"	151° 04' 03"	11° 50' 41"	1.0114999	15' 48.72"	23° 26' 15"	-3 m 01 s
20	148° 58' 55"	-0.48"	151° 06' 22"	11° 49' 50"	1.0114912	15' 48.73"	23° 26' 15"	-3 m 01 s
21	149° 01' 19"	-0.48"	151° 08' 40"	11° 48' 60"	1.0114826	15' 48.74"	23° 26' 15"	-3 m 00 s
22	149° 03' 44"	-0.48"	151° 10' 58"	11° 48' 10"	1.0114740	15' 48.74"	23° 26' 15"	-2 m 59 s
23	149° 06' 08"	-0.48"	151° 13' 17"	11° 47' 19"	1.0114654	15' 48.75"	23° 26' 15"	-2 m 59 s
24	149° 08' 33"	-0.49"	151° 15' 35"	11° 46' 29"	1.0114568	15' 48.76"	23° 26' 15"	-2 m 58 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	308° 51' 29"	-4° 25' 06"	312° 32' 23"	-22° 18' 07"	0° 58' 37"	15' 58.39"	241° 57' 34"	0.97059
1	309° 26' 24"	-4° 26' 32"	313° 09' 01"	-22° 10' 03"	0° 58' 36"	15' 58.08"	241° 19' 60"	0.97211
2	310° 01' 19"	-4° 27' 56"	313° 45' 33"	-22° 01' 52"	0° 58' 35"	15' 57.77"	240° 41' 12"	0.97358
3	310° 36' 12"	-4° 29' 19"	314° 22' 00"	-21° 53' 32"	0° 58' 34"	15' 57.46"	240° 1' 06"	0.97501
4	311° 11' 04"	-4° 30' 40"	314° 58' 21"	-21° 45' 05"	0° 58' 32"	15' 57.14"	239° 19' 33"	0.97640
5	311° 45' 55"	-4° 31' 59"	315° 34' 36"	-21° 36' 30"	0° 58' 31"	15' 56.82"	238° 36' 25"	0.97774
6	312° 20' 45"	-4° 33' 17"	316° 10' 46"	-21° 27' 47"	0° 58' 30"	15' 56.50"	237° 51' 34"	0.97905
7	312° 55' 34"	-4° 34' 32"	316° 46' 50"	-21° 18' 58"	0° 58' 29"	15' 56.17"	237° 4' 50"	0.98031
8	313° 30' 21"	-4° 35' 46"	317° 22' 48"	-21° 10' 00"	0° 58' 28"	15' 55.84"	236° 16' 01"	0.98152
9	314° 05' 07"	-4° 36' 59"	317° 58' 40"	-21° 00' 56"	0° 58' 26"	15' 55.51"	235° 24' 55"	0.98269
10	314° 39' 52"	-4° 38' 09"	318° 34' 27"	-20° 51' 44"	0° 58' 25"	15' 55.17"	234° 31' 17"	0.98382
11	315° 14' 36"	-4° 39' 18"	319° 10' 08"	-20° 42' 26"	0° 58' 24"	15' 54.83"	233° 34' 52"	0.98491
12	315° 49' 18"	-4° 40' 25"	319° 45' 42"	-20° 32' 60"	0° 58' 23"	15' 54.49"	232° 35' 22"	0.98595
13	316° 23' 59"	-4° 41' 30"	320° 21' 11"	-20° 23' 27"	0° 58' 21"	15' 54.14"	231° 32' 26"	0.98695
14	316° 58' 38"	-4° 42' 33"	320° 56' 34"	-20° 13' 48"	0° 58' 20"	15' 53.79"	230° 25' 40"	0.98791
15	317° 33' 17"	-4° 43' 35"	321° 31' 51"	-20° 04' 02"	0° 58' 19"	15' 53.44"	229° 14' 39"	0.98883
16	318° 07' 53"	-4° 44' 35"	322° 07' 02"	-19° 54' 09"	0° 58' 18"	15' 53.09"	227° 58' 51"	0.98970
17	318° 42' 29"	-4° 45' 33"	322° 42' 08"	-19° 44' 10"	0° 58' 16"	15' 52.73"	226° 37' 41"	0.99052
18	319° 17' 03"	-4° 46' 29"	323° 17' 07"	-19° 34' 05"	0° 58' 15"	15' 52.37"	225° 10' 30"	0.99131
19	319° 51' 35"	-4° 47' 24"	323° 52' 00"	-19° 23' 53"	0° 58' 14"	15' 52.00"	223° 36' 32"	0.99205
20	320° 26' 07"	-4° 48' 16"	324° 26' 47"	-19° 13' 35"	0° 58' 12"	15' 51.64"	221° 54' 53"	0.99275
21	321° 00' 36"	-4° 49' 07"	325° 01' 29"	-19° 03' 11"	0° 58' 11"	15' 51.27"	220° 4' 33"	0.99341
22	321° 35' 04"	-4° 49' 56"	325° 36' 04"	-18° 52' 41"	0° 58' 10"	15' 50.89"	218° 4' 22"	0.99402
23	322° 09' 31"	-4° 50' 43"	326° 10' 34"	-18° 42' 05"	0° 58' 08"	15' 50.52"	215° 53' 02"	0.99459
24	322° 43' 56"	-4° 51' 29"	326° 44' 57"	-18° 31' 23"	0° 58' 07"	15' 50.14"	213° 29' 03"	0.99512

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	149° 08' 33"	-0.49"	151° 15' 35"	11° 46' 29"	1.0114568	15' 48.76"	23° 26' 15"	-2 m 58 s
1	149° 10' 57"	-0.49"	151° 17' 53"	11° 45' 39"	1.0114481	15' 48.77"	23° 26' 15"	-2 m 58 s
2	149° 13' 21"	-0.49"	151° 20' 11"	11° 44' 48"	1.0114395	15' 48.78"	23° 26' 15"	-2 m 57 s
3	149° 15' 46"	-0.49"	151° 22' 30"	11° 43' 58"	1.0114309	15' 48.78"	23° 26' 15"	-2 m 56 s
4	149° 18' 10"	-0.49"	151° 24' 48"	11° 43' 07"	1.0114222	15' 48.79"	23° 26' 15"	-2 m 56 s
5	149° 20' 35"	-0.49"	151° 27' 06"	11° 42' 17"	1.0114136	15' 48.80"	23° 26' 15"	-2 m 55 s
6	149° 22' 59"	-0.50"	151° 29' 24"	11° 41' 26"	1.0114049	15' 48.81"	23° 26' 15"	-2 m 54 s
7	149° 25' 24"	-0.50"	151° 31' 42"	11° 40' 36"	1.0113963	15' 48.82"	23° 26' 15"	-2 m 54 s
8	149° 27' 48"	-0.50"	151° 34' 01"	11° 39' 45"	1.0113876	15' 48.83"	23° 26' 15"	-2 m 53 s
9	149° 30' 13"	-0.50"	151° 36' 19"	11° 38' 55"	1.0113790	15' 48.83"	23° 26' 15"	-2 m 52 s
10	149° 32' 37"	-0.50"	151° 38' 37"	11° 38' 04"	1.0113703	15' 48.84"	23° 26' 15"	-2 m 52 s
11	149° 35' 01"	-0.50"	151° 40' 55"	11° 37' 14"	1.0113617	15' 48.85"	23° 26' 15"	-2 m 51 s
12	149° 37' 26"	-0.51"	151° 43' 13"	11° 36' 23"	1.0113530	15' 48.86"	23° 26' 15"	-2 m 51 s
13	149° 39' 50"	-0.51"	151° 45' 31"	11° 35' 33"	1.0113443	15' 48.87"	23° 26' 15"	-2 m 50 s
14	149° 42' 15"	-0.51"	151° 47' 50"	11° 34' 42"	1.0113357	15' 48.87"	23° 26' 15"	-2 m 49 s
15	149° 44' 39"	-0.51"	151° 50' 08"	11° 33' 51"	1.0113270	15' 48.88"	23° 26' 15"	-2 m 49 s
16	149° 47' 04"	-0.51"	151° 52' 26"	11° 33' 01"	1.0113183	15' 48.89"	23° 26' 15"	-2 m 48 s
17	149° 49' 28"	-0.51"	151° 54' 44"	11° 32' 10"	1.0113096	15' 48.90"	23° 26' 15"	-2 m 47 s
18	149° 51' 53"	-0.51"	151° 57' 02"	11° 31' 19"	1.0113009	15' 48.91"	23° 26' 15"	-2 m 47 s
19	149° 54' 17"	-0.51"	151° 59' 20"	11° 30' 28"	1.0112922	15' 48.91"	23° 26' 15"	-2 m 46 s
20	149° 56' 42"	-0.52"	152° 01' 38"	11° 29' 38"	1.0112836	15' 48.92"	23° 26' 15"	-2 m 45 s
21	149° 59' 06"	-0.52"	152° 03' 56"	11° 28' 47"	1.0112749	15' 48.93"	23° 26' 15"	-2 m 45 s
22	150° 01' 31"	-0.52"	152° 06' 14"	11° 27' 56"	1.0112662	15' 48.94"	23° 26' 15"	-2 m 44 s
23	150° 03' 55"	-0.52"	152° 08' 32"	11° 27' 05"	1.0112575	15' 48.95"	23° 26' 15"	-2 m 43 s
24	150° 06' 20"	-0.52"	152° 10' 50"	11° 26' 15"	1.0112488	15' 48.96"	23° 26' 15"	-2 m 43 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	322° 43' 56"	-4° 51' 29"	326° 44' 57"	-18° 31' 23"	0° 58' 07"	15' 50.14"	213° 29' 03"	0.99512
1	323° 18' 20"	-4° 52' 12"	327° 19' 15"	-18° 20' 36"	0° 58' 05"	15' 49.76"	210° 50' 44"	0.99560
2	323° 52' 42"	-4° 52' 54"	327° 53' 27"	-18° 09' 43"	0° 58' 04"	15' 49.38"	207° 56' 14"	0.99604
3	324° 27' 02"	-4° 53' 34"	328° 27' 32"	-17° 58' 44"	0° 58' 03"	15' 48.99"	204° 43' 38"	0.99644
4	325° 01' 21"	-4° 54' 12"	329° 01' 32"	-17° 47' 40"	0° 58' 01"	15' 48.60"	201° 10' 53"	0.99680
5	325° 35' 38"	-4° 54' 49"	329° 35' 26"	-17° 36' 30"	0° 57' 60"	15' 48.21"	197° 16' 05"	0.99711
6	326° 09' 54"	-4° 55' 23"	330° 09' 14"	-17° 25' 16"	0° 57' 58"	15' 47.82"	192° 57' 40"	0.99738
7	326° 44' 08"	-4° 55' 56"	330° 42' 56"	-17° 13' 56"	0° 57' 57"	15' 47.42"	188° 14' 41"	0.99761
8	327° 18' 21"	-4° 56' 27"	331° 16' 33"	-17° 02' 31"	0° 57' 55"	15' 47.03"	183° 7' 15"	0.99780
9	327° 52' 31"	-4° 56' 56"	331° 50' 03"	-16° 51' 01"	0° 57' 54"	15' 46.63"	177° 36' 58"	0.99795
10	328° 26' 40"	-4° 57' 24"	332° 23' 28"	-16° 39' 26"	0° 57' 52"	15' 46.22"	171° 47' 14"	0.99805
11	329° 00' 48"	-4° 57' 49"	332° 56' 47"	-16° 27' 47"	0° 57' 51"	15' 45.82"	165° 43' 25"	0.99811
12	329° 34' 53"	-4° 58' 13"	333° 30' 01"	-16° 16' 02"	0° 57' 49"	15' 45.41"	159° 32' 29"	0.99813
13	330° 08' 57"	-4° 58' 35"	334° 03' 08"	-16° 04' 14"	0° 57' 48"	15' 45.00"	153° 22' 18"	0.99811
14	330° 42' 59"	-4° 58' 55"	334° 36' 10"	-15° 52' 20"	0° 57' 46"	15' 44.59"	147° 20' 40"	0.99804
15	331° 16' 60"	-4° 59' 14"	335° 09' 07"	-15° 40' 23"	0° 57' 45"	15' 44.18"	141° 34' 21"	0.99794
16	331° 50' 58"	-4° 59' 30"	335° 41' 57"	-15° 28' 21"	0° 57' 43"	15' 43.76"	136° 8' 24"	0.99779
17	332° 24' 55"	-4° 59' 45"	336° 14' 42"	-15° 16' 15"	0° 57' 42"	15' 43.35"	131° 5' 56"	0.99760
18	332° 58' 50"	-4° 59' 58"	336° 47' 22"	-15° 04' 04"	0° 57' 40"	15' 42.93"	126° 28' 18"	0.99737
19	333° 32' 44"	-5° 00' 09"	337° 19' 56"	-14° 51' 50"	0° 57' 39"	15' 42.51"	122° 15' 24"	0.99710
20	334° 06' 35"	-5° 00' 19"	337° 52' 25"	-14° 39' 32"	0° 57' 37"	15' 42.08"	118° 26' 12"	0.99679
21	334° 40' 25"	-5° 00' 27"	338° 24' 48"	-14° 27' 10"	0° 57' 36"	15' 41.66"	114° 59' 01"	0.99644
22	335° 14' 12"	-5° 00' 33"	338° 57' 05"	-14° 14' 44"	0° 57' 34"	15' 41.23"	111° 51' 56"	0.99605
23	335° 47' 58"	-5° 00' 37"	339° 29' 18"	-14° 02' 15"	0° 57' 33"	15' 40.81"	109° 2' 56"	0.99562
24	336° 21' 42"	-5° 00' 39"	340° 01' 25"	-13° 49' 42"	0° 57' 31"	15' 40.38"	106° 30' 04"	0.99515

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	150° 06' 20"	-0.52"	152° 10' 50"	11° 26' 15"	1.0112488	15' 48.96"	23° 26' 15"	-2 m 43 s
1	150° 08' 44"	-0.52"	152° 13' 08"	11° 25' 24"	1.0112401	15' 48.96"	23° 26' 15"	-2 m 42 s
2	150° 11' 09"	-0.52"	152° 15' 26"	11° 24' 33"	1.0112313	15' 48.97"	23° 26' 15"	-2 m 41 s
3	150° 13' 33"	-0.52"	152° 17' 44"	11° 23' 42"	1.0112226	15' 48.98"	23° 26' 15"	-2 m 41 s
4	150° 15' 58"	-0.52"	152° 20' 02"	11° 22' 51"	1.0112139	15' 48.99"	23° 26' 15"	-2 m 40 s
5	150° 18' 22"	-0.52"	152° 22' 20"	11° 22' 00"	1.0112052	15' 49.00"	23° 26' 15"	-2 m 40 s
6	150° 20' 47"	-0.52"	152° 24' 38"	11° 21' 09"	1.0111965	15' 49.00"	23° 26' 15"	-2 m 39 s
7	150° 23' 11"	-0.52"	152° 26' 56"	11° 20' 18"	1.0111877	15' 49.01"	23° 26' 15"	-2 m 38 s
8	150° 25' 36"	-0.52"	152° 29' 14"	11° 19' 27"	1.0111790	15' 49.02"	23° 26' 15"	-2 m 38 s
9	150° 28' 00"	-0.52"	152° 31' 32"	11° 18' 36"	1.0111703	15' 49.03"	23° 26' 15"	-2 m 37 s
10	150° 30' 25"	-0.52"	152° 33' 49"	11° 17' 45"	1.0111615	15' 49.04"	23° 26' 15"	-2 m 36 s
11	150° 32' 49"	-0.52"	152° 36' 07"	11° 16' 54"	1.0111528	15' 49.05"	23° 26' 15"	-2 m 36 s
12	150° 35' 14"	-0.52"	152° 38' 25"	11° 16' 03"	1.0111441	15' 49.05"	23° 26' 15"	-2 m 35 s
13	150° 37' 38"	-0.52"	152° 40' 43"	11° 15' 12"	1.0111353	15' 49.06"	23° 26' 15"	-2 m 34 s
14	150° 40' 03"	-0.52"	152° 43' 01"	11° 14' 21"	1.0111266	15' 49.07"	23° 26' 15"	-2 m 34 s
15	150° 42' 27"	-0.52"	152° 45' 19"	11° 13' 30"	1.0111178	15' 49.08"	23° 26' 15"	-2 m 33 s
16	150° 44' 52"	-0.52"	152° 47' 37"	11° 12' 39"	1.0111090	15' 49.09"	23° 26' 15"	-2 m 32 s
17	150° 47' 16"	-0.52"	152° 49' 54"	11° 11' 48"	1.0111003	15' 49.09"	23° 26' 15"	-2 m 32 s
18	150° 49' 41"	-0.52"	152° 52' 12"	11° 10' 57"	1.0110915	15' 49.10"	23° 26' 15"	-2 m 31 s
19	150° 52' 05"	-0.52"	152° 54' 30"	11° 10' 05"	1.0110828	15' 49.11"	23° 26' 15"	-2 m 30 s
20	150° 54' 30"	-0.52"	152° 56' 48"	11° 09' 14"	1.0110740	15' 49.12"	23° 26' 15"	-2 m 30 s
21	150° 56' 55"	-0.52"	152° 59' 05"	11° 08' 23"	1.0110652	15' 49.13"	23° 26' 15"	-2 m 29 s
22	150° 59' 19"	-0.52"	153° 01' 23"	11° 07' 32"	1.0110564	15' 49.14"	23° 26' 15"	-2 m 28 s
23	151° 01' 44"	-0.52"	153° 03' 41"	11° 06' 41"	1.0110476	15' 49.14"	23° 26' 15"	-2 m 28 s
24	151° 04' 08"	-0.52"	153° 05' 59"	11° 05' 49"	1.0110389	15' 49.15"	23° 26' 15"	-2 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	336° 21' 42"	-5° 00' 39"	340° 01' 25"	-13° 49' 42"	0° 57' 31"	15' 40.38"	106° 30' 04"	0.99515
1	336° 55' 24"	-5° 00' 40"	340° 33' 27"	-13° 37' 05"	0° 57' 29"	15' 39.95"	104° 11' 32"	0.99464
2	337° 29' 05"	-5° 00' 39"	341° 05' 23"	-13° 24' 25"	0° 57' 28"	15' 39.51"	102° 5' 41"	0.99408
3	338° 02' 43"	-5° 00' 36"	341° 37' 15"	-13° 11' 42"	0° 57' 26"	15' 39.08"	100° 11' 02"	0.99349
4	338° 36' 20"	-5° 00' 31"	342° 09' 01"	-12° 58' 55"	0° 57' 25"	15' 38.64"	98° 26' 18"	0.99286
5	339° 09' 54"	-5° 00' 25"	342° 40' 42"	-12° 46' 06"	0° 57' 23"	15' 38.21"	96° 50' 21"	0.99219
6	339° 43' 27"	-5° 00' 17"	343° 12' 18"	-12° 33' 13"	0° 57' 21"	15' 37.77"	95° 22' 11"	0.99148
7	340° 16' 57"	-5° 00' 07"	343° 43' 50"	-12° 20' 17"	0° 57' 20"	15' 37.33"	94° 0' 57"	0.99073
8	340° 50' 26"	-4° 59' 56"	344° 15' 16"	-12° 07' 19"	0° 57' 18"	15' 36.89"	92° 45' 54"	0.98995
9	341° 23' 53"	-4° 59' 43"	344° 46' 37"	-11° 54' 17"	0° 57' 17"	15' 36.45"	91° 36' 22"	0.98912
10	341° 57' 17"	-4° 59' 28"	345° 17' 54"	-11° 41' 13"	0° 57' 15"	15' 36.01"	90° 31' 48"	0.98826
11	342° 30' 40"	-4° 59' 11"	345° 49' 05"	-11° 28' 07"	0° 57' 13"	15' 35.56"	89° 31' 40"	0.98735
12	343° 04' 01"	-4° 58' 53"	346° 20' 12"	-11° 14' 57"	0° 57' 12"	15' 35.12"	88° 35' 34"	0.98641
13	343° 37' 20"	-4° 58' 33"	346° 51' 14"	-11° 01' 46"	0° 57' 10"	15' 34.67"	87° 43' 05"	0.98543
14	344° 10' 36"	-4° 58' 12"	347° 22' 12"	-10° 48' 31"	0° 57' 08"	15' 34.23"	86° 53' 55"	0.98442
15	344° 43' 51"	-4° 57' 48"	347° 53' 05"	-10° 35' 15"	0° 57' 07"	15' 33.78"	86° 7' 44"	0.98337
16	345° 17' 04"	-4° 57' 23"	348° 23' 54"	-10° 21' 56"	0° 57' 05"	15' 33.33"	85° 24' 18"	0.98228
17	345° 50' 15"	-4° 56' 57"	348° 54' 38"	-10° 08' 35"	0° 57' 03"	15' 32.88"	84° 43' 22"	0.98115
18	346° 23' 23"	-4° 56' 28"	349° 25' 17"	-9° 55' 13"	0° 57' 02"	15' 32.44"	84° 4' 43"	0.97998
19	346° 56' 30"	-4° 55' 58"	349° 55' 53"	-9° 41' 48"	0° 57' 00"	15' 31.99"	83° 28' 12"	0.97878
20	347° 29' 35"	-4° 55' 27"	350° 26' 24"	-9° 28' 21"	0° 56' 58"	15' 31.54"	82° 53' 37"	0.97755
21	348° 02' 37"	-4° 54' 54"	350° 56' 50"	-9° 14' 52"	0° 56' 57"	15' 31.09"	82° 20' 50"	0.97627
22	348° 35' 38"	-4° 54' 19"	351° 27' 13"	-9° 01' 22"	0° 56' 55"	15' 30.64"	81° 49' 43"	0.97497
23	349° 08' 36"	-4° 53' 43"	351° 57' 31"	-8° 47' 50"	0° 56' 54"	15' 30.18"	81° 20' 09"	0.97362
24	349° 41' 32"	-4° 53' 05"	352° 27' 46"	-8° 34' 16"	0° 56' 52"	15' 29.73"	80° 52' 02"	0.97224

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	151° 04' 08"	-0.52"	153° 05' 59"	11° 05' 49"	1.0110389	15' 49.15"	23° 26' 15"	-2 m 27 s
1	151° 06' 33"	-0.52"	153° 08' 16"	11° 04' 58"	1.0110301	15' 49.16"	23° 26' 15"	-2 m 26 s
2	151° 08' 57"	-0.52"	153° 10' 34"	11° 04' 07"	1.0110213	15' 49.17"	23° 26' 15"	-2 m 26 s
3	151° 11' 22"	-0.52"	153° 12' 52"	11° 03' 15"	1.0110125	15' 49.18"	23° 26' 15"	-2 m 25 s
4	151° 13' 46"	-0.52"	153° 15' 10"	11° 02' 24"	1.0110037	15' 49.19"	23° 26' 15"	-2 m 24 s
5	151° 16' 11"	-0.52"	153° 17' 27"	11° 01' 33"	1.0109949	15' 49.19"	23° 26' 15"	-2 m 24 s
6	151° 18' 36"	-0.52"	153° 19' 45"	11° 00' 41"	1.0109861	15' 49.20"	23° 26' 15"	-2 m 23 s
7	151° 21' 00"	-0.52"	153° 22' 03"	10° 59' 50"	1.0109773	15' 49.21"	23° 26' 15"	-2 m 22 s
8	151° 23' 25"	-0.52"	153° 24' 20"	10° 58' 59"	1.0109685	15' 49.22"	23° 26' 15"	-2 m 22 s
9	151° 25' 49"	-0.51"	153° 26' 38"	10° 58' 07"	1.0109597	15' 49.23"	23° 26' 15"	-2 m 21 s
10	151° 28' 14"	-0.51"	153° 28' 55"	10° 57' 16"	1.0109508	15' 49.24"	23° 26' 15"	-2 m 20 s
11	151° 30' 38"	-0.51"	153° 31' 13"	10° 56' 24"	1.0109420	15' 49.24"	23° 26' 15"	-2 m 20 s
12	151° 33' 03"	-0.51"	153° 33' 31"	10° 55' 33"	1.0109332	15' 49.25"	23° 26' 15"	-2 m 19 s
13	151° 35' 28"	-0.51"	153° 35' 48"	10° 54' 41"	1.0109244	15' 49.26"	23° 26' 15"	-2 m 18 s
14	151° 37' 52"	-0.51"	153° 38' 06"	10° 53' 50"	1.0109155	15' 49.27"	23° 26' 15"	-2 m 17 s
15	151° 40' 17"	-0.51"	153° 40' 23"	10° 52' 58"	1.0109067	15' 49.28"	23° 26' 15"	-2 m 17 s
16	151° 42' 41"	-0.51"	153° 42' 41"	10° 52' 07"	1.0108979	15' 49.28"	23° 26' 15"	-2 m 16 s
17	151° 45' 06"	-0.50"	153° 44' 59"	10° 51' 15"	1.0108890	15' 49.29"	23° 26' 15"	-2 m 15 s
18	151° 47' 31"	-0.50"	153° 47' 16"	10° 50' 23"	1.0108802	15' 49.30"	23° 26' 15"	-2 m 15 s
19	151° 49' 55"	-0.50"	153° 49' 34"	10° 49' 32"	1.0108713	15' 49.31"	23° 26' 15"	-2 m 14 s
20	151° 52' 20"	-0.50"	153° 51' 51"	10° 48' 40"	1.0108625	15' 49.32"	23° 26' 15"	-2 m 13 s
21	151° 54' 44"	-0.50"	153° 54' 09"	10° 47' 49"	1.0108536	15' 49.33"	23° 26' 15"	-2 m 13 s
22	151° 57' 09"	-0.50"	153° 56' 26"	10° 46' 57"	1.0108448	15' 49.33"	23° 26' 15"	-2 m 12 s
23	151° 59' 34"	-0.50"	153° 58' 44"	10° 46' 05"	1.0108359	15' 49.34"	23° 26' 15"	-2 m 11 s
24	152° 01' 58"	-0.49"	154° 01' 01"	10° 45' 14"	1.0108270	15' 49.35"	23° 26' 15"	-2 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	349° 41' 32"	-4° 53' 05"	352° 27' 46"	-8° 34' 16"	0° 56' 52"	15' 29.73"	80° 52' 02"	0.97224
1	350° 14' 27"	-4° 52' 25"	352° 57' 56"	-8° 20' 41"	0° 56' 50"	15' 29.28"	80° 25' 15"	0.97083
2	350° 47' 19"	-4° 51' 44"	353° 28' 02"	-8° 07' 04"	0° 56' 49"	15' 28.83"	79° 59' 43"	0.96938
3	351° 20' 09"	-4° 51' 01"	353° 58' 05"	-7° 53' 26"	0° 56' 47"	15' 28.38"	79° 35' 22"	0.96789
4	351° 52' 57"	-4° 50' 17"	354° 28' 04"	-7° 39' 47"	0° 56' 45"	15' 27.93"	79° 12' 06"	0.96637
5	352° 25' 43"	-4° 49' 31"	354° 57' 58"	-7° 26' 06"	0° 56' 44"	15' 27.47"	78° 49' 53"	0.96482
6	352° 58' 27"	-4° 48' 44"	355° 27' 50"	-7° 12' 24"	0° 56' 42"	15' 27.02"	78° 28' 38"	0.96323
7	353° 31' 08"	-4° 47' 55"	355° 57' 37"	-6° 58' 41"	0° 56' 40"	15' 26.57"	78° 7' 18"	0.96161
8	354° 03' 48"	-4° 47' 04"	356° 27' 21"	-6° 44' 57"	0° 56' 39"	15' 26.12"	77° 48' 50"	0.95996
9	354° 36' 25"	-4° 46' 12"	356° 57' 01"	-6° 31' 12"	0° 56' 37"	15' 25.67"	77° 30' 12"	0.95827
10	355° 09' 01"	-4° 45' 19"	357° 26' 38"	-6° 17' 26"	0° 56' 35"	15' 25.22"	77° 12' 20"	0.95655
11	355° 41' 34"	-4° 44' 24"	357° 56' 12"	-6° 03' 39"	0° 56' 34"	15' 24.77"	76° 55' 12"	0.95479
12	356° 14' 05"	-4° 43' 27"	358° 25' 42"	-5° 49' 52"	0° 56' 32"	15' 24.32"	76° 38' 47"	0.95301
13	356° 46' 35"	-4° 42' 29"	358° 55' 09"	-5° 36' 04"	0° 56' 30"	15' 23.87"	76° 23' 01"	0.95119
14	357° 19' 02"	-4° 41' 30"	359° 24' 33"	-5° 22' 15"	0° 56' 29"	15' 23.42"	76° 7' 53"	0.94934
15	357° 51' 26"	-4° 40' 29"	359° 53' 53"	-5° 08' 26"	0° 56' 27"	15' 22.97"	75° 53' 22"	0.94746
16	358° 23' 49"	-4° 39' 27"	0° 23' 10"	-4° 54' 36"	0° 56' 25"	15' 22.52"	75° 39' 26"	0.94554
17	358° 56' 10"	-4° 38' 23"	0° 52' 25"	-4° 40' 45"	0° 56' 24"	15' 22.07"	75° 26' 03"	0.94360
18	359° 28' 29"	-4° 37' 18"	1° 21' 36"	-4° 26' 55"	0° 56' 22"	15' 21.63"	75° 13' 11"	0.94162
19	0° 00' 45"	-4° 36' 11"	1° 50' 45"	-4° 13' 04"	0° 56' 20"	15' 21.18"	75° 0' 51"	0.93961
20	0° 32' 59"	-4° 35' 03"	2° 19' 50"	-3° 59' 12"	0° 56' 19"	15' 20.73"	74° 48' 59"	0.93757
21	1° 05' 12"	-4° 33' 54"	2° 48' 53"	-3° 45' 21"	0° 56' 17"	15' 20.29"	74° 37' 36"	0.93551
22	1° 37' 22"	-4° 32' 43"	3° 17' 53"	-3° 31' 29"	0° 56' 16"	15' 19.85"	74° 26' 40"	0.93341
23	2° 09' 30"	-4° 31' 31"	3° 46' 50"	-3° 17' 38"	0° 56' 14"	15' 19.40"	74° 16' 10"	0.93128
24	2° 41' 36"	-4° 30' 17"	4° 15' 45"	-3° 03' 46"	0° 56' 12"	15' 18.96"	74° 6' 05"	0.92912

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	152° 01' 58"	-0.49"	154° 01' 01"	10° 45' 14"	1.0108270	15' 49.35"	23° 26' 15"	-2 m 11 s
1	152° 04' 23"	-0.49"	154° 03' 19"	10° 44' 22"	1.0108182	15' 49.36"	23° 26' 15"	-2 m 10 s
2	152° 06' 48"	-0.49"	154° 05' 36"	10° 43' 30"	1.0108093	15' 49.37"	23° 26' 15"	-2 m 09 s
3	152° 09' 12"	-0.49"	154° 07' 53"	10° 42' 38"	1.0108004	15' 49.38"	23° 26' 15"	-2 m 09 s
4	152° 11' 37"	-0.49"	154° 10' 11"	10° 41' 47"	1.0107915	15' 49.38"	23° 26' 15"	-2 m 08 s
5	152° 14' 01"	-0.48"	154° 12' 28"	10° 40' 55"	1.0107826	15' 49.39"	23° 26' 15"	-2 m 07 s
6	152° 16' 26"	-0.48"	154° 14' 46"	10° 40' 03"	1.0107738	15' 49.40"	23° 26' 15"	-2 m 07 s
7	152° 18' 51"	-0.48"	154° 17' 03"	10° 39' 11"	1.0107649	15' 49.41"	23° 26' 15"	-2 m 06 s
8	152° 21' 15"	-0.48"	154° 19' 21"	10° 38' 19"	1.0107560	15' 49.42"	23° 26' 15"	-2 m 05 s
9	152° 23' 40"	-0.48"	154° 21' 38"	10° 37' 27"	1.0107471	15' 49.43"	23° 26' 15"	-2 m 04 s
10	152° 26' 05"	-0.47"	154° 23' 55"	10° 36' 36"	1.0107382	15' 49.43"	23° 26' 15"	-2 m 04 s
11	152° 28' 29"	-0.47"	154° 26' 13"	10° 35' 44"	1.0107293	15' 49.44"	23° 26' 15"	-2 m 03 s
12	152° 30' 54"	-0.47"	154° 28' 30"	10° 34' 52"	1.0107204	15' 49.45"	23° 26' 15"	-2 m 02 s
13	152° 33' 19"	-0.47"	154° 30' 47"	10° 33' 60"	1.0107114	15' 49.46"	23° 26' 15"	-2 m 02 s
14	152° 35' 43"	-0.46"	154° 33' 05"	10° 33' 08"	1.0107025	15' 49.47"	23° 26' 15"	-2 m 01 s
15	152° 38' 08"	-0.46"	154° 35' 22"	10° 32' 16"	1.0106936	15' 49.48"	23° 26' 15"	-2 m 00 s
16	152° 40' 33"	-0.46"	154° 37' 39"	10° 31' 24"	1.0106847	15' 49.49"	23° 26' 15"	-1 m 60 s
17	152° 42' 57"	-0.46"	154° 39' 57"	10° 30' 32"	1.0106757	15' 49.49"	23° 26' 15"	-1 m 59 s
18	152° 45' 22"	-0.45"	154° 42' 14"	10° 29' 40"	1.0106668	15' 49.50"	23° 26' 15"	-1 m 58 s
19	152° 47' 47"	-0.45"	154° 44' 31"	10° 28' 48"	1.0106579	15' 49.51"	23° 26' 15"	-1 m 57 s
20	152° 50' 11"	-0.45"	154° 46' 48"	10° 27' 56"	1.0106489	15' 49.52"	23° 26' 15"	-1 m 57 s
21	152° 52' 36"	-0.45"	154° 49' 06"	10° 27' 04"	1.0106400	15' 49.53"	23° 26' 15"	-1 m 56 s
22	152° 55' 01"	-0.44"	154° 51' 23"	10° 26' 12"	1.0106311	15' 49.54"	23° 26' 15"	-1 m 55 s
23	152° 57' 25"	-0.44"	154° 53' 40"	10° 25' 20"	1.0106221	15' 49.54"	23° 26' 15"	-1 m 55 s
24	152° 59' 50"	-0.44"	154° 55' 57"	10° 24' 28"	1.0106132	15' 49.55"	23° 26' 15"	-1 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	2° 41' 36"	-4° 30' 17"	4° 15' 45"	-3° 03' 46"	0° 56' 12"	15' 18.96"	74° 6' 05"	0.92912
1	3° 13' 40"	-4° 29' 03"	4° 44' 38"	-2° 49' 54"	0° 56' 11"	15' 18.52"	73° 56' 25"	0.92694
2	3° 45' 42"	-4° 27' 46"	5° 13' 27"	-2° 36' 03"	0° 56' 09"	15' 18.09"	73° 47' 08"	0.92472
3	4° 17' 42"	-4° 26' 29"	5° 42' 15"	-2° 22' 12"	0° 56' 08"	15' 17.65"	73° 38' 13"	0.92248
4	4° 49' 39"	-4° 25' 10"	6° 10' 60"	-2° 08' 21"	0° 56' 06"	15' 17.21"	73° 29' 41"	0.92021
5	5° 21' 35"	-4° 23' 50"	6° 39' 42"	-1° 54' 30"	0° 56' 04"	15' 16.78"	73° 21' 30"	0.91790
6	5° 53' 28"	-4° 22' 28"	7° 08' 23"	-1° 40' 39"	0° 56' 03"	15' 16.34"	73° 13' 40"	0.91558
7	6° 25' 20"	-4° 21' 05"	7° 37' 01"	-1° 26' 49"	0° 56' 01"	15' 15.91"	73° 6' 09"	0.91322
8	6° 57' 09"	-4° 19' 41"	8° 05' 38"	-1° 12' 60"	0° 55' 60"	15' 15.48"	72° 58' 59"	0.91084
9	7° 28' 57"	-4° 18' 16"	8° 34' 12"	0°-59' 11"	0° 55' 58"	15' 15.05"	72° 52' 07"	0.90843
10	8° 00' 42"	-4° 16' 50"	9° 02' 44"	0°-45' 22"	0° 55' 56"	15' 14.62"	72° 45' 33"	0.90599
11	8° 32' 25"	-4° 15' 22"	9° 31' 14"	0°-31' 35"	0° 55' 55"	15' 14.20"	72° 39' 17"	0.90352
12	9° 04' 06"	-4° 13' 53"	9° 59' 43"	0°-17' 47"	0° 55' 53"	15' 13.78"	72° 33' 19"	0.90103
13	9° 35' 46"	-4° 12' 22"	10° 28' 09"	0° -4' 01"	0° 55' 52"	15' 13.35"	72° 27' 38"	0.89851
14	10° 07' 23"	-4° 10' 51"	10° 56' 34"	0° 09' 45"	0° 55' 50"	15' 12.93"	72° 22' 13"	0.89597
15	10° 38' 58"	-4° 09' 18"	11° 24' 58"	0° 23' 29"	0° 55' 49"	15' 12.51"	72° 17' 05"	0.89340
16	11° 10' 31"	-4° 07' 44"	11° 53' 19"	0° 37' 13"	0° 55' 47"	15' 12.10"	72° 12' 12"	0.89081
17	11° 42' 02"	-4° 06' 09"	12° 21' 39"	0° 50' 56"	0° 55' 46"	15' 11.68"	72° 7' 35"	0.88819
18	12° 13' 31"	-4° 04' 33"	12° 49' 58"	1° 04' 38"	0° 55' 44"	15' 11.27"	72° 3' 13"	0.88555
19	12° 44' 59"	-4° 02' 56"	13° 18' 15"	1° 18' 19"	0° 55' 43"	15' 10.86"	71° 59' 06"	0.88288
20	13° 16' 24"	-4° 01' 17"	13° 46' 31"	1° 31' 59"	0° 55' 41"	15' 10.45"	71° 55' 13"	0.88019
21	13° 47' 47"	-3° 59' 38"	14° 14' 46"	1° 45' 37"	0° 55' 40"	15' 10.05"	71° 51' 34"	0.87747
22	14° 19' 08"	-3° 57' 57"	14° 42' 59"	1° 59' 15"	0° 55' 38"	15' 09.64"	71° 48' 10"	0.87473
23	14° 50' 28"	-3° 56' 15"	15° 11' 11"	2° 12' 51"	0° 55' 37"	15' 09.24"	71° 44' 58"	0.87197
24	15° 21' 45"	-3° 54' 32"	15° 39' 22"	2° 26' 26"	0° 55' 35"	15' 08.84"	71° 42' 01"	0.86918

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	152° 59' 50"	-0.44"	154° 55' 57"	10° 24' 28"	1.0106132	15' 49.55"	23° 26' 15"	-1 m 54 s
1	153° 02' 15"	-0.43"	154° 58' 15"	10° 23' 35"	1.0106042	15' 49.56"	23° 26' 15"	-1 m 53 s
2	153° 04' 39"	-0.43"	155° 00' 32"	10° 22' 43"	1.0105952	15' 49.57"	23° 26' 15"	-1 m 53 s
3	153° 07' 04"	-0.43"	155° 02' 49"	10° 21' 51"	1.0105863	15' 49.58"	23° 26' 15"	-1 m 52 s
4	153° 09' 29"	-0.43"	155° 05' 06"	10° 20' 59"	1.0105773	15' 49.59"	23° 26' 15"	-1 m 51 s
5	153° 11' 54"	-0.42"	155° 07' 23"	10° 20' 07"	1.0105683	15' 49.59"	23° 26' 15"	-1 m 50 s
6	153° 14' 18"	-0.42"	155° 09' 41"	10° 19' 14"	1.0105593	15' 49.60"	23° 26' 15"	-1 m 50 s
7	153° 16' 43"	-0.42"	155° 11' 58"	10° 18' 22"	1.0105504	15' 49.61"	23° 26' 15"	-1 m 49 s
8	153° 19' 08"	-0.41"	155° 14' 15"	10° 17' 30"	1.0105414	15' 49.62"	23° 26' 15"	-1 m 48 s
9	153° 21' 32"	-0.41"	155° 16' 32"	10° 16' 38"	1.0105324	15' 49.63"	23° 26' 15"	-1 m 48 s
10	153° 23' 57"	-0.41"	155° 18' 49"	10° 15' 45"	1.0105234	15' 49.64"	23° 26' 15"	-1 m 47 s
11	153° 26' 22"	-0.40"	155° 21' 06"	10° 14' 53"	1.0105144	15' 49.65"	23° 26' 15"	-1 m 46 s
12	153° 28' 47"	-0.40"	155° 23' 23"	10° 14' 01"	1.0105054	15' 49.65"	23° 26' 15"	-1 m 46 s
13	153° 31' 11"	-0.40"	155° 25' 41"	10° 13' 08"	1.0104964	15' 49.66"	23° 26' 15"	-1 m 45 s
14	153° 33' 36"	-0.39"	155° 27' 58"	10° 12' 16"	1.0104874	15' 49.67"	23° 26' 15"	-1 m 44 s
15	153° 36' 01"	-0.39"	155° 30' 15"	10° 11' 24"	1.0104784	15' 49.68"	23° 26' 15"	-1 m 43 s
16	153° 38' 26"	-0.39"	155° 32' 32"	10° 10' 31"	1.0104694	15' 49.69"	23° 26' 15"	-1 m 43 s
17	153° 40' 50"	-0.38"	155° 34' 49"	10° 09' 39"	1.0104603	15' 49.70"	23° 26' 15"	-1 m 42 s
18	153° 43' 15"	-0.38"	155° 37' 06"	10° 08' 47"	1.0104513	15' 49.70"	23° 26' 15"	-1 m 41 s
19	153° 45' 40"	-0.37"	155° 39' 23"	10° 07' 54"	1.0104423	15' 49.71"	23° 26' 15"	-1 m 41 s
20	153° 48' 04"	-0.37"	155° 41' 40"	10° 07' 02"	1.0104333	15' 49.72"	23° 26' 15"	-1 m 40 s
21	153° 50' 29"	-0.37"	155° 43' 57"	10° 06' 09"	1.0104242	15' 49.73"	23° 26' 15"	-1 m 39 s
22	153° 52' 54"	-0.36"	155° 46' 14"	10° 05' 17"	1.0104152	15' 49.74"	23° 26' 15"	-1 m 38 s
23	153° 55' 19"	-0.36"	155° 48' 31"	10° 04' 24"	1.0104061	15' 49.75"	23° 26' 15"	-1 m 38 s
24	153° 57' 44"	-0.36"	155° 50' 48"	10° 03' 32"	1.0103971	15' 49.76"	23° 26' 15"	-1 m 37 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	15° 21' 45"	-3° 54' 32"	15° 39' 22"	2° 26' 26"	0° 55' 35"	15' 08.84"	71° 42' 01"	0.86918
1	15° 53' 01"	-3° 52' 48"	16° 07' 32"	2° 39' 59"	0° 55' 34"	15' 08.45"	71° 39' 16"	0.86637
2	16° 24' 14"	-3° 51' 03"	16° 35' 41"	2° 53' 31"	0° 55' 32"	15' 08.05"	71° 36' 44"	0.86354
3	16° 55' 26"	-3° 49' 17"	17° 03' 49"	3° 07' 02"	0° 55' 31"	15' 07.66"	71° 34' 25"	0.86068
4	17° 26' 36"	-3° 47' 30"	17° 31' 56"	3° 20' 31"	0° 55' 29"	15' 07.27"	71° 32' 18"	0.85780
5	17° 57' 44"	-3° 45' 42"	18° 00' 02"	3° 33' 59"	0° 55' 28"	15' 06.88"	71° 30' 24"	0.85490
6	18° 28' 50"	-3° 43' 53"	18° 28' 08"	3° 47' 25"	0° 55' 27"	15' 06.50"	71° 28' 41"	0.85198
7	18° 59' 54"	-3° 42' 02"	18° 56' 13"	4° 00' 49"	0° 55' 25"	15' 06.12"	71° 27' 11"	0.84904
8	19° 30' 56"	-3° 40' 11"	19° 24' 17"	4° 14' 12"	0° 55' 24"	15' 05.74"	71° 25' 52"	0.84608
9	20° 01' 57"	-3° 38' 19"	19° 52' 21"	4° 27' 33"	0° 55' 22"	15' 05.36"	71° 24' 45"	0.84309
10	20° 32' 55"	-3° 36' 26"	20° 20' 24"	4° 40' 52"	0° 55' 21"	15' 04.99"	71° 23' 48"	0.84009
11	21° 03' 52"	-3° 34' 31"	20° 48' 26"	4° 54' 10"	0° 55' 20"	15' 04.62"	71° 23' 03"	0.83706
12	21° 34' 47"	-3° 32' 36"	21° 16' 29"	5° 07' 25"	0° 55' 18"	15' 04.25"	71° 22' 29"	0.83401
13	22° 05' 41"	-3° 30' 40"	21° 44' 31"	5° 20' 39"	0° 55' 17"	15' 03.89"	71° 22' 06"	0.83095
14	22° 36' 32"	-3° 28' 43"	22° 12' 32"	5° 33' 51"	0° 55' 16"	15' 03.53"	71° 21' 54"	0.82786
15	23° 07' 22"	-3° 26' 45"	22° 40' 34"	5° 47' 00"	0° 55' 14"	15' 03.17"	71° 21' 52"	0.82476
16	23° 38' 10"	-3° 24' 46"	23° 08' 35"	6° 00' 08"	0° 55' 13"	15' 02.81"	71° 22' 01"	0.82163
17	24° 08' 56"	-3° 22' 47"	23° 36' 36"	6° 13' 13"	0° 55' 12"	15' 02.46"	71° 22' 20"	0.81849
18	24° 39' 41"	-3° 20' 46"	24° 04' 37"	6° 26' 17"	0° 55' 11"	15' 02.11"	71° 22' 49"	0.81533
19	25° 10' 24"	-3° 18' 45"	24° 32' 38"	6° 39' 18"	0° 55' 09"	15' 01.77"	71° 23' 28"	0.81215
20	25° 41' 05"	-3° 16' 42"	25° 00' 39"	6° 52' 17"	0° 55' 08"	15' 01.42"	71° 24' 17"	0.80895
21	26° 11' 44"	-3° 14' 39"	25° 28' 40"	7° 05' 14"	0° 55' 07"	15' 01.09"	71° 25' 16"	0.80573
22	26° 42' 22"	-3° 12' 35"	25° 56' 42"	7° 18' 08"	0° 55' 06"	15' 00.75"	71° 26' 25"	0.80250
23	27° 12' 58"	-3° 10' 30"	26° 24' 43"	7° 31' 00"	0° 55' 04"	15' 00.42"	71° 27' 43"	0.79925
24	27° 43' 33"	-3° 08' 24"	26° 52' 45"	7° 43' 50"	0° 55' 03"	15' 00.09"	71° 29' 11"	0.79598

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	153° 57' 44"	-0.36"	155° 50' 48"	10° 03' 32"	1.0103971	15' 49.76"	23° 26' 15"	-1 m 37 s
1	154° 00' 08"	-0.35"	155° 53' 05"	10° 02' 39"	1.0103880	15' 49.76"	23° 26' 15"	-1 m 36 s
2	154° 02' 33"	-0.35"	155° 55' 22"	10° 01' 47"	1.0103790	15' 49.77"	23° 26' 15"	-1 m 35 s
3	154° 04' 58"	-0.34"	155° 57' 39"	10° 00' 54"	1.0103699	15' 49.78"	23° 26' 15"	-1 m 35 s
4	154° 07' 23"	-0.34"	155° 59' 56"	10° 00' 01"	1.0103609	15' 49.79"	23° 26' 15"	-1 m 34 s
5	154° 09' 47"	-0.34"	156° 02' 13"	9° 59' 09"	1.0103518	15' 49.80"	23° 26' 15"	-1 m 33 s
6	154° 12' 12"	-0.33"	156° 04' 30"	9° 58' 16"	1.0103427	15' 49.81"	23° 26' 15"	-1 m 33 s
7	154° 14' 37"	-0.33"	156° 06' 47"	9° 57' 23"	1.0103337	15' 49.81"	23° 26' 15"	-1 m 32 s
8	154° 17' 02"	-0.32"	156° 09' 04"	9° 56' 31"	1.0103246	15' 49.82"	23° 26' 15"	-1 m 31 s
9	154° 19' 27"	-0.32"	156° 11' 21"	9° 55' 38"	1.0103155	15' 49.83"	23° 26' 15"	-1 m 30 s
10	154° 21' 51"	-0.32"	156° 13' 38"	9° 54' 45"	1.0103064	15' 49.84"	23° 26' 15"	-1 m 30 s
11	154° 24' 16"	-0.31"	156° 15' 55"	9° 53' 53"	1.0102973	15' 49.85"	23° 26' 15"	-1 m 29 s
12	154° 26' 41"	-0.31"	156° 18' 11"	9° 53' 00"	1.0102882	15' 49.86"	23° 26' 15"	-1 m 28 s
13	154° 29' 06"	-0.30"	156° 20' 28"	9° 52' 07"	1.0102791	15' 49.87"	23° 26' 15"	-1 m 28 s
14	154° 31' 30"	-0.30"	156° 22' 45"	9° 51' 15"	1.0102700	15' 49.87"	23° 26' 15"	-1 m 27 s
15	154° 33' 55"	-0.29"	156° 25' 02"	9° 50' 22"	1.0102609	15' 49.88"	23° 26' 15"	-1 m 26 s
16	154° 36' 20"	-0.29"	156° 27' 19"	9° 49' 29"	1.0102518	15' 49.89"	23° 26' 15"	-1 m 25 s
17	154° 38' 45"	-0.29"	156° 29' 36"	9° 48' 36"	1.0102427	15' 49.90"	23° 26' 15"	-1 m 25 s
18	154° 41' 10"	-0.28"	156° 31' 53"	9° 47' 43"	1.0102335	15' 49.91"	23° 26' 15"	-1 m 24 s
19	154° 43' 35"	-0.28"	156° 34' 09"	9° 46' 50"	1.0102244	15' 49.92"	23° 26' 15"	-1 m 23 s
20	154° 45' 59"	-0.27"	156° 36' 26"	9° 45' 58"	1.0102153	15' 49.93"	23° 26' 15"	-1 m 22 s
21	154° 48' 24"	-0.27"	156° 38' 43"	9° 45' 05"	1.0102062	15' 49.93"	23° 26' 15"	-1 m 22 s
22	154° 50' 49"	-0.26"	156° 40' 60"	9° 44' 12"	1.0101970	15' 49.94"	23° 26' 15"	-1 m 21 s
23	154° 53' 14"	-0.26"	156° 43' 17"	9° 43' 19"	1.0101879	15' 49.95"	23° 26' 15"	-1 m 20 s
24	154° 55' 39"	-0.25"	156° 45' 33"	9° 42' 26"	1.0101787	15' 49.96"	23° 26' 15"	-1 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	27° 43' 33"	-3° 08' 24"	26° 52' 45"	7° 43' 50"	0° 55' 03"	15' 00.09"	71° 29' 11"	0.79598
1	28° 14' 06"	-3° 06' 18"	27° 20' 48"	7° 56' 37"	0° 55' 02"	14' 59.76"	71° 30' 48"	0.79269
2	28° 44' 37"	-3° 04' 11"	27° 48' 50"	8° 09' 22"	0° 55' 01"	14' 59.44"	71° 32' 35"	0.78939
3	29° 15' 07"	-3° 02' 03"	28° 16' 53"	8° 22' 04"	0° 54' 60"	14' 59.12"	71° 34' 31"	0.78607
4	29° 45' 36"	-2° 59' 54"	28° 44' 57"	8° 34' 44"	0° 54' 58"	14' 58.80"	71° 36' 36"	0.78273
5	30° 16' 02"	-2° 57' 44"	29° 13' 01"	8° 47' 21"	0° 54' 57"	14' 58.49"	71° 38' 50"	0.77938
6	30° 46' 28"	-2° 55' 34"	29° 41' 06"	8° 59' 55"	0° 54' 56"	14' 58.18"	71° 41' 13"	0.77601
7	31° 16' 51"	-2° 53' 23"	30° 09' 11"	9° 12' 27"	0° 54' 55"	14' 57.88"	71° 43' 45"	0.77263
8	31° 47' 14"	-2° 51' 11"	30° 37' 17"	9° 24' 56"	0° 54' 54"	14' 57.58"	71° 46' 26"	0.76923
9	32° 17' 34"	-2° 48' 58"	31° 05' 24"	9° 37' 22"	0° 54' 53"	14' 57.28"	71° 49' 16"	0.76582
10	32° 47' 54"	-2° 46' 45"	31° 33' 32"	9° 49' 46"	0° 54' 52"	14' 56.99"	71° 52' 14"	0.76239
11	33° 18' 12"	-2° 44' 31"	32° 01' 40"	10° 02' 06"	0° 54' 51"	14' 56.70"	71° 55' 22"	0.75895
12	33° 48' 28"	-2° 42' 17"	32° 29' 50"	10° 14' 24"	0° 54' 50"	14' 56.41"	71° 58' 37"	0.75549
13	34° 18' 43"	-2° 40' 01"	32° 58' 00"	10° 26' 39"	0° 54' 49"	14' 56.13"	72° 2' 01"	0.75202
14	34° 48' 57"	-2° 37' 45"	33° 26' 12"	10° 38' 51"	0° 54' 48"	14' 55.85"	72° 5' 34"	0.74854
15	35° 19' 09"	-2° 35' 29"	33° 54' 25"	10° 50' 59"	0° 54' 47"	14' 55.58"	72° 9' 15"	0.74504
16	35° 49' 20"	-2° 33' 11"	34° 22' 38"	11° 03' 05"	0° 54' 46"	14' 55.31"	72° 13' 04"	0.74152
17	36° 19' 30"	-2° 30' 54"	34° 50' 53"	11° 15' 08"	0° 54' 45"	14' 55.04"	72° 17' 02"	0.73800
18	36° 49' 38"	-2° 28' 35"	35° 19' 09"	11° 27' 07"	0° 54' 44"	14' 54.78"	72° 21' 08"	0.73446
19	37° 19' 45"	-2° 26' 16"	35° 47' 27"	11° 39' 04"	0° 54' 43"	14' 54.52"	72° 25' 22"	0.73091
20	37° 49' 51"	-2° 23' 56"	36° 15' 46"	11° 50' 57"	0° 54' 42"	14' 54.27"	72° 29' 44"	0.72734
21	38° 19' 56"	-2° 21' 36"	36° 44' 06"	12° 02' 47"	0° 54' 41"	14' 54.02"	72° 34' 14"	0.72377
22	38° 49' 59"	-2° 19' 15"	37° 12' 27"	12° 14' 33"	0° 54' 40"	14' 53.77"	72° 38' 52"	0.72018
23	39° 20' 01"	-2° 16' 54"	37° 40' 50"	12° 26' 17"	0° 54' 39"	14' 53.53"	72° 43' 38"	0.71658
24	39° 50' 02"	-2° 14' 32"	38° 09' 15"	12° 37' 56"	0° 54' 38"	14' 53.30"	72° 48' 32"	0.71297

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	154° 55' 39"	-0.25"	156° 45' 33"	9° 42' 26"	1.0101787	15' 49.96"	23° 26' 15"	-1 m 19 s
1	154° 58' 04"	-0.25"	156° 47' 50"	9° 41' 33"	1.0101696	15' 49.97"	23° 26' 15"	-1 m 19 s
2	155° 00' 28"	-0.24"	156° 50' 07"	9° 40' 40"	1.0101604	15' 49.98"	23° 26' 15"	-1 m 18 s
3	155° 02' 53"	-0.24"	156° 52' 24"	9° 39' 47"	1.0101513	15' 49.99"	23° 26' 15"	-1 m 17 s
4	155° 05' 18"	-0.24"	156° 54' 40"	9° 38' 54"	1.0101421	15' 50.00"	23° 26' 15"	-1 m 17 s
5	155° 07' 43"	-0.23"	156° 56' 57"	9° 38' 01"	1.0101329	15' 50.00"	23° 26' 15"	-1 m 16 s
6	155° 10' 08"	-0.23"	156° 59' 14"	9° 37' 08"	1.0101238	15' 50.01"	23° 26' 15"	-1 m 15 s
7	155° 12' 33"	-0.22"	157° 01' 31"	9° 36' 15"	1.0101146	15' 50.02"	23° 26' 15"	-1 m 14 s
8	155° 14' 58"	-0.22"	157° 03' 47"	9° 35' 22"	1.0101054	15' 50.03"	23° 26' 15"	-1 m 14 s
9	155° 17' 22"	-0.21"	157° 06' 04"	9° 34' 29"	1.0100962	15' 50.04"	23° 26' 15"	-1 m 13 s
10	155° 19' 47"	-0.21"	157° 08' 21"	9° 33' 36"	1.0100870	15' 50.05"	23° 26' 15"	-1 m 12 s
11	155° 22' 12"	-0.20"	157° 10' 37"	9° 32' 43"	1.0100778	15' 50.06"	23° 26' 15"	-1 m 11 s
12	155° 24' 37"	-0.20"	157° 12' 54"	9° 31' 50"	1.0100686	15' 50.06"	23° 26' 15"	-1 m 11 s
13	155° 27' 02"	-0.19"	157° 15' 11"	9° 30' 57"	1.0100594	15' 50.07"	23° 26' 15"	-1 m 10 s
14	155° 29' 27"	-0.19"	157° 17' 27"	9° 30' 03"	1.0100502	15' 50.08"	23° 26' 15"	-1 m 09 s
15	155° 31' 52"	-0.18"	157° 19' 44"	9° 29' 10"	1.0100410	15' 50.09"	23° 26' 15"	-1 m 08 s
16	155° 34' 16"	-0.18"	157° 22' 01"	9° 28' 17"	1.0100318	15' 50.10"	23° 26' 15"	-1 m 08 s
17	155° 36' 41"	-0.17"	157° 24' 17"	9° 27' 24"	1.0100226	15' 50.11"	23° 26' 15"	-1 m 07 s
18	155° 39' 06"	-0.17"	157° 26' 34"	9° 26' 31"	1.0100133	15' 50.12"	23° 26' 15"	-1 m 06 s
19	155° 41' 31"	-0.16"	157° 28' 50"	9° 25' 37"	1.0100041	15' 50.12"	23° 26' 15"	-1 m 05 s
20	155° 43' 56"	-0.16"	157° 31' 07"	9° 24' 44"	1.0099949	15' 50.13"	23° 26' 15"	-1 m 05 s
21	155° 46' 21"	-0.15"	157° 33' 24"	9° 23' 51"	1.0099856	15' 50.14"	23° 26' 15"	-1 m 04 s
22	155° 48' 46"	-0.15"	157° 35' 40"	9° 22' 58"	1.0099764	15' 50.15"	23° 26' 15"	-1 m 03 s
23	155° 51' 11"	-0.14"	157° 37' 57"	9° 22' 04"	1.0099671	15' 50.16"	23° 26' 15"	-1 m 02 s
24	155° 53' 36"	-0.14"	157° 40' 13"	9° 21' 11"	1.0099579	15' 50.17"	23° 26' 15"	-1 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	39° 50' 02"	-2° 14' 32"	38° 09' 15"	12° 37' 56"	0° 54' 38"	14' 53.30"	72° 48' 32"	0.71297
1	40° 20' 02"	-2° 12' 09"	38° 37' 41"	12° 49' 33"	0° 54' 37"	14' 53.06"	72° 53' 34"	0.70934
2	40° 50' 01"	-2° 09' 46"	39° 06' 09"	13° 01' 06"	0° 54' 36"	14' 52.83"	72° 58' 43"	0.70571
3	41° 19' 58"	-2° 07' 23"	39° 34' 38"	13° 12' 36"	0° 54' 36"	14' 52.61"	73° 4' 01"	0.70206
4	41° 49' 55"	-2° 04' 59"	40° 03' 10"	13° 24' 02"	0° 54' 35"	14' 52.39"	73° 9' 26"	0.69840
5	42° 19' 50"	-2° 02' 34"	40° 31' 42"	13° 35' 24"	0° 54' 34"	14' 52.17"	73° 14' 59"	0.69474
6	42° 49' 44"	-2° 00' 09"	41° 00' 17"	13° 46' 43"	0° 54' 33"	14' 51.96"	73° 20' 39"	0.69106
7	43° 19' 37"	-1° 57' 44"	41° 28' 54"	13° 57' 58"	0° 54' 32"	14' 51.75"	73° 26' 27"	0.68737
8	43° 49' 30"	-1° 55' 18"	41° 57' 32"	14° 09' 09"	0° 54' 32"	14' 51.55"	73° 32' 23"	0.68367
9	44° 19' 21"	-1° 52' 51"	42° 26' 13"	14° 20' 17"	0° 54' 31"	14' 51.35"	73° 38' 26"	0.67996
10	44° 49' 11"	-1° 50' 24"	42° 54' 55"	14° 31' 21"	0° 54' 30"	14' 51.16"	73° 44' 37"	0.67625
11	45° 19' 01"	-1° 47' 57"	43° 23' 39"	14° 42' 21"	0° 54' 30"	14' 50.97"	73° 50' 55"	0.67252
12	45° 48' 49"	-1° 45' 29"	43° 52' 26"	14° 53' 18"	0° 54' 29"	14' 50.78"	73° 57' 21"	0.66878
13	46° 18' 36"	-1° 43' 01"	44° 21' 14"	15° 04' 10"	0° 54' 28"	14' 50.60"	74° 3' 54"	0.66504
14	46° 48' 23"	-1° 40' 32"	44° 50' 05"	15° 14' 59"	0° 54' 28"	14' 50.43"	74° 10' 34"	0.66128
15	47° 18' 09"	-1° 38' 03"	45° 18' 58"	15° 25' 43"	0° 54' 27"	14' 50.25"	74° 17' 21"	0.65752
16	47° 47' 54"	-1° 35' 34"	45° 47' 53"	15° 36' 24"	0° 54' 26"	14' 50.09"	74° 24' 16"	0.65375
17	48° 17' 38"	-1° 33' 04"	46° 16' 51"	15° 47' 00"	0° 54' 26"	14' 49.92"	74° 31' 19"	0.64997
18	48° 47' 21"	-1° 30' 34"	46° 45' 50"	15° 57' 33"	0° 54' 25"	14' 49.77"	74° 38' 28"	0.64619
19	49° 17' 03"	-1° 28' 04"	47° 14' 52"	16° 08' 01"	0° 54' 25"	14' 49.61"	74° 45' 45"	0.64239
20	49° 46' 45"	-1° 25' 33"	47° 43' 57"	16° 18' 25"	0° 54' 24"	14' 49.46"	74° 53' 08"	0.63859
21	50° 16' 26"	-1° 23' 02"	48° 13' 04"	16° 28' 45"	0° 54' 24"	14' 49.32"	75° 0' 39"	0.63478
22	50° 46' 06"	-1° 20' 30"	48° 42' 13"	16° 39' 01"	0° 54' 23"	14' 49.18"	75° 8' 17"	0.63097
23	51° 15' 46"	-1° 17' 59"	49° 11' 25"	16° 49' 12"	0° 54' 23"	14' 49.05"	75° 16' 02"	0.62714
24	51° 45' 25"	-1° 15' 26"	49° 40' 39"	16° 59' 19"	0° 54' 22"	14' 48.92"	75° 23' 54"	0.62331

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	155° 53' 36"	-0.14"	157° 40' 13"	9° 21' 11"	1.0099579	15' 50.17"	23° 26' 15"	-1 m 02 s
1	155° 56' 01"	-0.13"	157° 42' 30"	9° 20' 18"	1.0099486	15' 50.18"	23° 26' 15"	-1 m 01 s
2	155° 58' 26"	-0.13"	157° 44' 46"	9° 19' 24"	1.0099393	15' 50.19"	23° 26' 15"	-1 m 00 s
3	156° 00' 50"	-0.12"	157° 47' 03"	9° 18' 31"	1.0099301	15' 50.19"	23° 26' 15"	0 m -59 s
4	156° 03' 15"	-0.12"	157° 49' 20"	9° 17' 38"	1.0099208	15' 50.20"	23° 26' 15"	0 m -59 s
5	156° 05' 40"	-0.11"	157° 51' 36"	9° 16' 44"	1.0099115	15' 50.21"	23° 26' 15"	0 m -58 s
6	156° 08' 05"	-0.11"	157° 53' 53"	9° 15' 51"	1.0099022	15' 50.22"	23° 26' 15"	0 m -57 s
7	156° 10' 30"	-0.10"	157° 56' 09"	9° 14' 58"	1.0098930	15' 50.23"	23° 26' 15"	0 m -56 s
8	156° 12' 55"	-0.10"	157° 58' 26"	9° 14' 04"	1.0098837	15' 50.24"	23° 26' 15"	0 m -56 s
9	156° 15' 20"	-0.09"	158° 00' 42"	9° 13' 11"	1.0098744	15' 50.25"	23° 26' 15"	0 m -55 s
10	156° 17' 45"	-0.09"	158° 02' 59"	9° 12' 17"	1.0098651	15' 50.26"	23° 26' 15"	0 m -54 s
11	156° 20' 10"	-0.08"	158° 05' 15"	9° 11' 24"	1.0098558	15' 50.26"	23° 26' 15"	0 m -53 s
12	156° 22' 35"	-0.08"	158° 07' 32"	9° 10' 30"	1.0098465	15' 50.27"	23° 26' 15"	0 m -53 s
13	156° 24' 60"	-0.07"	158° 09' 48"	9° 09' 37"	1.0098371	15' 50.28"	23° 26' 15"	0 m -52 s
14	156° 27' 25"	-0.06"	158° 12' 04"	9° 08' 43"	1.0098278	15' 50.29"	23° 26' 15"	0 m -51 s
15	156° 29' 50"	-0.06"	158° 14' 21"	9° 07' 50"	1.0098185	15' 50.30"	23° 26' 15"	0 m -50 s
16	156° 32' 15"	-0.05"	158° 16' 37"	9° 06' 56"	1.0098092	15' 50.31"	23° 26' 15"	0 m -50 s
17	156° 34' 40"	-0.05"	158° 18' 54"	9° 06' 03"	1.0097998	15' 50.32"	23° 26' 15"	0 m -49 s
18	156° 37' 05"	-0.04"	158° 21' 10"	9° 05' 09"	1.0097905	15' 50.33"	23° 26' 15"	0 m -48 s
19	156° 39' 30"	-0.04"	158° 23' 27"	9° 04' 15"	1.0097812	15' 50.33"	23° 26' 15"	0 m -48 s
20	156° 41' 55"	-0.03"	158° 25' 43"	9° 03' 22"	1.0097718	15' 50.34"	23° 26' 15"	0 m -47 s
21	156° 44' 20"	-0.03"	158° 27' 59"	9° 02' 28"	1.0097625	15' 50.35"	23° 26' 15"	0 m -46 s
22	156° 46' 45"	-0.02"	158° 30' 16"	9° 01' 35"	1.0097531	15' 50.36"	23° 26' 15"	0 m -45 s
23	156° 49' 09"	-0.02"	158° 32' 32"	9° 00' 41"	1.0097437	15' 50.37"	23° 26' 15"	0 m -44 s
24	156° 51' 34"	-0.01"	158° 34' 48"	8° 59' 47"	1.0097344	15' 50.38"	23° 26' 15"	0 m -44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	51° 45' 25"	-1° 15' 26"	49° 40' 39"	16° 59' 19"	0° 54' 22"	14' 48.92"	75° 23' 54"	0.62331
1	52° 15' 03"	-1° 12' 54"	50° 09' 56"	17° 09' 22"	0° 54' 22"	14' 48.79"	75° 31' 53"	0.61948
2	52° 44' 41"	-1° 10' 21"	50° 39' 16"	17° 19' 20"	0° 54' 21"	14' 48.67"	75° 39' 59"	0.61563
3	53° 14' 18"	-1° 07' 49"	51° 08' 38"	17° 29' 14"	0° 54' 21"	14' 48.55"	75° 48' 12"	0.61179
4	53° 43' 54"	-1° 05' 15"	51° 38' 03"	17° 39' 03"	0° 54' 20"	14' 48.44"	75° 56' 32"	0.60793
5	54° 13' 30"	-1° 02' 42"	52° 07' 31"	17° 48' 48"	0° 54' 20"	14' 48.34"	76° 4' 59"	0.60407
6	54° 43' 06"	-1° 00' 08"	52° 37' 01"	17° 58' 28"	0° 54' 20"	14' 48.24"	76° 13' 32"	0.60021
7	55° 12' 41"	0°-57' 34"	53° 06' 34"	18° 08' 04"	0° 54' 19"	14' 48.14"	76° 22' 13"	0.59633
8	55° 42' 15"	0°-55' 00"	53° 36' 10"	18° 17' 35"	0° 54' 19"	14' 48.05"	76° 31' 00"	0.59246
9	56° 11' 49"	0°-52' 26"	54° 05' 48"	18° 27' 01"	0° 54' 19"	14' 47.96"	76° 39' 54"	0.58858
10	56° 41' 23"	0°-49' 51"	54° 35' 30"	18° 36' 23"	0° 54' 18"	14' 47.88"	76° 48' 55"	0.58469
11	57° 10' 56"	0°-47' 16"	55° 05' 14"	18° 45' 39"	0° 54' 18"	14' 47.80"	76° 58' 02"	0.58080
12	57° 40' 28"	0°-44' 42"	55° 35' 02"	18° 54' 51"	0° 54' 18"	14' 47.73"	77° 7' 17"	0.57691
13	58° 10' 01"	0°-42' 06"	56° 04' 52"	19° 03' 58"	0° 54' 17"	14' 47.66"	77° 16' 37"	0.57301
14	58° 39' 33"	0°-39' 31"	56° 34' 45"	19° 13' 01"	0° 54' 17"	14' 47.60"	77° 26' 05"	0.56911
15	59° 09' 05"	0°-36' 56"	57° 04' 41"	19° 21' 58"	0° 54' 17"	14' 47.54"	77° 35' 39"	0.56520
16	59° 38' 36"	0°-34' 20"	57° 34' 40"	19° 30' 50"	0° 54' 17"	14' 47.48"	77° 45' 19"	0.56129
17	60° 08' 07"	0°-31' 44"	58° 04' 43"	19° 39' 38"	0° 54' 17"	14' 47.44"	77° 55' 07"	0.55738
18	60° 37' 38"	0°-29' 09"	58° 34' 48"	19° 48' 20"	0° 54' 16"	14' 47.39"	78° 5' 00"	0.55346
19	61° 07' 09"	0°-26' 33"	59° 04' 56"	19° 56' 57"	0° 54' 16"	14' 47.35"	78° 15' 00"	0.54954
20	61° 36' 39"	0°-23' 57"	59° 35' 08"	20° 05' 29"	0° 54' 16"	14' 47.32"	78° 25' 07"	0.54562
21	62° 06' 10"	0°-21' 20"	60° 05' 22"	20° 13' 56"	0° 54' 16"	14' 47.29"	78° 35' 20"	0.54170
22	62° 35' 40"	0°-18' 44"	60° 35' 40"	20° 22' 17"	0° 54' 16"	14' 47.27"	78° 45' 40"	0.53777
23	63° 05' 10"	0°-16' 08"	61° 06' 01"	20° 30' 34"	0° 54' 16"	14' 47.25"	78° 56' 05"	0.53384
24	63° 34' 40"	0°-13' 32"	61° 36' 25"	20° 38' 45"	0° 54' 16"	14' 47.23"	79° 6' 37"	0.52991

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	156° 51' 34"	-0.01"	158° 34' 48"	8° 59' 47"	1.0097344	15' 50.38"	23° 26' 15"	0 m-44 s
1	156° 53' 59"	-0.01"	158° 37' 05"	8° 58' 53"	1.0097250	15' 50.39"	23° 26' 15"	0 m-43 s
2	156° 56' 24"	-0.00"	158° 39' 21"	8° 57' 60"	1.0097156	15' 50.40"	23° 26' 15"	0 m-42 s
3	156° 58' 49"	0.00"	158° 41' 38"	8° 57' 06"	1.0097062	15' 50.41"	23° 26' 15"	0 m-41 s
4	157° 01' 14"	0.01"	158° 43' 54"	8° 56' 12"	1.0096969	15' 50.41"	23° 26' 15"	0 m-40 s
5	157° 03' 39"	0.01"	158° 46' 10"	8° 55' 19"	1.0096875	15' 50.42"	23° 26' 15"	0 m-40 s
6	157° 06' 04"	0.02"	158° 48' 26"	8° 54' 25"	1.0096781	15' 50.43"	23° 26' 15"	0 m-39 s
7	157° 08' 29"	0.02"	158° 50' 43"	8° 53' 31"	1.0096687	15' 50.44"	23° 26' 15"	0 m-38 s
8	157° 10' 54"	0.03"	158° 52' 59"	8° 52' 37"	1.0096593	15' 50.45"	23° 26' 15"	0 m-37 s
9	157° 13' 20"	0.04"	158° 55' 15"	8° 51' 43"	1.0096498	15' 50.46"	23° 26' 15"	0 m-37 s
10	157° 15' 45"	0.04"	158° 57' 32"	8° 50' 50"	1.0096404	15' 50.47"	23° 26' 15"	0 m-36 s
11	157° 18' 10"	0.05"	158° 59' 48"	8° 49' 56"	1.0096310	15' 50.48"	23° 26' 15"	0 m-35 s
12	157° 20' 35"	0.05"	159° 02' 04"	8° 49' 02"	1.0096216	15' 50.48"	23° 26' 15"	0 m-34 s
13	157° 22' 60"	0.06"	159° 04' 20"	8° 48' 08"	1.0096121	15' 50.49"	23° 26' 15"	0 m-34 s
14	157° 25' 25"	0.06"	159° 06' 37"	8° 47' 14"	1.0096027	15' 50.50"	23° 26' 15"	0 m-33 s
15	157° 27' 50"	0.07"	159° 08' 53"	8° 46' 20"	1.0095933	15' 50.51"	23° 26' 15"	0 m-32 s
16	157° 30' 15"	0.07"	159° 11' 09"	8° 45' 26"	1.0095838	15' 50.52"	23° 26' 15"	0 m-31 s
17	157° 32' 40"	0.08"	159° 13' 25"	8° 44' 32"	1.0095744	15' 50.53"	23° 26' 15"	0 m-30 s
18	157° 35' 05"	0.08"	159° 15' 42"	8° 43' 38"	1.0095649	15' 50.54"	23° 26' 15"	0 m-30 s
19	157° 37' 30"	0.09"	159° 17' 58"	8° 42' 45"	1.0095554	15' 50.55"	23° 26' 15"	0 m-29 s
20	157° 39' 55"	0.09"	159° 20' 14"	8° 41' 51"	1.0095460	15' 50.56"	23° 26' 15"	0 m-28 s
21	157° 42' 20"	0.10"	159° 22' 30"	8° 40' 57"	1.0095365	15' 50.56"	23° 26' 15"	0 m-27 s
22	157° 44' 45"	0.10"	159° 24' 46"	8° 40' 03"	1.0095270	15' 50.57"	23° 26' 15"	0 m-27 s
23	157° 47' 10"	0.11"	159° 27' 03"	8° 39' 09"	1.0095176	15' 50.58"	23° 26' 15"	0 m-26 s
24	157° 49' 35"	0.11"	159° 29' 19"	8° 38' 15"	1.0095081	15' 50.59"	23° 26' 15"	0 m-25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	63° 34' 40"	0°-13' 32"	61° 36' 25"	20° 38' 45"	0° 54' 16"	14' 47.23"	79° 6' 37"	0.52991
1	64° 04' 10"	0°-10' 55"	62° 06' 52"	20° 46' 50"	0° 54' 16"	14' 47.22"	79° 17' 16"	0.52598
2	64° 33' 40"	0° -8' 19"	62° 37' 23"	20° 54' 51"	0° 54' 16"	14' 47.22"	79° 28' 01"	0.52204
3	65° 03' 10"	0° -5' 42"	63° 07' 56"	21° 02' 45"	0° 54' 16"	14' 47.22"	79° 38' 52"	0.51811
4	65° 32' 39"	0° -3' 06"	63° 38' 33"	21° 10' 35"	0° 54' 16"	14' 47.23"	79° 49' 49"	0.51417
5	66° 02' 09"	0° 00'-32"	64° 09' 14"	21° 18' 16"	0° 54' 16"	14' 47.24"	80° 0' 52"	0.51023
6	66° 31' 39"	0° 02' 05"	64° 39' 57"	21° 25' 54"	0° 54' 16"	14' 47.25"	80° 12' 02"	0.50629
7	67° 01' 09"	0° 04' 42"	65° 10' 44"	21° 33' 27"	0° 54' 16"	14' 47.27"	80° 23' 17"	0.50235
8	67° 30' 39"	0° 07' 18"	65° 41' 34"	21° 40' 54"	0° 54' 16"	14' 47.30"	80° 34' 39"	0.49841
9	68° 00' 09"	0° 09' 55"	66° 12' 27"	21° 48' 16"	0° 54' 16"	14' 47.33"	80° 46' 07"	0.49447
10	68° 29' 40"	0° 12' 31"	66° 43' 24"	21° 55' 31"	0° 54' 16"	14' 47.36"	80° 57' 40"	0.49053
11	68° 59' 10"	0° 15' 08"	67° 14' 24"	22° 02' 41"	0° 54' 17"	14' 47.40"	81° 9' 20"	0.48659
12	69° 28' 41"	0° 17' 44"	67° 45' 27"	22° 09' 45"	0° 54' 17"	14' 47.45"	81° 21' 06"	0.48265
13	69° 58' 12"	0° 20' 20"	68° 16' 33"	22° 16' 44"	0° 54' 17"	14' 47.50"	81° 32' 57"	0.47871
14	70° 27' 43"	0° 22' 57"	68° 47' 43"	22° 23' 36"	0° 54' 17"	14' 47.55"	81° 44' 54"	0.47478
15	70° 57' 14"	0° 25' 33"	69° 18' 56"	22° 30' 22"	0° 54' 17"	14' 47.61"	81° 56' 58"	0.47084
16	71° 26' 46"	0° 28' 09"	69° 50' 12"	22° 37' 03"	0° 54' 18"	14' 47.67"	82° 9' 07"	0.46690
17	71° 56' 18"	0° 30' 45"	70° 21' 32"	22° 43' 37"	0° 54' 18"	14' 47.74"	82° 21' 21"	0.46297
18	72° 25' 50"	0° 33' 21"	70° 52' 55"	22° 50' 06"	0° 54' 18"	14' 47.82"	82° 33' 42"	0.45903
19	72° 55' 23"	0° 35' 56"	71° 24' 22"	22° 56' 28"	0° 54' 18"	14' 47.90"	82° 46' 08"	0.45510
20	73° 24' 56"	0° 38' 32"	71° 55' 51"	23° 02' 44"	0° 54' 19"	14' 47.98"	82° 58' 40"	0.45117
21	73° 54' 29"	0° 41' 08"	72° 27' 24"	23° 08' 54"	0° 54' 19"	14' 48.07"	83° 11' 17"	0.44724
22	74° 24' 03"	0° 43' 43"	72° 59' 01"	23° 14' 58"	0° 54' 19"	14' 48.16"	83° 24' 00"	0.44332
23	74° 53' 38"	0° 46' 18"	73° 30' 40"	23° 20' 56"	0° 54' 20"	14' 48.26"	83° 36' 49"	0.43940
24	75° 23' 12"	0° 48' 53"	74° 02' 23"	23° 26' 47"	0° 54' 20"	14' 48.36"	83° 49' 43"	0.43547

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	157° 49' 35"	0.11"	159° 29' 19"	8° 38' 15"	1.0095081	15' 50.59"	23° 26' 15"	0 m-25 s
1	157° 52' 00"	0.12"	159° 31' 35"	8° 37' 20"	1.0094986	15' 50.60"	23° 26' 15"	0 m-24 s
2	157° 54' 25"	0.12"	159° 33' 51"	8° 36' 26"	1.0094891	15' 50.61"	23° 26' 15"	0 m-23 s
3	157° 56' 50"	0.13"	159° 36' 07"	8° 35' 32"	1.0094796	15' 50.62"	23° 26' 15"	0 m-23 s
4	157° 59' 15"	0.14"	159° 38' 23"	8° 34' 38"	1.0094701	15' 50.63"	23° 26' 15"	0 m-22 s
5	158° 01' 40"	0.14"	159° 40' 40"	8° 33' 44"	1.0094605	15' 50.64"	23° 26' 15"	0 m-21 s
6	158° 04' 06"	0.15"	159° 42' 56"	8° 32' 50"	1.0094510	15' 50.65"	23° 26' 15"	0 m-20 s
7	158° 06' 31"	0.15"	159° 45' 12"	8° 31' 56"	1.0094415	15' 50.65"	23° 26' 15"	0 m-20 s
8	158° 08' 56"	0.16"	159° 47' 28"	8° 31' 02"	1.0094320	15' 50.66"	23° 26' 15"	0 m-19 s
9	158° 11' 21"	0.16"	159° 49' 44"	8° 30' 08"	1.0094224	15' 50.67"	23° 26' 15"	0 m-18 s
10	158° 13' 46"	0.17"	159° 52' 00"	8° 29' 13"	1.0094129	15' 50.68"	23° 26' 15"	0 m-17 s
11	158° 16' 11"	0.17"	159° 54' 16"	8° 28' 19"	1.0094034	15' 50.69"	23° 26' 15"	0 m-16 s
12	158° 18' 36"	0.18"	159° 56' 32"	8° 27' 25"	1.0093938	15' 50.70"	23° 26' 15"	0 m-16 s
13	158° 21' 01"	0.18"	159° 58' 48"	8° 26' 31"	1.0093843	15' 50.71"	23° 26' 15"	0 m-15 s
14	158° 23' 26"	0.19"	160° 01' 04"	8° 25' 37"	1.0093747	15' 50.72"	23° 26' 15"	0 m-14 s
15	158° 25' 51"	0.19"	160° 03' 21"	8° 24' 42"	1.0093651	15' 50.73"	23° 26' 15"	0 m-13 s
16	158° 28' 17"	0.20"	160° 05' 37"	8° 23' 48"	1.0093556	15' 50.74"	23° 26' 15"	0 m-13 s
17	158° 30' 42"	0.20"	160° 07' 53"	8° 22' 54"	1.0093460	15' 50.74"	23° 26' 15"	0 m-12 s
18	158° 33' 07"	0.21"	160° 10' 09"	8° 21' 60"	1.0093364	15' 50.75"	23° 26' 15"	0 m-11 s
19	158° 35' 32"	0.21"	160° 12' 25"	8° 21' 05"	1.0093268	15' 50.76"	23° 26' 15"	0 m-10 s
20	158° 37' 57"	0.22"	160° 14' 41"	8° 20' 11"	1.0093172	15' 50.77"	23° 26' 15"	0 m -9 s
21	158° 40' 22"	0.22"	160° 16' 57"	8° 19' 17"	1.0093076	15' 50.78"	23° 26' 15"	0 m -9 s
22	158° 42' 47"	0.23"	160° 19' 13"	8° 18' 22"	1.0092980	15' 50.79"	23° 26' 15"	0 m -8 s
23	158° 45' 12"	0.23"	160° 21' 29"	8° 17' 28"	1.0092884	15' 50.80"	23° 26' 15"	0 m -7 s
24	158° 47' 38"	0.24"	160° 23' 45"	8° 16' 33"	1.0092788	15' 50.81"	23° 26' 15"	0 m -6 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	75° 23' 12"	0° 48' 53"	74° 02' 23"	23° 26' 47"	0° 54' 20"	14' 48.36"	83° 49' 43"	0.43547
1	75° 52' 48"	0° 51' 28"	74° 34' 09"	23° 32' 32"	0° 54' 20"	14' 48.47"	84° 2' 42"	0.43156
2	76° 22' 24"	0° 54' 03"	75° 05' 59"	23° 38' 11"	0° 54' 21"	14' 48.59"	84° 15' 47"	0.42764
3	76° 51' 60"	0° 56' 37"	75° 37' 51"	23° 43' 43"	0° 54' 21"	14' 48.70"	84° 28' 57"	0.42373
4	77° 21' 37"	0° 59' 11"	76° 09' 47"	23° 49' 08"	0° 54' 22"	14' 48.83"	84° 42' 12"	0.41982
5	77° 51' 14"	1° 01' 45"	76° 41' 47"	23° 54' 28"	0° 54' 22"	14' 48.95"	84° 55' 33"	0.41592
6	78° 20' 53"	1° 04' 19"	77° 13' 49"	23° 59' 40"	0° 54' 23"	14' 49.09"	85° 8' 59"	0.41202
7	78° 50' 31"	1° 06' 52"	77° 45' 55"	24° 04' 46"	0° 54' 23"	14' 49.22"	85° 22' 30"	0.40812
8	79° 20' 11"	1° 09' 26"	78° 18' 03"	24° 09' 46"	0° 54' 24"	14' 49.37"	85° 36' 07"	0.40423
9	79° 49' 51"	1° 11' 59"	78° 50' 15"	24° 14' 39"	0° 54' 24"	14' 49.51"	85° 49' 48"	0.40034
10	80° 19' 32"	1° 14' 31"	79° 22' 31"	24° 19' 25"	0° 54' 25"	14' 49.66"	86° 3' 34"	0.39646
11	80° 49' 14"	1° 17' 04"	79° 54' 49"	24° 24' 04"	0° 54' 25"	14' 49.82"	86° 17' 26"	0.39258
12	81° 18' 56"	1° 19' 36"	80° 27' 10"	24° 28' 37"	0° 54' 26"	14' 49.98"	86° 31' 22"	0.38871
13	81° 48' 39"	1° 22' 08"	80° 59' 35"	24° 33' 03"	0° 54' 27"	14' 50.15"	86° 45' 23"	0.38484
14	82° 18' 23"	1° 24' 40"	81° 32' 02"	24° 37' 22"	0° 54' 27"	14' 50.32"	86° 59' 29"	0.38098
15	82° 48' 08"	1° 27' 11"	82° 04' 33"	24° 41' 34"	0° 54' 28"	14' 50.49"	87° 13' 40"	0.37713
16	83° 17' 53"	1° 29' 42"	82° 37' 07"	24° 45' 40"	0° 54' 29"	14' 50.67"	87° 27' 56"	0.37328
17	83° 47' 40"	1° 32' 12"	83° 09' 43"	24° 49' 38"	0° 54' 29"	14' 50.85"	87° 42' 16"	0.36943
18	84° 17' 27"	1° 34' 42"	83° 42' 23"	24° 53' 29"	0° 54' 30"	14' 51.04"	87° 56' 41"	0.36559
19	84° 47' 16"	1° 37' 12"	84° 15' 06"	24° 57' 14"	0° 54' 31"	14' 51.24"	88° 11' 11"	0.36176
20	85° 17' 05"	1° 39' 42"	84° 47' 51"	25° 00' 51"	0° 54' 31"	14' 51.43"	88° 25' 45"	0.35794
21	85° 46' 55"	1° 42' 11"	85° 20' 39"	25° 04' 21"	0° 54' 32"	14' 51.64"	88° 40' 24"	0.35412
22	86° 16' 46"	1° 44' 40"	85° 53' 31"	25° 07' 44"	0° 54' 33"	14' 51.84"	88° 55' 07"	0.35031
23	86° 46' 38"	1° 47' 08"	86° 26' 25"	25° 10' 60"	0° 54' 34"	14' 52.05"	89° 9' 54"	0.34651
24	87° 16' 32"	1° 49' 36"	86° 59' 21"	25° 14' 09"	0° 54' 34"	14' 52.27"	89° 24' 46"	0.34271

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	158° 47' 38"	0.24"	160° 23' 45"	8° 16' 33"	1.0092788	15' 50.81"	23° 26' 15"	0 m -6 s
1	158° 50' 03"	0.24"	160° 26' 01"	8° 15' 39"	1.0092692	15' 50.82"	23° 26' 15"	0 m -5 s
2	158° 52' 28"	0.25"	160° 28' 17"	8° 14' 45"	1.0092595	15' 50.83"	23° 26' 15"	0 m -5 s
3	158° 54' 53"	0.25"	160° 30' 33"	8° 13' 50"	1.0092499	15' 50.83"	23° 26' 15"	0 m -4 s
4	158° 57' 18"	0.25"	160° 32' 49"	8° 12' 56"	1.0092403	15' 50.84"	23° 26' 15"	0 m -3 s
5	158° 59' 43"	0.26"	160° 35' 05"	8° 12' 01"	1.0092306	15' 50.85"	23° 26' 15"	0 m -2 s
6	159° 02' 09"	0.26"	160° 37' 21"	8° 11' 07"	1.0092210	15' 50.86"	23° 26' 15"	0 m -1 s
7	159° 04' 34"	0.27"	160° 39' 36"	8° 10' 12"	1.0092113	15' 50.87"	23° 26' 15"	0 m -1 s
8	159° 06' 59"	0.27"	160° 41' 52"	8° 09' 18"	1.0092017	15' 50.88"	23° 26' 15"	0 m 00 s
9	159° 09' 24"	0.28"	160° 44' 08"	8° 08' 23"	1.0091920	15' 50.89"	23° 26' 15"	0 m 01 s
10	159° 11' 49"	0.28"	160° 46' 24"	8° 07' 29"	1.0091823	15' 50.90"	23° 26' 15"	0 m 02 s
11	159° 14' 14"	0.29"	160° 48' 40"	8° 06' 34"	1.0091727	15' 50.91"	23° 26' 15"	0 m 02 s
12	159° 16' 40"	0.29"	160° 50' 56"	8° 05' 40"	1.0091630	15' 50.92"	23° 26' 15"	0 m 03 s
13	159° 19' 05"	0.30"	160° 53' 12"	8° 04' 45"	1.0091533	15' 50.93"	23° 26' 15"	0 m 04 s
14	159° 21' 30"	0.30"	160° 55' 28"	8° 03' 51"	1.0091436	15' 50.94"	23° 26' 15"	0 m 05 s
15	159° 23' 55"	0.31"	160° 57' 44"	8° 02' 56"	1.0091339	15' 50.94"	23° 26' 15"	0 m 06 s
16	159° 26' 20"	0.31"	160° 59' 60"	8° 02' 02"	1.0091242	15' 50.95"	23° 26' 15"	0 m 06 s
17	159° 28' 46"	0.31"	161° 02' 16"	8° 01' 07"	1.0091145	15' 50.96"	23° 26' 15"	0 m 07 s
18	159° 31' 11"	0.32"	161° 04' 31"	8° 00' 12"	1.0091048	15' 50.97"	23° 26' 15"	0 m 08 s
19	159° 33' 36"	0.32"	161° 06' 47"	7° 59' 18"	1.0090951	15' 50.98"	23° 26' 15"	0 m 09 s
20	159° 36' 01"	0.33"	161° 09' 03"	7° 58' 23"	1.0090853	15' 50.99"	23° 26' 15"	0 m 10 s
21	159° 38' 26"	0.33"	161° 11' 19"	7° 57' 28"	1.0090756	15' 51.00"	23° 26' 15"	0 m 10 s
22	159° 40' 52"	0.34"	161° 13' 35"	7° 56' 34"	1.0090659	15' 51.01"	23° 26' 15"	0 m 11 s
23	159° 43' 17"	0.34"	161° 15' 51"	7° 55' 39"	1.0090561	15' 51.02"	23° 26' 15"	0 m 12 s
24	159° 45' 42"	0.34"	161° 18' 06"	7° 54' 44"	1.0090464	15' 51.03"	23° 26' 15"	0 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	87° 16' 32"	1° 49' 36"	86° 59' 21"	25° 14' 09"	0° 54' 34"	14' 52.27"	89° 24' 46"	0.34271
1	87° 46' 26"	1° 52' 03"	87° 32' 21"	25° 17' 10"	0° 54' 35"	14' 52.49"	89° 39' 42"	0.33893
2	88° 16' 21"	1° 54' 30"	88° 05' 23"	25° 20' 04"	0° 54' 36"	14' 52.72"	89° 54' 42"	0.33515
3	88° 46' 18"	1° 56' 57"	88° 38' 28"	25° 22' 51"	0° 54' 37"	14' 52.94"	90° 9' 47"	0.33137
4	89° 16' 15"	1° 59' 23"	89° 11' 36"	25° 25' 31"	0° 54' 38"	14' 53.18"	90° 24' 55"	0.32761
5	89° 46' 14"	2° 01' 49"	89° 44' 46"	25° 28' 03"	0° 54' 39"	14' 53.42"	90° 40' 08"	0.32386
6	90° 16' 14"	2° 04' 14"	90° 17' 58"	25° 30' 28"	0° 54' 39"	14' 53.66"	90° 55' 25"	0.32011
7	90° 46' 15"	2° 06' 38"	90° 51' 14"	25° 32' 46"	0° 54' 40"	14' 53.91"	91° 10' 45"	0.31638
8	91° 16' 17"	2° 09' 03"	91° 24' 31"	25° 34' 56"	0° 54' 41"	14' 54.16"	91° 26' 10"	0.31265
9	91° 46' 21"	2° 11' 26"	91° 57' 51"	25° 36' 58"	0° 54' 42"	14' 54.41"	91° 41' 38"	0.30893
10	92° 16' 25"	2° 13' 49"	92° 31' 14"	25° 38' 53"	0° 54' 43"	14' 54.67"	91° 57' 11"	0.30523
11	92° 46' 31"	2° 16' 12"	93° 04' 39"	25° 40' 41"	0° 54' 44"	14' 54.94"	92° 12' 47"	0.30153
12	93° 16' 39"	2° 18' 34"	93° 38' 06"	25° 42' 21"	0° 54' 45"	14' 55.20"	92° 28' 26"	0.29784
13	93° 46' 47"	2° 20' 55"	94° 11' 35"	25° 43' 53"	0° 54' 46"	14' 55.48"	92° 44' 10"	0.29417
14	94° 16' 57"	2° 23' 16"	94° 45' 06"	25° 45' 18"	0° 54' 47"	14' 55.75"	92° 59' 56"	0.29050
15	94° 47' 08"	2° 25' 37"	95° 18' 40"	25° 46' 35"	0° 54' 48"	14' 56.03"	93° 15' 47"	0.28685
16	95° 17' 21"	2° 27' 57"	95° 52' 16"	25° 47' 44"	0° 54' 49"	14' 56.32"	93° 31' 41"	0.28320
17	95° 47' 35"	2° 30' 16"	96° 25' 54"	25° 48' 46"	0° 54' 50"	14' 56.61"	93° 47' 38"	0.27957
18	96° 17' 50"	2° 32' 34"	96° 59' 33"	25° 49' 40"	0° 54' 51"	14' 56.90"	94° 3' 39"	0.27595
19	96° 48' 07"	2° 34' 52"	97° 33' 15"	25° 50' 26"	0° 54' 52"	14' 57.20"	94° 19' 43"	0.27234
20	97° 18' 26"	2° 37' 10"	98° 06' 59"	25° 51' 05"	0° 54' 54"	14' 57.50"	94° 35' 51"	0.26875
21	97° 48' 45"	2° 39' 26"	98° 40' 44"	25° 51' 35"	0° 54' 55"	14' 57.80"	94° 52' 01"	0.26516
22	98° 19' 07"	2° 41' 42"	99° 14' 31"	25° 51' 58"	0° 54' 56"	14' 58.11"	95° 8' 15"	0.26159
23	98° 49' 29"	2° 43' 58"	99° 48' 20"	25° 52' 14"	0° 54' 57"	14' 58.42"	95° 24' 32"	0.25803
24	99° 19' 54"	2° 46' 12"	100° 22' 11"	25° 52' 21"	0° 54' 58"	14' 58.74"	95° 40' 52"	0.25449

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	159° 45' 42"	0.34"	161° 18' 06"	7° 54' 44"	1.0090464	15' 51.03"	23° 26' 15"	0 m 13 s
1	159° 48' 07"	0.35"	161° 20' 22"	7° 53' 50"	1.0090366	15' 51.04"	23° 26' 15"	0 m 14 s
2	159° 50' 32"	0.35"	161° 22' 38"	7° 52' 55"	1.0090269	15' 51.05"	23° 26' 15"	0 m 14 s
3	159° 52' 58"	0.36"	161° 24' 54"	7° 52' 00"	1.0090171	15' 51.05"	23° 26' 15"	0 m 15 s
4	159° 55' 23"	0.36"	161° 27' 10"	7° 51' 05"	1.0090073	15' 51.06"	23° 26' 15"	0 m 16 s
5	159° 57' 48"	0.36"	161° 29' 25"	7° 50' 11"	1.0089976	15' 51.07"	23° 26' 15"	0 m 17 s
6	160° 00' 13"	0.37"	161° 31' 41"	7° 49' 16"	1.0089878	15' 51.08"	23° 26' 15"	0 m 18 s
7	160° 02' 39"	0.37"	161° 33' 57"	7° 48' 21"	1.0089780	15' 51.09"	23° 26' 15"	0 m 18 s
8	160° 05' 04"	0.38"	161° 36' 13"	7° 47' 26"	1.0089682	15' 51.10"	23° 26' 15"	0 m 19 s
9	160° 07' 29"	0.38"	161° 38' 28"	7° 46' 31"	1.0089584	15' 51.11"	23° 26' 15"	0 m 20 s
10	160° 09' 54"	0.38"	161° 40' 44"	7° 45' 37"	1.0089486	15' 51.12"	23° 26' 15"	0 m 21 s
11	160° 12' 20"	0.39"	161° 42' 60"	7° 44' 42"	1.0089388	15' 51.13"	23° 26' 15"	0 m 22 s
12	160° 14' 45"	0.39"	161° 45' 16"	7° 43' 47"	1.0089290	15' 51.14"	23° 26' 15"	0 m 23 s
13	160° 17' 10"	0.40"	161° 47' 31"	7° 42' 52"	1.0089191	15' 51.15"	23° 26' 15"	0 m 23 s
14	160° 19' 35"	0.40"	161° 49' 47"	7° 41' 57"	1.0089093	15' 51.16"	23° 26' 15"	0 m 24 s
15	160° 22' 01"	0.40"	161° 52' 03"	7° 41' 02"	1.0088995	15' 51.17"	23° 26' 15"	0 m 25 s
16	160° 24' 26"	0.41"	161° 54' 19"	7° 40' 07"	1.0088896	15' 51.17"	23° 26' 15"	0 m 26 s
17	160° 26' 51"	0.41"	161° 56' 34"	7° 39' 12"	1.0088798	15' 51.18"	23° 26' 15"	0 m 27 s
18	160° 29' 17"	0.41"	161° 58' 50"	7° 38' 17"	1.0088699	15' 51.19"	23° 26' 15"	0 m 27 s
19	160° 31' 42"	0.42"	162° 01' 06"	7° 37' 22"	1.0088601	15' 51.20"	23° 26' 15"	0 m 28 s
20	160° 34' 07"	0.42"	162° 03' 21"	7° 36' 28"	1.0088502	15' 51.21"	23° 26' 15"	0 m 29 s
21	160° 36' 32"	0.42"	162° 05' 37"	7° 35' 33"	1.0088404	15' 51.22"	23° 26' 15"	0 m 30 s
22	160° 38' 58"	0.43"	162° 07' 53"	7° 34' 38"	1.0088305	15' 51.23"	23° 26' 15"	0 m 31 s
23	160° 41' 23"	0.43"	162° 10' 08"	7° 33' 43"	1.0088206	15' 51.24"	23° 26' 15"	0 m 31 s
24	160° 43' 48"	0.43"	162° 12' 24"	7° 32' 48"	1.0088107	15' 51.25"	23° 26' 15"	0 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	99° 19' 54"	2° 46' 12"	100° 22' 11"	25° 52' 21"	0° 54' 58"	14' 58.74"	95° 40' 52"	0.25449
1	99° 50' 19"	2° 48' 26"	100° 56' 03"	25° 52' 20"	0° 54' 59"	14' 59.06"	95° 57' 15"	0.25095
2	100° 20' 47"	2° 50' 40"	101° 29' 57"	25° 52' 12"	0° 55' 00"	14' 59.39"	96° 13' 41"	0.24744
3	100° 51' 16"	2° 52' 52"	102° 03' 52"	25° 51' 55"	0° 55' 02"	14' 59.71"	96° 30' 10"	0.24393
4	101° 21' 46"	2° 55' 04"	102° 37' 49"	25° 51' 31"	0° 55' 03"	15' 00.04"	96° 46' 42"	0.24044
5	101° 52' 18"	2° 57' 15"	103° 11' 47"	25° 50' 59"	0° 55' 04"	15' 00.38"	97° 3' 17"	0.23696
6	102° 22' 52"	2° 59' 25"	103° 45' 47"	25° 50' 18"	0° 55' 05"	15' 00.72"	97° 19' 55"	0.23350
7	102° 53' 28"	3° 01' 35"	104° 19' 48"	25° 49' 30"	0° 55' 07"	15' 01.06"	97° 36' 35"	0.23005
8	103° 24' 05"	3° 03' 44"	104° 53' 50"	25° 48' 34"	0° 55' 08"	15' 01.41"	97° 53' 19"	0.22662
9	103° 54' 44"	3° 05' 52"	105° 27' 53"	25° 47' 30"	0° 55' 09"	15' 01.76"	98° 10' 05"	0.22321
10	104° 25' 24"	3° 07' 59"	106° 01' 57"	25° 46' 18"	0° 55' 10"	15' 02.11"	98° 26' 53"	0.21980
11	104° 56' 06"	3° 10' 06"	106° 36' 02"	25° 44' 58"	0° 55' 12"	15' 02.47"	98° 43' 45"	0.21642
12	105° 26' 50"	3° 12' 11"	107° 10' 09"	25° 43' 29"	0° 55' 13"	15' 02.83"	99° 0' 39"	0.21305
13	105° 57' 36"	3° 14' 16"	107° 44' 16"	25° 41' 53"	0° 55' 14"	15' 03.19"	99° 17' 35"	0.20970
14	106° 28' 23"	3° 16' 20"	108° 18' 24"	25° 40' 09"	0° 55' 16"	15' 03.56"	99° 34' 35"	0.20636
15	106° 59' 12"	3° 18' 23"	108° 52' 33"	25° 38' 17"	0° 55' 17"	15' 03.93"	99° 51' 37"	0.20304
16	107° 30' 03"	3° 20' 26"	109° 26' 42"	25° 36' 16"	0° 55' 19"	15' 04.30"	100° 8' 41"	0.19974
17	108° 00' 56"	3° 22' 27"	110° 00' 52"	25° 34' 08"	0° 55' 20"	15' 04.67"	100° 25' 48"	0.19645
18	108° 31' 51"	3° 24' 28"	110° 35' 03"	25° 31' 51"	0° 55' 21"	15' 05.05"	100° 42' 58"	0.19318
19	109° 02' 47"	3° 26' 27"	111° 09' 15"	25° 29' 27"	0° 55' 23"	15' 05.44"	101° 0' 10"	0.18993
20	109° 33' 46"	3° 28' 26"	111° 43' 27"	25° 26' 54"	0° 55' 24"	15' 05.82"	101° 17' 25"	0.18670
21	110° 04' 46"	3° 30' 24"	112° 17' 39"	25° 24' 13"	0° 55' 26"	15' 06.21"	101° 34' 42"	0.18349
22	110° 35' 48"	3° 32' 21"	112° 51' 52"	25° 21' 24"	0° 55' 27"	15' 06.60"	101° 52' 02"	0.18029
23	111° 06' 52"	3° 34' 17"	113° 26' 05"	25° 18' 27"	0° 55' 28"	15' 07.00"	102° 9' 24"	0.17712
24	111° 37' 58"	3° 36' 12"	114° 00' 18"	25° 15' 22"	0° 55' 30"	15' 07.39"	102° 26' 49"	0.17396

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	160° 43' 48"	0.43"	162° 12' 24"	7° 32' 48"	1.0088107	15' 51.25"	23° 26' 15"	0 m 32 s
1	160° 46' 14"	0.44"	162° 14' 40"	7° 31' 52"	1.0088008	15' 51.26"	23° 26' 15"	0 m 33 s
2	160° 48' 39"	0.44"	162° 16' 55"	7° 30' 57"	1.0087909	15' 51.27"	23° 26' 15"	0 m 34 s
3	160° 51' 04"	0.44"	162° 19' 11"	7° 30' 02"	1.0087810	15' 51.28"	23° 26' 15"	0 m 35 s
4	160° 53' 30"	0.45"	162° 21' 27"	7° 29' 07"	1.0087711	15' 51.29"	23° 26' 15"	0 m 35 s
5	160° 55' 55"	0.45"	162° 23' 42"	7° 28' 12"	1.0087612	15' 51.30"	23° 26' 15"	0 m 36 s
6	160° 58' 20"	0.45"	162° 25' 58"	7° 27' 17"	1.0087513	15' 51.30"	23° 26' 15"	0 m 37 s
7	161° 00' 45"	0.46"	162° 28' 13"	7° 26' 22"	1.0087413	15' 51.31"	23° 26' 15"	0 m 38 s
8	161° 03' 11"	0.46"	162° 30' 29"	7° 25' 27"	1.0087314	15' 51.32"	23° 26' 15"	0 m 39 s
9	161° 05' 36"	0.46"	162° 32' 45"	7° 24' 32"	1.0087214	15' 51.33"	23° 26' 15"	0 m 40 s
10	161° 08' 01"	0.47"	162° 35' 00"	7° 23' 37"	1.0087115	15' 51.34"	23° 26' 15"	0 m 40 s
11	161° 10' 27"	0.47"	162° 37' 16"	7° 22' 41"	1.0087015	15' 51.35"	23° 26' 15"	0 m 41 s
12	161° 12' 52"	0.47"	162° 39' 31"	7° 21' 46"	1.0086916	15' 51.36"	23° 26' 15"	0 m 42 s
13	161° 15' 17"	0.47"	162° 41' 47"	7° 20' 51"	1.0086816	15' 51.37"	23° 26' 15"	0 m 43 s
14	161° 17' 43"	0.48"	162° 44' 03"	7° 19' 56"	1.0086716	15' 51.38"	23° 26' 15"	0 m 44 s
15	161° 20' 08"	0.48"	162° 46' 18"	7° 19' 01"	1.0086617	15' 51.39"	23° 26' 15"	0 m 44 s
16	161° 22' 34"	0.48"	162° 48' 34"	7° 18' 05"	1.0086517	15' 51.40"	23° 26' 15"	0 m 45 s
17	161° 24' 59"	0.48"	162° 50' 49"	7° 17' 10"	1.0086417	15' 51.41"	23° 26' 15"	0 m 46 s
18	161° 27' 24"	0.49"	162° 53' 05"	7° 16' 15"	1.0086317	15' 51.42"	23° 26' 15"	0 m 47 s
19	161° 29' 50"	0.49"	162° 55' 20"	7° 15' 20"	1.0086217	15' 51.43"	23° 26' 15"	0 m 48 s
20	161° 32' 15"	0.49"	162° 57' 36"	7° 14' 24"	1.0086117	15' 51.44"	23° 26' 16"	0 m 49 s
21	161° 34' 40"	0.49"	162° 59' 51"	7° 13' 29"	1.0086017	15' 51.45"	23° 26' 16"	0 m 49 s
22	161° 37' 06"	0.50"	163° 02' 07"	7° 12' 34"	1.0085916	15' 51.46"	23° 26' 16"	0 m 50 s
23	161° 39' 31"	0.50"	163° 04' 22"	7° 11' 39"	1.0085816	15' 51.46"	23° 26' 16"	0 m 51 s
24	161° 41' 56"	0.50"	163° 06' 38"	7° 10' 43"	1.0085716	15' 51.47"	23° 26' 16"	0 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	111° 37' 58"	3° 36' 12"	114° 00' 18"	25° 15' 22"	0° 55' 30"	15' 07.39"	102° 26' 49"	0.17396
1	112° 09' 06"	3° 38' 06"	114° 34' 31"	25° 12' 09"	0° 55' 31"	15' 07.79"	102° 44' 17"	0.17082
2	112° 40' 16"	3° 39' 59"	115° 08' 45"	25° 08' 48"	0° 55' 33"	15' 08.20"	103° 1' 47"	0.16771
3	113° 11' 27"	3° 41' 51"	115° 42' 59"	25° 05' 18"	0° 55' 34"	15' 08.60"	103° 19' 20"	0.16461
4	113° 42' 41"	3° 43' 42"	116° 17' 12"	25° 01' 41"	0° 55' 36"	15' 09.01"	103° 36' 56"	0.16153
5	114° 13' 57"	3° 45' 32"	116° 51' 26"	24° 57' 56"	0° 55' 37"	15' 09.42"	103° 54' 34"	0.15847
6	114° 45' 15"	3° 47' 21"	117° 25' 40"	24° 54' 02"	0° 55' 39"	15' 09.84"	104° 12' 16"	0.15544
7	115° 16' 34"	3° 49' 09"	117° 59' 53"	24° 50' 00"	0° 55' 40"	15' 10.25"	104° 29' 60"	0.15242
8	115° 47' 56"	3° 50' 56"	118° 34' 06"	24° 45' 51"	0° 55' 42"	15' 10.67"	104° 47' 47"	0.14943
9	116° 19' 20"	3° 52' 41"	119° 08' 19"	24° 41' 33"	0° 55' 43"	15' 11.09"	105° 5' 37"	0.14646
10	116° 50' 45"	3° 54' 26"	119° 42' 32"	24° 37' 07"	0° 55' 45"	15' 11.52"	105° 23' 30"	0.14351
11	117° 22' 13"	3° 56' 10"	120° 16' 44"	24° 32' 34"	0° 55' 47"	15' 11.94"	105° 41' 26"	0.14058
12	117° 53' 43"	3° 57' 52"	120° 50' 56"	24° 27' 52"	0° 55' 48"	15' 12.37"	105° 59' 26"	0.13768
13	118° 25' 15"	3° 59' 34"	121° 25' 07"	24° 23' 02"	0° 55' 50"	15' 12.80"	106° 17' 29"	0.13479
14	118° 56' 49"	4° 01' 14"	121° 59' 18"	24° 18' 04"	0° 55' 51"	15' 13.23"	106° 35' 35"	0.13193
15	119° 28' 25"	4° 02' 53"	122° 33' 28"	24° 12' 58"	0° 55' 53"	15' 13.67"	106° 53' 45"	0.12910
16	120° 00' 03"	4° 04' 32"	123° 07' 37"	24° 07' 45"	0° 55' 55"	15' 14.10"	107° 11' 59"	0.12628
17	120° 31' 43"	4° 06' 08"	123° 41' 46"	24° 02' 23"	0° 55' 56"	15' 14.54"	107° 30' 17"	0.12349
18	121° 03' 26"	4° 07' 44"	124° 15' 54"	23° 56' 54"	0° 55' 58"	15' 14.98"	107° 48' 39"	0.12073
19	121° 35' 10"	4° 09' 19"	124° 50' 02"	23° 51' 16"	0° 55' 59"	15' 15.43"	108° 7' 05"	0.11799
20	122° 06' 57"	4° 10' 52"	125° 24' 08"	23° 45' 31"	0° 56' 01"	15' 15.87"	108° 25' 36"	0.11527
21	122° 38' 45"	4° 12' 24"	125° 58' 13"	23° 39' 37"	0° 56' 03"	15' 16.32"	108° 44' 11"	0.11258
22	123° 10' 36"	4° 13' 55"	126° 32' 18"	23° 33' 36"	0° 56' 04"	15' 16.77"	109° 2' 52"	0.10992
23	123° 42' 29"	4° 15' 25"	127° 06' 21"	23° 27' 27"	0° 56' 06"	15' 17.21"	109° 21' 37"	0.10728
24	124° 14' 25"	4° 16' 53"	127° 40' 24"	23° 21' 11"	0° 56' 08"	15' 17.67"	109° 40' 28"	0.10466

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	161° 41' 56"	0.50"	163° 06' 38"	7° 10' 43"	1.0085716	15' 51.47"	23° 26' 16"	0 m 52 s
1	161° 44' 22"	0.50"	163° 08' 53"	7° 09' 48"	1.0085615	15' 51.48"	23° 26' 16"	0 m 53 s
2	161° 46' 47"	0.51"	163° 11' 09"	7° 08' 53"	1.0085515	15' 51.49"	23° 26' 16"	0 m 54 s
3	161° 49' 13"	0.51"	163° 13' 24"	7° 07' 57"	1.0085414	15' 51.50"	23° 26' 16"	0 m 54 s
4	161° 51' 38"	0.51"	163° 15' 40"	7° 07' 02"	1.0085314	15' 51.51"	23° 26' 16"	0 m 55 s
5	161° 54' 03"	0.51"	163° 17' 55"	7° 06' 06"	1.0085213	15' 51.52"	23° 26' 16"	0 m 56 s
6	161° 56' 29"	0.51"	163° 20' 11"	7° 05' 11"	1.0085113	15' 51.53"	23° 26' 16"	0 m 57 s
7	161° 58' 54"	0.52"	163° 22' 26"	7° 04' 16"	1.0085012	15' 51.54"	23° 26' 16"	0 m 58 s
8	162° 01' 20"	0.52"	163° 24' 42"	7° 03' 20"	1.0084911	15' 51.55"	23° 26' 16"	0 m 58 s
9	162° 03' 45"	0.52"	163° 26' 57"	7° 02' 25"	1.0084810	15' 51.56"	23° 26' 16"	0 m 59 s
10	162° 06' 10"	0.52"	163° 29' 13"	7° 01' 29"	1.0084709	15' 51.57"	23° 26' 16"	1 m 00 s
11	162° 08' 36"	0.52"	163° 31' 28"	7° 00' 34"	1.0084608	15' 51.58"	23° 26' 16"	1 m 01 s
12	162° 11' 01"	0.52"	163° 33' 44"	6° 59' 38"	1.0084507	15' 51.59"	23° 26' 16"	1 m 02 s
13	162° 13' 27"	0.53"	163° 35' 59"	6° 58' 43"	1.0084406	15' 51.60"	23° 26' 16"	1 m 03 s
14	162° 15' 52"	0.53"	163° 38' 14"	6° 57' 47"	1.0084305	15' 51.61"	23° 26' 16"	1 m 03 s
15	162° 18' 17"	0.53"	163° 40' 30"	6° 56' 52"	1.0084203	15' 51.62"	23° 26' 16"	1 m 04 s
16	162° 20' 43"	0.53"	163° 42' 45"	6° 55' 56"	1.0084102	15' 51.63"	23° 26' 16"	1 m 05 s
17	162° 23' 08"	0.53"	163° 45' 01"	6° 55' 01"	1.0084001	15' 51.64"	23° 26' 16"	1 m 06 s
18	162° 25' 34"	0.53"	163° 47' 16"	6° 54' 05"	1.0083899	15' 51.65"	23° 26' 16"	1 m 07 s
19	162° 27' 59"	0.54"	163° 49' 31"	6° 53' 10"	1.0083798	15' 51.66"	23° 26' 16"	1 m 08 s
20	162° 30' 25"	0.54"	163° 51' 47"	6° 52' 14"	1.0083696	15' 51.66"	23° 26' 16"	1 m 08 s
21	162° 32' 50"	0.54"	163° 54' 02"	6° 51' 19"	1.0083594	15' 51.67"	23° 26' 16"	1 m 09 s
22	162° 35' 16"	0.54"	163° 56' 17"	6° 50' 23"	1.0083493	15' 51.68"	23° 26' 16"	1 m 10 s
23	162° 37' 41"	0.54"	163° 58' 33"	6° 49' 27"	1.0083391	15' 51.69"	23° 26' 16"	1 m 11 s
24	162° 40' 06"	0.54"	164° 00' 48"	6° 48' 32"	1.0083289	15' 51.70"	23° 26' 16"	1 m 12 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	124° 14' 25"	4° 16' 53"	127° 40' 24"	23° 21' 11"	0° 56' 08"	15' 17.67"	109° 40' 28"	0.10466
1	124° 46' 22"	4° 18' 21"	128° 14' 25"	23° 14' 46"	0° 56' 09"	15' 18.12"	109° 59' 25"	0.10208
2	125° 18' 21"	4° 19' 46"	128° 48' 26"	23° 08' 14"	0° 56' 11"	15' 18.57"	110° 18' 27"	0.09951
3	125° 50' 23"	4° 21' 11"	129° 22' 25"	23° 01' 34"	0° 56' 13"	15' 19.03"	110° 37' 36"	0.09698
4	126° 22' 27"	4° 22' 34"	129° 56' 23"	22° 54' 46"	0° 56' 14"	15' 19.49"	110° 56' 52"	0.09447
5	126° 54' 33"	4° 23' 57"	130° 30' 19"	22° 47' 51"	0° 56' 16"	15' 19.95"	111° 16' 14"	0.09199
6	127° 26' 41"	4° 25' 17"	131° 04' 15"	22° 40' 48"	0° 56' 18"	15' 20.41"	111° 35' 45"	0.08954
7	127° 58' 52"	4° 26' 37"	131° 38' 09"	22° 33' 37"	0° 56' 19"	15' 20.87"	111° 55' 23"	0.08711
8	128° 31' 04"	4° 27' 55"	132° 12' 01"	22° 26' 19"	0° 56' 21"	15' 21.33"	112° 15' 09"	0.08471
9	129° 03' 19"	4° 29' 12"	132° 45' 53"	22° 18' 53"	0° 56' 23"	15' 21.79"	112° 35' 04"	0.08235
10	129° 35' 36"	4° 30' 27"	133° 19' 42"	22° 11' 20"	0° 56' 24"	15' 22.26"	112° 55' 09"	0.08001
11	130° 07' 56"	4° 31' 41"	133° 53' 31"	22° 03' 39"	0° 56' 26"	15' 22.72"	113° 15' 24"	0.07769
12	130° 40' 17"	4° 32' 54"	134° 27' 17"	21° 55' 50"	0° 56' 28"	15' 23.19"	113° 35' 49"	0.07541
13	131° 12' 41"	4° 34' 05"	135° 01' 03"	21° 47' 55"	0° 56' 30"	15' 23.66"	113° 56' 26"	0.07316
14	131° 45' 07"	4° 35' 15"	135° 34' 46"	21° 39' 52"	0° 56' 31"	15' 24.13"	114° 17' 14"	0.07094
15	132° 17' 35"	4° 36' 23"	136° 08' 28"	21° 31' 41"	0° 56' 33"	15' 24.60"	114° 38' 15"	0.06874
16	132° 50' 05"	4° 37' 30"	136° 42' 09"	21° 23' 23"	0° 56' 35"	15' 25.07"	114° 59' 30"	0.06658
17	133° 22' 37"	4° 38' 36"	137° 15' 48"	21° 14' 58"	0° 56' 36"	15' 25.54"	115° 20' 60"	0.06445
18	133° 55' 12"	4° 39' 40"	137° 49' 25"	21° 06' 26"	0° 56' 38"	15' 26.01"	115° 42' 44"	0.06235
19	134° 27' 49"	4° 40' 43"	138° 23' 00"	20° 57' 46"	0° 56' 40"	15' 26.48"	116° 4' 46"	0.06028
20	135° 00' 28"	4° 41' 44"	138° 56' 34"	20° 48' 60"	0° 56' 42"	15' 26.95"	116° 27' 04"	0.05824
21	135° 33' 10"	4° 42' 44"	139° 30' 05"	20° 40' 06"	0° 56' 43"	15' 27.42"	116° 49' 42"	0.05623
22	136° 05' 53"	4° 43' 42"	140° 03' 36"	20° 31' 05"	0° 56' 45"	15' 27.89"	117° 12' 39"	0.05426
23	136° 38' 39"	4° 44' 39"	140° 37' 04"	20° 21' 57"	0° 56' 47"	15' 28.37"	117° 35' 58"	0.05232
24	137° 11' 27"	4° 45' 34"	141° 10' 30"	20° 12' 42"	0° 56' 49"	15' 28.84"	117° 59' 40"	0.05041

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	162° 40' 06"	0.54"	164° 00' 48"	6° 48' 32"	1.0083289	15' 51.70"	23° 26' 16"	1 m 12 s
1	162° 42' 32"	0.54"	164° 03' 04"	6° 47' 36"	1.0083187	15' 51.71"	23° 26' 16"	1 m 13 s
2	162° 44' 57"	0.54"	164° 05' 19"	6° 46' 41"	1.0083085	15' 51.72"	23° 26' 16"	1 m 13 s
3	162° 47' 23"	0.54"	164° 07' 34"	6° 45' 45"	1.0082983	15' 51.73"	23° 26' 16"	1 m 14 s
4	162° 49' 48"	0.54"	164° 09' 50"	6° 44' 49"	1.0082881	15' 51.74"	23° 26' 16"	1 m 15 s
5	162° 52' 14"	0.55"	164° 12' 05"	6° 43' 54"	1.0082779	15' 51.75"	23° 26' 16"	1 m 16 s
6	162° 54' 39"	0.55"	164° 14' 20"	6° 42' 58"	1.0082676	15' 51.76"	23° 26' 16"	1 m 17 s
7	162° 57' 05"	0.55"	164° 16' 36"	6° 42' 02"	1.0082574	15' 51.77"	23° 26' 16"	1 m 18 s
8	162° 59' 30"	0.55"	164° 18' 51"	6° 41' 07"	1.0082472	15' 51.78"	23° 26' 16"	1 m 18 s
9	163° 01' 56"	0.55"	164° 21' 06"	6° 40' 11"	1.0082369	15' 51.79"	23° 26' 16"	1 m 19 s
10	163° 04' 21"	0.55"	164° 23' 21"	6° 39' 15"	1.0082267	15' 51.80"	23° 26' 16"	1 m 20 s
11	163° 06' 47"	0.55"	164° 25' 37"	6° 38' 19"	1.0082164	15' 51.81"	23° 26' 16"	1 m 21 s
12	163° 09' 12"	0.55"	164° 27' 52"	6° 37' 24"	1.0082062	15' 51.82"	23° 26' 16"	1 m 22 s
13	163° 11' 38"	0.55"	164° 30' 07"	6° 36' 28"	1.0081959	15' 51.83"	23° 26' 16"	1 m 23 s
14	163° 14' 03"	0.55"	164° 32' 23"	6° 35' 32"	1.0081856	15' 51.84"	23° 26' 16"	1 m 23 s
15	163° 16' 29"	0.55"	164° 34' 38"	6° 34' 36"	1.0081753	15' 51.85"	23° 26' 16"	1 m 24 s
16	163° 18' 54"	0.55"	164° 36' 53"	6° 33' 41"	1.0081651	15' 51.86"	23° 26' 16"	1 m 25 s
17	163° 21' 20"	0.55"	164° 39' 08"	6° 32' 45"	1.0081548	15' 51.87"	23° 26' 16"	1 m 26 s
18	163° 23' 45"	0.55"	164° 41' 24"	6° 31' 49"	1.0081445	15' 51.88"	23° 26' 16"	1 m 27 s
19	163° 26' 11"	0.55"	164° 43' 39"	6° 30' 53"	1.0081342	15' 51.89"	23° 26' 16"	1 m 28 s
20	163° 28' 36"	0.55"	164° 45' 54"	6° 29' 57"	1.0081238	15' 51.90"	23° 26' 16"	1 m 28 s
21	163° 31' 02"	0.55"	164° 48' 09"	6° 29' 01"	1.0081135	15' 51.91"	23° 26' 16"	1 m 29 s
22	163° 33' 27"	0.55"	164° 50' 25"	6° 28' 06"	1.0081032	15' 51.92"	23° 26' 16"	1 m 30 s
23	163° 35' 53"	0.55"	164° 52' 40"	6° 27' 10"	1.0080929	15' 51.93"	23° 26' 16"	1 m 31 s
24	163° 38' 18"	0.55"	164° 54' 55"	6° 26' 14"	1.0080825	15' 51.94"	23° 26' 16"	1 m 32 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	137° 11' 27"	4° 45' 34"	141° 10' 30"	20° 12' 42"	0° 56' 49"	15' 28.84"	117° 59' 40"	0.05041
1	137° 44' 18"	4° 46' 28"	141° 43' 55"	20° 03' 20"	0° 56' 50"	15' 29.31"	118° 23' 47"	0.04853
2	138° 17' 10"	4° 47' 20"	142° 17' 18"	19° 53' 51"	0° 56' 52"	15' 29.79"	118° 48' 19"	0.04669
3	138° 50' 05"	4° 48' 11"	142° 50' 39"	19° 44' 16"	0° 56' 54"	15' 30.26"	119° 13' 20"	0.04487
4	139° 23' 02"	4° 48' 60"	143° 23' 58"	19° 34' 33"	0° 56' 56"	15' 30.73"	119° 38' 52"	0.04310
5	139° 56' 01"	4° 49' 47"	143° 57' 15"	19° 24' 44"	0° 56' 57"	15' 31.21"	120° 4' 56"	0.04136
6	140° 29' 02"	4° 50' 33"	144° 30' 30"	19° 14' 48"	0° 56' 59"	15' 31.68"	120° 31' 35"	0.03965
7	141° 02' 06"	4° 51' 18"	145° 03' 43"	19° 04' 46"	0° 57' 01"	15' 32.15"	120° 58' 52"	0.03797
8	141° 35' 11"	4° 52' 00"	145° 36' 54"	18° 54' 36"	0° 57' 02"	15' 32.62"	121° 26' 49"	0.03633
9	142° 08' 19"	4° 52' 42"	146° 10' 04"	18° 44' 21"	0° 57' 04"	15' 33.10"	121° 55' 31"	0.03473
10	142° 41' 29"	4° 53' 21"	146° 43' 11"	18° 33' 58"	0° 57' 06"	15' 33.57"	122° 24' 60"	0.03316
11	143° 14' 41"	4° 53' 59"	147° 16' 17"	18° 23' 30"	0° 57' 08"	15' 34.04"	122° 55' 20"	0.03162
12	143° 47' 56"	4° 54' 36"	147° 49' 20"	18° 12' 54"	0° 57' 09"	15' 34.51"	123° 26' 36"	0.03013
13	144° 21' 12"	4° 55' 10"	148° 22' 22"	18° 02' 13"	0° 57' 11"	15' 34.98"	123° 58' 52"	0.02866
14	144° 54' 31"	4° 55' 43"	148° 55' 22"	17° 51' 25"	0° 57' 13"	15' 35.45"	124° 32' 13"	0.02724
15	145° 27' 52"	4° 56' 15"	149° 28' 19"	17° 40' 31"	0° 57' 15"	15' 35.92"	125° 6' 46"	0.02585
16	146° 01' 15"	4° 56' 45"	150° 01' 15"	17° 29' 31"	0° 57' 16"	15' 36.39"	125° 42' 36"	0.02449
17	146° 34' 40"	4° 57' 13"	150° 34' 09"	17° 18' 24"	0° 57' 18"	15' 36.85"	126° 19' 50"	0.02318
18	147° 08' 08"	4° 57' 39"	151° 07' 01"	17° 07' 12"	0° 57' 20"	15' 37.32"	126° 58' 37"	0.02190
19	147° 41' 37"	4° 58' 04"	151° 39' 51"	16° 55' 53"	0° 57' 21"	15' 37.78"	127° 39' 05"	0.02066
20	148° 15' 09"	4° 58' 27"	152° 12' 39"	16° 44' 29"	0° 57' 23"	15' 38.25"	128° 21' 23"	0.01945
21	148° 48' 42"	4° 58' 48"	152° 45' 25"	16° 32' 59"	0° 57' 25"	15' 38.71"	129° 5' 43"	0.01829
22	149° 22' 18"	4° 59' 08"	153° 18' 09"	16° 21' 22"	0° 57' 27"	15' 39.17"	129° 52' 18"	0.01716
23	149° 55' 56"	4° 59' 26"	153° 50' 51"	16° 09' 40"	0° 57' 28"	15' 39.63"	130° 41' 19"	0.01607
24	150° 29' 36"	4° 59' 42"	154° 23' 31"	15° 57' 53"	0° 57' 30"	15' 40.09"	131° 33' 05"	0.01502

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	163° 38' 18"	0.55"	164° 54' 55"	6° 26' 14"	1.0080825	15' 51.94"	23° 26' 16"	1 m 32 s
1	163° 40' 44"	0.55"	164° 57' 10"	6° 25' 18"	1.0080722	15' 51.95"	23° 26' 16"	1 m 33 s
2	163° 43' 09"	0.55"	164° 59' 26"	6° 24' 22"	1.0080618	15' 51.96"	23° 26' 16"	1 m 34 s
3	163° 45' 35"	0.55"	165° 01' 41"	6° 23' 26"	1.0080515	15' 51.97"	23° 26' 16"	1 m 34 s
4	163° 48' 00"	0.55"	165° 03' 56"	6° 22' 30"	1.0080411	15' 51.98"	23° 26' 16"	1 m 35 s
5	163° 50' 26"	0.55"	165° 06' 11"	6° 21' 34"	1.0080307	15' 51.98"	23° 26' 16"	1 m 36 s
6	163° 52' 52"	0.55"	165° 08' 26"	6° 20' 38"	1.0080203	15' 51.99"	23° 26' 16"	1 m 37 s
7	163° 55' 17"	0.55"	165° 10' 42"	6° 19' 42"	1.0080100	15' 52.00"	23° 26' 16"	1 m 38 s
8	163° 57' 43"	0.55"	165° 12' 57"	6° 18' 46"	1.0079996	15' 52.01"	23° 26' 16"	1 m 39 s
9	164° 00' 08"	0.55"	165° 15' 12"	6° 17' 50"	1.0079892	15' 52.02"	23° 26' 16"	1 m 39 s
10	164° 02' 34"	0.55"	165° 17' 27"	6° 16' 54"	1.0079788	15' 52.03"	23° 26' 16"	1 m 40 s
11	164° 04' 59"	0.54"	165° 19' 42"	6° 15' 58"	1.0079683	15' 52.04"	23° 26' 16"	1 m 41 s
12	164° 07' 25"	0.54"	165° 21' 57"	6° 15' 02"	1.0079579	15' 52.05"	23° 26' 16"	1 m 42 s
13	164° 09' 50"	0.54"	165° 24' 13"	6° 14' 06"	1.0079475	15' 52.06"	23° 26' 16"	1 m 43 s
14	164° 12' 16"	0.54"	165° 26' 28"	6° 13' 10"	1.0079371	15' 52.07"	23° 26' 16"	1 m 44 s
15	164° 14' 42"	0.54"	165° 28' 43"	6° 12' 14"	1.0079266	15' 52.08"	23° 26' 16"	1 m 45 s
16	164° 17' 07"	0.54"	165° 30' 58"	6° 11' 18"	1.0079162	15' 52.09"	23° 26' 16"	1 m 45 s
17	164° 19' 33"	0.54"	165° 33' 13"	6° 10' 22"	1.0079057	15' 52.10"	23° 26' 16"	1 m 46 s
18	164° 21' 58"	0.54"	165° 35' 28"	6° 09' 26"	1.0078953	15' 52.11"	23° 26' 16"	1 m 47 s
19	164° 24' 24"	0.54"	165° 37' 43"	6° 08' 30"	1.0078848	15' 52.12"	23° 26' 16"	1 m 48 s
20	164° 26' 50"	0.54"	165° 39' 58"	6° 07' 34"	1.0078743	15' 52.13"	23° 26' 16"	1 m 49 s
21	164° 29' 15"	0.53"	165° 42' 14"	6° 06' 38"	1.0078639	15' 52.14"	23° 26' 16"	1 m 50 s
22	164° 31' 41"	0.53"	165° 44' 29"	6° 05' 42"	1.0078534	15' 52.15"	23° 26' 16"	1 m 50 s
23	164° 34' 06"	0.53"	165° 46' 44"	6° 04' 45"	1.0078429	15' 52.16"	23° 26' 16"	1 m 51 s
24	164° 36' 32"	0.53"	165° 48' 59"	6° 03' 49"	1.0078324	15' 52.17"	23° 26' 16"	1 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	150° 29' 36"	4° 59' 42"	154° 23' 31"	15° 57' 53"	0° 57' 30"	15' 40.09"	131° 33' 05"	0.01502
1	151° 03' 18"	4° 59' 56"	154° 56' 10"	15° 45' 59"	0° 57' 32"	15' 40.55"	132° 27' 51"	0.01401
2	151° 37' 02"	5° 00' 09"	155° 28' 46"	15° 34' 00"	0° 57' 33"	15' 41.01"	133° 25' 59"	0.01303
3	152° 10' 48"	5° 00' 20"	156° 01' 21"	15° 21' 56"	0° 57' 35"	15' 41.46"	134° 27' 51"	0.01210
4	152° 44' 36"	5° 00' 29"	156° 33' 53"	15° 09' 46"	0° 57' 37"	15' 41.91"	135° 33' 53"	0.01121
5	153° 18' 26"	5° 00' 37"	157° 06' 24"	14° 57' 30"	0° 57' 38"	15' 42.37"	136° 44' 34"	0.01035
6	153° 52' 18"	5° 00' 43"	157° 38' 54"	14° 45' 10"	0° 57' 40"	15' 42.82"	138° 0' 31"	0.00954
7	154° 26' 12"	5° 00' 47"	158° 11' 21"	14° 32' 44"	0° 57' 42"	15' 43.27"	139° 22' 20"	0.00876
8	155° 00' 08"	5° 00' 49"	158° 43' 46"	14° 20' 12"	0° 57' 43"	15' 43.71"	140° 50' 49"	0.00803
9	155° 34' 06"	5° 00' 49"	159° 16' 10"	14° 07' 36"	0° 57' 45"	15' 44.16"	142° 26' 48"	0.00733
10	156° 08' 06"	5° 00' 48"	159° 48' 32"	13° 54' 55"	0° 57' 46"	15' 44.60"	144° 11' 19"	0.00668
11	156° 42' 08"	5° 00' 45"	160° 20' 53"	13° 42' 08"	0° 57' 48"	15' 45.04"	146° 5' 29"	0.00607
12	157° 16' 12"	5° 00' 40"	160° 53' 11"	13° 29' 17"	0° 57' 50"	15' 45.48"	148° 10' 39"	0.00549
13	157° 50' 18"	5° 00' 33"	161° 25' 28"	13° 16' 20"	0° 57' 51"	15' 45.92"	150° 28' 16"	0.00496
14	158° 24' 26"	5° 00' 25"	161° 57' 44"	13° 03' 19"	0° 57' 53"	15' 46.35"	153° 0' 04"	0.00448
15	158° 58' 36"	5° 00' 14"	162° 29' 57"	12° 50' 13"	0° 57' 54"	15' 46.78"	155° 47' 54"	0.00403
16	159° 32' 47"	5° 00' 02"	163° 02' 09"	12° 37' 03"	0° 57' 56"	15' 47.22"	158° 53' 48"	0.00362
17	160° 07' 00"	4° 59' 48"	163° 34' 20"	12° 23' 47"	0° 57' 58"	15' 47.64"	162° 19' 52"	0.00326
18	160° 41' 16"	4° 59' 32"	164° 06' 29"	12° 10' 28"	0° 57' 59"	15' 48.07"	166° 8' 10"	0.00294
19	161° 15' 33"	4° 59' 15"	164° 38' 36"	11° 57' 03"	0° 58' 01"	15' 48.49"	170° 20' 28"	0.00266
20	161° 49' 51"	4° 58' 55"	165° 10' 42"	11° 43' 35"	0° 58' 02"	15' 48.92"	174° 57' 55"	0.00242
21	162° 24' 12"	4° 58' 34"	165° 42' 47"	11° 30' 02"	0° 58' 04"	15' 49.34"	180° 0' 54"	0.00222
22	162° 58' 34"	4° 58' 11"	166° 14' 50"	11° 16' 25"	0° 58' 05"	15' 49.75"	185° 28' 03"	0.00207
23	163° 32' 58"	4° 57' 46"	166° 46' 52"	11° 02' 44"	0° 58' 07"	15' 50.17"	191° 16' 16"	0.00196
24	164° 07' 25"	4° 57' 20"	167° 18' 52"	10° 48' 58"	0° 58' 08"	15' 50.58"	197° 20' 19"	0.00190

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	164° 36' 32"	0.53"	165° 48' 59"	6° 03' 49"	1.0078324	15' 52.17"	23° 26' 16"	1 m 52 s
1	164° 38' 58"	0.53"	165° 51' 14"	6° 02' 53"	1.0078219	15' 52.18"	23° 26' 16"	1 m 53 s
2	164° 41' 23"	0.53"	165° 53' 29"	6° 01' 57"	1.0078114	15' 52.19"	23° 26' 16"	1 m 54 s
3	164° 43' 49"	0.53"	165° 55' 44"	6° 01' 01"	1.0078009	15' 52.20"	23° 26' 16"	1 m 55 s
4	164° 46' 14"	0.52"	165° 57' 59"	6° 00' 05"	1.0077903	15' 52.21"	23° 26' 16"	1 m 56 s
5	164° 48' 40"	0.52"	166° 00' 14"	5° 59' 08"	1.0077798	15' 52.22"	23° 26' 16"	1 m 56 s
6	164° 51' 06"	0.52"	166° 02' 29"	5° 58' 12"	1.0077693	15' 52.23"	23° 26' 16"	1 m 57 s
7	164° 53' 31"	0.52"	166° 04' 44"	5° 57' 16"	1.0077587	15' 52.24"	23° 26' 16"	1 m 58 s
8	164° 55' 57"	0.52"	166° 06' 60"	5° 56' 20"	1.0077482	15' 52.25"	23° 26' 16"	1 m 59 s
9	164° 58' 23"	0.51"	166° 09' 15"	5° 55' 24"	1.0077376	15' 52.26"	23° 26' 16"	1 m 60 s
10	165° 00' 48"	0.51"	166° 11' 30"	5° 54' 27"	1.0077271	15' 52.27"	23° 26' 16"	2 m 01 s
11	165° 03' 14"	0.51"	166° 13' 45"	5° 53' 31"	1.0077165	15' 52.28"	23° 26' 16"	2 m 02 s
12	165° 05' 39"	0.51"	166° 15' 60"	5° 52' 35"	1.0077059	15' 52.29"	23° 26' 16"	2 m 02 s
13	165° 08' 05"	0.51"	166° 18' 15"	5° 51' 39"	1.0076953	15' 52.30"	23° 26' 16"	2 m 03 s
14	165° 10' 31"	0.50"	166° 20' 30"	5° 50' 42"	1.0076848	15' 52.31"	23° 26' 16"	2 m 04 s
15	165° 12' 56"	0.50"	166° 22' 45"	5° 49' 46"	1.0076742	15' 52.32"	23° 26' 16"	2 m 05 s
16	165° 15' 22"	0.50"	166° 24' 60"	5° 48' 50"	1.0076636	15' 52.33"	23° 26' 16"	2 m 06 s
17	165° 17' 48"	0.50"	166° 27' 15"	5° 47' 53"	1.0076530	15' 52.34"	23° 26' 16"	2 m 07 s
18	165° 20' 13"	0.49"	166° 29' 30"	5° 46' 57"	1.0076423	15' 52.35"	23° 26' 16"	2 m 08 s
19	165° 22' 39"	0.49"	166° 31' 45"	5° 46' 01"	1.0076317	15' 52.36"	23° 26' 16"	2 m 08 s
20	165° 25' 05"	0.49"	166° 33' 60"	5° 45' 04"	1.0076211	15' 52.37"	23° 26' 16"	2 m 09 s
21	165° 27' 30"	0.49"	166° 36' 15"	5° 44' 08"	1.0076105	15' 52.38"	23° 26' 16"	2 m 10 s
22	165° 29' 56"	0.48"	166° 38' 30"	5° 43' 12"	1.0075998	15' 52.39"	23° 26' 16"	2 m 11 s
23	165° 32' 22"	0.48"	166° 40' 45"	5° 42' 15"	1.0075892	15' 52.40"	23° 26' 16"	2 m 12 s
24	165° 34' 47"	0.48"	166° 42' 60"	5° 41' 19"	1.0075785	15' 52.41"	23° 26' 16"	2 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	164° 07' 25"	4° 57' 20"	167° 18' 52"	10° 48' 58"	0° 58' 08"	15' 50.58"	197° 20' 19"	0.00190
1	164° 41' 52"	4° 56' 51"	167° 50' 51"	10° 35' 09"	0° 58' 10"	15' 50.98"	203° 33' 09"	0.00187
2	165° 16' 22"	4° 56' 21"	168° 22' 49"	10° 21' 15"	0° 58' 11"	15' 51.39"	209° 46' 36"	0.00189
3	165° 50' 53"	4° 55' 48"	168° 54' 46"	10° 07' 18"	0° 58' 13"	15' 51.79"	215° 52' 24"	0.00195
4	166° 25' 26"	4° 55' 14"	169° 26' 42"	9° 53' 17"	0° 58' 14"	15' 52.19"	221° 43' 14"	0.00206
5	167° 00' 00"	4° 54' 38"	169° 58' 36"	9° 39' 12"	0° 58' 16"	15' 52.59"	227° 13' 33"	0.00221
6	167° 34' 36"	4° 54' 01"	170° 30' 30"	9° 25' 03"	0° 58' 17"	15' 52.98"	232° 19' 49"	0.00240
7	168° 09' 14"	4° 53' 21"	171° 02' 22"	9° 10' 51"	0° 58' 19"	15' 53.37"	237° 0' 29"	0.00264
8	168° 43' 54"	4° 52' 40"	171° 34' 13"	8° 56' 35"	0° 58' 20"	15' 53.76"	241° 15' 32"	0.00292
9	169° 18' 35"	4° 51' 56"	172° 06' 03"	8° 42' 16"	0° 58' 21"	15' 54.15"	245° 6' 02"	0.00324
10	169° 53' 17"	4° 51' 11"	172° 37' 53"	8° 27' 54"	0° 58' 23"	15' 54.53"	248° 33' 42"	0.00361
11	170° 28' 01"	4° 50' 24"	173° 09' 41"	8° 13' 28"	0° 58' 24"	15' 54.91"	251° 40' 33"	0.00403
12	171° 02' 47"	4° 49' 36"	173° 41' 29"	7° 58' 59"	0° 58' 26"	15' 55.28"	254° 28' 43"	0.00448
13	171° 37' 34"	4° 48' 45"	174° 13' 15"	7° 44' 27"	0° 58' 27"	15' 55.66"	257° 0' 14"	0.00498
14	172° 12' 23"	4° 47' 53"	174° 45' 01"	7° 29' 52"	0° 58' 28"	15' 56.02"	259° 17' 00"	0.00553
15	172° 47' 13"	4° 46' 58"	175° 16' 47"	7° 15' 14"	0° 58' 30"	15' 56.39"	261° 20' 45"	0.00612
16	173° 22' 05"	4° 46' 02"	175° 48' 31"	7° 00' 33"	0° 58' 31"	15' 56.75"	263° 12' 60"	0.00675
17	173° 56' 58"	4° 45' 04"	176° 20' 15"	6° 45' 50"	0° 58' 32"	15' 57.11"	264° 55' 06"	0.00743
18	174° 31' 52"	4° 44' 05"	176° 51' 59"	6° 31' 03"	0° 58' 34"	15' 57.47"	266° 28' 14"	0.00815
19	175° 06' 48"	4° 43' 03"	177° 23' 42"	6° 16' 14"	0° 58' 35"	15' 57.82"	267° 53' 26"	0.00892
20	175° 41' 45"	4° 41' 60"	177° 55' 24"	6° 01' 23"	0° 58' 36"	15' 58.17"	269° 11' 34"	0.00973
21	176° 16' 44"	4° 40' 54"	178° 27' 06"	5° 46' 29"	0° 58' 37"	15' 58.51"	270° 23' 26"	0.01058
22	176° 51' 44"	4° 39' 47"	178° 58' 48"	5° 31' 32"	0° 58' 39"	15' 58.85"	271° 29' 41"	0.01148
23	177° 26' 45"	4° 38' 39"	179° 30' 29"	5° 16' 33"	0° 58' 40"	15' 59.19"	272° 30' 55"	0.01243
24	178° 01' 48"	4° 37' 28"	180° 02' 10"	5° 01' 32"	0° 58' 41"	15' 59.52"	273° 27' 38"	0.01341

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	165° 34' 47"	0.48"	166° 42' 60"	5° 41' 19"	1.0075785	15' 52.41"	23° 26' 16"	2 m 13 s
1	165° 37' 13"	0.48"	166° 45' 15"	5° 40' 22"	1.0075679	15' 52.42"	23° 26' 16"	2 m 14 s
2	165° 39' 39"	0.47"	166° 47' 30"	5° 39' 26"	1.0075572	15' 52.43"	23° 26' 16"	2 m 14 s
3	165° 42' 04"	0.47"	166° 49' 45"	5° 38' 30"	1.0075465	15' 52.44"	23° 26' 16"	2 m 15 s
4	165° 44' 30"	0.47"	166° 51' 60"	5° 37' 33"	1.0075358	15' 52.45"	23° 26' 16"	2 m 16 s
5	165° 46' 56"	0.47"	166° 54' 15"	5° 36' 37"	1.0075252	15' 52.46"	23° 26' 16"	2 m 17 s
6	165° 49' 21"	0.46"	166° 56' 30"	5° 35' 40"	1.0075145	15' 52.47"	23° 26' 16"	2 m 18 s
7	165° 51' 47"	0.46"	166° 58' 45"	5° 34' 44"	1.0075038	15' 52.48"	23° 26' 16"	2 m 19 s
8	165° 54' 13"	0.46"	167° 00' 59"	5° 33' 47"	1.0074931	15' 52.49"	23° 26' 16"	2 m 20 s
9	165° 56' 39"	0.45"	167° 03' 14"	5° 32' 51"	1.0074824	15' 52.50"	23° 26' 16"	2 m 20 s
10	165° 59' 04"	0.45"	167° 05' 29"	5° 31' 54"	1.0074716	15' 52.51"	23° 26' 16"	2 m 21 s
11	166° 01' 30"	0.45"	167° 07' 44"	5° 30' 58"	1.0074609	15' 52.52"	23° 26' 16"	2 m 22 s
12	166° 03' 56"	0.44"	167° 09' 59"	5° 30' 01"	1.0074502	15' 52.53"	23° 26' 16"	2 m 23 s
13	166° 06' 21"	0.44"	167° 12' 14"	5° 29' 05"	1.0074395	15' 52.54"	23° 26' 16"	2 m 24 s
14	166° 08' 47"	0.44"	167° 14' 29"	5° 28' 08"	1.0074287	15' 52.55"	23° 26' 16"	2 m 25 s
15	166° 11' 13"	0.43"	167° 16' 44"	5° 27' 12"	1.0074180	15' 52.56"	23° 26' 16"	2 m 26 s
16	166° 13' 39"	0.43"	167° 18' 59"	5° 26' 15"	1.0074072	15' 52.57"	23° 26' 16"	2 m 26 s
17	166° 16' 04"	0.43"	167° 21' 14"	5° 25' 19"	1.0073964	15' 52.58"	23° 26' 16"	2 m 27 s
18	166° 18' 30"	0.42"	167° 23' 29"	5° 24' 22"	1.0073857	15' 52.59"	23° 26' 16"	2 m 28 s
19	166° 20' 56"	0.42"	167° 25' 44"	5° 23' 26"	1.0073749	15' 52.60"	23° 26' 16"	2 m 29 s
20	166° 23' 22"	0.42"	167° 27' 58"	5° 22' 29"	1.0073641	15' 52.61"	23° 26' 16"	2 m 30 s
21	166° 25' 47"	0.41"	167° 30' 13"	5° 21' 32"	1.0073533	15' 52.63"	23° 26' 16"	2 m 31 s
22	166° 28' 13"	0.41"	167° 32' 28"	5° 20' 36"	1.0073425	15' 52.64"	23° 26' 16"	2 m 32 s
23	166° 30' 39"	0.41"	167° 34' 43"	5° 19' 39"	1.0073318	15' 52.65"	23° 26' 16"	2 m 33 s
24	166° 33' 04"	0.40"	167° 36' 58"	5° 18' 43"	1.0073209	15' 52.66"	23° 26' 16"	2 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	178° 01' 48"	4° 37' 28"	180° 02' 10"	5° 01' 32"	0° 58' 41"	15' 59.52"	273° 27' 38"	0.01341
1	178° 36' 51"	4° 36' 16"	180° 33' 51"	4° 46' 29"	0° 58' 42"	15' 59.85"	274° 20' 17"	0.01445
2	179° 11' 56"	4° 35' 01"	181° 05' 32"	4° 31' 24"	0° 58' 44"	16' 00.18"	275° 9' 16"	0.01552
3	179° 47' 03"	4° 33' 45"	181° 37' 12"	4° 16' 17"	0° 58' 45"	16' 00.50"	275° 54' 55"	0.01665
4	180° 22' 10"	4° 32' 28"	182° 08' 53"	4° 01' 08"	0° 58' 46"	16' 00.82"	276° 37' 32"	0.01781
5	180° 57' 19"	4° 31' 08"	182° 40' 33"	3° 45' 57"	0° 58' 47"	16' 01.14"	277° 17' 24"	0.01902
6	181° 32' 29"	4° 29' 47"	183° 12' 14"	3° 30' 44"	0° 58' 48"	16' 01.45"	277° 54' 44"	0.02028
7	182° 07' 40"	4° 28' 24"	183° 43' 55"	3° 15' 30"	0° 58' 49"	16' 01.76"	278° 29' 44"	0.02158
8	182° 42' 52"	4° 26' 59"	184° 15' 36"	3° 00' 14"	0° 58' 51"	16' 02.06"	279° 2' 37"	0.02292
9	183° 18' 05"	4° 25' 32"	184° 47' 17"	2° 44' 56"	0° 58' 52"	16' 02.36"	279° 33' 32"	0.02431
10	183° 53' 19"	4° 24' 04"	185° 18' 58"	2° 29' 38"	0° 58' 53"	16' 02.66"	280° 2' 38"	0.02574
11	184° 28' 35"	4° 22' 34"	185° 50' 40"	2° 14' 18"	0° 58' 54"	16' 02.95"	280° 30' 03"	0.02722
12	185° 03' 51"	4° 21' 02"	186° 22' 22"	1° 58' 56"	0° 58' 55"	16' 03.23"	280° 55' 54"	0.02874
13	185° 39' 09"	4° 19' 29"	186° 54' 04"	1° 43' 34"	0° 58' 56"	16' 03.52"	281° 20' 18"	0.03030
14	186° 14' 27"	4° 17' 53"	187° 25' 47"	1° 28' 10"	0° 58' 57"	16' 03.80"	281° 43' 20"	0.03191
15	186° 49' 46"	4° 16' 16"	187° 57' 31"	1° 12' 46"	0° 58' 58"	16' 04.07"	282° 5' 07"	0.03356
16	187° 25' 07"	4° 14' 38"	188° 29' 15"	0° 57' 21"	0° 58' 59"	16' 04.34"	282° 25' 41"	0.03526
17	188° 00' 28"	4° 12' 58"	189° 00' 60"	0° 41' 55"	0° 58' 60"	16' 04.61"	282° 45' 09"	0.03700
18	188° 35' 50"	4° 11' 16"	189° 32' 45"	0° 26' 28"	0° 59' 01"	16' 04.88"	283° 3' 34"	0.03878
19	189° 11' 13"	4° 09' 32"	190° 04' 32"	0° 11' 01"	0° 59' 02"	16' 05.13"	283° 20' 60"	0.04060
20	189° 46' 37"	4° 07' 47"	190° 36' 19"	0° -4' 27"	0° 59' 03"	16' 05.39"	283° 37' 29"	0.04247
21	190° 22' 02"	4° 05' 60"	191° 08' 07"	0° -19' 56"	0° 59' 04"	16' 05.64"	283° 53' 06"	0.04439
22	190° 57' 27"	4° 04' 11"	191° 39' 56"	0° -35' 24"	0° 59' 05"	16' 05.89"	284° 7' 52"	0.04634
23	191° 32' 54"	4° 02' 21"	192° 11' 46"	0° -50' 53"	0° 59' 05"	16' 06.13"	284° 21' 50"	0.04834
24	192° 08' 21"	4° 00' 29"	192° 43' 37"	-1° 06' 23"	0° 59' 06"	16' 06.37"	284° 35' 03"	0.05038

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	166° 33' 04"	0.40"	167° 36' 58"	5° 18' 43"	1.0073209	15' 52.66"	23° 26' 16"	2 m 33 s
1	166° 35' 30"	0.40"	167° 39' 13"	5° 17' 46"	1.0073101	15' 52.67"	23° 26' 16"	2 m 34 s
2	166° 37' 56"	0.39"	167° 41' 28"	5° 16' 49"	1.0072993	15' 52.68"	23° 26' 16"	2 m 35 s
3	166° 40' 22"	0.39"	167° 43' 43"	5° 15' 53"	1.0072885	15' 52.69"	23° 26' 16"	2 m 36 s
4	166° 42' 48"	0.39"	167° 45' 57"	5° 14' 56"	1.0072777	15' 52.70"	23° 26' 16"	2 m 37 s
5	166° 45' 13"	0.38"	167° 48' 12"	5° 13' 59"	1.0072668	15' 52.71"	23° 26' 16"	2 m 38 s
6	166° 47' 39"	0.38"	167° 50' 27"	5° 13' 03"	1.0072560	15' 52.72"	23° 26' 16"	2 m 39 s
7	166° 50' 05"	0.37"	167° 52' 42"	5° 12' 06"	1.0072451	15' 52.73"	23° 26' 16"	2 m 39 s
8	166° 52' 31"	0.37"	167° 54' 57"	5° 11' 09"	1.0072343	15' 52.74"	23° 26' 16"	2 m 40 s
9	166° 54' 56"	0.37"	167° 57' 12"	5° 10' 13"	1.0072234	15' 52.75"	23° 26' 16"	2 m 41 s
10	166° 57' 22"	0.36"	167° 59' 26"	5° 09' 16"	1.0072126	15' 52.76"	23° 26' 16"	2 m 42 s
11	166° 59' 48"	0.36"	168° 01' 41"	5° 08' 19"	1.0072017	15' 52.77"	23° 26' 16"	2 m 43 s
12	167° 02' 14"	0.35"	168° 03' 56"	5° 07' 22"	1.0071908	15' 52.78"	23° 26' 16"	2 m 44 s
13	167° 04' 39"	0.35"	168° 06' 11"	5° 06' 26"	1.0071799	15' 52.79"	23° 26' 16"	2 m 45 s
14	167° 07' 05"	0.34"	168° 08' 26"	5° 05' 29"	1.0071690	15' 52.80"	23° 26' 16"	2 m 46 s
15	167° 09' 31"	0.34"	168° 10' 41"	5° 04' 32"	1.0071581	15' 52.81"	23° 26' 16"	2 m 46 s
16	167° 11' 57"	0.34"	168° 12' 55"	5° 03' 35"	1.0071472	15' 52.82"	23° 26' 16"	2 m 47 s
17	167° 14' 23"	0.33"	168° 15' 10"	5° 02' 39"	1.0071363	15' 52.83"	23° 26' 16"	2 m 48 s
18	167° 16' 48"	0.33"	168° 17' 25"	5° 01' 42"	1.0071254	15' 52.84"	23° 26' 16"	2 m 49 s
19	167° 19' 14"	0.32"	168° 19' 40"	5° 00' 45"	1.0071145	15' 52.85"	23° 26' 16"	2 m 50 s
20	167° 21' 40"	0.32"	168° 21' 55"	4° 59' 48"	1.0071036	15' 52.86"	23° 26' 16"	2 m 51 s
21	167° 24' 06"	0.31"	168° 24' 09"	4° 58' 51"	1.0070926	15' 52.87"	23° 26' 16"	2 m 52 s
22	167° 26' 32"	0.31"	168° 26' 24"	4° 57' 55"	1.0070817	15' 52.88"	23° 26' 16"	2 m 52 s
23	167° 28' 57"	0.30"	168° 28' 39"	4° 56' 58"	1.0070708	15' 52.89"	23° 26' 16"	2 m 53 s
24	167° 31' 23"	0.30"	168° 30' 54"	4° 56' 01"	1.0070598	15' 52.90"	23° 26' 16"	2 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	192° 08' 21"	4° 00' 29"	192° 43' 37"	-1° 06' 23"	0° 59' 06"	16' 06.37"	284° 35' 03"	0.05038
1	192° 43' 49"	3° 58' 36"	193° 15' 30"	-1° 21' 52"	0° 59' 07"	16' 06.60"	284° 47' 33"	0.05246
2	193° 19' 17"	3° 56' 41"	193° 47' 23"	-1° 37' 21"	0° 59' 08"	16' 06.83"	284° 59' 22"	0.05459
3	193° 54' 47"	3° 54' 44"	194° 19' 18"	-1° 52' 50"	0° 59' 09"	16' 07.06"	285° 10' 31"	0.05675
4	194° 30' 17"	3° 52' 46"	194° 51' 14"	-2° 08' 19"	0° 59' 10"	16' 07.28"	285° 21' 03"	0.05896
5	195° 05' 47"	3° 50' 46"	195° 23' 12"	-2° 23' 48"	0° 59' 10"	16' 07.49"	285° 30' 58"	0.06121
6	195° 41' 19"	3° 48' 45"	195° 55' 11"	-2° 39' 16"	0° 59' 11"	16' 07.71"	285° 40' 19"	0.06351
7	196° 16' 51"	3° 46' 42"	196° 27' 11"	-2° 54' 44"	0° 59' 12"	16' 07.92"	285° 49' 07"	0.06584
8	196° 52' 23"	3° 44' 38"	196° 59' 14"	-3° 10' 11"	0° 59' 13"	16' 08.12"	285° 57' 23"	0.06822
9	197° 27' 57"	3° 42' 32"	197° 31' 17"	-3° 25' 38"	0° 59' 13"	16' 08.32"	286° 5' 08"	0.07063
10	198° 03' 30"	3° 40' 25"	198° 03' 23"	-3° 41' 04"	0° 59' 14"	16' 08.52"	286° 12' 23"	0.07309
11	198° 39' 05"	3° 38' 16"	198° 35' 30"	-3° 56' 29"	0° 59' 15"	16' 08.71"	286° 19' 10"	0.07559
12	199° 14' 39"	3° 36' 06"	199° 07' 39"	-4° 11' 53"	0° 59' 16"	16' 08.89"	286° 25' 29"	0.07813
13	199° 50' 15"	3° 33' 54"	199° 39' 50"	-4° 27' 16"	0° 59' 16"	16' 09.08"	286° 31' 22"	0.08071
14	200° 25' 50"	3° 31' 41"	200° 12' 02"	-4° 42' 38"	0° 59' 17"	16' 09.26"	286° 36' 48"	0.08333
15	201° 01' 27"	3° 29' 26"	200° 44' 17"	-4° 57' 59"	0° 59' 18"	16' 09.43"	286° 41' 49"	0.08599
16	201° 37' 03"	3° 27' 10"	201° 16' 34"	-5° 13' 18"	0° 59' 18"	16' 09.60"	286° 46' 26"	0.08868
17	202° 12' 41"	3° 24' 53"	201° 48' 53"	-5° 28' 37"	0° 59' 19"	16' 09.77"	286° 50' 39"	0.09142
18	202° 48' 18"	3° 22' 34"	202° 21' 14"	-5° 43' 53"	0° 59' 19"	16' 09.93"	286° 54' 29"	0.09420
19	203° 23' 56"	3° 20' 14"	202° 53' 37"	-5° 59' 09"	0° 59' 20"	16' 10.09"	286° 57' 57"	0.09701
20	203° 59' 34"	3° 17' 53"	203° 26' 03"	-6° 14' 22"	0° 59' 21"	16' 10.24"	287° 1' 03"	0.09987
21	204° 35' 13"	3° 15' 30"	203° 58' 31"	-6° 29' 34"	0° 59' 21"	16' 10.39"	287° 3' 47"	0.10276
22	205° 10' 52"	3° 13' 06"	204° 31' 01"	-6° 44' 44"	0° 59' 22"	16' 10.53"	287° 6' 11"	0.10569
23	205° 46' 31"	3° 10' 41"	205° 03' 34"	-6° 59' 52"	0° 59' 22"	16' 10.67"	287° 8' 15"	0.10866
24	206° 22' 11"	3° 08' 14"	205° 36' 09"	-7° 14' 58"	0° 59' 23"	16' 10.81"	287° 9' 58"	0.11166

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	167° 31' 23"	0.30"	168° 30' 54"	4° 56' 01"	1.0070598	15' 52.90"	23° 26' 16"	2 m 54 s
1	167° 33' 49"	0.30"	168° 33' 08"	4° 55' 04"	1.0070489	15' 52.91"	23° 26' 16"	2 m 55 s
2	167° 36' 15"	0.29"	168° 35' 23"	4° 54' 07"	1.0070379	15' 52.92"	23° 26' 16"	2 m 56 s
3	167° 38' 41"	0.29"	168° 37' 38"	4° 53' 10"	1.0070269	15' 52.93"	23° 26' 16"	2 m 57 s
4	167° 41' 07"	0.28"	168° 39' 53"	4° 52' 14"	1.0070160	15' 52.94"	23° 26' 16"	2 m 58 s
5	167° 43' 32"	0.28"	168° 42' 08"	4° 51' 17"	1.0070050	15' 52.95"	23° 26' 16"	2 m 59 s
6	167° 45' 58"	0.27"	168° 44' 22"	4° 50' 20"	1.0069940	15' 52.96"	23° 26' 16"	2 m 59 s
7	167° 48' 24"	0.27"	168° 46' 37"	4° 49' 23"	1.0069830	15' 52.98"	23° 26' 16"	3 m 00 s
8	167° 50' 50"	0.26"	168° 48' 52"	4° 48' 26"	1.0069720	15' 52.99"	23° 26' 16"	3 m 01 s
9	167° 53' 16"	0.26"	168° 51' 07"	4° 47' 29"	1.0069610	15' 53.00"	23° 26' 16"	3 m 02 s
10	167° 55' 42"	0.25"	168° 53' 21"	4° 46' 32"	1.0069500	15' 53.01"	23° 26' 16"	3 m 03 s
11	167° 58' 07"	0.25"	168° 55' 36"	4° 45' 35"	1.0069390	15' 53.02"	23° 26' 16"	3 m 04 s
12	168° 00' 33"	0.24"	168° 57' 51"	4° 44' 38"	1.0069280	15' 53.03"	23° 26' 16"	3 m 05 s
13	168° 02' 59"	0.24"	169° 00' 05"	4° 43' 41"	1.0069170	15' 53.04"	23° 26' 16"	3 m 06 s
14	168° 05' 25"	0.23"	169° 02' 20"	4° 42' 44"	1.0069059	15' 53.05"	23° 26' 16"	3 m 06 s
15	168° 07' 51"	0.23"	169° 04' 35"	4° 41' 47"	1.0068949	15' 53.06"	23° 26' 16"	3 m 07 s
16	168° 10' 17"	0.22"	169° 06' 50"	4° 40' 50"	1.0068839	15' 53.07"	23° 26' 16"	3 m 08 s
17	168° 12' 43"	0.22"	169° 09' 04"	4° 39' 53"	1.0068728	15' 53.08"	23° 26' 16"	3 m 09 s
18	168° 15' 08"	0.21"	169° 11' 19"	4° 38' 56"	1.0068618	15' 53.09"	23° 26' 16"	3 m 10 s
19	168° 17' 34"	0.21"	169° 13' 34"	4° 37' 59"	1.0068507	15' 53.10"	23° 26' 16"	3 m 11 s
20	168° 20' 00"	0.20"	169° 15' 48"	4° 37' 02"	1.0068397	15' 53.11"	23° 26' 16"	3 m 12 s
21	168° 22' 26"	0.20"	169° 18' 03"	4° 36' 05"	1.0068286	15' 53.12"	23° 26' 16"	3 m 13 s
22	168° 24' 52"	0.19"	169° 20' 18"	4° 35' 08"	1.0068175	15' 53.13"	23° 26' 16"	3 m 13 s
23	168° 27' 18"	0.19"	169° 22' 33"	4° 34' 11"	1.0068065	15' 53.14"	23° 26' 16"	3 m 14 s
24	168° 29' 44"	0.18"	169° 24' 47"	4° 33' 14"	1.0067954	15' 53.15"	23° 26' 16"	3 m 15 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	206° 22' 11"	3° 08' 14"	205° 36' 09"	-7° 14' 58"	0° 59' 23"	16' 10.81"	287° 9' 58"	0.11166
1	206° 57' 51"	3° 05' 46"	206° 08' 47"	-7° 30' 02"	0° 59' 23"	16' 10.94"	287° 11' 22"	0.11470
2	207° 33' 31"	3° 03' 17"	206° 41' 28"	-7° 45' 03"	0° 59' 24"	16' 11.07"	287° 12' 28"	0.11778
3	208° 09' 11"	3° 00' 46"	207° 14' 11"	-8° 00' 03"	0° 59' 24"	16' 11.19"	287° 13' 14"	0.12090
4	208° 44' 51"	2° 58' 15"	207° 46' 57"	-8° 14' 60"	0° 59' 24"	16' 11.31"	287° 13' 42"	0.12405
5	209° 20' 32"	2° 55' 42"	208° 19' 45"	-8° 29' 54"	0° 59' 25"	16' 11.42"	287° 13' 53"	0.12724
6	209° 56' 13"	2° 53' 08"	208° 52' 37"	-8° 44' 46"	0° 59' 25"	16' 11.54"	287° 13' 46"	0.13046
7	210° 31' 54"	2° 50' 33"	209° 25' 32"	-8° 59' 35"	0° 59' 26"	16' 11.64"	287° 13' 21"	0.13372
8	211° 07' 35"	2° 47' 57"	209° 58' 29"	-9° 14' 22"	0° 59' 26"	16' 11.75"	287° 12' 40"	0.13701
9	211° 43' 17"	2° 45' 19"	210° 31' 30"	-9° 29' 05"	0° 59' 26"	16' 11.84"	287° 11' 42"	0.14034
10	212° 18' 58"	2° 42' 41"	211° 04' 33"	-9° 43' 46"	0° 59' 27"	16' 11.94"	287° 10' 28"	0.14370
11	212° 54' 40"	2° 40' 01"	211° 37' 40"	-9° 58' 23"	0° 59' 27"	16' 12.03"	287° 8' 57"	0.14710
12	213° 30' 21"	2° 37' 20"	212° 10' 50"	-10° 12' 58"	0° 59' 27"	16' 12.11"	287° 7' 11"	0.15053
13	214° 06' 03"	2° 34' 39"	212° 44' 03"	-10° 27' 29"	0° 59' 28"	16' 12.20"	287° 5' 09"	0.15399
14	214° 41' 45"	2° 31' 56"	213° 17' 19"	-10° 41' 57"	0° 59' 28"	16' 12.28"	287° 2' 52"	0.15749
15	215° 17' 26"	2° 29' 12"	213° 50' 39"	-10° 56' 21"	0° 59' 28"	16' 12.35"	287° 0' 19"	0.16101
16	215° 53' 08"	2° 26' 27"	214° 24' 02"	-11° 10' 42"	0° 59' 29"	16' 12.42"	286° 57' 32"	0.16457
17	216° 28' 50"	2° 23' 42"	214° 57' 29"	-11° 24' 59"	0° 59' 29"	16' 12.49"	286° 54' 30"	0.16817
18	217° 04' 32"	2° 20' 55"	215° 30' 59"	-11° 39' 12"	0° 59' 29"	16' 12.55"	286° 51' 13"	0.17179
19	217° 40' 13"	2° 18' 07"	216° 04' 32"	-11° 53' 22"	0° 59' 29"	16' 12.61"	286° 47' 42"	0.17545
20	218° 15' 55"	2° 15' 19"	216° 38' 10"	-12° 07' 28"	0° 59' 29"	16' 12.66"	286° 43' 56"	0.17913
21	218° 51' 37"	2° 12' 29"	217° 11' 50"	-12° 21' 29"	0° 59' 30"	16' 12.71"	286° 39' 57"	0.18285
22	219° 27' 18"	2° 09' 39"	217° 45' 35"	-12° 35' 27"	0° 59' 30"	16' 12.76"	286° 35' 43"	0.18659
23	220° 02' 60"	2° 06' 48"	218° 19' 23"	-12° 49' 20"	0° 59' 30"	16' 12.80"	286° 31' 16"	0.19037
24	220° 38' 41"	2° 03' 56"	218° 53' 15"	-13° 03' 09"	0° 59' 30"	16' 12.84"	286° 26' 36"	0.19418

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	168° 29' 44"	0.18"	169° 24' 47"	4° 33' 14"	1.0067954	15' 53.15"	23° 26' 16"	3 m 15 s
1	168° 32' 10"	0.17"	169° 27' 02"	4° 32' 17"	1.0067843	15' 53.16"	23° 26' 16"	3 m 16 s
2	168° 34' 35"	0.17"	169° 29' 17"	4° 31' 20"	1.0067732	15' 53.17"	23° 26' 16"	3 m 17 s
3	168° 37' 01"	0.16"	169° 31' 31"	4° 30' 23"	1.0067621	15' 53.18"	23° 26' 16"	3 m 18 s
4	168° 39' 27"	0.16"	169° 33' 46"	4° 29' 26"	1.0067510	15' 53.19"	23° 26' 16"	3 m 19 s
5	168° 41' 53"	0.15"	169° 36' 01"	4° 28' 29"	1.0067399	15' 53.21"	23° 26' 16"	3 m 20 s
6	168° 44' 19"	0.15"	169° 38' 15"	4° 27' 32"	1.0067288	15' 53.22"	23° 26' 16"	3 m 20 s
7	168° 46' 45"	0.14"	169° 40' 30"	4° 26' 35"	1.0067177	15' 53.23"	23° 26' 16"	3 m 21 s
8	168° 49' 11"	0.14"	169° 42' 45"	4° 25' 38"	1.0067065	15' 53.24"	23° 26' 16"	3 m 22 s
9	168° 51' 37"	0.13"	169° 44' 59"	4° 24' 41"	1.0066954	15' 53.25"	23° 26' 16"	3 m 23 s
10	168° 54' 03"	0.13"	169° 47' 14"	4° 23' 44"	1.0066843	15' 53.26"	23° 26' 16"	3 m 24 s
11	168° 56' 29"	0.12"	169° 49' 29"	4° 22' 46"	1.0066731	15' 53.27"	23° 26' 16"	3 m 25 s
12	168° 58' 54"	0.11"	169° 51' 43"	4° 21' 49"	1.0066620	15' 53.28"	23° 26' 16"	3 m 26 s
13	169° 01' 20"	0.11"	169° 53' 58"	4° 20' 52"	1.0066509	15' 53.29"	23° 26' 16"	3 m 27 s
14	169° 03' 46"	0.10"	169° 56' 13"	4° 19' 55"	1.0066397	15' 53.30"	23° 26' 16"	3 m 28 s
15	169° 06' 12"	0.10"	169° 58' 27"	4° 18' 58"	1.0066285	15' 53.31"	23° 26' 16"	3 m 28 s
16	169° 08' 38"	0.09"	170° 00' 42"	4° 18' 01"	1.0066174	15' 53.32"	23° 26' 16"	3 m 29 s
17	169° 11' 04"	0.09"	170° 02' 57"	4° 17' 04"	1.0066062	15' 53.33"	23° 26' 16"	3 m 30 s
18	169° 13' 30"	0.08"	170° 05' 11"	4° 16' 06"	1.0065950	15' 53.34"	23° 26' 16"	3 m 31 s
19	169° 15' 56"	0.08"	170° 07' 26"	4° 15' 09"	1.0065839	15' 53.35"	23° 26' 16"	3 m 32 s
20	169° 18' 22"	0.07"	170° 09' 40"	4° 14' 12"	1.0065727	15' 53.36"	23° 26' 16"	3 m 33 s
21	169° 20' 48"	0.06"	170° 11' 55"	4° 13' 15"	1.0065615	15' 53.37"	23° 26' 16"	3 m 34 s
22	169° 23' 14"	0.06"	170° 14' 10"	4° 12' 18"	1.0065503	15' 53.39"	23° 26' 16"	3 m 35 s
23	169° 25' 40"	0.05"	170° 16' 24"	4° 11' 20"	1.0065391	15' 53.40"	23° 26' 16"	3 m 35 s
24	169° 28' 06"	0.05"	170° 18' 39"	4° 10' 23"	1.0065279	15' 53.41"	23° 26' 16"	3 m 36 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	220° 38' 41"	2° 03' 56"	218° 53' 15"	-13° 03' 09"	0° 59' 30"	16' 12.84"	286° 26' 36"	0.19418
1	221° 14' 22"	2° 01' 03"	219° 27' 10"	-13° 16' 54"	0° 59' 30"	16' 12.87"	286° 21' 41"	0.19801
2	221° 50' 03"	1° 58' 09"	220° 01' 10"	-13° 30' 34"	0° 59' 30"	16' 12.91"	286° 16' 34"	0.20187
3	222° 25' 44"	1° 55' 15"	220° 35' 13"	-13° 44' 10"	0° 59' 30"	16' 12.93"	286° 11' 13"	0.20576
4	223° 01' 25"	1° 52' 20"	221° 09' 20"	-13° 57' 41"	0° 59' 31"	16' 12.96"	286° 5' 40"	0.20968
5	223° 37' 06"	1° 49' 24"	221° 43' 32"	-14° 11' 07"	0° 59' 31"	16' 12.98"	285° 59' 53"	0.21363
6	224° 12' 46"	1° 46' 27"	222° 17' 47"	-14° 24' 28"	0° 59' 31"	16' 12.99"	285° 53' 54"	0.21760
7	224° 48' 26"	1° 43' 30"	222° 52' 06"	-14° 37' 44"	0° 59' 31"	16' 13.01"	285° 47' 42"	0.22160
8	225° 24' 06"	1° 40' 32"	223° 26' 29"	-14° 50' 56"	0° 59' 31"	16' 13.02"	285° 41' 18"	0.22562
9	225° 59' 46"	1° 37' 33"	224° 00' 56"	-15° 04' 02"	0° 59' 31"	16' 13.02"	285° 34' 41"	0.22967
10	226° 35' 26"	1° 34' 34"	224° 35' 28"	-15° 17' 03"	0° 59' 31"	16' 13.02"	285° 27' 52"	0.23374
11	227° 11' 05"	1° 31' 34"	225° 10' 03"	-15° 29' 58"	0° 59' 31"	16' 13.02"	285° 20' 51"	0.23784
12	227° 46' 44"	1° 28' 34"	225° 44' 43"	-15° 42' 48"	0° 59' 31"	16' 13.02"	285° 13' 37"	0.24197
13	228° 22' 23"	1° 25' 33"	226° 19' 27"	-15° 55' 33"	0° 59' 31"	16' 13.01"	285° 6' 12"	0.24612
14	228° 58' 02"	1° 22' 31"	226° 54' 15"	-16° 08' 12"	0° 59' 31"	16' 13.00"	284° 58' 35"	0.25029
15	229° 33' 40"	1° 19' 29"	227° 29' 07"	-16° 20' 45"	0° 59' 31"	16' 12.98"	284° 50' 46"	0.25448
16	230° 09' 18"	1° 16' 26"	228° 04' 04"	-16° 33' 13"	0° 59' 31"	16' 12.96"	284° 42' 45"	0.25870
17	230° 44' 55"	1° 13' 23"	228° 39' 05"	-16° 45' 34"	0° 59' 30"	16' 12.94"	284° 34' 33"	0.26294
18	231° 20' 33"	1° 10' 20"	229° 14' 10"	-16° 57' 50"	0° 59' 30"	16' 12.92"	284° 26' 10"	0.26720
19	231° 56' 10"	1° 07' 15"	229° 49' 19"	-17° 09' 59"	0° 59' 30"	16' 12.89"	284° 17' 35"	0.27148
20	232° 31' 46"	1° 04' 11"	230° 24' 33"	-17° 22' 03"	0° 59' 30"	16' 12.85"	284° 8' 49"	0.27579
21	233° 07' 23"	1° 01' 06"	230° 59' 51"	-17° 33' 60"	0° 59' 30"	16' 12.82"	283° 59' 51"	0.28011
22	233° 42' 59"	0° 58' 01"	231° 35' 14"	-17° 45' 51"	0° 59' 30"	16' 12.78"	283° 50' 43"	0.28445
23	234° 18' 34"	0° 54' 55"	232° 10' 41"	-17° 57' 35"	0° 59' 30"	16' 12.74"	283° 41' 24"	0.28882
24	234° 54' 10"	0° 51' 49"	232° 46' 12"	-18° 09' 13"	0° 59' 30"	16' 12.69"	283° 31' 54"	0.29320

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	169° 28' 06"	0.05"	170° 18' 39"	4° 10' 23"	1.0065279	15' 53.41"	23° 26' 16"	3 m 36 s
1	169° 30' 32"	0.04"	170° 20' 54"	4° 09' 26"	1.0065167	15' 53.42"	23° 26' 16"	3 m 37 s
2	169° 32' 57"	0.04"	170° 23' 08"	4° 08' 29"	1.0065055	15' 53.43"	23° 26' 16"	3 m 38 s
3	169° 35' 23"	0.03"	170° 25' 23"	4° 07' 31"	1.0064943	15' 53.44"	23° 26' 16"	3 m 39 s
4	169° 37' 49"	0.02"	170° 27' 37"	4° 06' 34"	1.0064831	15' 53.45"	23° 26' 16"	3 m 40 s
5	169° 40' 15"	0.02"	170° 29' 52"	4° 05' 37"	1.0064719	15' 53.46"	23° 26' 16"	3 m 41 s
6	169° 42' 41"	0.01"	170° 32' 07"	4° 04' 40"	1.0064606	15' 53.47"	23° 26' 16"	3 m 42 s
7	169° 45' 07"	0.01"	170° 34' 21"	4° 03' 42"	1.0064494	15' 53.48"	23° 26' 16"	3 m 42 s
8	169° 47' 33"	0.00"	170° 36' 36"	4° 02' 45"	1.0064382	15' 53.49"	23° 26' 16"	3 m 43 s
9	169° 49' 59"	-0.00"	170° 38' 50"	4° 01' 48"	1.0064269	15' 53.50"	23° 26' 16"	3 m 44 s
10	169° 52' 25"	-0.01"	170° 41' 05"	4° 00' 50"	1.0064157	15' 53.51"	23° 26' 16"	3 m 45 s
11	169° 54' 51"	-0.02"	170° 43' 20"	3° 59' 53"	1.0064044	15' 53.52"	23° 26' 16"	3 m 46 s
12	169° 57' 17"	-0.02"	170° 45' 34"	3° 58' 56"	1.0063932	15' 53.53"	23° 26' 16"	3 m 47 s
13	169° 59' 43"	-0.03"	170° 47' 49"	3° 57' 59"	1.0063819	15' 53.54"	23° 26' 16"	3 m 48 s
14	170° 02' 09"	-0.03"	170° 50' 03"	3° 57' 01"	1.0063707	15' 53.56"	23° 26' 16"	3 m 49 s
15	170° 04' 35"	-0.04"	170° 52' 18"	3° 56' 04"	1.0063594	15' 53.57"	23° 26' 16"	3 m 50 s
16	170° 07' 01"	-0.04"	170° 54' 32"	3° 55' 07"	1.0063481	15' 53.58"	23° 26' 16"	3 m 50 s
17	170° 09' 27"	-0.05"	170° 56' 47"	3° 54' 09"	1.0063368	15' 53.59"	23° 26' 16"	3 m 51 s
18	170° 11' 53"	-0.06"	170° 59' 02"	3° 53' 12"	1.0063256	15' 53.60"	23° 26' 16"	3 m 52 s
19	170° 14' 19"	-0.06"	171° 01' 16"	3° 52' 14"	1.0063143	15' 53.61"	23° 26' 16"	3 m 53 s
20	170° 16' 45"	-0.07"	171° 03' 31"	3° 51' 17"	1.0063030	15' 53.62"	23° 26' 16"	3 m 54 s
21	170° 19' 11"	-0.07"	171° 05' 45"	3° 50' 20"	1.0062917	15' 53.63"	23° 26' 16"	3 m 55 s
22	170° 21' 37"	-0.08"	171° 07' 60"	3° 49' 22"	1.0062804	15' 53.64"	23° 26' 16"	3 m 56 s
23	170° 24' 03"	-0.08"	171° 10' 14"	3° 48' 25"	1.0062691	15' 53.65"	23° 26' 16"	3 m 57 s
24	170° 26' 29"	-0.09"	171° 12' 29"	3° 47' 28"	1.0062578	15' 53.66"	23° 26' 16"	3 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	234° 54' 10"	0° 51' 49"	232° 46' 12"	-18° 09' 13"	0° 59' 30"	16' 12.69"	283° 31' 54"	0.29320
1	235° 29' 45"	0° 48' 43"	233° 21' 48"	-18° 20' 44"	0° 59' 29"	16' 12.64"	283° 22' 13"	0.29760
2	236° 05' 19"	0° 45' 37"	233° 57' 28"	-18° 32' 08"	0° 59' 29"	16' 12.59"	283° 12' 21"	0.30202
3	236° 40' 53"	0° 42' 30"	234° 33' 12"	-18° 43' 26"	0° 59' 29"	16' 12.54"	283° 2' 19"	0.30645
4	237° 16' 27"	0° 39' 23"	235° 09' 01"	-18° 54' 36"	0° 59' 29"	16' 12.48"	282° 52' 06"	0.31091
5	237° 52' 00"	0° 36' 15"	235° 44' 54"	-19° 05' 40"	0° 59' 29"	16' 12.42"	282° 41' 43"	0.31538
6	238° 27' 33"	0° 33' 08"	236° 20' 52"	-19° 16' 37"	0° 59' 28"	16' 12.36"	282° 31' 09"	0.31987
7	239° 03' 05"	0° 30' 00"	236° 56' 54"	-19° 27' 26"	0° 59' 28"	16' 12.29"	282° 20' 26"	0.32437
8	239° 38' 37"	0° 26' 52"	237° 33' 00"	-19° 38' 08"	0° 59' 28"	16' 12.22"	282° 9' 32"	0.32889
9	240° 14' 09"	0° 23' 44"	238° 09' 11"	-19° 48' 43"	0° 59' 28"	16' 12.15"	281° 58' 28"	0.33342
10	240° 49' 40"	0° 20' 36"	238° 45' 26"	-19° 59' 11"	0° 59' 27"	16' 12.07"	281° 47' 14"	0.33797
11	241° 25' 10"	0° 17' 28"	239° 21' 46"	-20° 09' 31"	0° 59' 27"	16' 11.99"	281° 35' 51"	0.34253
12	242° 00' 41"	0° 14' 20"	239° 58' 09"	-20° 19' 43"	0° 59' 27"	16' 11.91"	281° 24' 17"	0.34711
13	242° 36' 10"	0° 11' 11"	240° 34' 37"	-20° 29' 48"	0° 59' 26"	16' 11.83"	281° 12' 34"	0.35170
14	243° 11' 40"	0° 08' 03"	241° 11' 10"	-20° 39' 45"	0° 59' 26"	16' 11.74"	281° 0' 42"	0.35630
15	243° 47' 08"	0° 04' 54"	241° 47' 46"	-20° 49' 34"	0° 59' 26"	16' 11.65"	280° 48' 40"	0.36091
16	244° 22' 37"	0° 01' 46"	242° 24' 27"	-20° 59' 15"	0° 59' 25"	16' 11.56"	280° 36' 29"	0.36554
17	244° 58' 04"	0° -1' 23"	243° 01' 12"	-21° 08' 48"	0° 59' 25"	16' 11.46"	280° 24' 08"	0.37017
18	245° 33' 32"	0° -4' 31"	243° 38' 02"	-21° 18' 13"	0° 59' 25"	16' 11.37"	280° 11' 38"	0.37482
19	246° 08' 58"	0° -7' 39"	244° 14' 55"	-21° 27' 30"	0° 59' 24"	16' 11.27"	279° 58' 60"	0.37948
20	246° 44' 25"	0° -10' 47"	244° 51' 53"	-21° 36' 39"	0° 59' 24"	16' 11.16"	279° 46' 12"	0.38415
21	247° 19' 50"	0° -13' 55"	245° 28' 55"	-21° 45' 40"	0° 59' 24"	16' 11.06"	279° 33' 15"	0.38882
22	247° 55' 12"	0° -17' 03"	246° 05' 56"	-21° 54' 31"	0° 59' 23"	16' 10.95"	279° 20' 12"	0.39350
23	248° 30' 36"	0° -20' 11"	246° 43' 06"	-22° 03' 14"	0° 59' 23"	16' 10.84"	279° 6' 58"	0.39820
24	249° 06' 00"	0° -23' 19"	247° 20' 20"	-22° 11' 50"	0° 59' 22"	16' 10.72"	278° 53' 35"	0.40290

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	170° 26' 29"	-0.09"	171° 12' 29"	3° 47' 28"	1.0062578	15' 53.66"	23° 26' 16"	3 m 58 s
1	170° 28' 55"	-0.10"	171° 14' 43"	3° 46' 30"	1.0062465	15' 53.67"	23° 26' 16"	3 m 58 s
2	170° 31' 21"	-0.10"	171° 16' 58"	3° 45' 33"	1.0062352	15' 53.68"	23° 26' 16"	3 m 59 s
3	170° 33' 47"	-0.11"	171° 19' 13"	3° 44' 35"	1.0062239	15' 53.69"	23° 26' 16"	4 m 00 s
4	170° 36' 13"	-0.11"	171° 21' 27"	3° 43' 38"	1.0062126	15' 53.71"	23° 26' 16"	4 m 01 s
5	170° 38' 39"	-0.12"	171° 23' 42"	3° 42' 40"	1.0062013	15' 53.72"	23° 26' 16"	4 m 02 s
6	170° 41' 05"	-0.13"	171° 25' 56"	3° 41' 43"	1.0061899	15' 53.73"	23° 26' 16"	4 m 03 s
7	170° 43' 31"	-0.13"	171° 28' 11"	3° 40' 46"	1.0061786	15' 53.74"	23° 26' 16"	4 m 04 s
8	170° 45' 57"	-0.14"	171° 30' 25"	3° 39' 48"	1.0061673	15' 53.75"	23° 26' 16"	4 m 05 s
9	170° 48' 23"	-0.14"	171° 32' 40"	3° 38' 51"	1.0061559	15' 53.76"	23° 26' 16"	4 m 05 s
10	170° 50' 49"	-0.15"	171° 34' 54"	3° 37' 53"	1.0061446	15' 53.77"	23° 26' 16"	4 m 06 s
11	170° 53' 15"	-0.15"	171° 37' 09"	3° 36' 56"	1.0061333	15' 53.78"	23° 26' 16"	4 m 07 s
12	170° 55' 41"	-0.16"	171° 39' 23"	3° 35' 58"	1.0061219	15' 53.79"	23° 26' 16"	4 m 08 s
13	170° 58' 07"	-0.17"	171° 41' 38"	3° 35' 01"	1.0061106	15' 53.80"	23° 26' 16"	4 m 09 s
14	171° 00' 33"	-0.17"	171° 43' 52"	3° 34' 03"	1.0060992	15' 53.81"	23° 26' 16"	4 m 10 s
15	171° 02' 59"	-0.18"	171° 46' 07"	3° 33' 06"	1.0060878	15' 53.82"	23° 26' 16"	4 m 11 s
16	171° 05' 26"	-0.18"	171° 48' 21"	3° 32' 08"	1.0060765	15' 53.83"	23° 26' 16"	4 m 12 s
17	171° 07' 52"	-0.19"	171° 50' 36"	3° 31' 11"	1.0060651	15' 53.84"	23° 26' 16"	4 m 13 s
18	171° 10' 18"	-0.19"	171° 52' 50"	3° 30' 13"	1.0060538	15' 53.86"	23° 26' 16"	4 m 13 s
19	171° 12' 44"	-0.20"	171° 55' 05"	3° 29' 16"	1.0060424	15' 53.87"	23° 26' 16"	4 m 14 s
20	171° 15' 10"	-0.21"	171° 57' 19"	3° 28' 18"	1.0060310	15' 53.88"	23° 26' 16"	4 m 15 s
21	171° 17' 36"	-0.21"	171° 59' 34"	3° 27' 21"	1.0060196	15' 53.89"	23° 26' 16"	4 m 16 s
22	171° 20' 02"	-0.22"	172° 01' 48"	3° 26' 23"	1.0060083	15' 53.90"	23° 26' 16"	4 m 17 s
23	171° 22' 28"	-0.22"	172° 04' 03"	3° 25' 26"	1.0059969	15' 53.91"	23° 26' 16"	4 m 18 s
24	171° 24' 54"	-0.23"	172° 06' 17"	3° 24' 28"	1.0059855	15' 53.92"	23° 26' 16"	4 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	249° 06' 00"	0°-23' 19"	247° 20' 20"	-22° 11' 50"	0° 59' 22"	16' 10.72"	278° 53' 35"	0.40290
1	249° 41' 24"	0°-26' 26"	247° 57' 37"	-22° 20' 16"	0° 59' 22"	16' 10.61"	278° 40' 05"	0.40761
2	250° 16' 47"	0°-29' 33"	248° 34' 59"	-22° 28' 34"	0° 59' 21"	16' 10.49"	278° 26' 26"	0.41233
3	250° 52' 10"	0°-32' 40"	249° 12' 24"	-22° 36' 43"	0° 59' 21"	16' 10.37"	278° 12' 38"	0.41705
4	251° 27' 32"	0°-35' 47"	249° 49' 53"	-22° 44' 43"	0° 59' 21"	16' 10.25"	277° 58' 43"	0.42178
5	252° 02' 53"	0°-38' 54"	250° 27' 26"	-22° 52' 35"	0° 59' 20"	16' 10.12"	277° 44' 40"	0.42652
6	252° 38' 14"	0°-41' 60"	251° 05' 03"	-23° 00' 17"	0° 59' 20"	16' 09.99"	277° 30' 29"	0.43126
7	253° 13' 34"	0°-45' 06"	251° 42' 43"	-23° 07' 50"	0° 59' 19"	16' 09.86"	277° 16' 10"	0.43600
8	253° 48' 54"	0°-48' 11"	252° 20' 27"	-23° 15' 15"	0° 59' 19"	16' 09.73"	277° 1' 43"	0.44075
9	254° 24' 13"	0°-51' 16"	252° 58' 14"	-23° 22' 30"	0° 59' 18"	16' 09.60"	276° 47' 10"	0.44551
10	254° 59' 32"	0°-54' 21"	253° 36' 04"	-23° 29' 36"	0° 59' 18"	16' 09.46"	276° 32' 28"	0.45027
11	255° 34' 50"	0°-57' 25"	254° 13' 58"	-23° 36' 32"	0° 59' 17"	16' 09.32"	276° 17' 40"	0.45503
12	256° 10' 07"	-1° 00' 29"	254° 51' 56"	-23° 43' 20"	0° 59' 17"	16' 09.18"	276° 2' 44"	0.45979
13	256° 45' 24"	-1° 03' 33"	255° 29' 56"	-23° 49' 58"	0° 59' 16"	16' 09.03"	275° 47' 41"	0.46456
14	257° 20' 41"	-1° 06' 36"	256° 07' 60"	-23° 56' 26"	0° 59' 16"	16' 08.89"	275° 32' 32"	0.46932
15	257° 55' 56"	-1° 09' 39"	256° 46' 06"	-24° 02' 45"	0° 59' 15"	16' 08.74"	275° 17' 16"	0.47409
16	258° 31' 11"	-1° 12' 41"	257° 24' 16"	-24° 08' 54"	0° 59' 14"	16' 08.59"	275° 1' 53"	0.47886
17	259° 06' 26"	-1° 15' 42"	258° 02' 29"	-24° 14' 54"	0° 59' 14"	16' 08.44"	274° 46' 23"	0.48363
18	259° 41' 40"	-1° 18' 43"	258° 40' 44"	-24° 20' 44"	0° 59' 13"	16' 08.28"	274° 30' 48"	0.48840
19	260° 16' 53"	-1° 21' 44"	259° 19' 02"	-24° 26' 25"	0° 59' 13"	16' 08.13"	274° 15' 06"	0.49316
20	260° 52' 06"	-1° 24' 44"	259° 57' 23"	-24° 31' 55"	0° 59' 12"	16' 07.97"	273° 59' 18"	0.49793
21	261° 27' 18"	-1° 27' 43"	260° 35' 46"	-24° 37' 16"	0° 59' 12"	16' 07.81"	273° 43' 24"	0.50270
22	262° 02' 30"	-1° 30' 42"	261° 14' 12"	-24° 42' 27"	0° 59' 11"	16' 07.65"	273° 27' 24"	0.50746
23	262° 37' 40"	-1° 33' 40"	261° 52' 40"	-24° 47' 28"	0° 59' 10"	16' 07.48"	273° 11' 19"	0.51222
24	263° 12' 51"	-1° 36' 38"	262° 31' 10"	-24° 52' 20"	0° 59' 10"	16' 07.31"	272° 55' 08"	0.51698

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	171° 24' 54"	-0.23"	172° 06' 17"	3° 24' 28"	1.0059855	15' 53.92"	23° 26' 16"	4 m 19 s
1	171° 27' 20"	-0.23"	172° 08' 32"	3° 23' 30"	1.0059741	15' 53.93"	23° 26' 16"	4 m 20 s
2	171° 29' 46"	-0.24"	172° 10' 46"	3° 22' 33"	1.0059627	15' 53.94"	23° 26' 16"	4 m 21 s
3	171° 32' 12"	-0.24"	172° 13' 01"	3° 21' 35"	1.0059513	15' 53.95"	23° 26' 16"	4 m 21 s
4	171° 34' 38"	-0.25"	172° 15' 15"	3° 20' 38"	1.0059399	15' 53.96"	23° 26' 16"	4 m 22 s
5	171° 37' 04"	-0.26"	172° 17' 30"	3° 19' 40"	1.0059285	15' 53.97"	23° 26' 16"	4 m 23 s
6	171° 39' 31"	-0.26"	172° 19' 44"	3° 18' 43"	1.0059171	15' 53.99"	23° 26' 16"	4 m 24 s
7	171° 41' 57"	-0.27"	172° 21' 59"	3° 17' 45"	1.0059057	15' 54.00"	23° 26' 16"	4 m 25 s
8	171° 44' 23"	-0.27"	172° 24' 13"	3° 16' 47"	1.0058943	15' 54.01"	23° 26' 16"	4 m 26 s
9	171° 46' 49"	-0.28"	172° 26' 28"	3° 15' 50"	1.0058829	15' 54.02"	23° 26' 16"	4 m 27 s
10	171° 49' 15"	-0.28"	172° 28' 42"	3° 14' 52"	1.0058715	15' 54.03"	23° 26' 16"	4 m 28 s
11	171° 51' 41"	-0.29"	172° 30' 57"	3° 13' 55"	1.0058601	15' 54.04"	23° 26' 16"	4 m 29 s
12	171° 54' 07"	-0.29"	172° 33' 11"	3° 12' 57"	1.0058486	15' 54.05"	23° 26' 16"	4 m 29 s
13	171° 56' 33"	-0.30"	172° 35' 26"	3° 11' 59"	1.0058372	15' 54.06"	23° 26' 16"	4 m 30 s
14	171° 58' 59"	-0.30"	172° 37' 40"	3° 11' 02"	1.0058258	15' 54.07"	23° 26' 16"	4 m 31 s
15	172° 01' 25"	-0.31"	172° 39' 55"	3° 10' 04"	1.0058144	15' 54.08"	23° 26' 16"	4 m 32 s
16	172° 03' 52"	-0.31"	172° 42' 09"	3° 09' 06"	1.0058029	15' 54.09"	23° 26' 16"	4 m 33 s
17	172° 06' 18"	-0.32"	172° 44' 24"	3° 08' 09"	1.0057915	15' 54.10"	23° 26' 16"	4 m 34 s
18	172° 08' 44"	-0.32"	172° 46' 38"	3° 07' 11"	1.0057801	15' 54.12"	23° 26' 16"	4 m 35 s
19	172° 11' 10"	-0.33"	172° 48' 53"	3° 06' 13"	1.0057686	15' 54.13"	23° 26' 16"	4 m 36 s
20	172° 13' 36"	-0.34"	172° 51' 07"	3° 05' 16"	1.0057572	15' 54.14"	23° 26' 16"	4 m 37 s
21	172° 16' 02"	-0.34"	172° 53' 21"	3° 04' 18"	1.0057457	15' 54.15"	23° 26' 16"	4 m 37 s
22	172° 18' 28"	-0.35"	172° 55' 36"	3° 03' 20"	1.0057343	15' 54.16"	23° 26' 16"	4 m 38 s
23	172° 20' 54"	-0.35"	172° 57' 50"	3° 02' 23"	1.0057228	15' 54.17"	23° 26' 16"	4 m 39 s
24	172° 23' 21"	-0.36"	173° 00' 05"	3° 01' 25"	1.0057114	15' 54.18"	23° 26' 16"	4 m 40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	263° 12' 51"	-1° 36' 38"	262° 31' 10"	-24° 52' 20"	0° 59' 10"	16' 07.31"	272° 55' 08"	0.51698
1	263° 48' 00"	-1° 39' 34"	263° 09' 43"	-24° 57' 01"	0° 59' 09"	16' 07.15"	272° 38' 51"	0.52173
2	264° 23' 09"	-1° 42' 31"	263° 48' 18"	-25° 01' 32"	0° 59' 09"	16' 06.97"	272° 22' 29"	0.52648
3	264° 58' 18"	-1° 45' 26"	264° 26' 54"	-25° 05' 53"	0° 59' 08"	16' 06.80"	272° 6' 03"	0.53123
4	265° 33' 26"	-1° 48' 21"	265° 05' 33"	-25° 10' 04"	0° 59' 07"	16' 06.63"	271° 49' 31"	0.53597
5	266° 08' 33"	-1° 51' 15"	265° 44' 13"	-25° 14' 05"	0° 59' 07"	16' 06.45"	271° 32' 54"	0.54070
6	266° 43' 39"	-1° 54' 08"	266° 22' 55"	-25° 17' 55"	0° 59' 06"	16' 06.27"	271° 16' 13"	0.54543
7	267° 18' 45"	-1° 57' 00"	267° 01' 39"	-25° 21' 36"	0° 59' 05"	16' 06.09"	270° 59' 27"	0.55016
8	267° 53' 50"	-1° 59' 52"	267° 40' 24"	-25° 25' 06"	0° 59' 05"	16' 05.91"	270° 42' 37"	0.55488
9	268° 28' 55"	-2° 02' 43"	268° 19' 10"	-25° 28' 26"	0° 59' 04"	16' 05.73"	270° 25' 42"	0.55959
10	269° 03' 59"	-2° 05' 32"	268° 57' 58"	-25° 31' 36"	0° 59' 03"	16' 05.54"	270° 8' 44"	0.56429
11	269° 39' 02"	-2° 08' 22"	269° 36' 47"	-25° 34' 35"	0° 59' 03"	16' 05.36"	269° 51' 41"	0.56899
12	270° 14' 05"	-2° 11' 10"	270° 15' 36"	-25° 37' 25"	0° 59' 02"	16' 05.17"	269° 34' 34"	0.57368
13	270° 49' 07"	-2° 13' 57"	270° 54' 27"	-25° 40' 04"	0° 59' 01"	16' 04.98"	269° 17' 24"	0.57835
14	271° 24' 08"	-2° 16' 44"	271° 33' 19"	-25° 42' 32"	0° 59' 01"	16' 04.78"	269° 0' 11"	0.58302
15	271° 59' 09"	-2° 19' 29"	272° 12' 11"	-25° 44' 50"	0° 58' 60"	16' 04.59"	268° 42' 53"	0.58768
16	272° 34' 09"	-2° 22' 14"	272° 51' 04"	-25° 46' 58"	0° 58' 59"	16' 04.39"	268° 25' 33"	0.59234
17	273° 09' 08"	-2° 24' 57"	273° 29' 57"	-25° 48' 55"	0° 58' 58"	16' 04.20"	268° 8' 10"	0.59698
18	273° 44' 07"	-2° 27' 40"	274° 08' 50"	-25° 50' 42"	0° 58' 58"	16' 04.00"	267° 50' 43"	0.60161
19	274° 19' 05"	-2° 30' 22"	274° 47' 44"	-25° 52' 19"	0° 58' 57"	16' 03.80"	267° 33' 14"	0.60622
20	274° 54' 03"	-2° 33' 03"	275° 26' 38"	-25° 53' 45"	0° 58' 56"	16' 03.59"	267° 15' 42"	0.61083
21	275° 28' 59"	-2° 35' 42"	276° 05' 32"	-25° 55' 01"	0° 58' 55"	16' 03.39"	266° 58' 08"	0.61543
22	276° 03' 55"	-2° 38' 21"	276° 44' 25"	-25° 56' 06"	0° 58' 55"	16' 03.18"	266° 40' 31"	0.62001
23	276° 38' 51"	-2° 40' 59"	277° 23' 19"	-25° 57' 01"	0° 58' 54"	16' 02.98"	266° 22' 52"	0.62458
24	277° 13' 45"	-2° 43' 35"	278° 02' 12"	-25° 57' 46"	0° 58' 53"	16' 02.77"	266° 5' 11"	0.62913

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	172° 23' 21"	-0.36"	173° 00' 05"	3° 01' 25"	1.0057114	15' 54.18"	23° 26' 16"	4 m 40 s
1	172° 25' 47"	-0.36"	173° 02' 19"	3° 00' 27"	1.0056999	15' 54.19"	23° 26' 16"	4 m 41 s
2	172° 28' 13"	-0.37"	173° 04' 34"	2° 59' 30"	1.0056885	15' 54.20"	23° 26' 16"	4 m 42 s
3	172° 30' 39"	-0.37"	173° 06' 48"	2° 58' 32"	1.0056770	15' 54.21"	23° 26' 16"	4 m 43 s
4	172° 33' 05"	-0.38"	173° 09' 03"	2° 57' 34"	1.0056656	15' 54.22"	23° 26' 16"	4 m 44 s
5	172° 35' 31"	-0.38"	173° 11' 17"	2° 56' 36"	1.0056541	15' 54.23"	23° 26' 16"	4 m 45 s
6	172° 37' 57"	-0.39"	173° 13' 32"	2° 55' 39"	1.0056426	15' 54.25"	23° 26' 16"	4 m 45 s
7	172° 40' 24"	-0.39"	173° 15' 46"	2° 54' 41"	1.0056312	15' 54.26"	23° 26' 16"	4 m 46 s
8	172° 42' 50"	-0.40"	173° 18' 00"	2° 53' 43"	1.0056197	15' 54.27"	23° 26' 16"	4 m 47 s
9	172° 45' 16"	-0.40"	173° 20' 15"	2° 52' 45"	1.0056082	15' 54.28"	23° 26' 16"	4 m 48 s
10	172° 47' 42"	-0.41"	173° 22' 29"	2° 51' 48"	1.0055968	15' 54.29"	23° 26' 16"	4 m 49 s
11	172° 50' 08"	-0.41"	173° 24' 44"	2° 50' 50"	1.0055853	15' 54.30"	23° 26' 16"	4 m 50 s
12	172° 52' 34"	-0.41"	173° 26' 58"	2° 49' 52"	1.0055738	15' 54.31"	23° 26' 16"	4 m 51 s
13	172° 55' 01"	-0.42"	173° 29' 13"	2° 48' 54"	1.0055623	15' 54.32"	23° 26' 16"	4 m 52 s
14	172° 57' 27"	-0.42"	173° 31' 27"	2° 47' 57"	1.0055509	15' 54.33"	23° 26' 16"	4 m 53 s
15	172° 59' 53"	-0.43"	173° 33' 42"	2° 46' 59"	1.0055394	15' 54.34"	23° 26' 16"	4 m 54 s
16	173° 02' 19"	-0.43"	173° 35' 56"	2° 46' 01"	1.0055279	15' 54.35"	23° 26' 16"	4 m 54 s
17	173° 04' 45"	-0.44"	173° 38' 10"	2° 45' 03"	1.0055164	15' 54.37"	23° 26' 16"	4 m 55 s
18	173° 07' 12"	-0.44"	173° 40' 25"	2° 44' 05"	1.0055049	15' 54.38"	23° 26' 16"	4 m 56 s
19	173° 09' 38"	-0.45"	173° 42' 39"	2° 43' 08"	1.0054934	15' 54.39"	23° 26' 16"	4 m 57 s
20	173° 12' 04"	-0.45"	173° 44' 54"	2° 42' 10"	1.0054819	15' 54.40"	23° 26' 16"	4 m 58 s
21	173° 14' 30"	-0.46"	173° 47' 08"	2° 41' 12"	1.0054704	15' 54.41"	23° 26' 16"	4 m 59 s
22	173° 16' 56"	-0.46"	173° 49' 23"	2° 40' 14"	1.0054589	15' 54.42"	23° 26' 16"	4 m 60 s
23	173° 19' 22"	-0.47"	173° 51' 37"	2° 39' 16"	1.0054474	15' 54.43"	23° 26' 16"	5 m 01 s
24	173° 21' 49"	-0.47"	173° 53' 51"	2° 38' 19"	1.0054359	15' 54.44"	23° 26' 16"	5 m 02 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	277° 13' 45"	-2° 43' 35"	278° 02' 12"	-25° 57' 46"	0° 58' 53"	16' 02.77"	266° 5' 11"	0.62913
1	277° 48' 39"	-2° 46' 11"	278° 41' 04"	-25° 58' 20"	0° 58' 52"	16' 02.56"	265° 47' 28"	0.63368
2	278° 23' 33"	-2° 48' 45"	279° 19' 56"	-25° 58' 43"	0° 58' 52"	16' 02.34"	265° 29' 43"	0.63821
3	278° 58' 25"	-2° 51' 18"	279° 58' 48"	-25° 58' 57"	0° 58' 51"	16' 02.13"	265° 11' 56"	0.64272
4	279° 33' 17"	-2° 53' 50"	280° 37' 38"	-25° 58' 60"	0° 58' 50"	16' 01.91"	264° 54' 08"	0.64722
5	280° 08' 08"	-2° 56' 21"	281° 16' 27"	-25° 58' 52"	0° 58' 49"	16' 01.70"	264° 36' 19"	0.65170
6	280° 42' 59"	-2° 58' 51"	281° 55' 16"	-25° 58' 34"	0° 58' 48"	16' 01.48"	264° 18' 28"	0.65617
7	281° 17' 49"	-3° 01' 20"	282° 34' 03"	-25° 58' 06"	0° 58' 48"	16' 01.26"	264° 0' 36"	0.66063
8	281° 52' 38"	-3° 03' 47"	283° 12' 48"	-25° 57' 28"	0° 58' 47"	16' 01.04"	263° 42' 43"	0.66506
9	282° 27' 26"	-3° 06' 14"	283° 51' 33"	-25° 56' 39"	0° 58' 46"	16' 00.81"	263° 24' 50"	0.66948
10	283° 02' 14"	-3° 08' 39"	284° 30' 15"	-25° 55' 40"	0° 58' 45"	16' 00.59"	263° 6' 55"	0.67389
11	283° 37' 01"	-3° 11' 03"	285° 08' 56"	-25° 54' 31"	0° 58' 44"	16' 00.36"	262° 49' 00"	0.67827
12	284° 11' 47"	-3° 13' 25"	285° 47' 36"	-25° 53' 11"	0° 58' 43"	16' 00.13"	262° 31' 04"	0.68264
13	284° 46' 32"	-3° 15' 47"	286° 26' 13"	-25° 51' 41"	0° 58' 43"	15' 59.90"	262° 13' 08"	0.68699
14	285° 21' 17"	-3° 18' 07"	287° 04' 48"	-25° 50' 01"	0° 58' 42"	15' 59.67"	261° 55' 12"	0.69132
15	285° 56' 01"	-3° 20' 25"	287° 43' 21"	-25° 48' 11"	0° 58' 41"	15' 59.44"	261° 37' 16"	0.69563
16	286° 30' 44"	-3° 22' 43"	288° 21' 52"	-25° 46' 11"	0° 58' 40"	15' 59.21"	261° 19' 20"	0.69992
17	287° 05' 27"	-3° 24' 59"	289° 00' 21"	-25° 44' 01"	0° 58' 39"	15' 58.97"	261° 1' 23"	0.70420
18	287° 40' 09"	-3° 27' 14"	289° 38' 47"	-25° 41' 41"	0° 58' 38"	15' 58.74"	260° 43' 27"	0.70845
19	288° 14' 50"	-3° 29' 28"	290° 17' 10"	-25° 39' 10"	0° 58' 37"	15' 58.50"	260° 25' 32"	0.71268
20	288° 49' 30"	-3° 31' 40"	290° 55' 31"	-25° 36' 30"	0° 58' 37"	15' 58.26"	260° 7' 36"	0.71689
21	289° 24' 10"	-3° 33' 51"	291° 33' 49"	-25° 33' 40"	0° 58' 36"	15' 58.02"	259° 49' 42"	0.72108
22	289° 58' 49"	-3° 36' 00"	292° 12' 04"	-25° 30' 40"	0° 58' 35"	15' 57.78"	259° 31' 47"	0.72525
23	290° 33' 27"	-3° 38' 08"	292° 50' 17"	-25° 27' 30"	0° 58' 34"	15' 57.53"	259° 13' 54"	0.72940
24	291° 08' 04"	-3° 40' 15"	293° 28' 26"	-25° 24' 10"	0° 58' 33"	15' 57.29"	258° 56' 01"	0.73352

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	173° 21' 49"	-0.47"	173° 53' 51"	2° 38' 19"	1.0054359	15' 54.44"	23° 26' 16"	5 m 02 s
1	173° 24' 15"	-0.47"	173° 56' 06"	2° 37' 21"	1.0054244	15' 54.45"	23° 26' 16"	5 m 02 s
2	173° 26' 41"	-0.48"	173° 58' 20"	2° 36' 23"	1.0054129	15' 54.46"	23° 26' 16"	5 m 03 s
3	173° 29' 07"	-0.48"	174° 00' 35"	2° 35' 25"	1.0054014	15' 54.47"	23° 26' 16"	5 m 04 s
4	173° 31' 34"	-0.49"	174° 02' 49"	2° 34' 27"	1.0053899	15' 54.49"	23° 26' 16"	5 m 05 s
5	173° 33' 60"	-0.49"	174° 05' 04"	2° 33' 29"	1.0053784	15' 54.50"	23° 26' 16"	5 m 06 s
6	173° 36' 26"	-0.49"	174° 07' 18"	2° 32' 32"	1.0053669	15' 54.51"	23° 26' 16"	5 m 07 s
7	173° 38' 52"	-0.50"	174° 09' 32"	2° 31' 34"	1.0053554	15' 54.52"	23° 26' 16"	5 m 08 s
8	173° 41' 18"	-0.50"	174° 11' 47"	2° 30' 36"	1.0053439	15' 54.53"	23° 26' 16"	5 m 09 s
9	173° 43' 45"	-0.51"	174° 14' 01"	2° 29' 38"	1.0053324	15' 54.54"	23° 26' 16"	5 m 10 s
10	173° 46' 11"	-0.51"	174° 16' 16"	2° 28' 40"	1.0053209	15' 54.55"	23° 26' 16"	5 m 10 s
11	173° 48' 37"	-0.52"	174° 18' 30"	2° 27' 42"	1.0053094	15' 54.56"	23° 26' 16"	5 m 11 s
12	173° 51' 03"	-0.52"	174° 20' 44"	2° 26' 44"	1.0052978	15' 54.57"	23° 26' 16"	5 m 12 s
13	173° 53' 30"	-0.52"	174° 22' 59"	2° 25' 46"	1.0052863	15' 54.58"	23° 26' 16"	5 m 13 s
14	173° 55' 56"	-0.53"	174° 25' 13"	2° 24' 48"	1.0052748	15' 54.59"	23° 26' 16"	5 m 14 s
15	173° 58' 22"	-0.53"	174° 27' 28"	2° 23' 51"	1.0052633	15' 54.61"	23° 26' 16"	5 m 15 s
16	174° 00' 48"	-0.53"	174° 29' 42"	2° 22' 53"	1.0052518	15' 54.62"	23° 26' 16"	5 m 16 s
17	174° 03' 15"	-0.54"	174° 31' 57"	2° 21' 55"	1.0052402	15' 54.63"	23° 26' 16"	5 m 17 s
18	174° 05' 41"	-0.54"	174° 34' 11"	2° 20' 57"	1.0052287	15' 54.64"	23° 26' 16"	5 m 18 s
19	174° 08' 07"	-0.55"	174° 36' 25"	2° 19' 59"	1.0052172	15' 54.65"	23° 26' 16"	5 m 18 s
20	174° 10' 33"	-0.55"	174° 38' 40"	2° 19' 01"	1.0052057	15' 54.66"	23° 26' 16"	5 m 19 s
21	174° 12' 60"	-0.55"	174° 40' 54"	2° 18' 03"	1.0051941	15' 54.67"	23° 26' 16"	5 m 20 s
22	174° 15' 26"	-0.56"	174° 43' 09"	2° 17' 05"	1.0051826	15' 54.68"	23° 26' 16"	5 m 21 s
23	174° 17' 52"	-0.56"	174° 45' 23"	2° 16' 07"	1.0051711	15' 54.69"	23° 26' 16"	5 m 22 s
24	174° 20' 18"	-0.56"	174° 47' 37"	2° 15' 09"	1.0051596	15' 54.70"	23° 26' 16"	5 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	291° 08' 04"	-3° 40' 15"	293° 28' 26"	-25° 24' 10"	0° 58' 33"	15' 57.29"	258° 56' 01"	0.73352
1	291° 42' 40"	-3° 42' 20"	294° 06' 31"	-25° 20' 40"	0° 58' 32"	15' 57.04"	258° 38' 10"	0.73763
2	292° 17' 16"	-3° 44' 24"	294° 44' 34"	-25° 17' 01"	0° 58' 31"	15' 56.79"	258° 20' 19"	0.74171
3	292° 51' 51"	-3° 46' 27"	295° 22' 33"	-25° 13' 12"	0° 58' 30"	15' 56.54"	258° 2' 29"	0.74576
4	293° 26' 25"	-3° 48' 28"	296° 00' 29"	-25° 09' 14"	0° 58' 29"	15' 56.29"	257° 44' 41"	0.74980
5	294° 00' 58"	-3° 50' 27"	296° 38' 21"	-25° 05' 06"	0° 58' 28"	15' 56.04"	257° 26' 54"	0.75380
6	294° 35' 31"	-3° 52' 25"	297° 16' 10"	-25° 00' 48"	0° 58' 27"	15' 55.79"	257° 9' 07"	0.75779
7	295° 10' 02"	-3° 54' 22"	297° 53' 54"	-24° 56' 21"	0° 58' 27"	15' 55.53"	256° 51' 23"	0.76175
8	295° 44' 33"	-3° 56' 17"	298° 31' 35"	-24° 51' 45"	0° 58' 26"	15' 55.27"	256° 33' 40"	0.76569
9	296° 19' 03"	-3° 58' 11"	299° 09' 12"	-24° 46' 59"	0° 58' 25"	15' 55.02"	256° 15' 58"	0.76960
10	296° 53' 33"	-4° 00' 03"	299° 46' 45"	-24° 42' 05"	0° 58' 24"	15' 54.76"	255° 58' 17"	0.77348
11	297° 28' 01"	-4° 01' 54"	300° 24' 14"	-24° 37' 00"	0° 58' 23"	15' 54.50"	255° 40' 39"	0.77734
12	298° 02' 29"	-4° 03' 43"	301° 01' 39"	-24° 31' 47"	0° 58' 22"	15' 54.23"	255° 23' 02"	0.78118
13	298° 36' 56"	-4° 05' 30"	301° 38' 59"	-24° 26' 25"	0° 58' 21"	15' 53.97"	255° 5' 26"	0.78498
14	299° 11' 21"	-4° 07' 16"	302° 16' 16"	-24° 20' 54"	0° 58' 20"	15' 53.71"	254° 47' 52"	0.78876
15	299° 45' 46"	-4° 09' 01"	302° 53' 27"	-24° 15' 13"	0° 58' 19"	15' 53.44"	254° 30' 20"	0.79252
16	300° 20' 11"	-4° 10' 44"	303° 30' 35"	-24° 09' 24"	0° 58' 18"	15' 53.17"	254° 12' 50"	0.79625
17	300° 54' 34"	-4° 12' 25"	304° 07' 38"	-24° 03' 26"	0° 58' 17"	15' 52.90"	253° 55' 21"	0.79994
18	301° 28' 57"	-4° 14' 05"	304° 44' 36"	-23° 57' 20"	0° 58' 16"	15' 52.63"	253° 37' 54"	0.80362
19	302° 03' 18"	-4° 15' 43"	305° 21' 30"	-23° 51' 04"	0° 58' 15"	15' 52.36"	253° 20' 29"	0.80726
20	302° 37' 39"	-4° 17' 20"	305° 58' 19"	-23° 44' 41"	0° 58' 14"	15' 52.09"	253° 3' 05"	0.81088
21	303° 11' 59"	-4° 18' 55"	306° 35' 03"	-23° 38' 08"	0° 58' 13"	15' 51.81"	252° 45' 43"	0.81446
22	303° 46' 18"	-4° 20' 28"	307° 11' 42"	-23° 31' 27"	0° 58' 12"	15' 51.54"	252° 28' 23"	0.81802
23	304° 20' 36"	-4° 22' 00"	307° 48' 17"	-23° 24' 38"	0° 58' 11"	15' 51.26"	252° 11' 05"	0.82155
24	304° 54' 53"	-4° 23' 30"	308° 24' 46"	-23° 17' 40"	0° 58' 10"	15' 50.98"	251° 53' 48"	0.82505

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	174° 20' 18"	-0.56"	174° 47' 37"	2° 15' 09"	1.0051596	15' 54.70"	23° 26' 16"	5 m 23 s
1	174° 22' 45"	-0.57"	174° 49' 52"	2° 14' 11"	1.0051480	15' 54.72"	23° 26' 16"	5 m 24 s
2	174° 25' 11"	-0.57"	174° 52' 06"	2° 13' 13"	1.0051365	15' 54.73"	23° 26' 16"	5 m 25 s
3	174° 27' 37"	-0.57"	174° 54' 21"	2° 12' 15"	1.0051250	15' 54.74"	23° 26' 16"	5 m 26 s
4	174° 30' 03"	-0.58"	174° 56' 35"	2° 11' 17"	1.0051134	15' 54.75"	23° 26' 16"	5 m 27 s
5	174° 32' 30"	-0.58"	174° 58' 49"	2° 10' 20"	1.0051019	15' 54.76"	23° 26' 16"	5 m 27 s
6	174° 34' 56"	-0.58"	175° 01' 04"	2° 09' 22"	1.0050904	15' 54.77"	23° 26' 16"	5 m 28 s
7	174° 37' 22"	-0.59"	175° 03' 18"	2° 08' 24"	1.0050788	15' 54.78"	23° 26' 16"	5 m 29 s
8	174° 39' 49"	-0.59"	175° 05' 33"	2° 07' 26"	1.0050673	15' 54.79"	23° 26' 16"	5 m 30 s
9	174° 42' 15"	-0.59"	175° 07' 47"	2° 06' 28"	1.0050557	15' 54.80"	23° 26' 16"	5 m 31 s
10	174° 44' 41"	-0.59"	175° 10' 02"	2° 05' 30"	1.0050442	15' 54.81"	23° 26' 16"	5 m 32 s
11	174° 47' 08"	-0.60"	175° 12' 16"	2° 04' 32"	1.0050327	15' 54.82"	23° 26' 16"	5 m 33 s
12	174° 49' 34"	-0.60"	175° 14' 30"	2° 03' 34"	1.0050211	15' 54.84"	23° 26' 16"	5 m 34 s
13	174° 52' 00"	-0.60"	175° 16' 45"	2° 02' 36"	1.0050096	15' 54.85"	23° 26' 16"	5 m 35 s
14	174° 54' 26"	-0.61"	175° 18' 59"	2° 01' 38"	1.0049980	15' 54.86"	23° 26' 16"	5 m 35 s
15	174° 56' 53"	-0.61"	175° 21' 14"	2° 00' 40"	1.0049865	15' 54.87"	23° 26' 16"	5 m 36 s
16	174° 59' 19"	-0.61"	175° 23' 28"	1° 59' 42"	1.0049750	15' 54.88"	23° 26' 16"	5 m 37 s
17	175° 01' 45"	-0.61"	175° 25' 42"	1° 58' 44"	1.0049634	15' 54.89"	23° 26' 16"	5 m 38 s
18	175° 04' 12"	-0.62"	175° 27' 57"	1° 57' 46"	1.0049519	15' 54.90"	23° 26' 16"	5 m 39 s
19	175° 06' 38"	-0.62"	175° 30' 11"	1° 56' 48"	1.0049403	15' 54.91"	23° 26' 16"	5 m 40 s
20	175° 09' 04"	-0.62"	175° 32' 26"	1° 55' 50"	1.0049288	15' 54.92"	23° 26' 16"	5 m 41 s
21	175° 11' 31"	-0.62"	175° 34' 40"	1° 54' 52"	1.0049172	15' 54.93"	23° 26' 16"	5 m 42 s
22	175° 13' 57"	-0.63"	175° 36' 54"	1° 53' 54"	1.0049057	15' 54.95"	23° 26' 16"	5 m 43 s
23	175° 16' 23"	-0.63"	175° 39' 09"	1° 52' 55"	1.0048941	15' 54.96"	23° 26' 16"	5 m 43 s
24	175° 18' 50"	-0.63"	175° 41' 23"	1° 51' 57"	1.0048826	15' 54.97"	23° 26' 16"	5 m 44 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	304° 54' 53"	-4° 23' 30"	308° 24' 46"	-23° 17' 40"	0° 58' 10"	15' 50.98"	251° 53' 48"	0.82505
1	305° 29' 09"	-4° 24' 59"	309° 01' 11"	-23° 10' 35"	0° 58' 09"	15' 50.70"	251° 36' 33"	0.82852
2	306° 03' 24"	-4° 26' 26"	309° 37' 30"	-23° 03' 21"	0° 58' 08"	15' 50.42"	251° 19' 20"	0.83196
3	306° 37' 39"	-4° 27' 51"	310° 13' 45"	-22° 55' 59"	0° 58' 07"	15' 50.14"	251° 2' 07"	0.83537
4	307° 11' 52"	-4° 29' 15"	310° 49' 54"	-22° 48' 29"	0° 58' 06"	15' 49.86"	250° 44' 57"	0.83875
5	307° 46' 04"	-4° 30' 37"	311° 25' 58"	-22° 40' 51"	0° 58' 05"	15' 49.57"	250° 27' 48"	0.84209
6	308° 20' 16"	-4° 31' 57"	312° 01' 57"	-22° 33' 05"	0° 58' 04"	15' 49.29"	250° 10' 40"	0.84541
7	308° 54' 27"	-4° 33' 16"	312° 37' 51"	-22° 25' 12"	0° 58' 03"	15' 49.00"	249° 53' 33"	0.84870
8	309° 28' 36"	-4° 34' 33"	313° 13' 40"	-22° 17' 11"	0° 58' 02"	15' 48.71"	249° 36' 27"	0.85195
9	310° 02' 45"	-4° 35' 48"	313° 49' 23"	-22° 09' 02"	0° 58' 00"	15' 48.42"	249° 19' 23"	0.85518
10	310° 36' 52"	-4° 37' 02"	314° 25' 01"	-22° 00' 45"	0° 57' 59"	15' 48.13"	249° 2' 19"	0.85837
11	311° 10' 59"	-4° 38' 14"	315° 00' 34"	-21° 52' 22"	0° 57' 58"	15' 47.84"	248° 45' 16"	0.86153
12	311° 45' 05"	-4° 39' 24"	315° 36' 01"	-21° 43' 51"	0° 57' 57"	15' 47.54"	248° 28' 14"	0.86466
13	312° 19' 09"	-4° 40' 32"	316° 11' 23"	-21° 35' 12"	0° 57' 56"	15' 47.25"	248° 11' 12"	0.86775
14	312° 53' 13"	-4° 41' 39"	316° 46' 39"	-21° 26' 27"	0° 57' 55"	15' 46.95"	247° 54' 10"	0.87081
15	313° 27' 16"	-4° 42' 44"	317° 21' 50"	-21° 17' 34"	0° 57' 54"	15' 46.66"	247° 37' 09"	0.87384
16	314° 01' 17"	-4° 43' 48"	317° 56' 56"	-21° 08' 35"	0° 57' 53"	15' 46.36"	247° 20' 07"	0.87684
17	314° 35' 18"	-4° 44' 50"	318° 31' 56"	-20° 59' 28"	0° 57' 52"	15' 46.06"	247° 3' 06"	0.87980
18	315° 09' 17"	-4° 45' 50"	319° 06' 51"	-20° 50' 15"	0° 57' 51"	15' 45.75"	246° 46' 03"	0.88273
19	315° 43' 16"	-4° 46' 48"	319° 41' 40"	-20° 40' 55"	0° 57' 50"	15' 45.45"	246° 29' 00"	0.88563
20	316° 17' 13"	-4° 47' 44"	320° 16' 24"	-20° 31' 28"	0° 57' 48"	15' 45.15"	246° 11' 56"	0.88849
21	316° 51' 10"	-4° 48' 39"	320° 51' 02"	-20° 21' 55"	0° 57' 47"	15' 44.84"	245° 54' 51"	0.89132
22	317° 25' 05"	-4° 49' 32"	321° 25' 34"	-20° 12' 15"	0° 57' 46"	15' 44.54"	245° 37' 44"	0.89411
23	317° 58' 59"	-4° 50' 24"	322° 00' 02"	-20° 02' 28"	0° 57' 45"	15' 44.23"	245° 20' 35"	0.89687
24	318° 32' 52"	-4° 51' 13"	322° 34' 23"	-19° 52' 36"	0° 57' 44"	15' 43.92"	245° 3' 24"	0.89960

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	175° 18' 50"	-0.63"	175° 41' 23"	1° 51' 57"	1.0048826	15' 54.97"	23° 26' 16"	5 m 44 s
1	175° 21' 16"	-0.63"	175° 43' 38"	1° 50' 59"	1.0048710	15' 54.98"	23° 26' 16"	5 m 45 s
2	175° 23' 42"	-0.63"	175° 45' 52"	1° 50' 01"	1.0048595	15' 54.99"	23° 26' 16"	5 m 46 s
3	175° 26' 09"	-0.64"	175° 48' 06"	1° 49' 03"	1.0048479	15' 55.00"	23° 26' 16"	5 m 47 s
4	175° 28' 35"	-0.64"	175° 50' 21"	1° 48' 05"	1.0048364	15' 55.01"	23° 26' 16"	5 m 48 s
5	175° 31' 01"	-0.64"	175° 52' 35"	1° 47' 07"	1.0048248	15' 55.02"	23° 26' 16"	5 m 49 s
6	175° 33' 28"	-0.64"	175° 54' 50"	1° 46' 09"	1.0048133	15' 55.03"	23° 26' 16"	5 m 50 s
7	175° 35' 54"	-0.65"	175° 57' 04"	1° 45' 11"	1.0048017	15' 55.04"	23° 26' 16"	5 m 51 s
8	175° 38' 21"	-0.65"	175° 59' 19"	1° 44' 13"	1.0047902	15' 55.06"	23° 26' 16"	5 m 52 s
9	175° 40' 47"	-0.65"	176° 01' 33"	1° 43' 15"	1.0047786	15' 55.07"	23° 26' 16"	5 m 52 s
10	175° 43' 13"	-0.65"	176° 03' 47"	1° 42' 17"	1.0047671	15' 55.08"	23° 26' 16"	5 m 53 s
11	175° 45' 40"	-0.65"	176° 06' 02"	1° 41' 19"	1.0047555	15' 55.09"	23° 26' 16"	5 m 54 s
12	175° 48' 06"	-0.65"	176° 08' 16"	1° 40' 21"	1.0047440	15' 55.10"	23° 26' 16"	5 m 55 s
13	175° 50' 32"	-0.66"	176° 10' 31"	1° 39' 23"	1.0047324	15' 55.11"	23° 26' 16"	5 m 56 s
14	175° 52' 59"	-0.66"	176° 12' 45"	1° 38' 24"	1.0047208	15' 55.12"	23° 26' 16"	5 m 57 s
15	175° 55' 25"	-0.66"	176° 14' 59"	1° 37' 26"	1.0047093	15' 55.13"	23° 26' 16"	5 m 58 s
16	175° 57' 52"	-0.66"	176° 17' 14"	1° 36' 28"	1.0046977	15' 55.14"	23° 26' 16"	5 m 59 s
17	176° 00' 18"	-0.66"	176° 19' 28"	1° 35' 30"	1.0046862	15' 55.15"	23° 26' 16"	5 m 60 s
18	176° 02' 44"	-0.66"	176° 21' 43"	1° 34' 32"	1.0046746	15' 55.16"	23° 26' 16"	6 m 00 s
19	176° 05' 11"	-0.66"	176° 23' 57"	1° 33' 34"	1.0046631	15' 55.18"	23° 26' 16"	6 m 01 s
20	176° 07' 37"	-0.67"	176° 26' 11"	1° 32' 36"	1.0046515	15' 55.19"	23° 26' 16"	6 m 02 s
21	176° 10' 04"	-0.67"	176° 28' 26"	1° 31' 38"	1.0046400	15' 55.20"	23° 26' 16"	6 m 03 s
22	176° 12' 30"	-0.67"	176° 30' 40"	1° 30' 40"	1.0046284	15' 55.21"	23° 26' 16"	6 m 04 s
23	176° 14' 56"	-0.67"	176° 32' 55"	1° 29' 41"	1.0046168	15' 55.22"	23° 26' 16"	6 m 05 s
24	176° 17' 23"	-0.67"	176° 35' 09"	1° 28' 43"	1.0046053	15' 55.23"	23° 26' 16"	6 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	318° 32' 52"	-4° 51' 13"	322° 34' 23"	-19° 52' 36"	0° 57' 44"	15' 43.92"	245° 3' 24"	0.89960
1	319° 06' 44"	-4° 52' 01"	323° 08' 39"	-19° 42' 37"	0° 57' 43"	15' 43.61"	244° 46' 11"	0.90229
2	319° 40' 35"	-4° 52' 47"	323° 42' 50"	-19° 32' 32"	0° 57' 42"	15' 43.30"	244° 28' 54"	0.90494
3	320° 14' 25"	-4° 53' 32"	324° 16' 55"	-19° 22' 21"	0° 57' 41"	15' 42.99"	244° 11' 35"	0.90756
4	320° 48' 14"	-4° 54' 14"	324° 50' 55"	-19° 12' 04"	0° 57' 39"	15' 42.67"	243° 54' 11"	0.91015
5	321° 22' 01"	-4° 54' 55"	325° 24' 49"	-19° 01' 41"	0° 57' 38"	15' 42.36"	243° 36' 44"	0.91270
6	321° 55' 47"	-4° 55' 35"	325° 58' 38"	-18° 51' 12"	0° 57' 37"	15' 42.04"	243° 19' 11"	0.91521
7	322° 29' 33"	-4° 56' 12"	326° 32' 21"	-18° 40' 37"	0° 57' 36"	15' 41.73"	243° 1' 34"	0.91769
8	323° 03' 17"	-4° 56' 48"	327° 05' 59"	-18° 29' 57"	0° 57' 35"	15' 41.41"	242° 43' 51"	0.92013
9	323° 36' 60"	-4° 57' 22"	327° 39' 31"	-18° 19' 11"	0° 57' 34"	15' 41.09"	242° 26' 01"	0.92254
10	324° 10' 41"	-4° 57' 54"	328° 12' 58"	-18° 08' 20"	0° 57' 32"	15' 40.77"	242° 8' 04"	0.92491
11	324° 44' 22"	-4° 58' 24"	328° 46' 20"	-17° 57' 24"	0° 57' 31"	15' 40.45"	241° 50' 00"	0.92724
12	325° 18' 01"	-4° 58' 53"	329° 19' 36"	-17° 46' 22"	0° 57' 30"	15' 40.12"	241° 31' 48"	0.92954
13	325° 51' 39"	-4° 59' 20"	329° 52' 47"	-17° 35' 15"	0° 57' 29"	15' 39.80"	241° 13' 26"	0.93180
14	326° 25' 16"	-4° 59' 45"	330° 25' 52"	-17° 24' 03"	0° 57' 28"	15' 39.48"	240° 54' 54"	0.93403
15	326° 58' 52"	-5° 00' 08"	330° 58' 53"	-17° 12' 45"	0° 57' 26"	15' 39.15"	240° 36' 12"	0.93621
16	327° 32' 26"	-5° 00' 30"	331° 31' 47"	-17° 01' 23"	0° 57' 25"	15' 38.82"	240° 17' 18"	0.93836
17	328° 05' 60"	-5° 00' 50"	332° 04' 37"	-16° 49' 56"	0° 57' 24"	15' 38.49"	239° 58' 11"	0.94048
18	328° 39' 32"	-5° 01' 08"	332° 37' 21"	-16° 38' 24"	0° 57' 23"	15' 38.16"	239° 38' 50"	0.94256
19	329° 13' 02"	-5° 01' 25"	333° 10' 01"	-16° 26' 48"	0° 57' 22"	15' 37.83"	239° 19' 14"	0.94460
20	329° 46' 32"	-5° 01' 40"	333° 42' 35"	-16° 15' 07"	0° 57' 20"	15' 37.50"	238° 59' 22"	0.94660
21	330° 19' 60"	-5° 01' 52"	334° 15' 03"	-16° 03' 21"	0° 57' 19"	15' 37.17"	238° 39' 13"	0.94856
22	330° 53' 27"	-5° 02' 04"	334° 47' 27"	-15° 51' 31"	0° 57' 18"	15' 36.84"	238° 18' 44"	0.95049
23	331° 26' 52"	-5° 02' 13"	335° 19' 46"	-15° 39' 36"	0° 57' 17"	15' 36.50"	237° 57' 55"	0.95238
24	332° 00' 17"	-5° 02' 21"	335° 51' 59"	-15° 27' 38"	0° 57' 15"	15' 36.17"	237° 36' 44"	0.95423

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	176° 17' 23"	-0.67"	176° 35' 09"	1° 28' 43"	1.0046053	15' 55.23"	23° 26' 16"	6 m 06 s
1	176° 19' 49"	-0.67"	176° 37' 24"	1° 27' 45"	1.0045937	15' 55.24"	23° 26' 16"	6 m 07 s
2	176° 22' 16"	-0.67"	176° 39' 38"	1° 26' 47"	1.0045822	15' 55.25"	23° 26' 16"	6 m 08 s
3	176° 24' 42"	-0.67"	176° 41' 52"	1° 25' 49"	1.0045706	15' 55.26"	23° 26' 16"	6 m 08 s
4	176° 27' 08"	-0.67"	176° 44' 07"	1° 24' 51"	1.0045591	15' 55.27"	23° 26' 16"	6 m 09 s
5	176° 29' 35"	-0.67"	176° 46' 21"	1° 23' 53"	1.0045475	15' 55.29"	23° 26' 16"	6 m 10 s
6	176° 32' 01"	-0.68"	176° 48' 36"	1° 22' 54"	1.0045359	15' 55.30"	23° 26' 16"	6 m 11 s
7	176° 34' 28"	-0.68"	176° 50' 50"	1° 21' 56"	1.0045244	15' 55.31"	23° 26' 16"	6 m 12 s
8	176° 36' 54"	-0.68"	176° 53' 05"	1° 20' 58"	1.0045128	15' 55.32"	23° 26' 16"	6 m 13 s
9	176° 39' 21"	-0.68"	176° 55' 19"	1° 19' 60"	1.0045013	15' 55.33"	23° 26' 16"	6 m 14 s
10	176° 41' 47"	-0.68"	176° 57' 33"	1° 19' 02"	1.0044897	15' 55.34"	23° 26' 16"	6 m 15 s
11	176° 44' 14"	-0.68"	176° 59' 48"	1° 18' 04"	1.0044781	15' 55.35"	23° 26' 16"	6 m 16 s
12	176° 46' 40"	-0.68"	177° 02' 02"	1° 17' 05"	1.0044666	15' 55.36"	23° 26' 16"	6 m 16 s
13	176° 49' 06"	-0.68"	177° 04' 17"	1° 16' 07"	1.0044550	15' 55.37"	23° 26' 16"	6 m 17 s
14	176° 51' 33"	-0.68"	177° 06' 31"	1° 15' 09"	1.0044435	15' 55.38"	23° 26' 16"	6 m 18 s
15	176° 53' 59"	-0.68"	177° 08' 46"	1° 14' 11"	1.0044319	15' 55.40"	23° 26' 16"	6 m 19 s
16	176° 56' 26"	-0.68"	177° 11' 00"	1° 13' 13"	1.0044204	15' 55.41"	23° 26' 16"	6 m 20 s
17	176° 58' 52"	-0.68"	177° 13' 14"	1° 12' 15"	1.0044088	15' 55.42"	23° 26' 16"	6 m 21 s
18	177° 01' 19"	-0.68"	177° 15' 29"	1° 11' 16"	1.0043972	15' 55.43"	23° 26' 16"	6 m 22 s
19	177° 03' 45"	-0.68"	177° 17' 43"	1° 10' 18"	1.0043857	15' 55.44"	23° 26' 16"	6 m 23 s
20	177° 06' 12"	-0.68"	177° 19' 58"	1° 09' 20"	1.0043741	15' 55.45"	23° 26' 16"	6 m 24 s
21	177° 08' 38"	-0.68"	177° 22' 12"	1° 08' 22"	1.0043626	15' 55.46"	23° 26' 16"	6 m 24 s
22	177° 11' 05"	-0.68"	177° 24' 27"	1° 07' 24"	1.0043510	15' 55.47"	23° 26' 16"	6 m 25 s
23	177° 13' 31"	-0.68"	177° 26' 41"	1° 06' 25"	1.0043394	15' 55.48"	23° 26' 16"	6 m 26 s
24	177° 15' 58"	-0.68"	177° 28' 56"	1° 05' 27"	1.0043279	15' 55.49"	23° 26' 16"	6 m 27 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	332° 00' 17"	-5° 02' 21"	335° 51' 59"	-15° 27' 38"	0° 57' 15"	15' 36.17"	237° 36' 44"	0.95423
1	332° 33' 40"	-5° 02' 27"	336° 24' 08"	-15° 15' 35"	0° 57' 14"	15' 35.83"	237° 15' 09"	0.95605
2	333° 07' 01"	-5° 02' 31"	336° 56' 12"	-15° 03' 28"	0° 57' 13"	15' 35.50"	236° 53' 08"	0.95783
3	333° 40' 22"	-5° 02' 34"	337° 28' 10"	-14° 51' 16"	0° 57' 12"	15' 35.16"	236° 30' 39"	0.95957
4	334° 13' 41"	-5° 02' 35"	338° 00' 04"	-14° 39' 01"	0° 57' 11"	15' 34.82"	236° 7' 39"	0.96127
5	334° 46' 59"	-5° 02' 34"	338° 31' 53"	-14° 26' 43"	0° 57' 09"	15' 34.48"	235° 44' 07"	0.96293
6	335° 20' 15"	-5° 02' 31"	339° 03' 37"	-14° 14' 20"	0° 57' 08"	15' 34.14"	235° 19' 59"	0.96456
7	335° 53' 30"	-5° 02' 27"	339° 35' 16"	-14° 01' 54"	0° 57' 07"	15' 33.80"	234° 55' 12"	0.96615
8	336° 26' 43"	-5° 02' 21"	340° 06' 51"	-13° 49' 24"	0° 57' 06"	15' 33.45"	234° 29' 44"	0.96770
9	336° 59' 56"	-5° 02' 14"	340° 38' 21"	-13° 36' 50"	0° 57' 04"	15' 33.11"	234° 3' 31"	0.96921
10	337° 33' 07"	-5° 02' 04"	341° 09' 46"	-13° 24' 13"	0° 57' 03"	15' 32.77"	233° 36' 28"	0.97068
11	338° 06' 16"	-5° 01' 53"	341° 41' 07"	-13° 11' 33"	0° 57' 02"	15' 32.42"	233° 8' 32"	0.97212
12	338° 39' 24"	-5° 01' 40"	342° 12' 23"	-12° 58' 49"	0° 57' 00"	15' 32.08"	232° 39' 39"	0.97352
13	339° 12' 31"	-5° 01' 26"	342° 43' 34"	-12° 46' 02"	0° 56' 59"	15' 31.73"	232° 9' 42"	0.97487
14	339° 45' 36"	-5° 01' 10"	343° 14' 41"	-12° 33' 12"	0° 56' 58"	15' 31.38"	231° 38' 36"	0.97620
15	340° 18' 40"	-5° 00' 52"	343° 45' 44"	-12° 20' 19"	0° 56' 57"	15' 31.03"	231° 6' 15"	0.97748
16	340° 51' 42"	-5° 00' 32"	344° 16' 42"	-12° 07' 23"	0° 56' 55"	15' 30.69"	230° 32' 32"	0.97872
17	341° 24' 43"	-5° 00' 11"	344° 47' 36"	-11° 54' 24"	0° 56' 54"	15' 30.34"	229° 57' 20"	0.97993
18	341° 57' 43"	-4° 59' 48"	345° 18' 26"	-11° 41' 22"	0° 56' 53"	15' 29.99"	229° 20' 29"	0.98110
19	342° 30' 41"	-4° 59' 24"	345° 49' 11"	-11° 28' 18"	0° 56' 52"	15' 29.64"	228° 41' 51"	0.98223
20	343° 03' 37"	-4° 58' 58"	346° 19' 52"	-11° 15' 11"	0° 56' 50"	15' 29.29"	228° 1' 13"	0.98332
21	343° 36' 33"	-4° 58' 30"	346° 50' 29"	-11° 02' 01"	0° 56' 49"	15' 28.93"	227° 18' 26"	0.98437
22	344° 09' 26"	-4° 58' 01"	347° 21' 02"	-10° 48' 49"	0° 56' 48"	15' 28.58"	226° 33' 13"	0.98538
23	344° 42' 19"	-4° 57' 30"	347° 51' 31"	-10° 35' 34"	0° 56' 46"	15' 28.23"	225° 45' 22"	0.98636
24	345° 15' 09"	-4° 56' 57"	348° 21' 56"	-10° 22' 17"	0° 56' 45"	15' 27.87"	224° 54' 34"	0.98730

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	177° 15' 58"	-0.68"	177° 28' 56"	1° 05' 27"	1.0043279	15' 55.49"	23° 26' 16"	6 m 27 s
1	177° 18' 24"	-0.68"	177° 31' 10"	1° 04' 29"	1.0043163	15' 55.51"	23° 26' 16"	6 m 28 s
2	177° 20' 51"	-0.68"	177° 33' 24"	1° 03' 31"	1.0043048	15' 55.52"	23° 26' 16"	6 m 29 s
3	177° 23' 17"	-0.68"	177° 35' 39"	1° 02' 32"	1.0042932	15' 55.53"	23° 26' 16"	6 m 30 s
4	177° 25' 44"	-0.68"	177° 37' 53"	1° 01' 34"	1.0042817	15' 55.54"	23° 26' 16"	6 m 31 s
5	177° 28' 10"	-0.68"	177° 40' 08"	1° 00' 36"	1.0042701	15' 55.55"	23° 26' 16"	6 m 32 s
6	177° 30' 37"	-0.68"	177° 42' 22"	0° 59' 38"	1.0042585	15' 55.56"	23° 26' 16"	6 m 32 s
7	177° 33' 03"	-0.68"	177° 44' 37"	0° 58' 40"	1.0042470	15' 55.57"	23° 26' 16"	6 m 33 s
8	177° 35' 30"	-0.68"	177° 46' 51"	0° 57' 41"	1.0042354	15' 55.58"	23° 26' 16"	6 m 34 s
9	177° 37' 56"	-0.67"	177° 49' 06"	0° 56' 43"	1.0042239	15' 55.59"	23° 26' 16"	6 m 35 s
10	177° 40' 23"	-0.67"	177° 51' 20"	0° 55' 45"	1.0042123	15' 55.60"	23° 26' 16"	6 m 36 s
11	177° 42' 49"	-0.67"	177° 53' 35"	0° 54' 47"	1.0042008	15' 55.62"	23° 26' 16"	6 m 37 s
12	177° 45' 16"	-0.67"	177° 55' 49"	0° 53' 48"	1.0041892	15' 55.63"	23° 26' 16"	6 m 38 s
13	177° 47' 42"	-0.67"	177° 58' 04"	0° 52' 50"	1.0041776	15' 55.64"	23° 26' 16"	6 m 39 s
14	177° 50' 09"	-0.67"	178° 00' 18"	0° 51' 52"	1.0041661	15' 55.65"	23° 26' 16"	6 m 40 s
15	177° 52' 35"	-0.67"	178° 02' 33"	0° 50' 54"	1.0041545	15' 55.66"	23° 26' 16"	6 m 40 s
16	177° 55' 02"	-0.67"	178° 04' 47"	0° 49' 55"	1.0041430	15' 55.67"	23° 26' 16"	6 m 41 s
17	177° 57' 29"	-0.67"	178° 07' 01"	0° 48' 57"	1.0041314	15' 55.68"	23° 26' 16"	6 m 42 s
18	177° 59' 55"	-0.67"	178° 09' 16"	0° 47' 59"	1.0041199	15' 55.69"	23° 26' 16"	6 m 43 s
19	178° 02' 22"	-0.66"	178° 11' 30"	0° 47' 01"	1.0041083	15' 55.70"	23° 26' 16"	6 m 44 s
20	178° 04' 48"	-0.66"	178° 13' 45"	0° 46' 02"	1.0040967	15' 55.71"	23° 26' 16"	6 m 45 s
21	178° 07' 15"	-0.66"	178° 15' 59"	0° 45' 04"	1.0040852	15' 55.73"	23° 26' 16"	6 m 46 s
22	178° 09' 41"	-0.66"	178° 18' 14"	0° 44' 06"	1.0040736	15' 55.74"	23° 26' 16"	6 m 47 s
23	178° 12' 08"	-0.66"	178° 20' 28"	0° 43' 08"	1.0040621	15' 55.75"	23° 26' 16"	6 m 48 s
24	178° 14' 34"	-0.66"	178° 22' 43"	0° 42' 09"	1.0040505	15' 55.76"	23° 26' 16"	6 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	345° 15' 09"	-4° 56' 57"	348° 21' 56"	-10° 22' 17"	0° 56' 45"	15' 27.87"	224° 54' 34"	0.98730
1	345° 47' 58"	-4° 56' 23"	348° 52' 17"	-10° 08' 58"	0° 56' 44"	15' 27.52"	224° 0' 29"	0.98820
2	346° 20' 46"	-4° 55' 47"	349° 22' 35"	-9° 55' 36"	0° 56' 42"	15' 27.17"	223° 2' 45"	0.98906
3	346° 53' 32"	-4° 55' 09"	349° 52' 48"	-9° 42' 12"	0° 56' 41"	15' 26.81"	222° 0' 57"	0.98988
4	347° 26' 17"	-4° 54' 30"	350° 22' 58"	-9° 28' 46"	0° 56' 40"	15' 26.46"	220° 54' 36"	0.99066
5	347° 59' 00"	-4° 53' 50"	350° 53' 04"	-9° 15' 19"	0° 56' 39"	15' 26.10"	219° 43' 08"	0.99141
6	348° 31' 42"	-4° 53' 07"	351° 23' 06"	-9° 01' 49"	0° 56' 37"	15' 25.74"	218° 25' 55"	0.99212
7	349° 04' 22"	-4° 52' 24"	351° 53' 05"	-8° 48' 17"	0° 56' 36"	15' 25.39"	217° 2' 12"	0.99279
8	349° 37' 01"	-4° 51' 38"	352° 22' 60"	-8° 34' 44"	0° 56' 35"	15' 25.03"	215° 31' 10"	0.99342
9	350° 09' 38"	-4° 50' 51"	352° 52' 51"	-8° 21' 09"	0° 56' 33"	15' 24.67"	213° 51' 49"	0.99402
10	350° 42' 13"	-4° 50' 03"	353° 22' 40"	-8° 07' 32"	0° 56' 32"	15' 24.32"	212° 3' 04"	0.99457
11	351° 14' 47"	-4° 49' 13"	353° 52' 24"	-7° 53' 54"	0° 56' 31"	15' 23.96"	210° 3' 35"	0.99509
12	351° 47' 19"	-4° 48' 21"	354° 22' 06"	-7° 40' 14"	0° 56' 29"	15' 23.60"	207° 51' 57"	0.99557
13	352° 19' 50"	-4° 47' 28"	354° 51' 44"	-7° 26' 33"	0° 56' 28"	15' 23.24"	205° 26' 30"	0.99601
14	352° 52' 19"	-4° 46' 33"	355° 21' 19"	-7° 12' 50"	0° 56' 27"	15' 22.88"	202° 45' 23"	0.99642
15	353° 24' 47"	-4° 45' 37"	355° 50' 51"	-6° 59' 06"	0° 56' 25"	15' 22.53"	199° 46' 37"	0.99678
16	353° 57' 13"	-4° 44' 40"	356° 20' 20"	-6° 45' 21"	0° 56' 24"	15' 22.17"	196° 28' 06"	0.99711
17	354° 29' 38"	-4° 43' 40"	356° 49' 46"	-6° 31' 35"	0° 56' 23"	15' 21.81"	192° 47' 45"	0.99740
18	355° 02' 01"	-4° 42' 40"	357° 19' 08"	-6° 17' 47"	0° 56' 21"	15' 21.45"	188° 43' 41"	0.99766
19	355° 34' 22"	-4° 41' 38"	357° 48' 28"	-6° 03' 59"	0° 56' 20"	15' 21.09"	184° 14' 33"	0.99787
20	356° 06' 42"	-4° 40' 34"	358° 17' 45"	-5° 50' 09"	0° 56' 19"	15' 20.73"	179° 19' 55"	0.99805
21	356° 38' 60"	-4° 39' 29"	358° 46' 59"	-5° 36' 19"	0° 56' 18"	15' 20.37"	174° 0' 41"	0.99819
22	357° 11' 16"	-4° 38' 23"	359° 16' 10"	-5° 22' 28"	0° 56' 16"	15' 20.01"	168° 19' 38"	0.99830
23	357° 43' 31"	-4° 37' 15"	359° 45' 19"	-5° 08' 36"	0° 56' 15"	15' 19.65"	162° 21' 31"	0.99837
24	358° 15' 45"	-4° 36' 06"	0° 14' 25"	-4° 54' 44"	0° 56' 14"	15' 19.30"	156° 13' 06"	0.99840

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	178° 14' 34"	-0.66"	178° 22' 43"	0° 42' 09"	1.0040505	15' 55.76"	23° 26' 16"	6 m 48 s
1	178° 17' 01"	-0.66"	178° 24' 57"	0° 41' 11"	1.0040390	15' 55.77"	23° 26' 16"	6 m 49 s
2	178° 19' 28"	-0.65"	178° 27' 12"	0° 40' 13"	1.0040274	15' 55.78"	23° 26' 16"	6 m 50 s
3	178° 21' 54"	-0.65"	178° 29' 26"	0° 39' 15"	1.0040159	15' 55.79"	23° 26' 16"	6 m 51 s
4	178° 24' 21"	-0.65"	178° 31' 41"	0° 38' 16"	1.0040043	15' 55.80"	23° 26' 16"	6 m 52 s
5	178° 26' 47"	-0.65"	178° 33' 55"	0° 37' 18"	1.0039927	15' 55.81"	23° 26' 16"	6 m 53 s
6	178° 29' 14"	-0.65"	178° 36' 10"	0° 36' 20"	1.0039812	15' 55.82"	23° 26' 16"	6 m 54 s
7	178° 31' 41"	-0.65"	178° 38' 24"	0° 35' 21"	1.0039696	15' 55.84"	23° 26' 16"	6 m 55 s
8	178° 34' 07"	-0.64"	178° 40' 39"	0° 34' 23"	1.0039581	15' 55.85"	23° 26' 16"	6 m 56 s
9	178° 36' 34"	-0.64"	178° 42' 53"	0° 33' 25"	1.0039465	15' 55.86"	23° 26' 16"	6 m 56 s
10	178° 39' 00"	-0.64"	178° 45' 08"	0° 32' 26"	1.0039350	15' 55.87"	23° 26' 16"	6 m 57 s
11	178° 41' 27"	-0.64"	178° 47' 22"	0° 31' 28"	1.0039234	15' 55.88"	23° 26' 16"	6 m 58 s
12	178° 43' 54"	-0.64"	178° 49' 37"	0° 30' 30"	1.0039119	15' 55.89"	23° 26' 16"	6 m 59 s
13	178° 46' 20"	-0.63"	178° 51' 51"	0° 29' 32"	1.0039003	15' 55.90"	23° 26' 16"	6 m 60 s
14	178° 48' 47"	-0.63"	178° 54' 06"	0° 28' 33"	1.0038888	15' 55.91"	23° 26' 16"	7 m 01 s
15	178° 51' 13"	-0.63"	178° 56' 21"	0° 27' 35"	1.0038772	15' 55.92"	23° 26' 16"	7 m 02 s
16	178° 53' 40"	-0.63"	178° 58' 35"	0° 26' 37"	1.0038657	15' 55.93"	23° 26' 16"	7 m 03 s
17	178° 56' 07"	-0.62"	179° 00' 50"	0° 25' 38"	1.0038541	15' 55.95"	23° 26' 16"	7 m 04 s
18	178° 58' 33"	-0.62"	179° 03' 04"	0° 24' 40"	1.0038425	15' 55.96"	23° 26' 16"	7 m 04 s
19	179° 00' 60"	-0.62"	179° 05' 19"	0° 23' 42"	1.0038310	15' 55.97"	23° 26' 16"	7 m 05 s
20	179° 03' 27"	-0.62"	179° 07' 33"	0° 22' 43"	1.0038194	15' 55.98"	23° 26' 16"	7 m 06 s
21	179° 05' 53"	-0.61"	179° 09' 48"	0° 21' 45"	1.0038079	15' 55.99"	23° 26' 16"	7 m 07 s
22	179° 08' 20"	-0.61"	179° 12' 02"	0° 20' 47"	1.0037963	15' 56.00"	23° 26' 16"	7 m 08 s
23	179° 10' 47"	-0.61"	179° 14' 17"	0° 19' 48"	1.0037848	15' 56.01"	23° 26' 16"	7 m 09 s
24	179° 13' 13"	-0.61"	179° 16' 31"	0° 18' 50"	1.0037732	15' 56.02"	23° 26' 16"	7 m 10 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	358° 15' 45"	-4° 36' 06"	0° 14' 25"	-4° 54' 44"	0° 56' 14"	15' 19.30"	156° 13' 06"	0.99840
1	358° 47' 56"	-4° 34' 55"	0° 43' 29"	-4° 40' 51"	0° 56' 12"	15' 18.94"	150° 2' 22"	0.99839
2	359° 20' 06"	-4° 33' 43"	1° 12' 30"	-4° 26' 57"	0° 56' 11"	15' 18.58"	143° 57' 42"	0.99835
3	359° 52' 15"	-4° 32' 29"	1° 41' 28"	-4° 13' 03"	0° 56' 10"	15' 18.22"	138° 6' 40"	0.99827
4	0° 24' 22"	-4° 31' 14"	2° 10' 24"	-3° 59' 08"	0° 56' 08"	15' 17.86"	132° 35' 12"	0.99815
5	0° 56' 27"	-4° 29' 58"	2° 39' 18"	-3° 45' 13"	0° 56' 07"	15' 17.50"	127° 27' 13"	0.99800
6	1° 28' 31"	-4° 28' 40"	3° 08' 09"	-3° 31' 17"	0° 56' 06"	15' 17.15"	122° 44' 40"	0.99781
7	2° 00' 32"	-4° 27' 21"	3° 36' 58"	-3° 17' 22"	0° 56' 04"	15' 16.79"	118° 27' 48"	0.99758
8	2° 32' 33"	-4° 26' 01"	4° 05' 45"	-3° 03' 26"	0° 56' 03"	15' 16.43"	114° 35' 46"	0.99732
9	3° 04' 31"	-4° 24' 39"	4° 34' 30"	-2° 49' 30"	0° 56' 02"	15' 16.08"	111° 6' 55"	0.99702
10	3° 36' 29"	-4° 23' 16"	5° 03' 13"	-2° 35' 34"	0° 56' 00"	15' 15.72"	107° 59' 16"	0.99669
11	4° 08' 24"	-4° 21' 52"	5° 31' 54"	-2° 21' 38"	0° 55' 59"	15' 15.36"	105° 10' 43"	0.99632
12	4° 40' 18"	-4° 20' 26"	6° 00' 33"	-2° 07' 42"	0° 55' 58"	15' 15.01"	102° 39' 11"	0.99591
13	5° 12' 10"	-4° 18' 59"	6° 29' 10"	-1° 53' 46"	0° 55' 57"	15' 14.65"	100° 22' 45"	0.99547
14	5° 44' 00"	-4° 17' 31"	6° 57' 45"	-1° 39' 50"	0° 55' 55"	15' 14.30"	98° 19' 39"	0.99499
15	6° 15' 49"	-4° 16' 01"	7° 26' 18"	-1° 25' 55"	0° 55' 54"	15' 13.95"	96° 28' 18"	0.99448
16	6° 47' 36"	-4° 14' 30"	7° 54' 50"	-1° 11' 60"	0° 55' 53"	15' 13.59"	94° 47' 21"	0.99393
17	7° 19' 22"	-4° 12' 58"	8° 23' 20"	0° -58' 05"	0° 55' 51"	15' 13.24"	93° 15' 33"	0.99335
18	7° 51' 06"	-4° 11' 25"	8° 51' 48"	0° -44' 10"	0° 55' 50"	15' 12.89"	91° 51' 52"	0.99273
19	8° 22' 48"	-4° 09' 50"	9° 20' 15"	0° -30' 16"	0° 55' 49"	15' 12.54"	90° 35' 23"	0.99208
20	8° 54' 29"	-4° 08' 15"	9° 48' 40"	0° -16' 23"	0° 55' 47"	15' 12.19"	89° 25' 18"	0.99139
21	9° 26' 08"	-4° 06' 38"	10° 17' 04"	0° -2' 30"	0° 55' 46"	15' 11.84"	88° 20' 55"	0.99067
22	9° 57' 45"	-4° 04' 60"	10° 45' 27"	0° 11' 22"	0° 55' 45"	15' 11.49"	87° 21' 39"	0.98991
23	10° 29' 21"	-4° 03' 20"	11° 13' 48"	0° 25' 14"	0° 55' 44"	15' 11.14"	86° 26' 57"	0.98912
24	11° 00' 55"	-4° 01' 40"	11° 42' 08"	0° 39' 05"	0° 55' 42"	15' 10.80"	85° 36' 24"	0.98829

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	179° 13' 13"	-0.61"	179° 16' 31"	0° 18' 50"	1.0037732	15' 56.02"	23° 26' 16"	7 m 10 s
1	179° 15' 40"	-0.60"	179° 18' 46"	0° 17' 52"	1.0037617	15' 56.03"	23° 26' 16"	7 m 11 s
2	179° 18' 06"	-0.60"	179° 21' 01"	0° 16' 54"	1.0037501	15' 56.04"	23° 26' 16"	7 m 11 s
3	179° 20' 33"	-0.60"	179° 23' 15"	0° 15' 55"	1.0037386	15' 56.06"	23° 26' 16"	7 m 12 s
4	179° 22' 60"	-0.60"	179° 25' 30"	0° 14' 57"	1.0037270	15' 56.07"	23° 26' 16"	7 m 13 s
5	179° 25' 26"	-0.59"	179° 27' 44"	0° 13' 59"	1.0037155	15' 56.08"	23° 26' 16"	7 m 14 s
6	179° 27' 53"	-0.59"	179° 29' 59"	0° 13' 00"	1.0037039	15' 56.09"	23° 26' 16"	7 m 15 s
7	179° 30' 20"	-0.59"	179° 32' 13"	0° 12' 02"	1.0036924	15' 56.10"	23° 26' 16"	7 m 16 s
8	179° 32' 47"	-0.58"	179° 34' 28"	0° 11' 04"	1.0036808	15' 56.11"	23° 26' 16"	7 m 17 s
9	179° 35' 13"	-0.58"	179° 36' 43"	0° 10' 05"	1.0036693	15' 56.12"	23° 26' 16"	7 m 18 s
10	179° 37' 40"	-0.58"	179° 38' 57"	0° 09' 07"	1.0036577	15' 56.13"	23° 26' 16"	7 m 19 s
11	179° 40' 07"	-0.58"	179° 41' 12"	0° 08' 09"	1.0036462	15' 56.14"	23° 26' 16"	7 m 19 s
12	179° 42' 33"	-0.57"	179° 43' 26"	0° 07' 10"	1.0036346	15' 56.15"	23° 26' 16"	7 m 20 s
13	179° 44' 60"	-0.57"	179° 45' 41"	0° 06' 12"	1.0036231	15' 56.17"	23° 26' 16"	7 m 21 s
14	179° 47' 27"	-0.57"	179° 47' 55"	0° 05' 13"	1.0036115	15' 56.18"	23° 26' 16"	7 m 22 s
15	179° 49' 53"	-0.56"	179° 50' 10"	0° 04' 15"	1.0036000	15' 56.19"	23° 26' 16"	7 m 23 s
16	179° 52' 20"	-0.56"	179° 52' 25"	0° 03' 17"	1.0035884	15' 56.20"	23° 26' 16"	7 m 24 s
17	179° 54' 47"	-0.56"	179° 54' 39"	0° 02' 18"	1.0035769	15' 56.21"	23° 26' 16"	7 m 25 s
18	179° 57' 14"	-0.55"	179° 56' 54"	0° 01' 20"	1.0035653	15' 56.22"	23° 26' 16"	7 m 26 s
19	179° 59' 40"	-0.55"	179° 59' 09"	0° 00' 22"	1.0035538	15' 56.23"	23° 26' 16"	7 m 26 s
20	180° 02' 07"	-0.55"	180° 01' 23"	0° 00' -37"	1.0035423	15' 56.24"	23° 26' 16"	7 m 27 s
21	180° 04' 34"	-0.54"	180° 03' 38"	0° -1' 35"	1.0035307	15' 56.25"	23° 26' 16"	7 m 28 s
22	180° 07' 00"	-0.54"	180° 05' 52"	0° -2' 33"	1.0035192	15' 56.26"	23° 26' 16"	7 m 29 s
23	180° 09' 27"	-0.53"	180° 08' 07"	0° -3' 32"	1.0035076	15' 56.28"	23° 26' 16"	7 m 30 s
24	180° 11' 54"	-0.53"	180° 10' 22"	0° -4' 30"	1.0034961	15' 56.29"	23° 26' 16"	7 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	11° 00' 55"	-4° 01' 40"	11° 42' 08"	0° 39' 05"	0° 55' 42"	15' 10.80"	85° 36' 24"	0.98829
1	11° 32' 28"	-3° 59' 58"	12° 10' 27"	0° 52' 55"	0° 55' 41"	15' 10.45"	84° 49' 33"	0.98743
2	12° 03' 59"	-3° 58' 15"	12° 38' 44"	1° 06' 44"	0° 55' 40"	15' 10.10"	84° 6' 04"	0.98654
3	12° 35' 28"	-3° 56' 31"	13° 07' 01"	1° 20' 32"	0° 55' 39"	15' 09.76"	83° 25' 39"	0.98561
4	13° 06' 55"	-3° 54' 46"	13° 35' 16"	1° 34' 20"	0° 55' 37"	15' 09.42"	82° 48' 02"	0.98465
5	13° 38' 21"	-3° 53' 00"	14° 03' 31"	1° 48' 06"	0° 55' 36"	15' 09.08"	82° 12' 56"	0.98366
6	14° 09' 46"	-3° 51' 13"	14° 31' 45"	2° 01' 51"	0° 55' 35"	15' 08.73"	81° 40' 11"	0.98263
7	14° 41' 09"	-3° 49' 24"	14° 59' 57"	2° 15' 35"	0° 55' 34"	15' 08.39"	81° 9' 34"	0.98157
8	15° 12' 30"	-3° 47' 35"	15° 28' 09"	2° 29' 18"	0° 55' 32"	15' 08.06"	80° 40' 55"	0.98048
9	15° 43' 49"	-3° 45' 44"	15° 56' 20"	2° 43' 00"	0° 55' 31"	15' 07.72"	80° 14' 04"	0.97935
10	16° 15' 07"	-3° 43' 53"	16° 24' 31"	2° 56' 41"	0° 55' 30"	15' 07.38"	79° 48' 54"	0.97820
11	16° 46' 23"	-3° 42' 00"	16° 52' 41"	3° 10' 20"	0° 55' 29"	15' 07.05"	79° 25' 18"	0.97700
12	17° 17' 38"	-3° 40' 07"	17° 20' 50"	3° 23' 58"	0° 55' 27"	15' 06.71"	79° 3' 08"	0.97578
13	17° 48' 51"	-3° 38' 12"	17° 48' 59"	3° 37' 34"	0° 55' 26"	15' 06.38"	78° 42' 19"	0.97453
14	18° 20' 03"	-3° 36' 16"	18° 17' 07"	3° 51' 09"	0° 55' 25"	15' 06.05"	78° 22' 45"	0.97324
15	18° 51' 12"	-3° 34' 19"	18° 45' 15"	4° 04' 42"	0° 55' 24"	15' 05.72"	78° 4' 21"	0.97192
16	19° 22' 21"	-3° 32' 22"	19° 13' 22"	4° 18' 14"	0° 55' 23"	15' 05.39"	77° 47' 03"	0.97057
17	19° 53' 27"	-3° 30' 23"	19° 41' 29"	4° 31' 44"	0° 55' 21"	15' 05.07"	77° 30' 47"	0.96919
18	20° 24' 33"	-3° 28' 23"	20° 09' 36"	4° 45' 12"	0° 55' 20"	15' 04.74"	77° 15' 29"	0.96777
19	20° 55' 36"	-3° 26' 23"	20° 37' 43"	4° 58' 39"	0° 55' 19"	15' 04.42"	77° 1' 05"	0.96633
20	21° 26' 38"	-3° 24' 21"	21° 05' 49"	5° 12' 04"	0° 55' 18"	15' 04.10"	76° 47' 33"	0.96485
21	21° 57' 39"	-3° 22' 19"	21° 33' 55"	5° 25' 27"	0° 55' 17"	15' 03.78"	76° 34' 49"	0.96335
22	22° 28' 38"	-3° 20' 16"	22° 02' 02"	5° 38' 48"	0° 55' 15"	15' 03.46"	76° 22' 52"	0.96181
23	22° 59' 35"	-3° 18' 11"	22° 30' 08"	5° 52' 07"	0° 55' 14"	15' 03.14"	76° 11' 38"	0.96024
24	23° 30' 31"	-3° 16' 06"	22° 58' 14"	6° 05' 24"	0° 55' 13"	15' 02.83"	76° 1' 05"	0.95865

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	180° 11' 54"	-0.53"	180° 10' 22"	0° -4' 30"	1.0034961	15' 56.29"	23° 26' 16"	7 m 31 s
1	180° 14' 21"	-0.53"	180° 12' 36"	0° -5' 28"	1.0034845	15' 56.30"	23° 26' 16"	7 m 32 s
2	180° 16' 47"	-0.52"	180° 14' 51"	0° -6' 27"	1.0034730	15' 56.31"	23° 26' 16"	7 m 33 s
3	180° 19' 14"	-0.52"	180° 17' 06"	0° -7' 25"	1.0034614	15' 56.32"	23° 26' 16"	7 m 33 s
4	180° 21' 41"	-0.52"	180° 19' 20"	0° -8' 24"	1.0034499	15' 56.33"	23° 26' 16"	7 m 34 s
5	180° 24' 08"	-0.51"	180° 21' 35"	0° -9' 22"	1.0034383	15' 56.34"	23° 26' 16"	7 m 35 s
6	180° 26' 34"	-0.51"	180° 23' 49"	0° -10' 20"	1.0034268	15' 56.35"	23° 26' 16"	7 m 36 s
7	180° 29' 01"	-0.50"	180° 26' 04"	0° -11' 19"	1.0034152	15' 56.36"	23° 26' 16"	7 m 37 s
8	180° 31' 28"	-0.50"	180° 28' 19"	0° -12' 17"	1.0034037	15' 56.37"	23° 26' 16"	7 m 38 s
9	180° 33' 55"	-0.50"	180° 30' 33"	0° -13' 15"	1.0033921	15' 56.39"	23° 26' 16"	7 m 39 s
10	180° 36' 21"	-0.49"	180° 32' 48"	0° -14' 14"	1.0033806	15' 56.40"	23° 26' 16"	7 m 40 s
11	180° 38' 48"	-0.49"	180° 35' 03"	0° -15' 12"	1.0033690	15' 56.41"	23° 26' 16"	7 m 41 s
12	180° 41' 15"	-0.48"	180° 37' 17"	0° -16' 10"	1.0033575	15' 56.42"	23° 26' 16"	7 m 41 s
13	180° 43' 42"	-0.48"	180° 39' 32"	0° -17' 09"	1.0033460	15' 56.43"	23° 26' 16"	7 m 42 s
14	180° 46' 09"	-0.48"	180° 41' 47"	0° -18' 07"	1.0033344	15' 56.44"	23° 26' 16"	7 m 43 s
15	180° 48' 35"	-0.47"	180° 44' 01"	0° -19' 06"	1.0033229	15' 56.45"	23° 26' 16"	7 m 44 s
16	180° 51' 02"	-0.47"	180° 46' 16"	0° -20' 04"	1.0033113	15' 56.46"	23° 26' 16"	7 m 45 s
17	180° 53' 29"	-0.46"	180° 48' 31"	0° -21' 02"	1.0032998	15' 56.47"	23° 26' 16"	7 m 46 s
18	180° 55' 56"	-0.46"	180° 50' 46"	0° -22' 01"	1.0032882	15' 56.48"	23° 26' 16"	7 m 47 s
19	180° 58' 23"	-0.45"	180° 53' 00"	0° -22' 59"	1.0032767	15' 56.50"	23° 26' 16"	7 m 48 s
20	181° 00' 49"	-0.45"	180° 55' 15"	0° -23' 58"	1.0032651	15' 56.51"	23° 26' 16"	7 m 48 s
21	181° 03' 16"	-0.45"	180° 57' 30"	0° -24' 56"	1.0032536	15' 56.52"	23° 26' 16"	7 m 49 s
22	181° 05' 43"	-0.44"	180° 59' 44"	0° -25' 54"	1.0032420	15' 56.53"	23° 26' 16"	7 m 50 s
23	181° 08' 10"	-0.44"	181° 01' 59"	0° -26' 53"	1.0032305	15' 56.54"	23° 26' 16"	7 m 51 s
24	181° 10' 37"	-0.43"	181° 04' 14"	0° -27' 51"	1.0032189	15' 56.55"	23° 26' 16"	7 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	23° 30' 31"	-3° 16' 06"	22° 58' 14"	6° 05' 24"	0° 55' 13"	15' 02.83"	76° 1' 05"	0.95865
1	24° 01' 25"	-3° 14' 00"	23° 26' 21"	6° 18' 39"	0° 55' 12"	15' 02.51"	75° 51' 12"	0.95702
2	24° 32' 18"	-3° 11' 53"	23° 54' 27"	6° 31' 52"	0° 55' 11"	15' 02.20"	75° 41' 57"	0.95536
3	25° 03' 09"	-3° 09' 46"	24° 22' 34"	6° 45' 03"	0° 55' 10"	15' 01.89"	75° 33' 16"	0.95368
4	25° 33' 59"	-3° 07' 37"	24° 50' 41"	6° 58' 12"	0° 55' 09"	15' 01.59"	75° 25' 10"	0.95196
5	26° 04' 47"	-3° 05' 28"	25° 18' 49"	7° 11' 18"	0° 55' 07"	15' 01.28"	75° 17' 37"	0.95021
6	26° 35' 34"	-3° 03' 17"	25° 46' 56"	7° 24' 23"	0° 55' 06"	15' 00.98"	75° 10' 34"	0.94844
7	27° 06' 19"	-3° 01' 06"	26° 15' 05"	7° 37' 25"	0° 55' 05"	15' 00.68"	75° 4' 02"	0.94664
8	27° 37' 03"	-2° 58' 55"	26° 43' 13"	7° 50' 24"	0° 55' 04"	15' 00.38"	74° 57' 58"	0.94480
9	28° 07' 45"	-2° 56' 42"	27° 11' 22"	8° 03' 21"	0° 55' 03"	15' 00.08"	74° 52' 21"	0.94294
10	28° 38' 26"	-2° 54' 29"	27° 39' 32"	8° 16' 16"	0° 55' 02"	14' 59.78"	74° 47' 11"	0.94105
11	29° 09' 05"	-2° 52' 14"	28° 07' 42"	8° 29' 08"	0° 55' 01"	14' 59.49"	74° 42' 26"	0.93914
12	29° 39' 43"	-2° 49' 60"	28° 35' 53"	8° 41' 58"	0° 54' 60"	14' 59.20"	74° 38' 05"	0.93719
13	30° 10' 20"	-2° 47' 44"	29° 04' 05"	8° 54' 45"	0° 54' 59"	14' 58.91"	74° 34' 08"	0.93522
14	30° 40' 55"	-2° 45' 28"	29° 32' 17"	9° 07' 29"	0° 54' 58"	14' 58.62"	74° 30' 34"	0.93322
15	31° 11' 28"	-2° 43' 11"	30° 00' 31"	9° 20' 11"	0° 54' 57"	14' 58.34"	74° 27' 22"	0.93119
16	31° 42' 01"	-2° 40' 53"	30° 28' 45"	9° 32' 49"	0° 54' 56"	14' 58.06"	74° 24' 31"	0.92913
17	32° 12' 31"	-2° 38' 34"	30° 56' 60"	9° 45' 26"	0° 54' 55"	14' 57.78"	74° 22' 00"	0.92705
18	32° 43' 01"	-2° 36' 15"	31° 25' 16"	9° 57' 59"	0° 54' 54"	14' 57.50"	74° 19' 50"	0.92494
19	33° 13' 29"	-2° 33' 56"	31° 53' 32"	10° 10' 29"	0° 54' 53"	14' 57.23"	74° 17' 58"	0.92280
20	33° 43' 56"	-2° 31' 35"	32° 21' 50"	10° 22' 57"	0° 54' 52"	14' 56.96"	74° 16' 26"	0.92064
21	34° 14' 21"	-2° 29' 14"	32° 50' 09"	10° 35' 21"	0° 54' 51"	14' 56.69"	74° 15' 11"	0.91845
22	34° 44' 45"	-2° 26' 53"	33° 18' 30"	10° 47' 43"	0° 54' 50"	14' 56.42"	74° 14' 15"	0.91624
23	35° 15' 08"	-2° 24' 30"	33° 46' 51"	11° 00' 01"	0° 54' 49"	14' 56.15"	74° 13' 35"	0.91400
24	35° 45' 29"	-2° 22' 07"	34° 15' 14"	11° 12' 17"	0° 54' 48"	14' 55.89"	74° 13' 12"	0.91173

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	181° 10' 37"	-0.43"	181° 04' 14"	0°-27' 51"	1.0032189	15' 56.55"	23° 26' 16"	7 m 52 s
1	181° 13' 04"	-0.43"	181° 06' 29"	0°-28' 49"	1.0032074	15' 56.56"	23° 26' 16"	7 m 53 s
2	181° 15' 30"	-0.42"	181° 08' 43"	0°-29' 48"	1.0031959	15' 56.57"	23° 26' 16"	7 m 54 s
3	181° 17' 57"	-0.42"	181° 10' 58"	0°-30' 46"	1.0031843	15' 56.58"	23° 26' 16"	7 m 55 s
4	181° 20' 24"	-0.41"	181° 13' 13"	0°-31' 45"	1.0031728	15' 56.59"	23° 26' 16"	7 m 55 s
5	181° 22' 51"	-0.41"	181° 15' 27"	0°-32' 43"	1.0031612	15' 56.61"	23° 26' 16"	7 m 56 s
6	181° 25' 18"	-0.41"	181° 17' 42"	0°-33' 41"	1.0031497	15' 56.62"	23° 26' 16"	7 m 57 s
7	181° 27' 45"	-0.40"	181° 19' 57"	0°-34' 40"	1.0031381	15' 56.63"	23° 26' 16"	7 m 58 s
8	181° 30' 11"	-0.40"	181° 22' 12"	0°-35' 38"	1.0031266	15' 56.64"	23° 26' 16"	7 m 59 s
9	181° 32' 38"	-0.39"	181° 24' 26"	0°-36' 37"	1.0031150	15' 56.65"	23° 26' 16"	7 m 60 s
10	181° 35' 05"	-0.39"	181° 26' 41"	0°-37' 35"	1.0031035	15' 56.66"	23° 26' 16"	8 m 01 s
11	181° 37' 32"	-0.38"	181° 28' 56"	0°-38' 33"	1.0030919	15' 56.67"	23° 26' 16"	8 m 01 s
12	181° 39' 59"	-0.38"	181° 31' 11"	0°-39' 32"	1.0030804	15' 56.68"	23° 26' 16"	8 m 02 s
13	181° 42' 26"	-0.37"	181° 33' 26"	0°-40' 30"	1.0030688	15' 56.69"	23° 26' 16"	8 m 03 s
14	181° 44' 53"	-0.37"	181° 35' 40"	0°-41' 28"	1.0030573	15' 56.71"	23° 26' 16"	8 m 04 s
15	181° 47' 20"	-0.36"	181° 37' 55"	0°-42' 27"	1.0030457	15' 56.72"	23° 26' 16"	8 m 05 s
16	181° 49' 46"	-0.36"	181° 40' 10"	0°-43' 25"	1.0030342	15' 56.73"	23° 26' 16"	8 m 06 s
17	181° 52' 13"	-0.35"	181° 42' 25"	0°-44' 24"	1.0030227	15' 56.74"	23° 26' 16"	8 m 07 s
18	181° 54' 40"	-0.35"	181° 44' 39"	0°-45' 22"	1.0030111	15' 56.75"	23° 26' 16"	8 m 08 s
19	181° 57' 07"	-0.34"	181° 46' 54"	0°-46' 20"	1.0029996	15' 56.76"	23° 26' 16"	8 m 08 s
20	181° 59' 34"	-0.34"	181° 49' 09"	0°-47' 19"	1.0029880	15' 56.77"	23° 26' 16"	8 m 09 s
21	182° 02' 01"	-0.33"	181° 51' 24"	0°-48' 17"	1.0029765	15' 56.78"	23° 26' 16"	8 m 10 s
22	182° 04' 28"	-0.33"	181° 53' 39"	0°-49' 16"	1.0029649	15' 56.79"	23° 26' 16"	8 m 11 s
23	182° 06' 55"	-0.32"	181° 55' 53"	0°-50' 14"	1.0029534	15' 56.80"	23° 26' 16"	8 m 12 s
24	182° 09' 22"	-0.32"	181° 58' 08"	0°-51' 12"	1.0029418	15' 56.82"	23° 26' 16"	8 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	35° 45' 29"	-2° 22' 07"	34° 15' 14"	11° 12' 17"	0° 54' 48"	14' 55.89"	74° 13' 12"	0.91173
1	36° 15' 49"	-2° 19' 44"	34° 43' 37"	11° 24' 29"	0° 54' 47"	14' 55.63"	74° 13' 06"	0.90944
2	36° 46' 08"	-2° 17' 20"	35° 12' 02"	11° 36' 38"	0° 54' 46"	14' 55.38"	74° 13' 15"	0.90712
3	37° 16' 25"	-2° 14' 55"	35° 40' 29"	11° 48' 43"	0° 54' 45"	14' 55.12"	74° 13' 40"	0.90478
4	37° 46' 41"	-2° 12' 30"	36° 08' 57"	12° 00' 46"	0° 54' 44"	14' 54.87"	74° 14' 21"	0.90241
5	38° 16' 56"	-2° 10' 04"	36° 37' 26"	12° 12' 45"	0° 54' 43"	14' 54.62"	74° 15' 15"	0.90002
6	38° 47' 10"	-2° 07' 38"	37° 05' 57"	12° 24' 41"	0° 54' 42"	14' 54.38"	74° 16' 25"	0.89760
7	39° 17' 22"	-2° 05' 12"	37° 34' 29"	12° 36' 33"	0° 54' 41"	14' 54.14"	74° 17' 48"	0.89516
8	39° 47' 34"	-2° 02' 44"	38° 03' 03"	12° 48' 22"	0° 54' 40"	14' 53.90"	74° 19' 25"	0.89269
9	40° 17' 44"	-2° 00' 17"	38° 31' 39"	13° 00' 08"	0° 54' 39"	14' 53.66"	74° 21' 16"	0.89021
10	40° 47' 52"	-1° 57' 48"	39° 00' 16"	13° 11' 49"	0° 54' 39"	14' 53.43"	74° 23' 20"	0.88769
11	41° 18' 00"	-1° 55' 20"	39° 28' 55"	13° 23' 28"	0° 54' 38"	14' 53.20"	74° 25' 37"	0.88516
12	41° 48' 07"	-1° 52' 50"	39° 57' 35"	13° 35' 02"	0° 54' 37"	14' 52.97"	74° 28' 07"	0.88260
13	42° 18' 12"	-1° 50' 21"	40° 26' 18"	13° 46' 33"	0° 54' 36"	14' 52.75"	74° 30' 49"	0.88001
14	42° 48' 16"	-1° 47' 51"	40° 55' 02"	13° 58' 01"	0° 54' 35"	14' 52.52"	74° 33' 43"	0.87741
15	43° 18' 19"	-1° 45' 20"	41° 23' 48"	14° 09' 24"	0° 54' 35"	14' 52.31"	74° 36' 49"	0.87478
16	43° 48' 21"	-1° 42' 49"	41° 52' 36"	14° 20' 44"	0° 54' 34"	14' 52.09"	74° 40' 08"	0.87213
17	44° 18' 22"	-1° 40' 18"	42° 21' 26"	14° 31' 60"	0° 54' 33"	14' 51.88"	74° 43' 38"	0.86945
18	44° 48' 22"	-1° 37' 46"	42° 50' 18"	14° 43' 12"	0° 54' 32"	14' 51.67"	74° 47' 19"	0.86676
19	45° 18' 20"	-1° 35' 14"	43° 19' 11"	14° 54' 20"	0° 54' 31"	14' 51.47"	74° 51' 11"	0.86404
20	45° 48' 18"	-1° 32' 42"	43° 48' 07"	15° 05' 24"	0° 54' 31"	14' 51.26"	74° 55' 15"	0.86130
21	46° 18' 14"	-1° 30' 09"	44° 17' 05"	15° 16' 24"	0° 54' 30"	14' 51.07"	74° 59' 29"	0.85854
22	46° 48' 10"	-1° 27' 36"	44° 46' 05"	15° 27' 20"	0° 54' 29"	14' 50.87"	75° 3' 54"	0.85575
23	47° 18' 05"	-1° 25' 03"	45° 15' 07"	15° 38' 12"	0° 54' 29"	14' 50.68"	75° 8' 30"	0.85295
24	47° 47' 58"	-1° 22' 29"	45° 44' 11"	15° 48' 60"	0° 54' 28"	14' 50.49"	75° 13' 16"	0.85012

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	182° 09' 22"	-0.32"	181° 58' 08"	0°-51' 12"	1.0029418	15' 56.82"	23° 26' 16"	8 m 13 s
1	182° 11' 49"	-0.31"	182° 00' 23"	0°-52' 11"	1.0029303	15' 56.83"	23° 26' 16"	8 m 14 s
2	182° 14' 15"	-0.31"	182° 02' 38"	0°-53' 09"	1.0029187	15' 56.84"	23° 26' 16"	8 m 15 s
3	182° 16' 42"	-0.30"	182° 04' 53"	0°-54' 08"	1.0029072	15' 56.85"	23° 26' 16"	8 m 15 s
4	182° 19' 09"	-0.30"	182° 07' 08"	0°-55' 06"	1.0028956	15' 56.86"	23° 26' 16"	8 m 16 s
5	182° 21' 36"	-0.29"	182° 09' 23"	0°-56' 04"	1.0028841	15' 56.87"	23° 26' 16"	8 m 17 s
6	182° 24' 03"	-0.29"	182° 11' 37"	0°-57' 03"	1.0028725	15' 56.88"	23° 26' 16"	8 m 18 s
7	182° 26' 30"	-0.28"	182° 13' 52"	0°-58' 01"	1.0028610	15' 56.89"	23° 26' 16"	8 m 19 s
8	182° 28' 57"	-0.28"	182° 16' 07"	0°-58' 60"	1.0028494	15' 56.90"	23° 26' 16"	8 m 20 s
9	182° 31' 24"	-0.27"	182° 18' 22"	0°-59' 58"	1.0028379	15' 56.91"	23° 26' 16"	8 m 21 s
10	182° 33' 51"	-0.27"	182° 20' 37"	-1° 00' 56"	1.0028263	15' 56.93"	23° 26' 16"	8 m 21 s
11	182° 36' 18"	-0.26"	182° 22' 52"	-1° 01' 55"	1.0028148	15' 56.94"	23° 26' 16"	8 m 22 s
12	182° 38' 45"	-0.26"	182° 25' 07"	-1° 02' 53"	1.0028032	15' 56.95"	23° 26' 16"	8 m 23 s
13	182° 41' 12"	-0.25"	182° 27' 21"	-1° 03' 52"	1.0027917	15' 56.96"	23° 26' 16"	8 m 24 s
14	182° 43' 39"	-0.25"	182° 29' 36"	-1° 04' 50"	1.0027801	15' 56.97"	23° 26' 16"	8 m 25 s
15	182° 46' 06"	-0.24"	182° 31' 51"	-1° 05' 48"	1.0027686	15' 56.98"	23° 26' 16"	8 m 26 s
16	182° 48' 33"	-0.24"	182° 34' 06"	-1° 06' 47"	1.0027570	15' 56.99"	23° 26' 16"	8 m 27 s
17	182° 50' 60"	-0.23"	182° 36' 21"	-1° 07' 45"	1.0027455	15' 57.00"	23° 26' 16"	8 m 27 s
18	182° 53' 27"	-0.23"	182° 38' 36"	-1° 08' 44"	1.0027339	15' 57.01"	23° 26' 16"	8 m 28 s
19	182° 55' 54"	-0.22"	182° 40' 51"	-1° 09' 42"	1.0027224	15' 57.02"	23° 26' 16"	8 m 29 s
20	182° 58' 21"	-0.21"	182° 43' 06"	-1° 10' 40"	1.0027108	15' 57.04"	23° 26' 16"	8 m 30 s
21	183° 00' 48"	-0.21"	182° 45' 21"	-1° 11' 39"	1.0026993	15' 57.05"	23° 26' 16"	8 m 31 s
22	183° 03' 15"	-0.20"	182° 47' 36"	-1° 12' 37"	1.0026877	15' 57.06"	23° 26' 16"	8 m 32 s
23	183° 05' 42"	-0.20"	182° 49' 51"	-1° 13' 36"	1.0026762	15' 57.07"	23° 26' 16"	8 m 33 s
24	183° 08' 09"	-0.19"	182° 52' 06"	-1° 14' 34"	1.0026646	15' 57.08"	23° 26' 16"	8 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	47° 47' 58"	-1° 22' 29"	45° 44' 11"	15° 48' 60"	0° 54' 28"	14' 50.49"	75° 13' 16"	0.85012
1	48° 17' 51"	-1° 19' 55"	46° 13' 18"	15° 59' 43"	0° 54' 27"	14' 50.31"	75° 18' 12"	0.84728
2	48° 47' 42"	-1° 17' 20"	46° 42' 27"	16° 10' 23"	0° 54' 27"	14' 50.12"	75° 23' 18"	0.84441
3	49° 17' 33"	-1° 14' 46"	47° 11' 38"	16° 20' 58"	0° 54' 26"	14' 49.95"	75° 28' 35"	0.84152
4	49° 47' 23"	-1° 12' 11"	47° 40' 51"	16° 31' 29"	0° 54' 25"	14' 49.77"	75° 34' 01"	0.83861
5	50° 17' 12"	-1° 09' 35"	48° 10' 07"	16° 41' 55"	0° 54' 25"	14' 49.60"	75° 39' 36"	0.83569
6	50° 46' 60"	-1° 06' 60"	48° 39' 25"	16° 52' 17"	0° 54' 24"	14' 49.43"	75° 45' 22"	0.83274
7	51° 16' 47"	-1° 04' 24"	49° 08' 45"	17° 02' 35"	0° 54' 23"	14' 49.27"	75° 51' 16"	0.82977
8	51° 46' 33"	-1° 01' 48"	49° 38' 08"	17° 12' 48"	0° 54' 23"	14' 49.11"	75° 57' 20"	0.82678
9	52° 16' 19"	0°-59' 12"	50° 07' 33"	17° 22' 56"	0° 54' 22"	14' 48.96"	76° 3' 34"	0.82378
10	52° 46' 03"	0°-56' 35"	50° 37' 01"	17° 33' 00"	0° 54' 22"	14' 48.80"	76° 9' 56"	0.82075
11	53° 15' 47"	0°-53' 59"	51° 06' 31"	17° 42' 60"	0° 54' 21"	14' 48.65"	76° 16' 27"	0.81771
12	53° 45' 30"	0°-51' 22"	51° 36' 04"	17° 52' 55"	0° 54' 21"	14' 48.51"	76° 23' 07"	0.81464
13	54° 15' 12"	0°-48' 45"	52° 05' 40"	18° 02' 45"	0° 54' 20"	14' 48.37"	76° 29' 56"	0.81156
14	54° 44' 54"	0°-46' 08"	52° 35' 17"	18° 12' 30"	0° 54' 20"	14' 48.23"	76° 36' 54"	0.80846
15	55° 14' 35"	0°-43' 30"	53° 04' 58"	18° 22' 11"	0° 54' 19"	14' 48.10"	76° 43' 60"	0.80534
16	55° 44' 15"	0°-40' 53"	53° 34' 41"	18° 31' 47"	0° 54' 19"	14' 47.97"	76° 51' 14"	0.80221
17	56° 13' 54"	0°-38' 15"	54° 04' 27"	18° 41' 17"	0° 54' 18"	14' 47.84"	76° 58' 37"	0.79905
18	56° 43' 33"	0°-35' 38"	54° 34' 16"	18° 50' 44"	0° 54' 18"	14' 47.72"	77° 6' 09"	0.79588
19	57° 13' 11"	0°-32' 60"	55° 04' 07"	19° 00' 05"	0° 54' 17"	14' 47.61"	77° 13' 48"	0.79269
20	57° 42' 48"	0°-30' 22"	55° 34' 01"	19° 09' 21"	0° 54' 17"	14' 47.49"	77° 21' 36"	0.78949
21	58° 12' 25"	0°-27' 44"	56° 03' 58"	19° 18' 32"	0° 54' 16"	14' 47.38"	77° 29' 31"	0.78626
22	58° 42' 01"	0°-25' 05"	56° 33' 57"	19° 27' 38"	0° 54' 16"	14' 47.28"	77° 37' 34"	0.78302
23	59° 11' 37"	0°-22' 27"	57° 03' 59"	19° 36' 39"	0° 54' 16"	14' 47.18"	77° 45' 46"	0.77976
24	59° 41' 12"	0°-19' 49"	57° 34' 04"	19° 45' 35"	0° 54' 15"	14' 47.08"	77° 54' 05"	0.77649

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	183° 08' 09"	-0.19"	182° 52' 06"	-1° 14' 34"	1.0026646	15' 57.08"	23° 26' 16"	8 m 34 s
1	183° 10' 36"	-0.19"	182° 54' 20"	-1° 15' 32"	1.0026530	15' 57.09"	23° 26' 16"	8 m 34 s
2	183° 13' 03"	-0.18"	182° 56' 35"	-1° 16' 31"	1.0026415	15' 57.10"	23° 26' 16"	8 m 35 s
3	183° 15' 30"	-0.18"	182° 58' 50"	-1° 17' 29"	1.0026299	15' 57.11"	23° 26' 16"	8 m 36 s
4	183° 17' 57"	-0.17"	183° 01' 05"	-1° 18' 28"	1.0026184	15' 57.12"	23° 26' 16"	8 m 37 s
5	183° 20' 24"	-0.17"	183° 03' 20"	-1° 19' 26"	1.0026068	15' 57.13"	23° 26' 16"	8 m 38 s
6	183° 22' 51"	-0.16"	183° 05' 35"	-1° 20' 24"	1.0025953	15' 57.15"	23° 26' 16"	8 m 39 s
7	183° 25' 18"	-0.16"	183° 07' 50"	-1° 21' 23"	1.0025837	15' 57.16"	23° 26' 16"	8 m 40 s
8	183° 27' 45"	-0.15"	183° 10' 05"	-1° 22' 21"	1.0025722	15' 57.17"	23° 26' 16"	8 m 40 s
9	183° 30' 12"	-0.15"	183° 12' 20"	-1° 23' 19"	1.0025606	15' 57.18"	23° 26' 16"	8 m 41 s
10	183° 32' 39"	-0.14"	183° 14' 35"	-1° 24' 18"	1.0025490	15' 57.19"	23° 26' 16"	8 m 42 s
11	183° 35' 06"	-0.14"	183° 16' 50"	-1° 25' 16"	1.0025375	15' 57.20"	23° 26' 16"	8 m 43 s
12	183° 37' 33"	-0.13"	183° 19' 05"	-1° 26' 15"	1.0025259	15' 57.21"	23° 26' 16"	8 m 44 s
13	183° 40' 00"	-0.12"	183° 21' 20"	-1° 27' 13"	1.0025144	15' 57.22"	23° 26' 16"	8 m 45 s
14	183° 42' 27"	-0.12"	183° 23' 35"	-1° 28' 11"	1.0025028	15' 57.23"	23° 26' 16"	8 m 46 s
15	183° 44' 54"	-0.11"	183° 25' 50"	-1° 29' 10"	1.0024912	15' 57.25"	23° 26' 16"	8 m 46 s
16	183° 47' 21"	-0.11"	183° 28' 05"	-1° 30' 08"	1.0024797	15' 57.26"	23° 26' 16"	8 m 47 s
17	183° 49' 48"	-0.10"	183° 30' 20"	-1° 31' 07"	1.0024681	15' 57.27"	23° 26' 16"	8 m 48 s
18	183° 52' 16"	-0.10"	183° 32' 35"	-1° 32' 05"	1.0024566	15' 57.28"	23° 26' 16"	8 m 49 s
19	183° 54' 43"	-0.09"	183° 34' 50"	-1° 33' 03"	1.0024450	15' 57.29"	23° 26' 16"	8 m 50 s
20	183° 57' 10"	-0.09"	183° 37' 05"	-1° 34' 02"	1.0024334	15' 57.30"	23° 26' 16"	8 m 51 s
21	183° 59' 37"	-0.08"	183° 39' 21"	-1° 35' 00"	1.0024219	15' 57.31"	23° 26' 16"	8 m 52 s
22	184° 02' 04"	-0.08"	183° 41' 36"	-1° 35' 59"	1.0024103	15' 57.32"	23° 26' 16"	8 m 52 s
23	184° 04' 31"	-0.07"	183° 43' 51"	-1° 36' 57"	1.0023987	15' 57.33"	23° 26' 16"	8 m 53 s
24	184° 06' 58"	-0.07"	183° 46' 06"	-1° 37' 55"	1.0023872	15' 57.34"	23° 26' 16"	8 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	59° 41' 12"	0°-19' 49"	57° 34' 04"	19° 45' 35"	0° 54' 15"	14' 47.08"	77° 54' 05"	0.77649
1	60° 10' 46"	0°-17' 11"	58° 04' 12"	19° 54' 26"	0° 54' 15"	14' 46.99"	78° 2' 31"	0.77320
2	60° 40' 20"	0°-14' 32"	58° 34' 23"	20° 03' 11"	0° 54' 15"	14' 46.90"	78° 11' 06"	0.76989
3	61° 09' 54"	0°-11' 54"	59° 04' 37"	20° 11' 51"	0° 54' 14"	14' 46.81"	78° 19' 48"	0.76657
4	61° 39' 27"	0° -9' 15"	59° 34' 53"	20° 20' 26"	0° 54' 14"	14' 46.73"	78° 28' 37"	0.76323
5	62° 08' 59"	0° -6' 37"	60° 05' 12"	20° 28' 56"	0° 54' 14"	14' 46.66"	78° 37' 34"	0.75988
6	62° 38' 31"	0° -3' 58"	60° 35' 35"	20° 37' 20"	0° 54' 14"	14' 46.59"	78° 46' 38"	0.75651
7	63° 08' 03"	0° -1' 20"	61° 05' 60"	20° 45' 39"	0° 54' 13"	14' 46.52"	78° 55' 49"	0.75313
8	63° 37' 34"	0° 01' 19"	61° 36' 28"	20° 53' 52"	0° 54' 13"	14' 46.45"	79° 5' 07"	0.74973
9	64° 07' 05"	0° 03' 57"	62° 06' 59"	21° 01' 60"	0° 54' 13"	14' 46.40"	79° 14' 32"	0.74631
10	64° 36' 36"	0° 06' 35"	62° 37' 33"	21° 10' 02"	0° 54' 13"	14' 46.34"	79° 24' 05"	0.74288
11	65° 06' 06"	0° 09' 11"	63° 08' 10"	21° 17' 56"	0° 54' 12"	14' 46.29"	79° 33' 46"	0.73944
12	65° 35' 36"	0° 11' 49"	63° 38' 50"	21° 25' 47"	0° 54' 12"	14' 46.24"	79° 43' 32"	0.73598
13	66° 05' 05"	0° 14' 28"	64° 09' 33"	21° 33' 33"	0° 54' 12"	14' 46.20"	79° 53' 25"	0.73251
14	66° 34' 35"	0° 17' 06"	64° 40' 18"	21° 41' 12"	0° 54' 12"	14' 46.17"	80° 3' 24"	0.72903
15	67° 04' 04"	0° 19' 44"	65° 11' 07"	21° 48' 46"	0° 54' 12"	14' 46.13"	80° 13' 31"	0.72553
16	67° 33' 32"	0° 22' 22"	65° 41' 59"	21° 56' 14"	0° 54' 12"	14' 46.11"	80° 23' 44"	0.72201
17	68° 03' 01"	0° 24' 60"	66° 12' 53"	22° 03' 37"	0° 54' 12"	14' 46.08"	80° 34' 03"	0.71849
18	68° 32' 30"	0° 27' 37"	66° 43' 51"	22° 10' 53"	0° 54' 12"	14' 46.06"	80° 44' 29"	0.71495
19	69° 01' 58"	0° 30' 15"	67° 14' 52"	22° 18' 04"	0° 54' 12"	14' 46.05"	80° 55' 01"	0.71140
20	69° 31' 26"	0° 32' 52"	67° 45' 55"	22° 25' 08"	0° 54' 12"	14' 46.04"	81° 5' 39"	0.70783
21	70° 00' 54"	0° 35' 30"	68° 17' 02"	22° 32' 07"	0° 54' 11"	14' 46.03"	81° 16' 24"	0.70425
22	70° 30' 22"	0° 38' 07"	68° 48' 11"	22° 38' 60"	0° 54' 11"	14' 46.03"	81° 27' 15"	0.70066
23	70° 59' 50"	0° 40' 44"	69° 19' 24"	22° 45' 46"	0° 54' 11"	14' 46.03"	81° 38' 12"	0.69706
24	71° 29' 17"	0° 43' 21"	69° 50' 39"	22° 52' 27"	0° 54' 12"	14' 46.04"	81° 49' 15"	0.69344

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	184° 06' 58"	-0.07"	183° 46' 06"	-1° 37' 55"	1.0023872	15' 57.34"	23° 26' 16"	8 m 54 s
1	184° 09' 25"	-0.06"	183° 48' 21"	-1° 38' 54"	1.0023756	15' 57.36"	23° 26' 16"	8 m 55 s
2	184° 11' 52"	-0.06"	183° 50' 36"	-1° 39' 52"	1.0023640	15' 57.37"	23° 26' 16"	8 m 56 s
3	184° 14' 19"	-0.05"	183° 52' 51"	-1° 40' 50"	1.0023525	15' 57.38"	23° 26' 16"	8 m 57 s
4	184° 16' 47"	-0.05"	183° 55' 06"	-1° 41' 49"	1.0023409	15' 57.39"	23° 26' 16"	8 m 57 s
5	184° 19' 14"	-0.04"	183° 57' 21"	-1° 42' 47"	1.0023293	15' 57.40"	23° 26' 16"	8 m 58 s
6	184° 21' 41"	-0.03"	183° 59' 36"	-1° 43' 46"	1.0023178	15' 57.41"	23° 26' 16"	8 m 59 s
7	184° 24' 08"	-0.03"	184° 01' 51"	-1° 44' 44"	1.0023062	15' 57.42"	23° 26' 16"	9 m 00 s
8	184° 26' 35"	-0.02"	184° 04' 07"	-1° 45' 42"	1.0022946	15' 57.43"	23° 26' 16"	9 m 01 s
9	184° 29' 02"	-0.02"	184° 06' 22"	-1° 46' 41"	1.0022831	15' 57.44"	23° 26' 16"	9 m 02 s
10	184° 31' 29"	-0.01"	184° 08' 37"	-1° 47' 39"	1.0022715	15' 57.46"	23° 26' 16"	9 m 03 s
11	184° 33' 56"	-0.01"	184° 10' 52"	-1° 48' 37"	1.0022599	15' 57.47"	23° 26' 16"	9 m 03 s
12	184° 36' 24"	-0.00"	184° 13' 07"	-1° 49' 36"	1.0022483	15' 57.48"	23° 26' 16"	9 m 04 s
13	184° 38' 51"	0.00"	184° 15' 22"	-1° 50' 34"	1.0022368	15' 57.49"	23° 26' 16"	9 m 05 s
14	184° 41' 18"	0.01"	184° 17' 37"	-1° 51' 32"	1.0022252	15' 57.50"	23° 26' 16"	9 m 06 s
15	184° 43' 45"	0.01"	184° 19' 53"	-1° 52' 31"	1.0022136	15' 57.51"	23° 26' 16"	9 m 07 s
16	184° 46' 12"	0.02"	184° 22' 08"	-1° 53' 29"	1.0022020	15' 57.52"	23° 26' 16"	9 m 08 s
17	184° 48' 39"	0.02"	184° 24' 23"	-1° 54' 28"	1.0021905	15' 57.53"	23° 26' 16"	9 m 09 s
18	184° 51' 07"	0.03"	184° 26' 38"	-1° 55' 26"	1.0021789	15' 57.54"	23° 26' 16"	9 m 09 s
19	184° 53' 34"	0.03"	184° 28' 53"	-1° 56' 24"	1.0021673	15' 57.55"	23° 26' 16"	9 m 10 s
20	184° 56' 01"	0.04"	184° 31' 08"	-1° 57' 23"	1.0021557	15' 57.57"	23° 26' 16"	9 m 11 s
21	184° 58' 28"	0.04"	184° 33' 24"	-1° 58' 21"	1.0021442	15' 57.58"	23° 26' 16"	9 m 12 s
22	185° 00' 55"	0.05"	184° 35' 39"	-1° 59' 19"	1.0021326	15' 57.59"	23° 26' 16"	9 m 13 s
23	185° 03' 22"	0.05"	184° 37' 54"	-2° 00' 18"	1.0021210	15' 57.60"	23° 26' 16"	9 m 14 s
24	185° 05' 50"	0.06"	184° 40' 09"	-2° 01' 16"	1.0021094	15' 57.61"	23° 26' 16"	9 m 14 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	71° 29' 17"	0° 43' 21"	69° 50' 39"	22° 52' 27"	0° 54' 12"	14' 46.04"	81° 49' 15"	0.69344
1	71° 58' 45"	0° 45' 57"	70° 21' 58"	22° 59' 01"	0° 54' 12"	14' 46.05"	82° 0' 24"	0.68982
2	72° 28' 13"	0° 48' 34"	70° 53' 19"	23° 05' 30"	0° 54' 12"	14' 46.07"	82° 11' 39"	0.68618
3	72° 57' 40"	0° 51' 10"	71° 24' 44"	23° 11' 52"	0° 54' 12"	14' 46.09"	82° 22' 59"	0.68253
4	73° 27' 08"	0° 53' 46"	71° 56' 11"	23° 18' 08"	0° 54' 12"	14' 46.12"	82° 34' 26"	0.67887
5	73° 56' 36"	0° 56' 22"	72° 27' 42"	23° 24' 17"	0° 54' 12"	14' 46.15"	82° 45' 58"	0.67519
6	74° 26' 04"	0° 58' 57"	72° 59' 15"	23° 30' 20"	0° 54' 12"	14' 46.19"	82° 57' 36"	0.67151
7	74° 55' 32"	1° 01' 32"	73° 30' 51"	23° 36' 17"	0° 54' 12"	14' 46.23"	83° 9' 19"	0.66781
8	75° 24' 60"	1° 04' 07"	74° 02' 30"	23° 42' 08"	0° 54' 12"	14' 46.27"	83° 21' 08"	0.66411
9	75° 54' 28"	1° 06' 42"	74° 34' 12"	23° 47' 52"	0° 54' 13"	14' 46.32"	83° 33' 02"	0.66039
10	76° 23' 56"	1° 09' 17"	75° 05' 57"	23° 53' 30"	0° 54' 13"	14' 46.38"	83° 45' 01"	0.65667
11	76° 53' 25"	1° 11' 51"	75° 37' 45"	23° 59' 01"	0° 54' 13"	14' 46.44"	83° 57' 06"	0.65293
12	77° 22' 54"	1° 14' 25"	76° 09' 36"	24° 04' 25"	0° 54' 13"	14' 46.50"	84° 9' 16"	0.64918
13	77° 52' 23"	1° 16' 58"	76° 41' 29"	24° 09' 43"	0° 54' 13"	14' 46.57"	84° 21' 31"	0.64543
14	78° 21' 52"	1° 19' 32"	77° 13' 26"	24° 14' 55"	0° 54' 14"	14' 46.65"	84° 33' 51"	0.64166
15	78° 51' 22"	1° 22' 05"	77° 45' 25"	24° 19' 60"	0° 54' 14"	14' 46.72"	84° 46' 16"	0.63789
16	79° 20' 51"	1° 24' 37"	78° 17' 27"	24° 24' 58"	0° 54' 14"	14' 46.81"	84° 58' 46"	0.63410
17	79° 50' 22"	1° 27' 09"	78° 49' 32"	24° 29' 49"	0° 54' 15"	14' 46.90"	85° 11' 21"	0.63031
18	80° 19' 52"	1° 29' 41"	79° 21' 39"	24° 34' 34"	0° 54' 15"	14' 46.99"	85° 24' 01"	0.62651
19	80° 49' 23"	1° 32' 13"	79° 53' 50"	24° 39' 12"	0° 54' 15"	14' 47.09"	85° 36' 45"	0.62270
20	81° 18' 54"	1° 34' 44"	80° 26' 03"	24° 43' 43"	0° 54' 16"	14' 47.19"	85° 49' 34"	0.61888
21	81° 48' 26"	1° 37' 15"	80° 58' 18"	24° 48' 08"	0° 54' 16"	14' 47.30"	86° 2' 27"	0.61505
22	82° 17' 58"	1° 39' 45"	81° 30' 37"	24° 52' 25"	0° 54' 17"	14' 47.41"	86° 15' 25"	0.61121
23	82° 47' 31"	1° 42' 15"	82° 02' 58"	24° 56' 36"	0° 54' 17"	14' 47.53"	86° 28' 28"	0.60737
24	83° 17' 04"	1° 44' 45"	82° 35' 21"	25° 00' 39"	0° 54' 17"	14' 47.65"	86° 41' 34"	0.60352

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	185° 05' 50"	0.06"	184° 40' 09"	-2° 01' 16"	1.0021094	15' 57.61"	23° 26' 16"	9 m 14 s
1	185° 08' 17"	0.06"	184° 42' 24"	-2° 02' 14"	1.0020978	15' 57.62"	23° 26' 16"	9 m 15 s
2	185° 10' 44"	0.07"	184° 44' 40"	-2° 03' 13"	1.0020863	15' 57.63"	23° 26' 16"	9 m 16 s
3	185° 13' 11"	0.07"	184° 46' 55"	-2° 04' 11"	1.0020747	15' 57.64"	23° 26' 16"	9 m 17 s
4	185° 15' 38"	0.08"	184° 49' 10"	-2° 05' 09"	1.0020631	15' 57.65"	23° 26' 16"	9 m 18 s
5	185° 18' 06"	0.08"	184° 51' 25"	-2° 06' 08"	1.0020515	15' 57.67"	23° 26' 16"	9 m 19 s
6	185° 20' 33"	0.09"	184° 53' 41"	-2° 07' 06"	1.0020399	15' 57.68"	23° 26' 16"	9 m 20 s
7	185° 23' 00"	0.09"	184° 55' 56"	-2° 08' 04"	1.0020283	15' 57.69"	23° 26' 16"	9 m 20 s
8	185° 25' 27"	0.10"	184° 58' 11"	-2° 09' 03"	1.0020167	15' 57.70"	23° 26' 16"	9 m 21 s
9	185° 27' 55"	0.10"	185° 00' 27"	-2° 10' 01"	1.0020052	15' 57.71"	23° 26' 16"	9 m 22 s
10	185° 30' 22"	0.11"	185° 02' 42"	-2° 10' 59"	1.0019936	15' 57.72"	23° 26' 16"	9 m 23 s
11	185° 32' 49"	0.11"	185° 04' 57"	-2° 11' 58"	1.0019820	15' 57.73"	23° 26' 16"	9 m 24 s
12	185° 35' 16"	0.12"	185° 07' 12"	-2° 12' 56"	1.0019704	15' 57.74"	23° 26' 16"	9 m 25 s
13	185° 37' 43"	0.12"	185° 09' 28"	-2° 13' 54"	1.0019588	15' 57.75"	23° 26' 16"	9 m 25 s
14	185° 40' 11"	0.12"	185° 11' 43"	-2° 14' 53"	1.0019472	15' 57.77"	23° 26' 16"	9 m 26 s
15	185° 42' 38"	0.13"	185° 13' 58"	-2° 15' 51"	1.0019356	15' 57.78"	23° 26' 16"	9 m 27 s
16	185° 45' 05"	0.13"	185° 16' 14"	-2° 16' 49"	1.0019240	15' 57.79"	23° 26' 16"	9 m 28 s
17	185° 47' 32"	0.14"	185° 18' 29"	-2° 17' 48"	1.0019124	15' 57.80"	23° 26' 16"	9 m 29 s
18	185° 49' 60"	0.14"	185° 20' 44"	-2° 18' 46"	1.0019008	15' 57.81"	23° 26' 16"	9 m 30 s
19	185° 52' 27"	0.15"	185° 22' 60"	-2° 19' 44"	1.0018892	15' 57.82"	23° 26' 16"	9 m 30 s
20	185° 54' 54"	0.15"	185° 25' 15"	-2° 20' 43"	1.0018776	15' 57.83"	23° 26' 16"	9 m 31 s
21	185° 57' 22"	0.16"	185° 27' 30"	-2° 21' 41"	1.0018660	15' 57.84"	23° 26' 16"	9 m 32 s
22	185° 59' 49"	0.16"	185° 29' 46"	-2° 22' 39"	1.0018544	15' 57.85"	23° 26' 16"	9 m 33 s
23	186° 02' 16"	0.17"	185° 32' 01"	-2° 23' 38"	1.0018428	15' 57.86"	23° 26' 16"	9 m 34 s
24	186° 04' 43"	0.17"	185° 34' 16"	-2° 24' 36"	1.0018312	15' 57.88"	23° 26' 16"	9 m 35 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	83° 17' 04"	1° 44' 45"	82° 35' 21"	25° 00' 39"	0° 54' 17"	14' 47.65"	86° 41' 34"	0.60352
1	83° 46' 37"	1° 47' 14"	83° 07' 48"	25° 04' 36"	0° 54' 18"	14' 47.78"	86° 54' 45"	0.59966
2	84° 16' 12"	1° 49' 43"	83° 40' 16"	25° 08' 26"	0° 54' 18"	14' 47.91"	87° 8' 00"	0.59579
3	84° 45' 46"	1° 52' 11"	84° 12' 48"	25° 12' 08"	0° 54' 19"	14' 48.04"	87° 21' 19"	0.59192
4	85° 15' 22"	1° 54' 39"	84° 45' 21"	25° 15' 44"	0° 54' 19"	14' 48.18"	87° 34' 42"	0.58804
5	85° 44' 58"	1° 57' 06"	85° 17' 58"	25° 19' 12"	0° 54' 20"	14' 48.33"	87° 48' 09"	0.58415
6	86° 14' 34"	1° 59' 33"	85° 50' 36"	25° 22' 34"	0° 54' 20"	14' 48.48"	88° 1' 40"	0.58025
7	86° 44' 11"	2° 01' 60"	86° 23' 17"	25° 25' 48"	0° 54' 21"	14' 48.64"	88° 15' 15"	0.57635
8	87° 13' 49"	2° 04' 25"	86° 56' 01"	25° 28' 55"	0° 54' 22"	14' 48.80"	88° 28' 53"	0.57244
9	87° 43' 28"	2° 06' 51"	87° 28' 47"	25° 31' 55"	0° 54' 22"	14' 48.97"	88° 42' 35"	0.56853
10	88° 13' 07"	2° 09' 16"	88° 01' 35"	25° 34' 48"	0° 54' 23"	14' 49.14"	88° 56' 21"	0.56461
11	88° 42' 47"	2° 11' 40"	88° 34' 25"	25° 37' 33"	0° 54' 24"	14' 49.31"	89° 10' 10"	0.56069
12	89° 12' 28"	2° 14' 04"	89° 07' 18"	25° 40' 11"	0° 54' 24"	14' 49.49"	89° 24' 02"	0.55676
13	89° 42' 09"	2° 16' 27"	89° 40' 13"	25° 42' 42"	0° 54' 25"	14' 49.68"	89° 37' 58"	0.55282
14	90° 11' 52"	2° 18' 50"	90° 13' 10"	25° 45' 05"	0° 54' 26"	14' 49.87"	89° 51' 57"	0.54888
15	90° 41' 35"	2° 21' 12"	90° 46' 09"	25° 47' 21"	0° 54' 26"	14' 50.06"	90° 5' 59"	0.54493
16	91° 11' 19"	2° 23' 34"	91° 19' 10"	25° 49' 30"	0° 54' 27"	14' 50.26"	90° 20' 04"	0.54098
17	91° 41' 04"	2° 25' 55"	91° 52' 13"	25° 51' 31"	0° 54' 28"	14' 50.47"	90° 34' 12"	0.53703
18	92° 10' 50"	2° 28' 16"	92° 25' 18"	25° 53' 25"	0° 54' 29"	14' 50.68"	90° 48' 22"	0.53307
19	92° 40' 37"	2° 30' 35"	92° 58' 26"	25° 55' 12"	0° 54' 29"	14' 50.89"	91° 2' 36"	0.52910
20	93° 10' 25"	2° 32' 55"	93° 31' 35"	25° 56' 51"	0° 54' 30"	14' 51.11"	91° 16' 52"	0.52514
21	93° 40' 14"	2° 35' 13"	94° 04' 46"	25° 58' 22"	0° 54' 31"	14' 51.34"	91° 31' 11"	0.52116
22	94° 10' 04"	2° 37' 31"	94° 37' 58"	25° 59' 46"	0° 54' 32"	14' 51.57"	91° 45' 33"	0.51719
23	94° 39' 54"	2° 39' 49"	95° 11' 13"	26° 01' 02"	0° 54' 33"	14' 51.80"	91° 59' 57"	0.51321
24	95° 09' 46"	2° 42' 06"	95° 44' 29"	26° 02' 11"	0° 54' 34"	14' 52.04"	92° 14' 23"	0.50923

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	186° 04' 43"	0.17"	185° 34' 16"	-2° 24' 36"	1.0018312	15' 57.88"	23° 26' 16"	9 m 35 s
1	186° 07' 11"	0.17"	185° 36' 32"	-2° 25' 34"	1.0018196	15' 57.89"	23° 26' 16"	9 m 35 s
2	186° 09' 38"	0.18"	185° 38' 47"	-2° 26' 32"	1.0018080	15' 57.90"	23° 26' 16"	9 m 36 s
3	186° 12' 05"	0.18"	185° 41' 03"	-2° 27' 31"	1.0017964	15' 57.91"	23° 26' 16"	9 m 37 s
4	186° 14' 33"	0.19"	185° 43' 18"	-2° 28' 29"	1.0017848	15' 57.92"	23° 26' 16"	9 m 38 s
5	186° 16' 60"	0.19"	185° 45' 33"	-2° 29' 27"	1.0017732	15' 57.93"	23° 26' 16"	9 m 39 s
6	186° 19' 27"	0.20"	185° 47' 49"	-2° 30' 26"	1.0017616	15' 57.94"	23° 26' 16"	9 m 40 s
7	186° 21' 55"	0.20"	185° 50' 04"	-2° 31' 24"	1.0017500	15' 57.95"	23° 26' 16"	9 m 40 s
8	186° 24' 22"	0.20"	185° 52' 20"	-2° 32' 22"	1.0017383	15' 57.96"	23° 26' 16"	9 m 41 s
9	186° 26' 49"	0.21"	185° 54' 35"	-2° 33' 21"	1.0017267	15' 57.98"	23° 26' 16"	9 m 42 s
10	186° 29' 16"	0.21"	185° 56' 51"	-2° 34' 19"	1.0017151	15' 57.99"	23° 26' 16"	9 m 43 s
11	186° 31' 44"	0.22"	185° 59' 06"	-2° 35' 17"	1.0017035	15' 58.00"	23° 26' 16"	9 m 44 s
12	186° 34' 11"	0.22"	186° 01' 21"	-2° 36' 15"	1.0016919	15' 58.01"	23° 26' 16"	9 m 45 s
13	186° 36' 38"	0.22"	186° 03' 37"	-2° 37' 14"	1.0016803	15' 58.02"	23° 26' 16"	9 m 45 s
14	186° 39' 06"	0.23"	186° 05' 52"	-2° 38' 12"	1.0016687	15' 58.03"	23° 26' 16"	9 m 46 s
15	186° 41' 33"	0.23"	186° 08' 08"	-2° 39' 10"	1.0016570	15' 58.04"	23° 26' 16"	9 m 47 s
16	186° 44' 01"	0.24"	186° 10' 23"	-2° 40' 08"	1.0016454	15' 58.05"	23° 26' 16"	9 m 48 s
17	186° 46' 28"	0.24"	186° 12' 39"	-2° 41' 07"	1.0016338	15' 58.06"	23° 26' 16"	9 m 49 s
18	186° 48' 55"	0.24"	186° 14' 54"	-2° 42' 05"	1.0016222	15' 58.08"	23° 26' 16"	9 m 50 s
19	186° 51' 23"	0.25"	186° 17' 10"	-2° 43' 03"	1.0016105	15' 58.09"	23° 26' 16"	9 m 50 s
20	186° 53' 50"	0.25"	186° 19' 25"	-2° 44' 01"	1.0015989	15' 58.10"	23° 26' 16"	9 m 51 s
21	186° 56' 17"	0.25"	186° 21' 41"	-2° 44' 60"	1.0015873	15' 58.11"	23° 26' 16"	9 m 52 s
22	186° 58' 45"	0.26"	186° 23' 56"	-2° 45' 58"	1.0015757	15' 58.12"	23° 26' 16"	9 m 53 s
23	187° 01' 12"	0.26"	186° 26' 12"	-2° 46' 56"	1.0015640	15' 58.13"	23° 26' 16"	9 m 54 s
24	187° 03' 39"	0.26"	186° 28' 28"	-2° 47' 54"	1.0015524	15' 58.14"	23° 26' 16"	9 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	95° 09' 46"	2° 42' 06"	95° 44' 29"	26° 02' 11"	0° 54' 34"	14' 52.04"	92° 14' 23"	0.50923
1	95° 39' 39"	2° 44' 22"	96° 17' 47"	26° 03' 12"	0° 54' 34"	14' 52.28"	92° 28' 52"	0.50524
2	96° 09' 33"	2° 46' 37"	96° 51' 07"	26° 04' 06"	0° 54' 35"	14' 52.53"	92° 43' 23"	0.50125
3	96° 39' 28"	2° 48' 52"	97° 24' 28"	26° 04' 52"	0° 54' 36"	14' 52.79"	92° 57' 56"	0.49726
4	97° 09' 25"	2° 51' 06"	97° 57' 51"	26° 05' 30"	0° 54' 37"	14' 53.04"	93° 12' 31"	0.49327
5	97° 39' 22"	2° 53' 19"	98° 31' 15"	26° 06' 01"	0° 54' 38"	14' 53.31"	93° 27' 08"	0.48928
6	98° 09' 21"	2° 55' 32"	99° 04' 41"	26° 06' 23"	0° 54' 39"	14' 53.57"	93° 41' 47"	0.48528
7	98° 39' 21"	2° 57' 44"	99° 38' 08"	26° 06' 39"	0° 54' 40"	14' 53.85"	93° 56' 27"	0.48128
8	99° 09' 22"	2° 59' 55"	100° 11' 36"	26° 06' 46"	0° 54' 41"	14' 54.12"	94° 11' 09"	0.47728
9	99° 39' 25"	3° 02' 05"	100° 45' 06"	26° 06' 46"	0° 54' 42"	14' 54.41"	94° 25' 53"	0.47328
10	100° 09' 28"	3° 04' 15"	101° 18' 37"	26° 06' 38"	0° 54' 43"	14' 54.69"	94° 40' 39"	0.46928
11	100° 39' 33"	3° 06' 24"	101° 52' 09"	26° 06' 22"	0° 54' 44"	14' 54.99"	94° 55' 25"	0.46527
12	101° 09' 40"	3° 08' 32"	102° 25' 43"	26° 05' 59"	0° 54' 45"	14' 55.28"	95° 10' 13"	0.46127
13	101° 39' 47"	3° 10' 39"	102° 59' 17"	26° 05' 28"	0° 54' 47"	14' 55.58"	95° 25' 03"	0.45726
14	102° 09' 56"	3° 12' 46"	103° 32' 53"	26° 04' 48"	0° 54' 48"	14' 55.89"	95° 39' 53"	0.45326
15	102° 40' 07"	3° 14' 52"	104° 06' 29"	26° 04' 02"	0° 54' 49"	14' 56.20"	95° 54' 45"	0.44925
16	103° 10' 19"	3° 16' 57"	104° 40' 07"	26° 03' 07"	0° 54' 50"	14' 56.51"	96° 9' 38"	0.44524
17	103° 40' 32"	3° 19' 01"	105° 13' 45"	26° 02' 04"	0° 54' 51"	14' 56.83"	96° 24' 31"	0.44124
18	104° 10' 47"	3° 21' 04"	105° 47' 25"	26° 00' 54"	0° 54' 52"	14' 57.16"	96° 39' 25"	0.43723
19	104° 41' 03"	3° 23' 07"	106° 21' 05"	25° 59' 36"	0° 54' 54"	14' 57.49"	96° 54' 21"	0.43323
20	105° 11' 21"	3° 25' 08"	106° 54' 46"	25° 58' 09"	0° 54' 55"	14' 57.82"	97° 9' 16"	0.42923
21	105° 41' 40"	3° 27' 09"	107° 28' 27"	25° 56' 35"	0° 54' 56"	14' 58.16"	97° 24' 13"	0.42522
22	106° 12' 01"	3° 29' 09"	108° 02' 09"	25° 54' 53"	0° 54' 57"	14' 58.50"	97° 39' 09"	0.42122
23	106° 42' 24"	3° 31' 08"	108° 35' 52"	25° 53' 04"	0° 54' 59"	14' 58.85"	97° 54' 07"	0.41723
24	107° 12' 48"	3° 33' 06"	109° 09' 36"	25° 51' 06"	0° 54' 60"	14' 59.20"	98° 9' 04"	0.41323

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	187° 03' 39"	0.26"	186° 28' 28"	-2° 47' 54"	1.0015524	15' 58.14"	23° 26' 16"	9 m 55 s
1	187° 06' 07"	0.27"	186° 30' 43"	-2° 48' 53"	1.0015408	15' 58.15"	23° 26' 16"	9 m 55 s
2	187° 08' 34"	0.27"	186° 32' 59"	-2° 49' 51"	1.0015291	15' 58.16"	23° 26' 16"	9 m 56 s
3	187° 11' 02"	0.28"	186° 35' 14"	-2° 50' 49"	1.0015175	15' 58.18"	23° 26' 16"	9 m 57 s
4	187° 13' 29"	0.28"	186° 37' 30"	-2° 51' 47"	1.0015059	15' 58.19"	23° 26' 16"	9 m 58 s
5	187° 15' 56"	0.28"	186° 39' 45"	-2° 52' 46"	1.0014942	15' 58.20"	23° 26' 16"	9 m 59 s
6	187° 18' 24"	0.29"	186° 42' 01"	-2° 53' 44"	1.0014826	15' 58.21"	23° 26' 16"	9 m 59 s
7	187° 20' 51"	0.29"	186° 44' 17"	-2° 54' 42"	1.0014709	15' 58.22"	23° 26' 16"	10 m 00 s
8	187° 23' 19"	0.29"	186° 46' 32"	-2° 55' 40"	1.0014593	15' 58.23"	23° 26' 16"	10 m 01 s
9	187° 25' 46"	0.30"	186° 48' 48"	-2° 56' 39"	1.0014477	15' 58.24"	23° 26' 16"	10 m 02 s
10	187° 28' 13"	0.30"	186° 51' 03"	-2° 57' 37"	1.0014360	15' 58.25"	23° 26' 16"	10 m 03 s
11	187° 30' 41"	0.30"	186° 53' 19"	-2° 58' 35"	1.0014244	15' 58.27"	23° 26' 16"	10 m 04 s
12	187° 33' 08"	0.30"	186° 55' 35"	-2° 59' 33"	1.0014127	15' 58.28"	23° 26' 16"	10 m 04 s
13	187° 35' 36"	0.31"	186° 57' 50"	-3° 00' 31"	1.0014011	15' 58.29"	23° 26' 16"	10 m 05 s
14	187° 38' 03"	0.31"	187° 00' 06"	-3° 01' 30"	1.0013894	15' 58.30"	23° 26' 16"	10 m 06 s
15	187° 40' 31"	0.31"	187° 02' 22"	-3° 02' 28"	1.0013778	15' 58.31"	23° 26' 16"	10 m 07 s
16	187° 42' 58"	0.32"	187° 04' 37"	-3° 03' 26"	1.0013661	15' 58.32"	23° 26' 16"	10 m 08 s
17	187° 45' 26"	0.32"	187° 06' 53"	-3° 04' 24"	1.0013545	15' 58.33"	23° 26' 16"	10 m 08 s
18	187° 47' 53"	0.32"	187° 09' 09"	-3° 05' 22"	1.0013428	15' 58.34"	23° 26' 16"	10 m 09 s
19	187° 50' 20"	0.32"	187° 11' 24"	-3° 06' 21"	1.0013311	15' 58.35"	23° 26' 16"	10 m 10 s
20	187° 52' 48"	0.33"	187° 13' 40"	-3° 07' 19"	1.0013195	15' 58.37"	23° 26' 16"	10 m 11 s
21	187° 55' 15"	0.33"	187° 15' 56"	-3° 08' 17"	1.0013078	15' 58.38"	23° 26' 16"	10 m 12 s
22	187° 57' 43"	0.33"	187° 18' 11"	-3° 09' 15"	1.0012962	15' 58.39"	23° 26' 16"	10 m 13 s
23	188° 00' 10"	0.34"	187° 20' 27"	-3° 10' 13"	1.0012845	15' 58.40"	23° 26' 16"	10 m 13 s
24	188° 02' 38"	0.34"	187° 22' 43"	-3° 11' 12"	1.0012728	15' 58.41"	23° 26' 16"	10 m 14 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	107° 12' 48"	3° 33' 06"	109° 09' 36"	25° 51' 06"	0° 54' 60"	14' 59.20"	98° 9' 04"	0.41323
1	107° 43' 13"	3° 35' 03"	109° 43' 19"	25° 49' 01"	0° 55' 01"	14' 59.56"	98° 24' 02"	0.40923
2	108° 13' 41"	3° 36' 59"	110° 17' 04"	25° 46' 47"	0° 55' 02"	14' 59.92"	98° 38' 59"	0.40524
3	108° 44' 10"	3° 38' 55"	110° 50' 48"	25° 44' 26"	0° 55' 04"	15' 00.28"	98° 53' 57"	0.40125
4	109° 14' 40"	3° 40' 49"	111° 24' 33"	25° 41' 56"	0° 55' 05"	15' 00.65"	99° 8' 55"	0.39726
5	109° 45' 13"	3° 42' 42"	111° 58' 19"	25° 39' 19"	0° 55' 07"	15' 01.03"	99° 23' 53"	0.39328
6	110° 15' 47"	3° 44' 35"	112° 32' 04"	25° 36' 34"	0° 55' 08"	15' 01.40"	99° 38' 51"	0.38930
7	110° 46' 23"	3° 46' 26"	113° 05' 50"	25° 33' 41"	0° 55' 09"	15' 01.79"	99° 53' 48"	0.38532
8	111° 17' 00"	3° 48' 17"	113° 39' 36"	25° 30' 40"	0° 55' 11"	15' 02.17"	100° 8' 45"	0.38135
9	111° 47' 40"	3° 50' 07"	114° 13' 22"	25° 27' 32"	0° 55' 12"	15' 02.56"	100° 23' 41"	0.37738
10	112° 18' 21"	3° 51' 55"	114° 47' 08"	25° 24' 15"	0° 55' 14"	15' 02.96"	100° 38' 37"	0.37341
11	112° 49' 04"	3° 53' 43"	115° 20' 54"	25° 20' 50"	0° 55' 15"	15' 03.36"	100° 53' 33"	0.36945
12	113° 19' 49"	3° 55' 29"	115° 54' 40"	25° 17' 18"	0° 55' 17"	15' 03.76"	101° 8' 28"	0.36550
13	113° 50' 36"	3° 57' 15"	116° 28' 26"	25° 13' 37"	0° 55' 18"	15' 04.17"	101° 23' 22"	0.36155
14	114° 21' 24"	3° 58' 59"	117° 02' 12"	25° 09' 49"	0° 55' 20"	15' 04.58"	101° 38' 15"	0.35760
15	114° 52' 15"	4° 00' 42"	117° 35' 57"	25° 05' 53"	0° 55' 21"	15' 05.00"	101° 53' 07"	0.35366
16	115° 23' 07"	4° 02' 25"	118° 09' 43"	25° 01' 49"	0° 55' 23"	15' 05.42"	102° 7' 59"	0.34972
17	115° 54' 02"	4° 04' 06"	118° 43' 28"	24° 57' 37"	0° 55' 24"	15' 05.84"	102° 22' 49"	0.34580
18	116° 24' 58"	4° 05' 46"	119° 17' 12"	24° 53' 17"	0° 55' 26"	15' 06.27"	102° 37' 39"	0.34187
19	116° 55' 57"	4° 07' 25"	119° 50' 57"	24° 48' 50"	0° 55' 27"	15' 06.70"	102° 52' 27"	0.33796
20	117° 26' 57"	4° 09' 03"	120° 24' 41"	24° 44' 14"	0° 55' 29"	15' 07.14"	103° 7' 13"	0.33405
21	117° 57' 59"	4° 10' 40"	120° 58' 24"	24° 39' 31"	0° 55' 31"	15' 07.58"	103° 21' 59"	0.33015
22	118° 29' 04"	4° 12' 16"	121° 32' 07"	24° 34' 40"	0° 55' 32"	15' 08.02"	103° 36' 43"	0.32625
23	119° 00' 10"	4° 13' 50"	122° 05' 49"	24° 29' 41"	0° 55' 34"	15' 08.47"	103° 51' 26"	0.32236
24	119° 31' 19"	4° 15' 23"	122° 39' 31"	24° 24' 34"	0° 55' 36"	15' 08.92"	104° 6' 07"	0.31849

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	188° 02' 38"	0.34"	187° 22' 43"	-3° 11' 12"	1.0012728	15' 58.41"	23° 26' 16"	10 m 14 s
1	188° 05' 05"	0.34"	187° 24' 59"	-3° 12' 10"	1.0012612	15' 58.42"	23° 26' 16"	10 m 15 s
2	188° 07' 33"	0.34"	187° 27' 14"	-3° 13' 08"	1.0012495	15' 58.43"	23° 26' 16"	10 m 16 s
3	188° 10' 00"	0.35"	187° 29' 30"	-3° 14' 06"	1.0012378	15' 58.44"	23° 26' 16"	10 m 17 s
4	188° 12' 28"	0.35"	187° 31' 46"	-3° 15' 04"	1.0012262	15' 58.45"	23° 26' 16"	10 m 17 s
5	188° 14' 55"	0.35"	187° 34' 02"	-3° 16' 02"	1.0012145	15' 58.47"	23° 26' 16"	10 m 18 s
6	188° 17' 23"	0.35"	187° 36' 17"	-3° 17' 01"	1.0012028	15' 58.48"	23° 26' 16"	10 m 19 s
7	188° 19' 50"	0.35"	187° 38' 33"	-3° 17' 59"	1.0011911	15' 58.49"	23° 26' 16"	10 m 20 s
8	188° 22' 18"	0.36"	187° 40' 49"	-3° 18' 57"	1.0011794	15' 58.50"	23° 26' 16"	10 m 21 s
9	188° 24' 45"	0.36"	187° 43' 05"	-3° 19' 55"	1.0011678	15' 58.51"	23° 26' 16"	10 m 21 s
10	188° 27' 13"	0.36"	187° 45' 21"	-3° 20' 53"	1.0011561	15' 58.52"	23° 26' 16"	10 m 22 s
11	188° 29' 40"	0.36"	187° 47' 36"	-3° 21' 51"	1.0011444	15' 58.53"	23° 26' 16"	10 m 23 s
12	188° 32' 08"	0.36"	187° 49' 52"	-3° 22' 49"	1.0011327	15' 58.54"	23° 26' 16"	10 m 24 s
13	188° 34' 35"	0.37"	187° 52' 08"	-3° 23' 47"	1.0011210	15' 58.56"	23° 26' 16"	10 m 25 s
14	188° 37' 03"	0.37"	187° 54' 24"	-3° 24' 46"	1.0011093	15' 58.57"	23° 26' 16"	10 m 26 s
15	188° 39' 30"	0.37"	187° 56' 40"	-3° 25' 44"	1.0010976	15' 58.58"	23° 26' 16"	10 m 26 s
16	188° 41' 58"	0.37"	187° 58' 56"	-3° 26' 42"	1.0010860	15' 58.59"	23° 26' 16"	10 m 27 s
17	188° 44' 26"	0.37"	188° 01' 11"	-3° 27' 40"	1.0010743	15' 58.60"	23° 26' 16"	10 m 28 s
18	188° 46' 53"	0.38"	188° 03' 27"	-3° 28' 38"	1.0010626	15' 58.61"	23° 26' 16"	10 m 29 s
19	188° 49' 21"	0.38"	188° 05' 43"	-3° 29' 36"	1.0010509	15' 58.62"	23° 26' 16"	10 m 30 s
20	188° 51' 48"	0.38"	188° 07' 59"	-3° 30' 34"	1.0010392	15' 58.63"	23° 26' 16"	10 m 30 s
21	188° 54' 16"	0.38"	188° 10' 15"	-3° 31' 32"	1.0010275	15' 58.65"	23° 26' 16"	10 m 31 s
22	188° 56' 43"	0.38"	188° 12' 31"	-3° 32' 30"	1.0010158	15' 58.66"	23° 26' 16"	10 m 32 s
23	188° 59' 11"	0.38"	188° 14' 47"	-3° 33' 29"	1.0010041	15' 58.67"	23° 26' 16"	10 m 33 s
24	189° 01' 38"	0.38"	188° 17' 03"	-3° 34' 27"	1.0009923	15' 58.68"	23° 26' 16"	10 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	119° 31' 19"	4° 15' 23"	122° 39' 31"	24° 24' 34"	0° 55' 36"	15' 08.92"	104° 6' 07"	0.31849
1	120° 02' 30"	4° 16' 56"	123° 13' 12"	24° 19' 19"	0° 55' 37"	15' 09.38"	104° 20' 47"	0.31461
2	120° 33' 43"	4° 18' 27"	123° 46' 53"	24° 13' 57"	0° 55' 39"	15' 09.84"	104° 35' 25"	0.31075
3	121° 04' 58"	4° 19' 57"	124° 20' 32"	24° 08' 27"	0° 55' 41"	15' 10.30"	104° 50' 01"	0.30690
4	121° 36' 15"	4° 21' 25"	124° 54' 11"	24° 02' 49"	0° 55' 42"	15' 10.77"	105° 4' 36"	0.30305
5	122° 07' 34"	4° 22' 53"	125° 27' 50"	23° 57' 03"	0° 55' 44"	15' 11.24"	105° 19' 09"	0.29922
6	122° 38' 55"	4° 24' 19"	126° 01' 27"	23° 51' 10"	0° 55' 46"	15' 11.71"	105° 33' 40"	0.29539
7	123° 10' 19"	4° 25' 44"	126° 35' 04"	23° 45' 09"	0° 55' 47"	15' 12.19"	105° 48' 09"	0.29157
8	123° 41' 45"	4° 27' 08"	127° 08' 39"	23° 39' 00"	0° 55' 49"	15' 12.67"	106° 2' 36"	0.28777
9	124° 13' 13"	4° 28' 30"	127° 42' 14"	23° 32' 44"	0° 55' 51"	15' 13.15"	106° 17' 01"	0.28397
10	124° 44' 43"	4° 29' 51"	128° 15' 48"	23° 26' 20"	0° 55' 53"	15' 13.64"	106° 31' 24"	0.28018
11	125° 16' 16"	4° 31' 11"	128° 49' 20"	23° 19' 48"	0° 55' 55"	15' 14.13"	106° 45' 45"	0.27641
12	125° 47' 51"	4° 32' 30"	129° 22' 52"	23° 13' 09"	0° 55' 56"	15' 14.62"	107° 0' 04"	0.27265
13	126° 19' 28"	4° 33' 47"	129° 56' 23"	23° 06' 22"	0° 55' 58"	15' 15.12"	107° 14' 21"	0.26889
14	126° 51' 08"	4° 35' 03"	130° 29' 52"	22° 59' 28"	0° 56' 00"	15' 15.62"	107° 28' 35"	0.26515
15	127° 22' 50"	4° 36' 18"	131° 03' 21"	22° 52' 26"	0° 56' 02"	15' 16.12"	107° 42' 47"	0.26143
16	127° 54' 34"	4° 37' 32"	131° 36' 48"	22° 45' 17"	0° 56' 04"	15' 16.62"	107° 56' 57"	0.25771
17	128° 26' 20"	4° 38' 44"	132° 10' 14"	22° 37' 60"	0° 56' 06"	15' 17.13"	108° 11' 04"	0.25401
18	128° 58' 09"	4° 39' 54"	132° 43' 39"	22° 30' 36"	0° 56' 08"	15' 17.64"	108° 25' 10"	0.25032
19	129° 30' 00"	4° 41' 04"	133° 17' 03"	22° 23' 04"	0° 56' 09"	15' 18.16"	108° 39' 12"	0.24664
20	130° 01' 54"	4° 42' 12"	133° 50' 25"	22° 15' 25"	0° 56' 11"	15' 18.68"	108° 53' 13"	0.24298
21	130° 33' 50"	4° 43' 18"	134° 23' 46"	22° 07' 38"	0° 56' 13"	15' 19.20"	109° 7' 11"	0.23933
22	131° 05' 49"	4° 44' 24"	134° 57' 06"	21° 59' 44"	0° 56' 15"	15' 19.72"	109° 21' 06"	0.23570
23	131° 37' 50"	4° 45' 27"	135° 30' 25"	21° 51' 43"	0° 56' 17"	15' 20.25"	109° 34' 59"	0.23208
24	132° 09' 53"	4° 46' 30"	136° 03' 42"	21° 43' 34"	0° 56' 19"	15' 20.77"	109° 48' 49"	0.22847

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	189° 01' 38"	0.38"	188° 17' 03"	-3° 34' 27"	1.0009923	15' 58.68"	23° 26' 16"	10 m 34 s
1	189° 04' 06"	0.39"	188° 19' 19"	-3° 35' 25"	1.0009806	15' 58.69"	23° 26' 16"	10 m 34 s
2	189° 06' 34"	0.39"	188° 21' 35"	-3° 36' 23"	1.0009689	15' 58.70"	23° 26' 16"	10 m 35 s
3	189° 09' 01"	0.39"	188° 23' 51"	-3° 37' 21"	1.0009572	15' 58.71"	23° 26' 16"	10 m 36 s
4	189° 11' 29"	0.39"	188° 26' 07"	-3° 38' 19"	1.0009455	15' 58.72"	23° 26' 16"	10 m 37 s
5	189° 13' 56"	0.39"	188° 28' 22"	-3° 39' 17"	1.0009338	15' 58.73"	23° 26' 16"	10 m 38 s
6	189° 16' 24"	0.39"	188° 30' 38"	-3° 40' 15"	1.0009221	15' 58.75"	23° 26' 16"	10 m 38 s
7	189° 18' 52"	0.39"	188° 32' 54"	-3° 41' 13"	1.0009103	15' 58.76"	23° 26' 16"	10 m 39 s
8	189° 21' 19"	0.39"	188° 35' 10"	-3° 42' 11"	1.0008986	15' 58.77"	23° 26' 16"	10 m 40 s
9	189° 23' 47"	0.39"	188° 37' 26"	-3° 43' 09"	1.0008869	15' 58.78"	23° 26' 16"	10 m 41 s
10	189° 26' 14"	0.39"	188° 39' 42"	-3° 44' 07"	1.0008752	15' 58.79"	23° 26' 16"	10 m 42 s
11	189° 28' 42"	0.40"	188° 41' 58"	-3° 45' 05"	1.0008634	15' 58.80"	23° 26' 16"	10 m 42 s
12	189° 31' 10"	0.40"	188° 44' 14"	-3° 46' 03"	1.0008517	15' 58.81"	23° 26' 16"	10 m 43 s
13	189° 33' 37"	0.40"	188° 46' 30"	-3° 47' 01"	1.0008400	15' 58.82"	23° 26' 16"	10 m 44 s
14	189° 36' 05"	0.40"	188° 48' 47"	-3° 47' 59"	1.0008282	15' 58.84"	23° 26' 16"	10 m 45 s
15	189° 38' 32"	0.40"	188° 51' 03"	-3° 48' 57"	1.0008165	15' 58.85"	23° 26' 16"	10 m 46 s
16	189° 41' 00"	0.40"	188° 53' 19"	-3° 49' 55"	1.0008048	15' 58.86"	23° 26' 16"	10 m 46 s
17	189° 43' 28"	0.40"	188° 55' 35"	-3° 50' 53"	1.0007930	15' 58.87"	23° 26' 16"	10 m 47 s
18	189° 45' 55"	0.40"	188° 57' 51"	-3° 51' 51"	1.0007813	15' 58.88"	23° 26' 16"	10 m 48 s
19	189° 48' 23"	0.40"	189° 00' 07"	-3° 52' 49"	1.0007695	15' 58.89"	23° 26' 16"	10 m 49 s
20	189° 50' 51"	0.40"	189° 02' 23"	-3° 53' 47"	1.0007578	15' 58.90"	23° 26' 16"	10 m 49 s
21	189° 53' 18"	0.40"	189° 04' 39"	-3° 54' 45"	1.0007460	15' 58.91"	23° 26' 16"	10 m 50 s
22	189° 55' 46"	0.40"	189° 06' 55"	-3° 55' 43"	1.0007343	15' 58.93"	23° 26' 16"	10 m 51 s
23	189° 58' 14"	0.40"	189° 09' 11"	-3° 56' 41"	1.0007225	15' 58.94"	23° 26' 16"	10 m 52 s
24	190° 00' 41"	0.40"	189° 11' 27"	-3° 57' 39"	1.0007108	15' 58.95"	23° 26' 16"	10 m 53 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	132° 09' 53"	4° 46' 30"	136° 03' 42"	21° 43' 34"	0° 56' 19"	15' 20.77"	109° 48' 49"	0.22847
1	132° 41' 59"	4° 47' 31"	136° 36' 58"	21° 35' 19"	0° 56' 21"	15' 21.30"	110° 2' 37"	0.22488
2	133° 14' 07"	4° 48' 30"	137° 10' 12"	21° 26' 56"	0° 56' 23"	15' 21.84"	110° 16' 23"	0.22131
3	133° 46' 18"	4° 49' 28"	137° 43' 26"	21° 18' 25"	0° 56' 25"	15' 22.37"	110° 30' 06"	0.21775
4	134° 18' 31"	4° 50' 25"	138° 16' 37"	21° 09' 48"	0° 56' 27"	15' 22.91"	110° 43' 46"	0.21421
5	134° 50' 47"	4° 51' 20"	138° 49' 48"	21° 01' 04"	0° 56' 29"	15' 23.45"	110° 57' 24"	0.21068
6	135° 23' 05"	4° 52' 14"	139° 22' 56"	20° 52' 12"	0° 56' 31"	15' 23.99"	111° 10' 60"	0.20717
7	135° 55' 26"	4° 53' 06"	139° 56' 04"	20° 43' 13"	0° 56' 33"	15' 24.54"	111° 24' 32"	0.20368
8	136° 27' 49"	4° 53' 57"	140° 29' 10"	20° 34' 08"	0° 56' 35"	15' 25.09"	111° 38' 03"	0.20021
9	137° 00' 15"	4° 54' 46"	141° 02' 14"	20° 24' 55"	0° 56' 37"	15' 25.63"	111° 51' 31"	0.19675
10	137° 32' 43"	4° 55' 34"	141° 35' 17"	20° 15' 35"	0° 56' 39"	15' 26.19"	112° 4' 56"	0.19331
11	138° 05' 14"	4° 56' 20"	142° 08' 19"	20° 06' 09"	0° 56' 41"	15' 26.74"	112° 18' 19"	0.18989
12	138° 37' 48"	4° 57' 04"	142° 41' 19"	19° 56' 35"	0° 56' 43"	15' 27.29"	112° 31' 40"	0.18649
13	139° 10' 24"	4° 57' 47"	143° 14' 17"	19° 46' 55"	0° 56' 45"	15' 27.85"	112° 44' 58"	0.18311
14	139° 43' 03"	4° 58' 29"	143° 47' 15"	19° 37' 08"	0° 56' 47"	15' 28.41"	112° 58' 15"	0.17975
15	140° 15' 44"	4° 59' 09"	144° 20' 10"	19° 27' 14"	0° 56' 49"	15' 28.97"	113° 11' 28"	0.17641
16	140° 48' 28"	4° 59' 47"	144° 53' 04"	19° 17' 14"	0° 56' 51"	15' 29.53"	113° 24' 40"	0.17308
17	141° 21' 14"	5° 00' 24"	145° 25' 57"	19° 07' 06"	0° 56' 53"	15' 30.09"	113° 37' 49"	0.16978
18	141° 54' 03"	5° 00' 59"	145° 58' 48"	18° 56' 52"	0° 56' 55"	15' 30.65"	113° 50' 56"	0.16650
19	142° 26' 55"	5° 01' 32"	146° 31' 37"	18° 46' 32"	0° 56' 57"	15' 31.22"	114° 4' 02"	0.16324
20	142° 59' 49"	5° 02' 04"	147° 04' 25"	18° 36' 05"	0° 56' 59"	15' 31.79"	114° 17' 05"	0.16001
21	143° 32' 46"	5° 02' 35"	147° 37' 12"	18° 25' 31"	0° 57' 01"	15' 32.35"	114° 30' 06"	0.15679
22	144° 05' 45"	5° 03' 03"	148° 09' 57"	18° 14' 51"	0° 57' 04"	15' 32.92"	114° 43' 06"	0.15360
23	144° 38' 47"	5° 03' 30"	148° 42' 41"	18° 04' 05"	0° 57' 06"	15' 33.49"	114° 56' 04"	0.15043
24	145° 11' 52"	5° 03' 55"	149° 15' 23"	17° 53' 12"	0° 57' 08"	15' 34.06"	115° 9' 00"	0.14728

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	190° 00' 41"	0.40"	189° 11' 27"	-3° 57' 39"	1.0007108	15' 58.95"	23° 26' 16"	10 m 53 s
1	190° 03' 09"	0.40"	189° 13' 44"	-3° 58' 37"	1.0006990	15' 58.96"	23° 26' 16"	10 m 53 s
2	190° 05' 37"	0.40"	189° 15' 60"	-3° 59' 35"	1.0006872	15' 58.97"	23° 26' 16"	10 m 54 s
3	190° 08' 04"	0.40"	189° 18' 16"	-4° 00' 33"	1.0006755	15' 58.98"	23° 26' 16"	10 m 55 s
4	190° 10' 32"	0.40"	189° 20' 32"	-4° 01' 31"	1.0006637	15' 58.99"	23° 26' 16"	10 m 56 s
5	190° 12' 60"	0.40"	189° 22' 48"	-4° 02' 29"	1.0006519	15' 59.00"	23° 26' 16"	10 m 57 s
6	190° 15' 27"	0.40"	189° 25' 04"	-4° 03' 27"	1.0006402	15' 59.02"	23° 26' 16"	10 m 57 s
7	190° 17' 55"	0.40"	189° 27' 21"	-4° 04' 25"	1.0006284	15' 59.03"	23° 26' 16"	10 m 58 s
8	190° 20' 23"	0.40"	189° 29' 37"	-4° 05' 23"	1.0006166	15' 59.04"	23° 26' 16"	10 m 59 s
9	190° 22' 50"	0.40"	189° 31' 53"	-4° 06' 21"	1.0006049	15' 59.05"	23° 26' 16"	10 m 60 s
10	190° 25' 18"	0.40"	189° 34' 09"	-4° 07' 19"	1.0005931	15' 59.06"	23° 26' 16"	11 m 00 s
11	190° 27' 46"	0.40"	189° 36' 25"	-4° 08' 17"	1.0005813	15' 59.07"	23° 26' 16"	11 m 01 s
12	190° 30' 14"	0.40"	189° 38' 42"	-4° 09' 15"	1.0005695	15' 59.08"	23° 26' 16"	11 m 02 s
13	190° 32' 41"	0.40"	189° 40' 58"	-4° 10' 13"	1.0005577	15' 59.10"	23° 26' 16"	11 m 03 s
14	190° 35' 09"	0.40"	189° 43' 14"	-4° 11' 11"	1.0005459	15' 59.11"	23° 26' 16"	11 m 04 s
15	190° 37' 37"	0.40"	189° 45' 30"	-4° 12' 09"	1.0005341	15' 59.12"	23° 26' 16"	11 m 04 s
16	190° 40' 04"	0.40"	189° 47' 47"	-4° 13' 06"	1.0005224	15' 59.13"	23° 26' 16"	11 m 05 s
17	190° 42' 32"	0.39"	189° 50' 03"	-4° 14' 04"	1.0005106	15' 59.14"	23° 26' 16"	11 m 06 s
18	190° 44' 60"	0.39"	189° 52' 19"	-4° 15' 02"	1.0004988	15' 59.15"	23° 26' 16"	11 m 07 s
19	190° 47' 28"	0.39"	189° 54' 35"	-4° 16' 00"	1.0004870	15' 59.16"	23° 26' 16"	11 m 07 s
20	190° 49' 55"	0.39"	189° 56' 52"	-4° 16' 58"	1.0004752	15' 59.17"	23° 26' 16"	11 m 08 s
21	190° 52' 23"	0.39"	189° 59' 08"	-4° 17' 56"	1.0004634	15' 59.19"	23° 26' 16"	11 m 09 s
22	190° 54' 51"	0.39"	190° 01' 24"	-4° 18' 54"	1.0004516	15' 59.20"	23° 26' 16"	11 m 10 s
23	190° 57' 19"	0.39"	190° 03' 41"	-4° 19' 52"	1.0004397	15' 59.21"	23° 26' 16"	11 m 11 s
24	190° 59' 46"	0.39"	190° 05' 57"	-4° 20' 50"	1.0004279	15' 59.22"	23° 26' 16"	11 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 11' 52"	5° 03' 55"	149° 15' 23"	17° 53' 12"	0° 57' 08"	15' 34.06"	115° 9' 00"	0.14728
1	145° 44' 60"	5° 04' 19"	149° 48' 03"	17° 42' 13"	0° 57' 10"	15' 34.64"	115° 21' 55"	0.14416
2	146° 18' 10"	5° 04' 41"	150° 20' 42"	17° 31' 08"	0° 57' 12"	15' 35.21"	115° 34' 49"	0.14106
3	146° 51' 22"	5° 05' 01"	150° 53' 20"	17° 19' 56"	0° 57' 14"	15' 35.78"	115° 47' 41"	0.13798
4	147° 24' 38"	5° 05' 20"	151° 25' 56"	17° 08' 38"	0° 57' 16"	15' 36.36"	116° 0' 33"	0.13493
5	147° 57' 55"	5° 05' 37"	151° 58' 31"	16° 57' 15"	0° 57' 18"	15' 36.93"	116° 13' 23"	0.13190
6	148° 31' 16"	5° 05' 52"	152° 31' 05"	16° 45' 45"	0° 57' 20"	15' 37.51"	116° 26' 12"	0.12890
7	149° 04' 39"	5° 06' 06"	153° 03' 37"	16° 34' 09"	0° 57' 23"	15' 38.08"	116° 39' 02"	0.12592
8	149° 38' 05"	5° 06' 17"	153° 36' 07"	16° 22' 27"	0° 57' 25"	15' 38.66"	116° 51' 50"	0.12297
9	150° 11' 34"	5° 06' 27"	154° 08' 36"	16° 10' 39"	0° 57' 27"	15' 39.24"	117° 4' 39"	0.12005
10	150° 45' 05"	5° 06' 36"	154° 41' 04"	15° 58' 45"	0° 57' 29"	15' 39.81"	117° 17' 27"	0.11715
11	151° 18' 38"	5° 06' 42"	155° 13' 31"	15° 46' 45"	0° 57' 31"	15' 40.39"	117° 30' 16"	0.11428
12	151° 52' 15"	5° 06' 47"	155° 45' 56"	15° 34' 40"	0° 57' 33"	15' 40.97"	117° 43' 05"	0.11144
13	152° 25' 54"	5° 06' 50"	156° 18' 20"	15° 22' 29"	0° 57' 35"	15' 41.54"	117° 55' 55"	0.10863
14	152° 59' 36"	5° 06' 51"	156° 50' 42"	15° 10' 12"	0° 57' 37"	15' 42.12"	118° 8' 46"	0.10584
15	153° 33' 20"	5° 06' 51"	157° 23' 04"	14° 57' 50"	0° 57' 39"	15' 42.70"	118° 21' 38"	0.10308
16	154° 07' 07"	5° 06' 48"	157° 55' 24"	14° 45' 22"	0° 57' 42"	15' 43.27"	118° 34' 32"	0.10035
17	154° 40' 56"	5° 06' 44"	158° 27' 43"	14° 32' 49"	0° 57' 44"	15' 43.85"	118° 47' 28"	0.09765
18	155° 14' 48"	5° 06' 38"	159° 00' 01"	14° 20' 10"	0° 57' 46"	15' 44.42"	119° 0' 26"	0.09498
19	155° 48' 43"	5° 06' 31"	159° 32' 17"	14° 07' 26"	0° 57' 48"	15' 45.00"	119° 13' 27"	0.09234
20	156° 22' 41"	5° 06' 21"	160° 04' 33"	13° 54' 37"	0° 57' 50"	15' 45.57"	119° 26' 31"	0.08973
21	156° 56' 41"	5° 06' 10"	160° 36' 47"	13° 41' 42"	0° 57' 52"	15' 46.14"	119° 39' 39"	0.08715
22	157° 30' 43"	5° 05' 56"	161° 09' 00"	13° 28' 42"	0° 57' 54"	15' 46.72"	119° 52' 51"	0.08460
23	158° 04' 48"	5° 05' 41"	161° 41' 12"	13° 15' 37"	0° 57' 56"	15' 47.29"	120° 6' 07"	0.08208
24	158° 38' 56"	5° 05' 25"	162° 13' 24"	13° 02' 27"	0° 57' 58"	15' 47.86"	120° 19' 29"	0.07960

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	190° 59' 46"	0.39"	190° 05' 57"	-4° 20' 50"	1.0004279	15' 59.22"	23° 26' 16"	11 m 11 s
1	191° 02' 14"	0.39"	190° 08' 13"	-4° 21' 47"	1.0004161	15' 59.23"	23° 26' 16"	11 m 12 s
2	191° 04' 42"	0.39"	190° 10' 30"	-4° 22' 45"	1.0004043	15' 59.24"	23° 26' 16"	11 m 13 s
3	191° 07' 10"	0.38"	190° 12' 46"	-4° 23' 43"	1.0003925	15' 59.25"	23° 26' 16"	11 m 14 s
4	191° 09' 37"	0.38"	190° 15' 03"	-4° 24' 41"	1.0003807	15' 59.26"	23° 26' 16"	11 m 14 s
5	191° 12' 05"	0.38"	190° 17' 19"	-4° 25' 39"	1.0003688	15' 59.28"	23° 26' 16"	11 m 15 s
6	191° 14' 33"	0.38"	190° 19' 35"	-4° 26' 37"	1.0003570	15' 59.29"	23° 26' 16"	11 m 16 s
7	191° 17' 01"	0.38"	190° 21' 52"	-4° 27' 34"	1.0003452	15' 59.30"	23° 26' 16"	11 m 17 s
8	191° 19' 29"	0.38"	190° 24' 08"	-4° 28' 32"	1.0003334	15' 59.31"	23° 26' 16"	11 m 18 s
9	191° 21' 56"	0.37"	190° 26' 25"	-4° 29' 30"	1.0003215	15' 59.32"	23° 26' 16"	11 m 18 s
10	191° 24' 24"	0.37"	190° 28' 41"	-4° 30' 28"	1.0003097	15' 59.33"	23° 26' 16"	11 m 19 s
11	191° 26' 52"	0.37"	190° 30' 57"	-4° 31' 26"	1.0002978	15' 59.34"	23° 26' 16"	11 m 20 s
12	191° 29' 20"	0.37"	190° 33' 14"	-4° 32' 23"	1.0002860	15' 59.36"	23° 26' 16"	11 m 21 s
13	191° 31' 48"	0.37"	190° 35' 30"	-4° 33' 21"	1.0002742	15' 59.37"	23° 26' 16"	11 m 21 s
14	191° 34' 15"	0.37"	190° 37' 47"	-4° 34' 19"	1.0002623	15' 59.38"	23° 26' 16"	11 m 22 s
15	191° 36' 43"	0.36"	190° 40' 03"	-4° 35' 17"	1.0002505	15' 59.39"	23° 26' 16"	11 m 23 s
16	191° 39' 11"	0.36"	190° 42' 20"	-4° 36' 15"	1.0002386	15' 59.40"	23° 26' 16"	11 m 24 s
17	191° 41' 39"	0.36"	190° 44' 36"	-4° 37' 12"	1.0002268	15' 59.41"	23° 26' 16"	11 m 24 s
18	191° 44' 07"	0.36"	190° 46' 53"	-4° 38' 10"	1.0002149	15' 59.42"	23° 26' 16"	11 m 25 s
19	191° 46' 34"	0.36"	190° 49' 09"	-4° 39' 08"	1.0002030	15' 59.44"	23° 26' 16"	11 m 26 s
20	191° 49' 02"	0.35"	190° 51' 26"	-4° 40' 06"	1.0001912	15' 59.45"	23° 26' 16"	11 m 27 s
21	191° 51' 30"	0.35"	190° 53' 42"	-4° 41' 03"	1.0001793	15' 59.46"	23° 26' 16"	11 m 28 s
22	191° 53' 58"	0.35"	190° 55' 59"	-4° 42' 01"	1.0001675	15' 59.47"	23° 26' 16"	11 m 28 s
23	191° 56' 26"	0.35"	190° 58' 16"	-4° 42' 59"	1.0001556	15' 59.48"	23° 26' 16"	11 m 29 s
24	191° 58' 54"	0.34"	191° 00' 32"	-4° 43' 57"	1.0001437	15' 59.49"	23° 26' 16"	11 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	158° 38' 56"	5° 05' 25"	162° 13' 24"	13° 02' 27"	0° 57' 58"	15' 47.86"	120° 19' 29"	0.07960
1	159° 13' 07"	5° 05' 06"	162° 45' 34"	12° 49' 12"	0° 58' 00"	15' 48.43"	120° 32' 56"	0.07715
2	159° 47' 19"	5° 04' 45"	163° 17' 43"	12° 35' 52"	0° 58' 03"	15' 49.00"	120° 46' 30"	0.07473
3	160° 21' 35"	5° 04' 23"	163° 49' 51"	12° 22' 27"	0° 58' 05"	15' 49.56"	121° 0' 11"	0.07234
4	160° 55' 53"	5° 03' 59"	164° 21' 59"	12° 08' 58"	0° 58' 07"	15' 50.13"	121° 13' 60"	0.06998
5	161° 30' 14"	5° 03' 33"	164° 54' 06"	11° 55' 23"	0° 58' 09"	15' 50.69"	121° 27' 57"	0.06766
6	162° 04' 37"	5° 03' 05"	165° 26' 11"	11° 41' 44"	0° 58' 11"	15' 51.25"	121° 42' 03"	0.06537
7	162° 39' 02"	5° 02' 35"	165° 58' 16"	11° 28' 01"	0° 58' 13"	15' 51.82"	121° 56' 20"	0.06312
8	163° 13' 30"	5° 02' 03"	166° 30' 21"	11° 14' 12"	0° 58' 15"	15' 52.38"	122° 10' 48"	0.06090
9	163° 48' 01"	5° 01' 30"	167° 02' 24"	11° 00' 20"	0° 58' 17"	15' 52.93"	122° 25' 29"	0.05872
10	164° 22' 34"	5° 00' 54"	167° 34' 27"	10° 46' 23"	0° 58' 19"	15' 53.49"	122° 40' 23"	0.05657
11	164° 57' 10"	5° 00' 17"	168° 06' 29"	10° 32' 21"	0° 58' 21"	15' 54.04"	122° 55' 32"	0.05446
12	165° 31' 48"	4° 59' 38"	168° 38' 31"	10° 18' 15"	0° 58' 23"	15' 54.59"	123° 10' 57"	0.05238
13	166° 06' 28"	4° 58' 56"	169° 10' 32"	10° 04' 06"	0° 58' 25"	15' 55.14"	123° 26' 39"	0.05034
14	166° 41' 11"	4° 58' 13"	169° 42' 33"	9° 49' 52"	0° 58' 27"	15' 55.69"	123° 42' 41"	0.04834
15	167° 15' 57"	4° 57' 29"	170° 14' 33"	9° 35' 33"	0° 58' 29"	15' 56.24"	123° 59' 03"	0.04637
16	167° 50' 45"	4° 56' 42"	170° 46' 33"	9° 21' 11"	0° 58' 31"	15' 56.78"	124° 15' 49"	0.04445
17	168° 25' 35"	4° 55' 53"	171° 18' 32"	9° 06' 45"	0° 58' 33"	15' 57.32"	124° 32' 59"	0.04256
18	169° 00' 27"	4° 55' 03"	171° 50' 31"	8° 52' 16"	0° 58' 35"	15' 57.86"	124° 50' 36"	0.04070
19	169° 35' 22"	4° 54' 10"	172° 22' 30"	8° 37' 42"	0° 58' 37"	15' 58.39"	125° 8' 43"	0.03889
20	170° 10' 20"	4° 53' 16"	172° 54' 28"	8° 23' 05"	0° 58' 39"	15' 58.92"	125° 27' 22"	0.03711
21	170° 45' 19"	4° 52' 19"	173° 26' 26"	8° 08' 24"	0° 58' 41"	15' 59.45"	125° 46' 36"	0.03538
22	171° 20' 21"	4° 51' 21"	173° 58' 25"	7° 53' 39"	0° 58' 43"	15' 59.98"	126° 6' 28"	0.03368
23	171° 55' 26"	4° 50' 21"	174° 30' 23"	7° 38' 52"	0° 58' 45"	16' 00.50"	126° 27' 03"	0.03202
24	172° 30' 32"	4° 49' 19"	175° 02' 21"	7° 24' 00"	0° 58' 47"	16' 01.02"	126° 48' 24"	0.03040

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	191° 58' 54"	0.34"	191° 00' 32"	-4° 43' 57"	1.0001437	15' 59.49"	23° 26' 16"	11 m 30 s
1	192° 01' 22"	0.34"	191° 02' 49"	-4° 44' 54"	1.0001318	15' 59.50"	23° 26' 16"	11 m 31 s
2	192° 03' 49"	0.34"	191° 05' 05"	-4° 45' 52"	1.0001200	15' 59.51"	23° 26' 16"	11 m 31 s
3	192° 06' 17"	0.34"	191° 07' 22"	-4° 46' 50"	1.0001081	15' 59.53"	23° 26' 16"	11 m 32 s
4	192° 08' 45"	0.33"	191° 09' 38"	-4° 47' 47"	1.0000962	15' 59.54"	23° 26' 16"	11 m 33 s
5	192° 11' 13"	0.33"	191° 11' 55"	-4° 48' 45"	1.0000843	15' 59.55"	23° 26' 16"	11 m 34 s
6	192° 13' 41"	0.33"	191° 14' 12"	-4° 49' 43"	1.0000724	15' 59.56"	23° 26' 16"	11 m 34 s
7	192° 16' 09"	0.33"	191° 16' 28"	-4° 50' 41"	1.0000605	15' 59.57"	23° 26' 16"	11 m 35 s
8	192° 18' 37"	0.32"	191° 18' 45"	-4° 51' 38"	1.0000487	15' 59.58"	23° 26' 16"	11 m 36 s
9	192° 21' 04"	0.32"	191° 21' 02"	-4° 52' 36"	1.0000368	15' 59.59"	23° 26' 16"	11 m 37 s
10	192° 23' 32"	0.32"	191° 23' 18"	-4° 53' 34"	1.0000249	15' 59.61"	23° 26' 16"	11 m 37 s
11	192° 26' 00"	0.31"	191° 25' 35"	-4° 54' 31"	1.0000130	15' 59.62"	23° 26' 16"	11 m 38 s
12	192° 28' 28"	0.31"	191° 27' 52"	-4° 55' 29"	1.0000011	15' 59.63"	23° 26' 16"	11 m 39 s
13	192° 30' 56"	0.31"	191° 30' 08"	-4° 56' 27"	0.9999892	15' 59.64"	23° 26' 16"	11 m 40 s
14	192° 33' 24"	0.31"	191° 32' 25"	-4° 57' 24"	0.9999773	15' 59.65"	23° 26' 16"	11 m 40 s
15	192° 35' 52"	0.30"	191° 34' 42"	-4° 58' 22"	0.9999653	15' 59.66"	23° 26' 16"	11 m 41 s
16	192° 38' 20"	0.30"	191° 36' 59"	-4° 59' 19"	0.9999534	15' 59.67"	23° 26' 16"	11 m 42 s
17	192° 40' 48"	0.30"	191° 39' 15"	-5° 00' 17"	0.9999415	15' 59.69"	23° 26' 16"	11 m 43 s
18	192° 43' 16"	0.29"	191° 41' 32"	-5° 01' 15"	0.9999296	15' 59.70"	23° 26' 16"	11 m 43 s
19	192° 45' 43"	0.29"	191° 43' 49"	-5° 02' 12"	0.9999177	15' 59.71"	23° 26' 16"	11 m 44 s
20	192° 48' 11"	0.29"	191° 46' 06"	-5° 03' 10"	0.9999058	15' 59.72"	23° 26' 16"	11 m 45 s
21	192° 50' 39"	0.28"	191° 48' 22"	-5° 04' 07"	0.9998938	15' 59.73"	23° 26' 16"	11 m 46 s
22	192° 53' 07"	0.28"	191° 50' 39"	-5° 05' 05"	0.9998819	15' 59.74"	23° 26' 16"	11 m 46 s
23	192° 55' 35"	0.28"	191° 52' 56"	-5° 06' 03"	0.9998700	15' 59.75"	23° 26' 16"	11 m 47 s
24	192° 58' 03"	0.27"	191° 55' 13"	-5° 07' 00"	0.9998580	15' 59.77"	23° 26' 16"	11 m 48 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	172° 30' 32"	4° 49' 19"	175° 02' 21"	7° 24' 00"	0° 58' 47"	16' 01.02"	126° 48' 24"	0.03040
1	173° 05' 41"	4° 48' 15"	175° 34' 19"	7° 09' 06"	0° 58' 49"	16' 01.54"	127° 10' 36"	0.02883
2	173° 40' 52"	4° 47' 10"	176° 06' 17"	6° 54' 08"	0° 58' 50"	16' 02.05"	127° 33' 43"	0.02729
3	174° 16' 05"	4° 46' 02"	176° 38' 15"	6° 39' 07"	0° 58' 52"	16' 02.56"	127° 57' 51"	0.02580
4	174° 51' 21"	4° 44' 53"	177° 10' 13"	6° 24' 03"	0° 58' 54"	16' 03.07"	128° 23' 06"	0.02434
5	175° 26' 39"	4° 43' 41"	177° 42' 12"	6° 08' 56"	0° 58' 56"	16' 03.57"	128° 49' 36"	0.02293
6	176° 01' 59"	4° 42' 28"	178° 14' 10"	5° 53' 46"	0° 58' 58"	16' 04.07"	129° 17' 27"	0.02156
7	176° 37' 21"	4° 41' 13"	178° 46' 09"	5° 38' 34"	0° 58' 60"	16' 04.57"	129° 46' 49"	0.02023
8	177° 12' 45"	4° 39' 56"	179° 18' 09"	5° 23' 18"	0° 59' 02"	16' 05.06"	130° 17' 52"	0.01894
9	177° 48' 11"	4° 38' 37"	179° 50' 09"	5° 08' 00"	0° 59' 03"	16' 05.55"	130° 50' 47"	0.01770
10	178° 23' 39"	4° 37' 16"	180° 22' 09"	4° 52' 39"	0° 59' 05"	16' 06.04"	131° 25' 46"	0.01650
11	178° 59' 10"	4° 35' 53"	180° 54' 10"	4° 37' 16"	0° 59' 07"	16' 06.52"	132° 3' 05"	0.01534
12	179° 34' 42"	4° 34' 29"	181° 26' 11"	4° 21' 51"	0° 59' 09"	16' 06.99"	132° 43' 01"	0.01423
13	180° 10' 17"	4° 33' 02"	181° 58' 13"	4° 06' 23"	0° 59' 10"	16' 07.47"	133° 25' 52"	0.01316
14	180° 45' 53"	4° 31' 34"	182° 30' 16"	3° 50' 53"	0° 59' 12"	16' 07.93"	134° 12' 02"	0.01213
15	181° 21' 32"	4° 30' 04"	183° 02' 19"	3° 35' 20"	0° 59' 14"	16' 08.40"	135° 1' 57"	0.01115
16	181° 57' 12"	4° 28' 32"	183° 34' 23"	3° 19' 46"	0° 59' 15"	16' 08.86"	135° 56' 08"	0.01021
17	182° 32' 55"	4° 26' 58"	184° 06' 28"	3° 04' 10"	0° 59' 17"	16' 09.31"	136° 55' 11"	0.00932
18	183° 08' 39"	4° 25' 22"	184° 38' 34"	2° 48' 32"	0° 59' 19"	16' 09.76"	137° 59' 49"	0.00847
19	183° 44' 25"	4° 23' 45"	185° 10' 41"	2° 32' 52"	0° 59' 20"	16' 10.21"	139° 10' 52"	0.00767
20	184° 20' 13"	4° 22' 06"	185° 42' 49"	2° 17' 10"	0° 59' 22"	16' 10.65"	140° 29' 21"	0.00692
21	184° 56' 03"	4° 20' 24"	186° 14' 58"	2° 01' 27"	0° 59' 24"	16' 11.08"	141° 56' 28"	0.00620
22	185° 31' 54"	4° 18' 41"	186° 47' 08"	1° 45' 42"	0° 59' 25"	16' 11.51"	143° 33' 41"	0.00554
23	186° 07' 48"	4° 16' 57"	187° 19' 19"	1° 29' 56"	0° 59' 27"	16' 11.94"	145° 22' 45"	0.00492
24	186° 43' 43"	4° 15' 10"	187° 51' 31"	1° 14' 08"	0° 59' 28"	16' 12.36"	147° 25' 47"	0.00435

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	192° 58' 03"	0.27"	191° 55' 13"	-5° 07' 00"	0.9998580	15' 59.77"	23° 26' 16"	11 m 48 s
1	193° 00' 31"	0.27"	191° 57' 30"	-5° 07' 58"	0.9998461	15' 59.78"	23° 26' 16"	11 m 49 s
2	193° 02' 59"	0.27"	191° 59' 46"	-5° 08' 55"	0.9998342	15' 59.79"	23° 26' 16"	11 m 49 s
3	193° 05' 27"	0.26"	192° 02' 03"	-5° 09' 53"	0.9998222	15' 59.80"	23° 26' 16"	11 m 50 s
4	193° 07' 55"	0.26"	192° 04' 20"	-5° 10' 50"	0.9998103	15' 59.81"	23° 26' 16"	11 m 51 s
5	193° 10' 23"	0.25"	192° 06' 37"	-5° 11' 48"	0.9997983	15' 59.82"	23° 26' 16"	11 m 52 s
6	193° 12' 51"	0.25"	192° 08' 54"	-5° 12' 46"	0.9997864	15' 59.84"	23° 26' 16"	11 m 52 s
7	193° 15' 19"	0.25"	192° 11' 11"	-5° 13' 43"	0.9997744	15' 59.85"	23° 26' 16"	11 m 53 s
8	193° 17' 47"	0.24"	192° 13' 28"	-5° 14' 41"	0.9997625	15' 59.86"	23° 26' 16"	11 m 54 s
9	193° 20' 15"	0.24"	192° 15' 44"	-5° 15' 38"	0.9997505	15' 59.87"	23° 26' 16"	11 m 55 s
10	193° 22' 43"	0.24"	192° 18' 01"	-5° 16' 36"	0.9997386	15' 59.88"	23° 26' 16"	11 m 55 s
11	193° 25' 11"	0.23"	192° 20' 18"	-5° 17' 33"	0.9997266	15' 59.89"	23° 26' 16"	11 m 56 s
12	193° 27' 39"	0.23"	192° 22' 35"	-5° 18' 31"	0.9997146	15' 59.90"	23° 26' 16"	11 m 57 s
13	193° 30' 07"	0.22"	192° 24' 52"	-5° 19' 28"	0.9997027	15' 59.92"	23° 26' 16"	11 m 57 s
14	193° 32' 35"	0.22"	192° 27' 09"	-5° 20' 26"	0.9996907	15' 59.93"	23° 26' 16"	11 m 58 s
15	193° 35' 03"	0.22"	192° 29' 26"	-5° 21' 23"	0.9996787	15' 59.94"	23° 26' 16"	11 m 59 s
16	193° 37' 31"	0.21"	192° 31' 43"	-5° 22' 21"	0.9996668	15' 59.95"	23° 26' 16"	11 m 60 s
17	193° 39' 59"	0.21"	192° 34' 00"	-5° 23' 18"	0.9996548	15' 59.96"	23° 26' 16"	12 m 00 s
18	193° 42' 27"	0.20"	192° 36' 17"	-5° 24' 15"	0.9996428	15' 59.97"	23° 26' 16"	12 m 01 s
19	193° 44' 55"	0.20"	192° 38' 34"	-5° 25' 13"	0.9996308	15' 59.98"	23° 26' 16"	12 m 02 s
20	193° 47' 23"	0.19"	192° 40' 51"	-5° 26' 10"	0.9996188	15' 60.00"	23° 26' 16"	12 m 03 s
21	193° 49' 51"	0.19"	192° 43' 08"	-5° 27' 08"	0.9996068	16' 00.01"	23° 26' 16"	12 m 03 s
22	193° 52' 19"	0.19"	192° 45' 25"	-5° 28' 05"	0.9995949	16' 00.02"	23° 26' 16"	12 m 04 s
23	193° 54' 47"	0.18"	192° 47' 42"	-5° 29' 03"	0.9995829	16' 00.03"	23° 26' 16"	12 m 05 s
24	193° 57' 15"	0.18"	192° 49' 59"	-5° 30' 00"	0.9995709	16' 00.04"	23° 26' 16"	12 m 06 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	186° 43' 43"	4° 15' 10"	187° 51' 31"	1° 14' 08"	0° 59' 28"	16' 12.36"	147° 25' 47"	0.00435
1	187° 19' 40"	4° 13' 22"	188° 23' 45"	0° 58' 20"	0° 59' 30"	16' 12.78"	149° 45' 20"	0.00382
2	187° 55' 38"	4° 11' 32"	188° 56' 00"	0° 42' 30"	0° 59' 31"	16' 13.19"	152° 24' 28"	0.00334
3	188° 31' 39"	4° 09' 40"	189° 28' 17"	0° 26' 39"	0° 59' 33"	16' 13.59"	155° 26' 54"	0.00291
4	189° 07' 40"	4° 07' 46"	190° 00' 35"	0° 10' 47"	0° 59' 34"	16' 13.99"	158° 56' 52"	0.00253
5	189° 43' 44"	4° 05' 51"	190° 32' 55"	0° -5' 06"	0° 59' 36"	16' 14.39"	162° 59' 15"	0.00219
6	190° 19' 49"	4° 03' 54"	191° 05' 16"	0° -20' 60"	0° 59' 37"	16' 14.78"	167° 39' 10"	0.00190
7	190° 55' 56"	4° 01' 55"	191° 37' 39"	0° -36' 54"	0° 59' 39"	16' 15.16"	173° 1' 25"	0.00165
8	191° 32' 02"	3° 59' 55"	192° 10' 02"	0° -52' 48"	0° 59' 40"	16' 15.54"	179° 9' 06"	0.00146
9	192° 08' 12"	3° 57' 53"	192° 42' 29"	-1° 08' 43"	0° 59' 41"	16' 15.92"	186° 2' 48"	0.00131
10	192° 44' 23"	3° 55' 49"	193° 14' 57"	-1° 24' 39"	0° 59' 43"	16' 16.28"	193° 37' 15"	0.00121
11	193° 20' 36"	3° 53' 43"	193° 47' 27"	-1° 40' 35"	0° 59' 44"	16' 16.64"	201° 40' 52"	0.00116
12	193° 56' 50"	3° 51' 36"	194° 19' 59"	-1° 56' 31"	0° 59' 45"	16' 17.00"	209° 56' 07"	0.00116
13	194° 33' 05"	3° 49' 27"	194° 52' 33"	-2° 12' 27"	0° 59' 47"	16' 17.35"	218° 2' 47"	0.00120
14	195° 09' 22"	3° 47' 16"	195° 25' 09"	-2° 28' 24"	0° 59' 48"	16' 17.69"	225° 42' 36"	0.00130
15	195° 45' 40"	3° 45' 04"	195° 57' 47"	-2° 44' 20"	0° 59' 49"	16' 18.03"	232° 42' 51"	0.00144
16	196° 21' 60"	3° 42' 51"	196° 30' 28"	-3° 00' 16"	0° 59' 50"	16' 18.36"	238° 57' 26"	0.00163
17	196° 58' 20"	3° 40' 35"	197° 03' 11"	-3° 16' 11"	0° 59' 52"	16' 18.69"	244° 25' 44"	0.00187
18	197° 34' 42"	3° 38' 18"	197° 35' 56"	-3° 32' 06"	0° 59' 53"	16' 19.01"	249° 10' 41"	0.00216
19	198° 11' 05"	3° 35' 60"	198° 08' 43"	-3° 48' 01"	0° 59' 54"	16' 19.32"	253° 16' 57"	0.00249
20	198° 47' 29"	3° 33' 40"	198° 41' 33"	-4° 03' 55"	0° 59' 55"	16' 19.63"	256° 49' 39"	0.00288
21	199° 23' 55"	3° 31' 18"	199° 14' 25"	-4° 19' 48"	0° 59' 56"	16' 19.93"	259° 53' 42"	0.00332
22	200° 00' 21"	3° 28' 55"	199° 47' 20"	-4° 35' 41"	0° 59' 57"	16' 20.23"	262° 33' 30"	0.00380
23	200° 36' 49"	3° 26' 30"	200° 20' 18"	-4° 51' 32"	0° 59' 58"	16' 20.52"	264° 52' 49"	0.00433
24	201° 13' 18"	3° 24' 04"	200° 53' 18"	-5° 07' 23"	0° 59' 59"	16' 20.80"	266° 54' 49"	0.00492

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	193° 57' 15"	0.18"	192° 49' 59"	-5° 30' 00"	0.9995709	16' 00.04"	23° 26' 16"	12 m 06 s
1	193° 59' 43"	0.17"	192° 52' 16"	-5° 30' 57"	0.9995589	16' 00.05"	23° 26' 16"	12 m 06 s
2	194° 02' 11"	0.17"	192° 54' 33"	-5° 31' 55"	0.9995469	16' 00.07"	23° 26' 16"	12 m 07 s
3	194° 04' 39"	0.16"	192° 56' 50"	-5° 32' 52"	0.9995349	16' 00.08"	23° 26' 16"	12 m 08 s
4	194° 07' 07"	0.16"	192° 59' 08"	-5° 33' 50"	0.9995229	16' 00.09"	23° 26' 16"	12 m 08 s
5	194° 09' 35"	0.15"	193° 01' 25"	-5° 34' 47"	0.9995109	16' 00.10"	23° 26' 16"	12 m 09 s
6	194° 12' 03"	0.15"	193° 03' 42"	-5° 35' 44"	0.9994988	16' 00.11"	23° 26' 16"	12 m 10 s
7	194° 14' 31"	0.14"	193° 05' 59"	-5° 36' 42"	0.9994868	16' 00.12"	23° 26' 16"	12 m 11 s
8	194° 16' 59"	0.14"	193° 08' 16"	-5° 37' 39"	0.9994748	16' 00.13"	23° 26' 16"	12 m 11 s
9	194° 19' 27"	0.14"	193° 10' 33"	-5° 38' 36"	0.9994628	16' 00.15"	23° 26' 16"	12 m 12 s
10	194° 21' 55"	0.13"	193° 12' 50"	-5° 39' 34"	0.9994508	16' 00.16"	23° 26' 16"	12 m 13 s
11	194° 24' 23"	0.13"	193° 15' 08"	-5° 40' 31"	0.9994388	16' 00.17"	23° 26' 16"	12 m 13 s
12	194° 26' 51"	0.12"	193° 17' 25"	-5° 41' 28"	0.9994267	16' 00.18"	23° 26' 16"	12 m 14 s
13	194° 29' 19"	0.12"	193° 19' 42"	-5° 42' 26"	0.9994147	16' 00.19"	23° 26' 16"	12 m 15 s
14	194° 31' 47"	0.11"	193° 21' 59"	-5° 43' 23"	0.9994027	16' 00.20"	23° 26' 16"	12 m 16 s
15	194° 34' 15"	0.11"	193° 24' 16"	-5° 44' 20"	0.9993906	16' 00.22"	23° 26' 16"	12 m 16 s
16	194° 36' 43"	0.10"	193° 26' 34"	-5° 45' 18"	0.9993786	16' 00.23"	23° 26' 16"	12 m 17 s
17	194° 39' 12"	0.10"	193° 28' 51"	-5° 46' 15"	0.9993666	16' 00.24"	23° 26' 16"	12 m 18 s
18	194° 41' 40"	0.09"	193° 31' 08"	-5° 47' 12"	0.9993545	16' 00.25"	23° 26' 16"	12 m 18 s
19	194° 44' 08"	0.09"	193° 33' 25"	-5° 48' 09"	0.9993425	16' 00.26"	23° 26' 16"	12 m 19 s
20	194° 46' 36"	0.08"	193° 35' 43"	-5° 49' 07"	0.9993304	16' 00.27"	23° 26' 16"	12 m 20 s
21	194° 49' 04"	0.08"	193° 37' 60"	-5° 50' 04"	0.9993184	16' 00.28"	23° 26' 16"	12 m 21 s
22	194° 51' 32"	0.07"	193° 40' 17"	-5° 51' 01"	0.9993064	16' 00.30"	23° 26' 16"	12 m 21 s
23	194° 54' 00"	0.07"	193° 42' 34"	-5° 51' 58"	0.9992943	16' 00.31"	23° 26' 16"	12 m 22 s
24	194° 56' 28"	0.06"	193° 44' 52"	-5° 52' 56"	0.9992823	16' 00.32"	23° 26' 16"	12 m 23 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	201° 13' 18"	3° 24' 04"	200° 53' 18"	-5° 07' 23"	0° 59' 59"	16' 20.80"	266° 54' 49"	0.00492
1	201° 49' 47"	3° 21' 36"	201° 26' 20"	-5° 23' 12"	1° 00' 00"	16' 21.07"	268° 42' 10"	0.00555
2	202° 26' 18"	3° 19' 07"	201° 59' 26"	-5° 38' 60"	1° 00' 01"	16' 21.34"	270° 17' 02"	0.00623
3	203° 02' 50"	3° 16' 37"	202° 32' 35"	-5° 54' 47"	1° 00' 02"	16' 21.61"	271° 41' 14"	0.00696
4	203° 39' 22"	3° 14' 05"	203° 05' 46"	-6° 10' 32"	1° 00' 03"	16' 21.86"	272° 56' 15"	0.00774
5	204° 15' 56"	3° 11' 31"	203° 39' 00"	-6° 26' 15"	1° 00' 04"	16' 22.11"	274° 3' 22"	0.00857
6	204° 52' 30"	3° 08' 56"	204° 12' 18"	-6° 41' 57"	1° 00' 05"	16' 22.36"	275° 3' 35"	0.00944
7	205° 29' 05"	3° 06' 20"	204° 45' 38"	-6° 57' 37"	1° 00' 06"	16' 22.59"	275° 57' 47"	0.01037
8	206° 05' 41"	3° 03' 43"	205° 19' 01"	-7° 13' 16"	1° 00' 07"	16' 22.82"	276° 46' 43"	0.01134
9	206° 42' 18"	3° 01' 04"	205° 52' 28"	-7° 28' 52"	1° 00' 08"	16' 23.05"	277° 30' 59"	0.01237
10	207° 18' 55"	2° 58' 24"	206° 25' 58"	-7° 44' 26"	1° 00' 08"	16' 23.26"	278° 11' 07"	0.01344
11	207° 55' 33"	2° 55' 42"	206° 59' 31"	-7° 59' 58"	1° 00' 09"	16' 23.47"	278° 47' 35"	0.01456
12	208° 32' 12"	2° 52' 59"	207° 33' 07"	-8° 15' 28"	1° 00' 10"	16' 23.68"	279° 20' 44"	0.01573
13	209° 08' 52"	2° 50' 15"	208° 06' 47"	-8° 30' 55"	1° 00' 11"	16' 23.87"	279° 50' 56"	0.01695
14	209° 45' 32"	2° 47' 30"	208° 40' 31"	-8° 46' 19"	1° 00' 11"	16' 24.06"	280° 18' 28"	0.01822
15	210° 22' 13"	2° 44' 44"	209° 14' 17"	-9° 01' 41"	1° 00' 12"	16' 24.25"	280° 43' 35"	0.01954
16	210° 58' 54"	2° 41' 56"	209° 48' 08"	-9° 17' 00"	1° 00' 13"	16' 24.42"	281° 6' 30"	0.02090
17	211° 35' 36"	2° 39' 07"	210° 22' 02"	-9° 32' 17"	1° 00' 13"	16' 24.59"	281° 27' 24"	0.02232
18	212° 12' 18"	2° 36' 17"	210° 55' 59"	-9° 47' 30"	1° 00' 14"	16' 24.75"	281° 46' 29"	0.02378
19	212° 49' 00"	2° 33' 26"	211° 30' 00"	-10° 02' 40"	1° 00' 14"	16' 24.91"	282° 3' 52"	0.02529
20	213° 25' 44"	2° 30' 34"	212° 04' 05"	-10° 17' 47"	1° 00' 15"	16' 25.06"	282° 19' 41"	0.02685
21	214° 02' 27"	2° 27' 40"	212° 38' 14"	-10° 32' 51"	1° 00' 15"	16' 25.20"	282° 34' 05"	0.02845
22	214° 39' 11"	2° 24' 46"	213° 12' 26"	-10° 47' 51"	1° 00' 16"	16' 25.34"	282° 47' 09"	0.03011
23	215° 15' 55"	2° 21' 51"	213° 46' 43"	-11° 02' 48"	1° 00' 16"	16' 25.47"	282° 58' 58"	0.03181
24	215° 52' 40"	2° 18' 54"	214° 21' 03"	-11° 17' 41"	1° 00' 17"	16' 25.59"	283° 9' 39"	0.03356

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	194° 56' 28"	0.06"	193° 44' 52"	-5° 52' 56"	0.9992823	16' 00.32"	23° 26' 16"	12 m 23 s
1	194° 58' 56"	0.06"	193° 47' 09"	-5° 53' 53"	0.9992702	16' 00.33"	23° 26' 16"	12 m 23 s
2	195° 01' 24"	0.05"	193° 49' 26"	-5° 54' 50"	0.9992581	16' 00.34"	23° 26' 16"	12 m 24 s
3	195° 03' 52"	0.05"	193° 51' 44"	-5° 55' 47"	0.9992461	16' 00.35"	23° 26' 16"	12 m 25 s
4	195° 06' 21"	0.04"	193° 54' 01"	-5° 56' 44"	0.9992340	16' 00.37"	23° 26' 16"	12 m 26 s
5	195° 08' 49"	0.04"	193° 56' 19"	-5° 57' 42"	0.9992220	16' 00.38"	23° 26' 16"	12 m 26 s
6	195° 11' 17"	0.03"	193° 58' 36"	-5° 58' 39"	0.9992099	16' 00.39"	23° 26' 16"	12 m 27 s
7	195° 13' 45"	0.02"	194° 00' 53"	-5° 59' 36"	0.9991978	16' 00.40"	23° 26' 16"	12 m 28 s
8	195° 16' 13"	0.02"	194° 03' 11"	-6° 00' 33"	0.9991857	16' 00.41"	23° 26' 16"	12 m 28 s
9	195° 18' 41"	0.01"	194° 05' 28"	-6° 01' 30"	0.9991737	16' 00.42"	23° 26' 16"	12 m 29 s
10	195° 21' 09"	0.01"	194° 07' 46"	-6° 02' 27"	0.9991616	16' 00.44"	23° 26' 16"	12 m 30 s
11	195° 23' 38"	0.00"	194° 10' 03"	-6° 03' 25"	0.9991495	16' 00.45"	23° 26' 16"	12 m 31 s
12	195° 26' 06"	-0.00"	194° 12' 20"	-6° 04' 22"	0.9991374	16' 00.46"	23° 26' 16"	12 m 31 s
13	195° 28' 34"	-0.01"	194° 14' 38"	-6° 05' 19"	0.9991254	16' 00.47"	23° 26' 16"	12 m 32 s
14	195° 31' 02"	-0.01"	194° 16' 55"	-6° 06' 16"	0.9991133	16' 00.48"	23° 26' 16"	12 m 33 s
15	195° 33' 30"	-0.02"	194° 19' 13"	-6° 07' 13"	0.9991012	16' 00.49"	23° 26' 16"	12 m 33 s
16	195° 35' 58"	-0.02"	194° 21' 30"	-6° 08' 10"	0.9990891	16' 00.50"	23° 26' 16"	12 m 34 s
17	195° 38' 26"	-0.03"	194° 23' 48"	-6° 09' 07"	0.9990770	16' 00.52"	23° 26' 16"	12 m 35 s
18	195° 40' 55"	-0.03"	194° 26' 05"	-6° 10' 04"	0.9990649	16' 00.53"	23° 26' 16"	12 m 35 s
19	195° 43' 23"	-0.04"	194° 28' 23"	-6° 11' 01"	0.9990528	16' 00.54"	23° 26' 16"	12 m 36 s
20	195° 45' 51"	-0.05"	194° 30' 40"	-6° 11' 59"	0.9990407	16' 00.55"	23° 26' 16"	12 m 37 s
21	195° 48' 19"	-0.05"	194° 32' 58"	-6° 12' 56"	0.9990286	16' 00.56"	23° 26' 16"	12 m 38 s
22	195° 50' 47"	-0.06"	194° 35' 16"	-6° 13' 53"	0.9990165	16' 00.57"	23° 26' 16"	12 m 38 s
23	195° 53' 15"	-0.06"	194° 37' 33"	-6° 14' 50"	0.9990044	16' 00.59"	23° 26' 16"	12 m 39 s
24	195° 55' 44"	-0.07"	194° 39' 51"	-6° 15' 47"	0.9989923	16' 00.60"	23° 26' 16"	12 m 40 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	215° 52' 40"	2° 18' 54"	214° 21' 03"	-11° 17' 41"	1° 00' 17"	16' 25.59"	283° 9' 39"	0.03356
1	216° 29' 24"	2° 15' 57"	214° 55' 27"	-11° 32' 30"	1° 00' 17"	16' 25.70"	283° 19' 15"	0.03535
2	217° 06' 09"	2° 12' 58"	215° 29' 55"	-11° 47' 15"	1° 00' 18"	16' 25.81"	283° 27' 50"	0.03719
3	217° 42' 55"	2° 09' 59"	216° 04' 28"	-12° 01' 57"	1° 00' 18"	16' 25.91"	283° 35' 29"	0.03908
4	218° 19' 40"	2° 06' 58"	216° 39' 04"	-12° 16' 34"	1° 00' 18"	16' 26.00"	283° 42' 14"	0.04102
5	218° 56' 25"	2° 03' 57"	217° 13' 44"	-12° 31' 07"	1° 00' 19"	16' 26.09"	283° 48' 09"	0.04300
6	219° 33' 11"	2° 00' 55"	217° 48' 29"	-12° 45' 36"	1° 00' 19"	16' 26.17"	283° 53' 17"	0.04503
7	220° 09' 57"	1° 57' 52"	218° 23' 17"	-12° 59' 60"	1° 00' 19"	16' 26.25"	283° 57' 39"	0.04711
8	220° 46' 43"	1° 54' 48"	218° 58' 10"	-13° 14' 19"	1° 00' 20"	16' 26.31"	284° 1' 19"	0.04923
9	221° 23' 28"	1° 51' 43"	219° 33' 08"	-13° 28' 35"	1° 00' 20"	16' 26.37"	284° 4' 19"	0.05139
10	222° 00' 14"	1° 48' 38"	220° 08' 09"	-13° 42' 45"	1° 00' 20"	16' 26.43"	284° 6' 39"	0.05360
11	222° 36' 60"	1° 45' 31"	220° 43' 15"	-13° 56' 50"	1° 00' 20"	16' 26.47"	284° 8' 23"	0.05586
12	223° 13' 46"	1° 42' 24"	221° 18' 25"	-14° 10' 51"	1° 00' 20"	16' 26.51"	284° 9' 32"	0.05816
13	223° 50' 31"	1° 39' 17"	221° 53' 39"	-14° 24' 46"	1° 00' 20"	16' 26.55"	284° 10' 08"	0.06050
14	224° 27' 17"	1° 36' 08"	222° 28' 58"	-14° 38' 36"	1° 00' 20"	16' 26.57"	284° 10' 11"	0.06289
15	225° 04' 02"	1° 32' 59"	223° 04' 21"	-14° 52' 21"	1° 00' 21"	16' 26.59"	284° 9' 43"	0.06533
16	225° 40' 47"	1° 29' 49"	223° 39' 49"	-15° 05' 60"	1° 00' 21"	16' 26.61"	284° 8' 46"	0.06780
17	226° 17' 32"	1° 26' 39"	224° 15' 21"	-15° 19' 34"	1° 00' 21"	16' 26.61"	284° 7' 20"	0.07032
18	226° 54' 17"	1° 23' 28"	224° 50' 58"	-15° 33' 02"	1° 00' 21"	16' 26.61"	284° 5' 27"	0.07289
19	227° 31' 02"	1° 20' 16"	225° 26' 39"	-15° 46' 24"	1° 00' 21"	16' 26.61"	284° 3' 08"	0.07549
20	228° 07' 46"	1° 17' 04"	226° 02' 24"	-15° 59' 40"	1° 00' 21"	16' 26.59"	284° 0' 23"	0.07814
21	228° 44' 30"	1° 13' 51"	226° 38' 14"	-16° 12' 51"	1° 00' 20"	16' 26.57"	283° 57' 13"	0.08083
22	229° 21' 13"	1° 10' 38"	227° 14' 09"	-16° 25' 55"	1° 00' 20"	16' 26.55"	283° 53' 39"	0.08357
23	229° 57' 56"	1° 07' 25"	227° 50' 08"	-16° 38' 53"	1° 00' 20"	16' 26.51"	283° 49' 43"	0.08634
24	230° 34' 39"	1° 04' 11"	228° 26' 12"	-16° 51' 45"	1° 00' 20"	16' 26.47"	283° 45' 24"	0.08915

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	195° 55' 44"	-0.07"	194° 39' 51"	-6° 15' 47"	0.9989923	16' 00.60"	23° 26' 16"	12 m 40 s
1	195° 58' 12"	-0.07"	194° 42' 08"	-6° 16' 44"	0.9989802	16' 00.61"	23° 26' 16"	12 m 40 s
2	196° 00' 40"	-0.08"	194° 44' 26"	-6° 17' 41"	0.9989681	16' 00.62"	23° 26' 16"	12 m 41 s
3	196° 03' 08"	-0.08"	194° 46' 44"	-6° 18' 38"	0.9989560	16' 00.63"	23° 26' 16"	12 m 42 s
4	196° 05' 36"	-0.09"	194° 49' 01"	-6° 19' 35"	0.9989439	16' 00.64"	23° 26' 16"	12 m 42 s
5	196° 08' 05"	-0.10"	194° 51' 19"	-6° 20' 32"	0.9989318	16' 00.66"	23° 26' 16"	12 m 43 s
6	196° 10' 33"	-0.10"	194° 53' 37"	-6° 21' 29"	0.9989197	16' 00.67"	23° 26' 16"	12 m 44 s
7	196° 13' 01"	-0.11"	194° 55' 54"	-6° 22' 26"	0.9989076	16' 00.68"	23° 26' 16"	12 m 44 s
8	196° 15' 29"	-0.11"	194° 58' 12"	-6° 23' 23"	0.9988955	16' 00.69"	23° 26' 16"	12 m 45 s
9	196° 17' 57"	-0.12"	195° 00' 30"	-6° 24' 20"	0.9988833	16' 00.70"	23° 26' 16"	12 m 46 s
10	196° 20' 26"	-0.12"	195° 02' 47"	-6° 25' 16"	0.9988712	16' 00.71"	23° 26' 16"	12 m 47 s
11	196° 22' 54"	-0.13"	195° 05' 05"	-6° 26' 13"	0.9988591	16' 00.73"	23° 26' 16"	12 m 47 s
12	196° 25' 22"	-0.14"	195° 07' 23"	-6° 27' 10"	0.9988470	16' 00.74"	23° 26' 16"	12 m 48 s
13	196° 27' 50"	-0.14"	195° 09' 40"	-6° 28' 07"	0.9988348	16' 00.75"	23° 26' 16"	12 m 49 s
14	196° 30' 18"	-0.15"	195° 11' 58"	-6° 29' 04"	0.9988227	16' 00.76"	23° 26' 16"	12 m 49 s
15	196° 32' 47"	-0.15"	195° 14' 16"	-6° 30' 01"	0.9988106	16' 00.77"	23° 26' 16"	12 m 50 s
16	196° 35' 15"	-0.16"	195° 16' 34"	-6° 30' 58"	0.9987985	16' 00.78"	23° 26' 16"	12 m 51 s
17	196° 37' 43"	-0.16"	195° 18' 51"	-6° 31' 55"	0.9987863	16' 00.80"	23° 26' 16"	12 m 51 s
18	196° 40' 11"	-0.17"	195° 21' 09"	-6° 32' 52"	0.9987742	16' 00.81"	23° 26' 16"	12 m 52 s
19	196° 42' 40"	-0.18"	195° 23' 27"	-6° 33' 49"	0.9987621	16' 00.82"	23° 26' 16"	12 m 53 s
20	196° 45' 08"	-0.18"	195° 25' 45"	-6° 34' 45"	0.9987499	16' 00.83"	23° 26' 16"	12 m 53 s
21	196° 47' 36"	-0.19"	195° 28' 03"	-6° 35' 42"	0.9987378	16' 00.84"	23° 26' 16"	12 m 54 s
22	196° 50' 04"	-0.19"	195° 30' 21"	-6° 36' 39"	0.9987256	16' 00.85"	23° 26' 16"	12 m 55 s
23	196° 52' 33"	-0.20"	195° 32' 38"	-6° 37' 36"	0.9987135	16' 00.87"	23° 26' 16"	12 m 55 s
24	196° 55' 01"	-0.20"	195° 34' 56"	-6° 38' 33"	0.9987014	16' 00.88"	23° 26' 16"	12 m 56 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	230° 34' 39"	1° 04' 11"	228° 26' 12"	-16° 51' 45"	1° 00' 20"	16' 26.47"	283° 45' 24"	0.08915
1	231° 11' 22"	1° 00' 56"	229° 02' 20"	-17° 04' 31"	1° 00' 20"	16' 26.43"	283° 40' 43"	0.09201
2	231° 48' 04"	0° 57' 41"	229° 38' 33"	-17° 17' 10"	1° 00' 20"	16' 26.38"	283° 35' 41"	0.09491
3	232° 24' 45"	0° 54' 26"	230° 14' 50"	-17° 29' 42"	1° 00' 20"	16' 26.32"	283° 30' 19"	0.09784
4	233° 01' 26"	0° 51' 10"	230° 51' 12"	-17° 42' 07"	1° 00' 19"	16' 26.25"	283° 24' 37"	0.10082
5	233° 38' 06"	0° 47' 54"	231° 27' 39"	-17° 54' 26"	1° 00' 19"	16' 26.18"	283° 18' 35"	0.10383
6	234° 14' 46"	0° 44' 38"	232° 04' 10"	-18° 06' 38"	1° 00' 19"	16' 26.11"	283° 12' 15"	0.10689
7	234° 51' 26"	0° 41' 21"	232° 40' 45"	-18° 18' 43"	1° 00' 18"	16' 26.02"	283° 5' 36"	0.10998
8	235° 28' 05"	0° 38' 05"	233° 17' 25"	-18° 30' 40"	1° 00' 18"	16' 25.93"	282° 58' 39"	0.11311
9	236° 04' 43"	0° 34' 48"	233° 54' 10"	-18° 42' 30"	1° 00' 18"	16' 25.84"	282° 51' 25"	0.11628
10	236° 41' 20"	0° 31' 30"	234° 30' 59"	-18° 54' 13"	1° 00' 17"	16' 25.74"	282° 43' 54"	0.11949
11	237° 17' 57"	0° 28' 13"	235° 07' 53"	-19° 05' 49"	1° 00' 17"	16' 25.63"	282° 36' 06"	0.12273
12	237° 54' 33"	0° 24' 56"	235° 44' 51"	-19° 17' 17"	1° 00' 17"	16' 25.52"	282° 28' 02"	0.12601
13	238° 31' 09"	0° 21' 38"	236° 21' 54"	-19° 28' 37"	1° 00' 16"	16' 25.40"	282° 19' 42"	0.12933
14	239° 07' 43"	0° 18' 20"	236° 59' 01"	-19° 39' 50"	1° 00' 16"	16' 25.27"	282° 11' 06"	0.13268
15	239° 44' 17"	0° 15' 02"	237° 36' 12"	-19° 50' 54"	1° 00' 15"	16' 25.14"	282° 2' 15"	0.13606
16	240° 20' 50"	0° 11' 44"	238° 13' 28"	-20° 01' 51"	1° 00' 15"	16' 25.01"	281° 53' 10"	0.13949
17	240° 57' 23"	0° 08' 26"	238° 50' 48"	-20° 12' 40"	1° 00' 14"	16' 24.86"	281° 43' 50"	0.14294
18	241° 33' 54"	0° 05' 09"	239° 28' 13"	-20° 23' 21"	1° 00' 14"	16' 24.72"	281° 34' 15"	0.14643
19	242° 10' 25"	0° 01' 51"	240° 05' 42"	-20° 33' 53"	1° 00' 13"	16' 24.56"	281° 24' 27"	0.14996
20	242° 46' 55"	0° -1' 27"	240° 43' 15"	-20° 44' 17"	1° 00' 13"	16' 24.41"	281° 14' 25"	0.15352
21	243° 23' 24"	0° -4' 45"	241° 20' 53"	-20° 54' 33"	1° 00' 12"	16' 24.24"	281° 4' 10"	0.15711
22	243° 59' 52"	0° -8' 03"	241° 58' 34"	-21° 04' 40"	1° 00' 11"	16' 24.07"	280° 53' 42"	0.16073
23	244° 36' 19"	0° -11' 20"	242° 36' 20"	-21° 14' 39"	1° 00' 11"	16' 23.90"	280° 43' 01"	0.16438
24	245° 12' 46"	0° -14' 37"	243° 14' 10"	-21° 24' 29"	1° 00' 10"	16' 23.72"	280° 32' 08"	0.16807

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	196° 55' 01"	-0.20"	195° 34' 56"	-6° 38' 33"	0.9987014	16' 00.88"	23° 26' 16"	12 m 56 s
1	196° 57' 29"	-0.21"	195° 37' 14"	-6° 39' 30"	0.9986892	16' 00.89"	23° 26' 16"	12 m 57 s
2	196° 59' 57"	-0.22"	195° 39' 32"	-6° 40' 26"	0.9986771	16' 00.90"	23° 26' 16"	12 m 57 s
3	197° 02' 26"	-0.22"	195° 41' 50"	-6° 41' 23"	0.9986649	16' 00.91"	23° 26' 16"	12 m 58 s
4	197° 04' 54"	-0.23"	195° 44' 08"	-6° 42' 20"	0.9986528	16' 00.92"	23° 26' 16"	12 m 59 s
5	197° 07' 22"	-0.23"	195° 46' 26"	-6° 43' 17"	0.9986406	16' 00.94"	23° 26' 16"	12 m 59 s
6	197° 09' 51"	-0.24"	195° 48' 44"	-6° 44' 13"	0.9986285	16' 00.95"	23° 26' 16"	13 m 00 s
7	197° 12' 19"	-0.24"	195° 51' 02"	-6° 45' 10"	0.9986163	16' 00.96"	23° 26' 16"	13 m 01 s
8	197° 14' 47"	-0.25"	195° 53' 20"	-6° 46' 07"	0.9986042	16' 00.97"	23° 26' 16"	13 m 01 s
9	197° 17' 15"	-0.26"	195° 55' 38"	-6° 47' 04"	0.9985920	16' 00.98"	23° 26' 16"	13 m 02 s
10	197° 19' 44"	-0.26"	195° 57' 56"	-6° 48' 00"	0.9985799	16' 00.99"	23° 26' 16"	13 m 03 s
11	197° 22' 12"	-0.27"	196° 00' 14"	-6° 48' 57"	0.9985677	16' 01.01"	23° 26' 16"	13 m 03 s
12	197° 24' 40"	-0.27"	196° 02' 32"	-6° 49' 54"	0.9985556	16' 01.02"	23° 26' 16"	13 m 04 s
13	197° 27' 09"	-0.28"	196° 04' 50"	-6° 50' 50"	0.9985434	16' 01.03"	23° 26' 16"	13 m 05 s
14	197° 29' 37"	-0.28"	196° 07' 08"	-6° 51' 47"	0.9985312	16' 01.04"	23° 26' 16"	13 m 05 s
15	197° 32' 05"	-0.29"	196° 09' 26"	-6° 52' 44"	0.9985191	16' 01.05"	23° 26' 16"	13 m 06 s
16	197° 34' 33"	-0.30"	196° 11' 44"	-6° 53' 40"	0.9985069	16' 01.06"	23° 26' 16"	13 m 07 s
17	197° 37' 02"	-0.30"	196° 14' 02"	-6° 54' 37"	0.9984948	16' 01.08"	23° 26' 16"	13 m 07 s
18	197° 39' 30"	-0.31"	196° 16' 20"	-6° 55' 34"	0.9984826	16' 01.09"	23° 26' 16"	13 m 08 s
19	197° 41' 58"	-0.31"	196° 18' 38"	-6° 56' 30"	0.9984704	16' 01.10"	23° 26' 16"	13 m 09 s
20	197° 44' 27"	-0.32"	196° 20' 56"	-6° 57' 27"	0.9984583	16' 01.11"	23° 26' 16"	13 m 09 s
21	197° 46' 55"	-0.32"	196° 23' 14"	-6° 58' 24"	0.9984461	16' 01.12"	23° 26' 16"	13 m 10 s
22	197° 49' 23"	-0.33"	196° 25' 32"	-6° 59' 20"	0.9984339	16' 01.14"	23° 26' 16"	13 m 11 s
23	197° 51' 52"	-0.34"	196° 27' 51"	-7° 00' 17"	0.9984218	16' 01.15"	23° 26' 16"	13 m 11 s
24	197° 54' 20"	-0.34"	196° 30' 09"	-7° 01' 13"	0.9984096	16' 01.16"	23° 26' 16"	13 m 12 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	245° 12' 46"	0°-14' 37"	243° 14' 10"	-21° 24' 29"	1° 00' 10"	16' 23.72"	280° 32' 08"	0.16807
1	245° 49' 11"	0°-17' 55"	243° 52' 03"	-21° 34' 10"	1° 00' 09"	16' 23.53"	280° 21' 02"	0.17179
2	246° 25' 35"	0°-21' 12"	244° 30' 01"	-21° 43' 42"	1° 00' 09"	16' 23.34"	280° 9' 44"	0.17553
3	247° 01' 59"	0°-24' 28"	245° 08' 03"	-21° 53' 06"	1° 00' 08"	16' 23.15"	279° 58' 14"	0.17931
4	247° 38' 21"	0°-27' 45"	245° 46' 09"	-22° 02' 20"	1° 00' 07"	16' 22.95"	279° 46' 33"	0.18312
5	248° 14' 42"	0°-31' 01"	246° 24' 18"	-22° 11' 26"	1° 00' 06"	16' 22.74"	279° 34' 41"	0.18695
6	248° 51' 03"	0°-34' 17"	247° 02' 32"	-22° 20' 22"	1° 00' 06"	16' 22.53"	279° 22' 38"	0.19082
7	249° 27' 22"	0°-37' 33"	247° 40' 49"	-22° 29' 09"	1° 00' 05"	16' 22.32"	279° 10' 23"	0.19471
8	250° 03' 40"	0°-40' 48"	248° 19' 09"	-22° 37' 47"	1° 00' 04"	16' 22.10"	278° 57' 59"	0.19863
9	250° 39' 57"	0°-44' 03"	248° 57' 33"	-22° 46' 15"	1° 00' 03"	16' 21.87"	278° 45' 23"	0.20258
10	251° 16' 13"	0°-47' 18"	249° 36' 01"	-22° 54' 34"	1° 00' 02"	16' 21.64"	278° 32' 38"	0.20656
11	251° 52' 25"	0°-50' 32"	250° 14' 28"	-23° 02' 42"	1° 00' 02"	16' 21.41"	278° 19' 44"	0.21055
12	252° 28' 38"	0°-53' 45"	250° 53' 03"	-23° 10' 42"	1° 00' 01"	16' 21.17"	278° 6' 39"	0.21458
13	253° 04' 51"	0°-56' 59"	251° 31' 41"	-23° 18' 32"	0° 59' 60"	16' 20.93"	277° 53' 25"	0.21863
14	253° 41' 02"	-1° 00' 12"	252° 10' 22"	-23° 26' 13"	0° 59' 59"	16' 20.68"	277° 40' 02"	0.22271
15	254° 17' 12"	-1° 03' 24"	252° 49' 06"	-23° 33' 43"	0° 59' 58"	16' 20.43"	277° 26' 29"	0.22681
16	254° 53' 22"	-1° 06' 36"	253° 27' 53"	-23° 41' 04"	0° 59' 57"	16' 20.17"	277° 12' 48"	0.23093
17	255° 29' 29"	-1° 09' 47"	254° 06' 43"	-23° 48' 15"	0° 59' 56"	16' 19.91"	276° 58' 58"	0.23508
18	256° 05' 36"	-1° 12' 58"	254° 45' 35"	-23° 55' 16"	0° 59' 55"	16' 19.65"	276° 44' 59"	0.23925
19	256° 41' 41"	-1° 16' 08"	255° 24' 31"	-24° 02' 06"	0° 59' 54"	16' 19.38"	276° 30' 53"	0.24345
20	257° 17' 45"	-1° 19' 17"	256° 03' 29"	-24° 08' 47"	0° 59' 53"	16' 19.11"	276° 16' 38"	0.24766
21	257° 53' 48"	-1° 22' 26"	256° 42' 30"	-24° 15' 18"	0° 59' 52"	16' 18.84"	276° 2' 16"	0.25190
22	258° 29' 50"	-1° 25' 34"	257° 21' 33"	-24° 21' 38"	0° 59' 51"	16' 18.56"	275° 47' 46"	0.25616
23	259° 05' 50"	-1° 28' 42"	258° 00' 39"	-24° 27' 48"	0° 59' 50"	16' 18.27"	275° 33' 08"	0.26044
24	259° 41' 49"	-1° 31' 49"	258° 39' 47"	-24° 33' 48"	0° 59' 49"	16' 17.99"	275° 18' 24"	0.26474

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	197° 54' 20"	-0.34"	196° 30' 09"	-7° 01' 13"	0.9984096	16' 01.16"	23° 26' 16"	13 m 12 s
1	197° 56' 48"	-0.35"	196° 32' 27"	-7° 02' 10"	0.9983974	16' 01.17"	23° 26' 16"	13 m 13 s
2	197° 59' 17"	-0.35"	196° 34' 45"	-7° 03' 06"	0.9983853	16' 01.18"	23° 26' 16"	13 m 13 s
3	198° 01' 45"	-0.36"	196° 37' 03"	-7° 04' 03"	0.9983731	16' 01.19"	23° 26' 16"	13 m 14 s
4	198° 04' 13"	-0.36"	196° 39' 21"	-7° 04' 60"	0.9983609	16' 01.21"	23° 26' 16"	13 m 15 s
5	198° 06' 42"	-0.37"	196° 41' 40"	-7° 05' 56"	0.9983488	16' 01.22"	23° 26' 16"	13 m 15 s
6	198° 09' 10"	-0.37"	196° 43' 58"	-7° 06' 53"	0.9983366	16' 01.23"	23° 26' 16"	13 m 16 s
7	198° 11' 38"	-0.38"	196° 46' 16"	-7° 07' 49"	0.9983244	16' 01.24"	23° 26' 16"	13 m 17 s
8	198° 14' 07"	-0.38"	196° 48' 34"	-7° 08' 46"	0.9983123	16' 01.25"	23° 26' 16"	13 m 17 s
9	198° 16' 35"	-0.39"	196° 50' 53"	-7° 09' 42"	0.9983001	16' 01.26"	23° 26' 16"	13 m 18 s
10	198° 19' 04"	-0.40"	196° 53' 11"	-7° 10' 39"	0.9982879	16' 01.28"	23° 26' 16"	13 m 18 s
11	198° 21' 32"	-0.40"	196° 55' 29"	-7° 11' 35"	0.9982757	16' 01.29"	23° 26' 16"	13 m 19 s
12	198° 24' 00"	-0.41"	196° 57' 47"	-7° 12' 32"	0.9982636	16' 01.30"	23° 26' 16"	13 m 20 s
13	198° 26' 29"	-0.41"	197° 00' 06"	-7° 13' 28"	0.9982514	16' 01.31"	23° 26' 16"	13 m 20 s
14	198° 28' 57"	-0.42"	197° 02' 24"	-7° 14' 24"	0.9982392	16' 01.32"	23° 26' 16"	13 m 21 s
15	198° 31' 25"	-0.42"	197° 04' 42"	-7° 15' 21"	0.9982271	16' 01.33"	23° 26' 16"	13 m 22 s
16	198° 33' 54"	-0.43"	197° 07' 01"	-7° 16' 17"	0.9982149	16' 01.35"	23° 26' 16"	13 m 22 s
17	198° 36' 22"	-0.43"	197° 09' 19"	-7° 17' 14"	0.9982027	16' 01.36"	23° 26' 16"	13 m 23 s
18	198° 38' 51"	-0.44"	197° 11' 38"	-7° 18' 10"	0.9981905	16' 01.37"	23° 26' 16"	13 m 24 s
19	198° 41' 19"	-0.44"	197° 13' 56"	-7° 19' 06"	0.9981784	16' 01.38"	23° 26' 16"	13 m 24 s
20	198° 43' 47"	-0.45"	197° 16' 14"	-7° 20' 03"	0.9981662	16' 01.39"	23° 26' 16"	13 m 25 s
21	198° 46' 16"	-0.45"	197° 18' 33"	-7° 20' 59"	0.9981540	16' 01.40"	23° 26' 16"	13 m 26 s
22	198° 48' 44"	-0.46"	197° 20' 51"	-7° 21' 56"	0.9981418	16' 01.42"	23° 26' 16"	13 m 26 s
23	198° 51' 13"	-0.46"	197° 23' 10"	-7° 22' 52"	0.9981297	16' 01.43"	23° 26' 16"	13 m 27 s
24	198° 53' 41"	-0.47"	197° 25' 28"	-7° 23' 48"	0.9981175	16' 01.44"	23° 26' 16"	13 m 27 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	259° 41' 49"	-1° 31' 49"	258° 39' 47"	-24° 33' 48"	0° 59' 49"	16' 17.99"	275° 18' 24"	0.26474
1	260° 17' 47"	-1° 34' 55"	259° 18' 57"	-24° 39' 37"	0° 59' 48"	16' 17.69"	275° 3' 32"	0.26906
2	260° 53' 43"	-1° 38' 00"	259° 58' 09"	-24° 45' 16"	0° 59' 47"	16' 17.40"	274° 48' 34"	0.27339
3	261° 29' 38"	-1° 41' 05"	260° 37' 23"	-24° 50' 45"	0° 59' 46"	16' 17.10"	274° 33' 30"	0.27775
4	262° 05' 32"	-1° 44' 09"	261° 16' 39"	-24° 56' 03"	0° 59' 45"	16' 16.80"	274° 18' 19"	0.28212
5	262° 41' 24"	-1° 47' 12"	261° 55' 56"	-25° 01' 11"	0° 59' 43"	16' 16.50"	274° 3' 01"	0.28652
6	263° 17' 15"	-1° 50' 14"	262° 35' 15"	-25° 06' 08"	0° 59' 42"	16' 16.19"	273° 47' 38"	0.29092
7	263° 53' 05"	-1° 53' 15"	263° 14' 36"	-25° 10' 55"	0° 59' 41"	16' 15.88"	273° 32' 09"	0.29535
8	264° 28' 53"	-1° 56' 16"	263° 53' 58"	-25° 15' 31"	0° 59' 40"	16' 15.56"	273° 16' 35"	0.29979
9	265° 04' 40"	-1° 59' 15"	264° 33' 22"	-25° 19' 56"	0° 59' 39"	16' 15.24"	273° 0' 55"	0.30425
10	265° 40' 26"	-2° 02' 14"	265° 12' 46"	-25° 24' 11"	0° 59' 38"	16' 14.92"	272° 45' 11"	0.30872
11	266° 16' 10"	-2° 05' 12"	265° 52' 12"	-25° 28' 15"	0° 59' 37"	16' 14.60"	272° 29' 21"	0.31320
12	266° 51' 53"	-2° 08' 09"	266° 31' 38"	-25° 32' 09"	0° 59' 35"	16' 14.27"	272° 13' 26"	0.31770
13	267° 27' 34"	-2° 11' 05"	267° 11' 05"	-25° 35' 51"	0° 59' 34"	16' 13.94"	271° 57' 27"	0.32222
14	268° 03' 14"	-2° 14' 00"	267° 50' 33"	-25° 39' 23"	0° 59' 33"	16' 13.61"	271° 41' 24"	0.32674
15	268° 38' 52"	-2° 16' 54"	268° 30' 02"	-25° 42' 44"	0° 59' 32"	16' 13.28"	271° 25' 17"	0.33128
16	269° 14' 29"	-2° 19' 47"	269° 09' 30"	-25° 45' 55"	0° 59' 30"	16' 12.94"	271° 9' 05"	0.33584
17	269° 50' 05"	-2° 22' 39"	269° 48' 60"	-25° 48' 54"	0° 59' 29"	16' 12.60"	270° 52' 50"	0.34040
18	270° 25' 39"	-2° 25' 30"	270° 28' 29"	-25° 51' 43"	0° 59' 28"	16' 12.26"	270° 36' 32"	0.34497
19	271° 01' 12"	-2° 28' 20"	271° 07' 58"	-25° 54' 21"	0° 59' 27"	16' 11.91"	270° 20' 10"	0.34956
20	271° 36' 43"	-2° 31' 09"	271° 47' 27"	-25° 56' 48"	0° 59' 25"	16' 11.56"	270° 3' 45"	0.35415
21	272° 12' 13"	-2° 33' 57"	272° 26' 56"	-25° 59' 05"	0° 59' 24"	16' 11.21"	269° 47' 17"	0.35876
22	272° 47' 41"	-2° 36' 43"	273° 06' 25"	-26° 01' 10"	0° 59' 23"	16' 10.86"	269° 30' 46"	0.36337
23	273° 23' 08"	-2° 39' 29"	273° 45' 53"	-26° 03' 05"	0° 59' 22"	16' 10.51"	269° 14' 13"	0.36800
24	273° 58' 33"	-2° 42' 13"	274° 25' 21"	-26° 04' 49"	0° 59' 20"	16' 10.15"	268° 57' 37"	0.37263

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	198° 53' 41"	-0.47"	197° 25' 28"	-7° 23' 48"	0.9981175	16' 01.44"	23° 26' 16"	13 m 27 s
1	198° 56' 09"	-0.48"	197° 27' 47"	-7° 24' 45"	0.9981053	16' 01.45"	23° 26' 16"	13 m 28 s
2	198° 58' 38"	-0.48"	197° 30' 05"	-7° 25' 41"	0.9980931	16' 01.46"	23° 26' 16"	13 m 29 s
3	199° 01' 06"	-0.49"	197° 32' 24"	-7° 26' 37"	0.9980810	16' 01.48"	23° 26' 16"	13 m 29 s
4	199° 03' 35"	-0.49"	197° 34' 42"	-7° 27' 33"	0.9980688	16' 01.49"	23° 26' 16"	13 m 30 s
5	199° 06' 03"	-0.50"	197° 37' 01"	-7° 28' 30"	0.9980566	16' 01.50"	23° 26' 16"	13 m 31 s
6	199° 08' 31"	-0.50"	197° 39' 19"	-7° 29' 26"	0.9980444	16' 01.51"	23° 26' 16"	13 m 31 s
7	199° 10' 60"	-0.51"	197° 41' 38"	-7° 30' 22"	0.9980323	16' 01.52"	23° 26' 16"	13 m 32 s
8	199° 13' 28"	-0.51"	197° 43' 56"	-7° 31' 18"	0.9980201	16' 01.53"	23° 26' 16"	13 m 32 s
9	199° 15' 57"	-0.52"	197° 46' 15"	-7° 32' 15"	0.9980079	16' 01.55"	23° 26' 16"	13 m 33 s
10	199° 18' 25"	-0.52"	197° 48' 33"	-7° 33' 11"	0.9979958	16' 01.56"	23° 26' 16"	13 m 34 s
11	199° 20' 54"	-0.53"	197° 50' 52"	-7° 34' 07"	0.9979836	16' 01.57"	23° 26' 16"	13 m 34 s
12	199° 23' 22"	-0.53"	197° 53' 10"	-7° 35' 03"	0.9979714	16' 01.58"	23° 26' 16"	13 m 35 s
13	199° 25' 50"	-0.53"	197° 55' 29"	-7° 35' 60"	0.9979592	16' 01.59"	23° 26' 16"	13 m 36 s
14	199° 28' 19"	-0.54"	197° 57' 48"	-7° 36' 56"	0.9979471	16' 01.60"	23° 26' 16"	13 m 36 s
15	199° 30' 47"	-0.54"	198° 00' 06"	-7° 37' 52"	0.9979349	16' 01.62"	23° 26' 16"	13 m 37 s
16	199° 33' 16"	-0.55"	198° 02' 25"	-7° 38' 48"	0.9979227	16' 01.63"	23° 26' 16"	13 m 37 s
17	199° 35' 44"	-0.55"	198° 04' 44"	-7° 39' 44"	0.9979106	16' 01.64"	23° 26' 16"	13 m 38 s
18	199° 38' 13"	-0.56"	198° 07' 02"	-7° 40' 40"	0.9978984	16' 01.65"	23° 26' 16"	13 m 39 s
19	199° 40' 41"	-0.56"	198° 09' 21"	-7° 41' 36"	0.9978862	16' 01.66"	23° 26' 16"	13 m 39 s
20	199° 43' 10"	-0.57"	198° 11' 40"	-7° 42' 33"	0.9978741	16' 01.67"	23° 26' 16"	13 m 40 s
21	199° 45' 38"	-0.57"	198° 13' 59"	-7° 43' 29"	0.9978619	16' 01.69"	23° 26' 16"	13 m 41 s
22	199° 48' 07"	-0.58"	198° 16' 17"	-7° 44' 25"	0.9978497	16' 01.70"	23° 26' 16"	13 m 41 s
23	199° 50' 35"	-0.58"	198° 18' 36"	-7° 45' 21"	0.9978376	16' 01.71"	23° 26' 16"	13 m 42 s
24	199° 53' 04"	-0.59"	198° 20' 55"	-7° 46' 17"	0.9978254	16' 01.72"	23° 26' 16"	13 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	273° 58' 33"	-2° 42' 13"	274° 25' 21"	-26° 04' 49"	0° 59' 20"	16' 10.15"	268° 57' 37"	0.37263
1	274° 33' 57"	-2° 44' 56"	275° 04' 48"	-26° 06' 22"	0° 59' 19"	16' 09.79"	268° 40' 59"	0.37727
2	275° 09' 19"	-2° 47' 39"	275° 44' 14"	-26° 07' 45"	0° 59' 18"	16' 09.43"	268° 24' 20"	0.38191
3	275° 44' 40"	-2° 50' 19"	276° 23' 39"	-26° 08' 56"	0° 59' 16"	16' 09.07"	268° 7' 38"	0.38657
4	276° 19' 60"	-2° 52' 59"	277° 03' 03"	-26° 09' 57"	0° 59' 15"	16' 08.70"	267° 50' 55"	0.39123
5	276° 55' 17"	-2° 55' 38"	277° 42' 26"	-26° 10' 47"	0° 59' 14"	16' 08.33"	267° 34' 10"	0.39589
6	277° 30' 34"	-2° 58' 15"	278° 21' 47"	-26° 11' 27"	0° 59' 12"	16' 07.96"	267° 17' 25"	0.40056
7	278° 05' 49"	-3° 00' 51"	279° 01' 07"	-26° 11' 55"	0° 59' 11"	16' 07.59"	267° 0' 38"	0.40524
8	278° 41' 02"	-3° 03' 26"	279° 40' 25"	-26° 12' 13"	0° 59' 09"	16' 07.22"	266° 43' 50"	0.40992
9	279° 16' 14"	-3° 05' 59"	280° 19' 42"	-26° 12' 20"	0° 59' 08"	16' 06.85"	266° 27' 02"	0.41461
10	279° 51' 24"	-3° 08' 31"	280° 58' 56"	-26° 12' 17"	0° 59' 07"	16' 06.47"	266° 10' 13"	0.41929
11	280° 26' 33"	-3° 11' 02"	281° 38' 09"	-26° 12' 03"	0° 59' 05"	16' 06.10"	265° 53' 24"	0.42399
12	281° 01' 40"	-3° 13' 32"	282° 17' 20"	-26° 11' 38"	0° 59' 04"	16' 05.72"	265° 36' 35"	0.42868
13	281° 36' 46"	-3° 16' 00"	282° 56' 28"	-26° 11' 03"	0° 59' 03"	16' 05.34"	265° 19' 45"	0.43338
14	282° 11' 50"	-3° 18' 27"	283° 35' 34"	-26° 10' 17"	0° 59' 01"	16' 04.96"	265° 2' 56"	0.43807
15	282° 46' 52"	-3° 20' 53"	284° 14' 37"	-26° 09' 21"	0° 58' 60"	16' 04.57"	264° 46' 08"	0.44277
16	283° 21' 54"	-3° 23' 17"	284° 53' 38"	-26° 08' 14"	0° 58' 58"	16' 04.19"	264° 29' 20"	0.44748
17	283° 56' 53"	-3° 25' 40"	285° 32' 37"	-26° 06' 57"	0° 58' 57"	16' 03.80"	264° 12' 33"	0.45218
18	284° 31' 51"	-3° 28' 01"	286° 11' 32"	-26° 05' 30"	0° 58' 55"	16' 03.42"	263° 55' 46"	0.45688
19	285° 06' 48"	-3° 30' 21"	286° 50' 24"	-26° 03' 52"	0° 58' 54"	16' 03.03"	263° 39' 01"	0.46158
20	285° 41' 43"	-3° 32' 40"	287° 29' 14"	-26° 02' 03"	0° 58' 53"	16' 02.64"	263° 22' 17"	0.46628
21	286° 16' 36"	-3° 34' 57"	288° 08' 00"	-26° 00' 05"	0° 58' 51"	16' 02.25"	263° 5' 34"	0.47098
22	286° 51' 28"	-3° 37' 13"	288° 46' 43"	-25° 57' 56"	0° 58' 50"	16' 01.86"	262° 48' 53"	0.47568
23	287° 26' 18"	-3° 39' 27"	289° 25' 23"	-25° 55' 37"	0° 58' 48"	16' 01.47"	262° 32' 13"	0.48037
24	288° 01' 07"	-3° 41' 40"	290° 03' 59"	-25° 53' 08"	0° 58' 47"	16' 01.08"	262° 15' 36"	0.48506

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblliquity	Equation Of Time
0	199° 53' 04"	-0.59"	198° 20' 55"	-7° 46' 17"	0.9978254	16' 01.72"	23° 26' 16"	13 m 42 s
1	199° 55' 32"	-0.59"	198° 23' 14"	-7° 47' 13"	0.9978132	16' 01.73"	23° 26' 16"	13 m 43 s
2	199° 58' 01"	-0.59"	198° 25' 32"	-7° 48' 09"	0.9978011	16' 01.74"	23° 26' 16"	13 m 44 s
3	200° 00' 29"	-0.60"	198° 27' 51"	-7° 49' 05"	0.9977889	16' 01.76"	23° 26' 16"	13 m 44 s
4	200° 02' 58"	-0.60"	198° 30' 10"	-7° 50' 01"	0.9977767	16' 01.77"	23° 26' 16"	13 m 45 s
5	200° 05' 26"	-0.61"	198° 32' 29"	-7° 50' 57"	0.9977646	16' 01.78"	23° 26' 16"	13 m 45 s
6	200° 07' 54"	-0.61"	198° 34' 48"	-7° 51' 53"	0.9977524	16' 01.79"	23° 26' 16"	13 m 46 s
7	200° 10' 23"	-0.62"	198° 37' 06"	-7° 52' 49"	0.9977403	16' 01.80"	23° 26' 16"	13 m 47 s
8	200° 12' 51"	-0.62"	198° 39' 25"	-7° 53' 45"	0.9977281	16' 01.82"	23° 26' 16"	13 m 47 s
9	200° 15' 20"	-0.62"	198° 41' 44"	-7° 54' 41"	0.9977160	16' 01.83"	23° 26' 16"	13 m 48 s
10	200° 17' 48"	-0.63"	198° 44' 03"	-7° 55' 37"	0.9977038	16' 01.84"	23° 26' 16"	13 m 48 s
11	200° 20' 17"	-0.63"	198° 46' 22"	-7° 56' 33"	0.9976916	16' 01.85"	23° 26' 16"	13 m 49 s
12	200° 22' 46"	-0.64"	198° 48' 41"	-7° 57' 29"	0.9976795	16' 01.86"	23° 26' 16"	13 m 50 s
13	200° 25' 14"	-0.64"	198° 50' 60"	-7° 58' 25"	0.9976673	16' 01.87"	23° 26' 16"	13 m 50 s
14	200° 27' 43"	-0.65"	198° 53' 19"	-7° 59' 21"	0.9976552	16' 01.89"	23° 26' 16"	13 m 51 s
15	200° 30' 11"	-0.65"	198° 55' 38"	-8° 00' 16"	0.9976430	16' 01.90"	23° 26' 16"	13 m 51 s
16	200° 32' 40"	-0.65"	198° 57' 57"	-8° 01' 12"	0.9976309	16' 01.91"	23° 26' 16"	13 m 52 s
17	200° 35' 08"	-0.66"	199° 00' 16"	-8° 02' 08"	0.9976188	16' 01.92"	23° 26' 16"	13 m 53 s
18	200° 37' 37"	-0.66"	199° 02' 35"	-8° 03' 04"	0.9976066	16' 01.93"	23° 26' 16"	13 m 53 s
19	200° 40' 05"	-0.66"	199° 04' 54"	-8° 03' 60"	0.9975945	16' 01.94"	23° 26' 16"	13 m 54 s
20	200° 42' 34"	-0.67"	199° 07' 13"	-8° 04' 56"	0.9975823	16' 01.96"	23° 26' 16"	13 m 54 s
21	200° 45' 02"	-0.67"	199° 09' 32"	-8° 05' 52"	0.9975702	16' 01.97"	23° 26' 16"	13 m 55 s
22	200° 47' 31"	-0.68"	199° 11' 51"	-8° 06' 47"	0.9975581	16' 01.98"	23° 26' 16"	13 m 56 s
23	200° 49' 59"	-0.68"	199° 14' 10"	-8° 07' 43"	0.9975459	16' 01.99"	23° 26' 16"	13 m 56 s
24	200° 52' 28"	-0.68"	199° 16' 29"	-8° 08' 39"	0.9975338	16' 02.00"	23° 26' 16"	13 m 57 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	288° 01' 07"	-3° 41' 40"	290° 03' 59"	-25° 53' 08"	0° 58' 47"	16' 01.08"	262° 15' 36"	0.48506
1	288° 35' 54"	-3° 43' 51"	290° 42' 31"	-25° 50' 29"	0° 58' 45"	16' 00.68"	261° 58' 60"	0.48975
2	289° 10' 40"	-3° 46' 01"	291° 21' 00"	-25° 47' 40"	0° 58' 44"	16' 00.29"	261° 42' 26"	0.49444
3	289° 45' 24"	-3° 48' 10"	291° 59' 25"	-25° 44' 41"	0° 58' 43"	15' 59.90"	261° 25' 55"	0.49912
4	290° 20' 07"	-3° 50' 16"	292° 37' 47"	-25° 41' 32"	0° 58' 41"	15' 59.50"	261° 9' 26"	0.50380
5	290° 54' 48"	-3° 52' 22"	293° 16' 04"	-25° 38' 13"	0° 58' 40"	15' 59.10"	260° 53' 00"	0.50848
6	291° 29' 27"	-3° 54' 26"	293° 54' 17"	-25° 34' 45"	0° 58' 38"	15' 58.71"	260° 36' 37"	0.51314
7	292° 04' 05"	-3° 56' 28"	294° 32' 26"	-25° 31' 06"	0° 58' 37"	15' 58.31"	260° 20' 16"	0.51781
8	292° 38' 42"	-3° 58' 29"	295° 10' 31"	-25° 27' 18"	0° 58' 35"	15' 57.91"	260° 3' 58"	0.52247
9	293° 13' 17"	-4° 00' 28"	295° 48' 31"	-25° 23' 21"	0° 58' 34"	15' 57.51"	259° 47' 44"	0.52712
10	293° 47' 50"	-4° 02' 26"	296° 26' 27"	-25° 19' 13"	0° 58' 32"	15' 57.11"	259° 31' 33"	0.53176
11	294° 22' 22"	-4° 04' 22"	297° 04' 19"	-25° 14' 57"	0° 58' 31"	15' 56.72"	259° 15' 25"	0.53640
12	294° 56' 52"	-4° 06' 17"	297° 42' 06"	-25° 10' 31"	0° 58' 29"	15' 56.32"	258° 59' 20"	0.54103
13	295° 31' 21"	-4° 08' 10"	298° 19' 48"	-25° 05' 55"	0° 58' 28"	15' 55.92"	258° 43' 19"	0.54565
14	296° 05' 48"	-4° 10' 01"	298° 57' 26"	-25° 01' 10"	0° 58' 26"	15' 55.52"	258° 27' 22"	0.55027
15	296° 40' 13"	-4° 11' 51"	299° 34' 58"	-24° 56' 16"	0° 58' 25"	15' 55.12"	258° 11' 29"	0.55488
16	297° 14' 38"	-4° 13' 40"	300° 12' 26"	-24° 51' 13"	0° 58' 24"	15' 54.71"	257° 55' 40"	0.55947
17	297° 49' 00"	-4° 15' 26"	300° 49' 49"	-24° 46' 01"	0° 58' 22"	15' 54.31"	257° 39' 54"	0.56406
18	298° 23' 21"	-4° 17' 11"	301° 27' 07"	-24° 40' 40"	0° 58' 21"	15' 53.91"	257° 24' 13"	0.56864
19	298° 57' 41"	-4° 18' 55"	302° 04' 20"	-24° 35' 10"	0° 58' 19"	15' 53.51"	257° 8' 36"	0.57321
20	299° 31' 59"	-4° 20' 37"	302° 41' 27"	-24° 29' 31"	0° 58' 18"	15' 53.11"	256° 53' 04"	0.57777
21	300° 06' 15"	-4° 22' 17"	303° 18' 30"	-24° 23' 43"	0° 58' 16"	15' 52.71"	256° 37' 36"	0.58231
22	300° 40' 30"	-4° 23' 55"	303° 55' 27"	-24° 17' 47"	0° 58' 15"	15' 52.31"	256° 22' 12"	0.58685
23	301° 14' 43"	-4° 25' 32"	304° 32' 19"	-24° 11' 42"	0° 58' 13"	15' 51.91"	256° 6' 53"	0.59138
24	301° 48' 55"	-4° 27' 07"	305° 09' 06"	-24° 05' 28"	0° 58' 12"	15' 51.50"	255° 51' 39"	0.59589

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	200° 52' 28"	-0.68"	199° 16' 29"	-8° 08' 39"	0.9975338	16' 02.00"	23° 26' 16"	13 m 57 s
1	200° 54' 56"	-0.69"	199° 18' 48"	-8° 09' 35"	0.9975216	16' 02.01"	23° 26' 16"	13 m 57 s
2	200° 57' 25"	-0.69"	199° 21' 07"	-8° 10' 31"	0.9975095	16' 02.03"	23° 26' 16"	13 m 58 s
3	200° 59' 54"	-0.69"	199° 23' 26"	-8° 11' 26"	0.9974974	16' 02.04"	23° 26' 16"	13 m 59 s
4	201° 02' 22"	-0.70"	199° 25' 45"	-8° 12' 22"	0.9974853	16' 02.05"	23° 26' 16"	13 m 59 s
5	201° 04' 51"	-0.70"	199° 28' 05"	-8° 13' 18"	0.9974731	16' 02.06"	23° 26' 16"	13 m 60 s
6	201° 07' 19"	-0.70"	199° 30' 24"	-8° 14' 13"	0.9974610	16' 02.07"	23° 26' 16"	14 m 00 s
7	201° 09' 48"	-0.71"	199° 32' 43"	-8° 15' 09"	0.9974489	16' 02.08"	23° 26' 16"	14 m 01 s
8	201° 12' 16"	-0.71"	199° 35' 02"	-8° 16' 05"	0.9974368	16' 02.10"	23° 26' 16"	14 m 02 s
9	201° 14' 45"	-0.71"	199° 37' 21"	-8° 17' 00"	0.9974246	16' 02.11"	23° 26' 16"	14 m 02 s
10	201° 17' 14"	-0.72"	199° 39' 40"	-8° 17' 56"	0.9974125	16' 02.12"	23° 26' 16"	14 m 03 s
11	201° 19' 42"	-0.72"	199° 41' 60"	-8° 18' 52"	0.9974004	16' 02.13"	23° 26' 16"	14 m 03 s
12	201° 22' 11"	-0.72"	199° 44' 19"	-8° 19' 47"	0.9973883	16' 02.14"	23° 26' 16"	14 m 04 s
13	201° 24' 39"	-0.72"	199° 46' 38"	-8° 20' 43"	0.9973762	16' 02.15"	23° 26' 16"	14 m 04 s
14	201° 27' 08"	-0.73"	199° 48' 57"	-8° 21' 39"	0.9973641	16' 02.17"	23° 26' 16"	14 m 05 s
15	201° 29' 36"	-0.73"	199° 51' 17"	-8° 22' 34"	0.9973520	16' 02.18"	23° 26' 16"	14 m 06 s
16	201° 32' 05"	-0.73"	199° 53' 36"	-8° 23' 30"	0.9973399	16' 02.19"	23° 26' 16"	14 m 06 s
17	201° 34' 34"	-0.74"	199° 55' 55"	-8° 24' 25"	0.9973277	16' 02.20"	23° 26' 16"	14 m 07 s
18	201° 37' 02"	-0.74"	199° 58' 15"	-8° 25' 21"	0.9973156	16' 02.21"	23° 26' 16"	14 m 07 s
19	201° 39' 31"	-0.74"	200° 00' 34"	-8° 26' 17"	0.9973035	16' 02.22"	23° 26' 16"	14 m 08 s
20	201° 41' 59"	-0.74"	200° 02' 53"	-8° 27' 12"	0.9972914	16' 02.24"	23° 26' 16"	14 m 08 s
21	201° 44' 28"	-0.75"	200° 05' 13"	-8° 28' 08"	0.9972794	16' 02.25"	23° 26' 16"	14 m 09 s
22	201° 46' 57"	-0.75"	200° 07' 32"	-8° 29' 03"	0.9972673	16' 02.26"	23° 26' 16"	14 m 10 s
23	201° 49' 25"	-0.75"	200° 09' 52"	-8° 29' 59"	0.9972552	16' 02.27"	23° 26' 16"	14 m 10 s
24	201° 51' 54"	-0.75"	200° 12' 11"	-8° 30' 54"	0.9972431	16' 02.28"	23° 26' 16"	14 m 11 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	301° 48' 55"	-4° 27' 07"	305° 09' 06"	-24° 05' 28"	0° 58' 12"	15' 51.50"	255° 51' 39"	0.59589
1	302° 23' 05"	-4° 28' 41"	305° 45' 47"	-23° 59' 06"	0° 58' 10"	15' 51.10"	255° 36' 30"	0.60039
2	302° 57' 14"	-4° 30' 13"	306° 22' 22"	-23° 52' 36"	0° 58' 09"	15' 50.70"	255° 21' 26"	0.60488
3	303° 31' 22"	-4° 31' 43"	306° 58' 53"	-23° 45' 57"	0° 58' 07"	15' 50.30"	255° 6' 26"	0.60935
4	304° 05' 27"	-4° 33' 12"	307° 35' 17"	-23° 39' 10"	0° 58' 06"	15' 49.90"	254° 51' 32"	0.61382
5	304° 39' 32"	-4° 34' 38"	308° 11' 36"	-23° 32' 15"	0° 58' 04"	15' 49.50"	254° 36' 42"	0.61826
6	305° 13' 34"	-4° 36' 04"	308° 47' 50"	-23° 25' 12"	0° 58' 03"	15' 49.10"	254° 21' 58"	0.62270
7	305° 47' 35"	-4° 37' 27"	309° 23' 58"	-23° 18' 00"	0° 58' 01"	15' 48.70"	254° 7' 19"	0.62712
8	306° 21' 35"	-4° 38' 49"	309° 59' 60"	-23° 10' 41"	0° 58' 00"	15' 48.30"	253° 52' 46"	0.63153
9	306° 55' 33"	-4° 40' 09"	310° 35' 56"	-23° 03' 14"	0° 57' 59"	15' 47.90"	253° 38' 18"	0.63592
10	307° 29' 30"	-4° 41' 27"	311° 11' 47"	-22° 55' 40"	0° 57' 57"	15' 47.50"	253° 23' 55"	0.64029
11	308° 03' 25"	-4° 42' 44"	311° 47' 32"	-22° 47' 57"	0° 57' 56"	15' 47.10"	253° 9' 38"	0.64465
12	308° 37' 19"	-4° 43' 59"	312° 23' 11"	-22° 40' 07"	0° 57' 54"	15' 46.70"	252° 55' 26"	0.64900
13	309° 11' 11"	-4° 45' 12"	312° 58' 44"	-22° 32' 10"	0° 57' 53"	15' 46.30"	252° 41' 20"	0.65333
14	309° 45' 02"	-4° 46' 24"	313° 34' 12"	-22° 24' 05"	0° 57' 51"	15' 45.91"	252° 27' 20"	0.65764
15	310° 18' 51"	-4° 47' 34"	314° 09' 34"	-22° 15' 53"	0° 57' 50"	15' 45.51"	252° 13' 25"	0.66193
16	310° 52' 38"	-4° 48' 42"	314° 44' 49"	-22° 07' 34"	0° 57' 48"	15' 45.11"	251° 59' 36"	0.66621
17	311° 26' 25"	-4° 49' 48"	315° 19' 59"	-21° 59' 07"	0° 57' 47"	15' 44.72"	251° 45' 53"	0.67047
18	312° 00' 09"	-4° 50' 53"	315° 55' 03"	-21° 50' 33"	0° 57' 45"	15' 44.32"	251° 32' 15"	0.67472
19	312° 33' 53"	-4° 51' 56"	316° 30' 02"	-21° 41' 53"	0° 57' 44"	15' 43.92"	251° 18' 44"	0.67894
20	313° 07' 34"	-4° 52' 57"	317° 04' 54"	-21° 33' 05"	0° 57' 43"	15' 43.53"	251° 5' 18"	0.68315
21	313° 41' 15"	-4° 53' 57"	317° 39' 40"	-21° 24' 11"	0° 57' 41"	15' 43.13"	250° 51' 58"	0.68734
22	314° 14' 53"	-4° 54' 54"	318° 14' 21"	-21° 15' 10"	0° 57' 40"	15' 42.74"	250° 38' 44"	0.69151
23	314° 48' 31"	-4° 55' 50"	318° 48' 56"	-21° 06' 02"	0° 57' 38"	15' 42.35"	250° 25' 36"	0.69566
24	315° 22' 06"	-4° 56' 45"	319° 23' 25"	-20° 56' 48"	0° 57' 37"	15' 41.96"	250° 12' 34"	0.69979

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	201° 51' 54"	-0.75"	200° 12' 11"	-8° 30' 54"	0.9972431	16' 02.28"	23° 26' 16"	14 m 11 s
1	201° 54' 23"	-0.76"	200° 14' 30"	-8° 31' 50"	0.9972310	16' 02.29"	23° 26' 16"	14 m 11 s
2	201° 56' 51"	-0.76"	200° 16' 50"	-8° 32' 45"	0.9972189	16' 02.31"	23° 26' 16"	14 m 12 s
3	201° 59' 20"	-0.76"	200° 19' 09"	-8° 33' 40"	0.9972068	16' 02.32"	23° 26' 16"	14 m 12 s
4	202° 01' 48"	-0.76"	200° 21' 29"	-8° 34' 36"	0.9971947	16' 02.33"	23° 26' 16"	14 m 13 s
5	202° 04' 17"	-0.77"	200° 23' 48"	-8° 35' 31"	0.9971827	16' 02.34"	23° 26' 16"	14 m 14 s
6	202° 06' 46"	-0.77"	200° 26' 08"	-8° 36' 27"	0.9971706	16' 02.35"	23° 26' 16"	14 m 14 s
7	202° 09' 14"	-0.77"	200° 28' 27"	-8° 37' 22"	0.9971585	16' 02.36"	23° 26' 16"	14 m 15 s
8	202° 11' 43"	-0.77"	200° 30' 47"	-8° 38' 18"	0.9971465	16' 02.38"	23° 26' 16"	14 m 15 s
9	202° 14' 12"	-0.77"	200° 33' 06"	-8° 39' 13"	0.9971344	16' 02.39"	23° 26' 16"	14 m 16 s
10	202° 16' 40"	-0.78"	200° 35' 26"	-8° 40' 08"	0.9971223	16' 02.40"	23° 26' 16"	14 m 16 s
11	202° 19' 09"	-0.78"	200° 37' 45"	-8° 41' 04"	0.9971103	16' 02.41"	23° 26' 16"	14 m 17 s
12	202° 21' 38"	-0.78"	200° 40' 05"	-8° 41' 59"	0.9970982	16' 02.42"	23° 26' 16"	14 m 17 s
13	202° 24' 06"	-0.78"	200° 42' 24"	-8° 42' 54"	0.9970861	16' 02.43"	23° 26' 16"	14 m 18 s
14	202° 26' 35"	-0.78"	200° 44' 44"	-8° 43' 50"	0.9970741	16' 02.45"	23° 26' 16"	14 m 19 s
15	202° 29' 04"	-0.79"	200° 47' 04"	-8° 44' 45"	0.9970620	16' 02.46"	23° 26' 16"	14 m 19 s
16	202° 31' 32"	-0.79"	200° 49' 23"	-8° 45' 40"	0.9970500	16' 02.47"	23° 26' 16"	14 m 20 s
17	202° 34' 01"	-0.79"	200° 51' 43"	-8° 46' 35"	0.9970379	16' 02.48"	23° 26' 16"	14 m 20 s
18	202° 36' 30"	-0.79"	200° 54' 03"	-8° 47' 31"	0.9970259	16' 02.49"	23° 26' 16"	14 m 21 s
19	202° 38' 58"	-0.79"	200° 56' 22"	-8° 48' 26"	0.9970139	16' 02.50"	23° 26' 16"	14 m 21 s
20	202° 41' 27"	-0.79"	200° 58' 42"	-8° 49' 21"	0.9970018	16' 02.52"	23° 26' 16"	14 m 22 s
21	202° 43' 56"	-0.79"	201° 01' 02"	-8° 50' 16"	0.9969898	16' 02.53"	23° 26' 16"	14 m 22 s
22	202° 46' 24"	-0.80"	201° 03' 21"	-8° 51' 12"	0.9969778	16' 02.54"	23° 26' 16"	14 m 23 s
23	202° 48' 53"	-0.80"	201° 05' 41"	-8° 52' 07"	0.9969657	16' 02.55"	23° 26' 16"	14 m 23 s
24	202° 51' 22"	-0.80"	201° 08' 01"	-8° 53' 02"	0.9969537	16' 02.56"	23° 26' 16"	14 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	315° 22' 06"	-4° 56' 45"	319° 23' 25"	-20° 56' 48"	0° 57' 37"	15' 41.96"	250° 12' 34"	0.69979
1	315° 55' 41"	-4° 57' 37"	319° 57' 47"	-20° 47' 27"	0° 57' 35"	15' 41.56"	249° 59' 38"	0.70390
2	316° 29' 14"	-4° 58' 28"	320° 32' 04"	-20° 37' 60"	0° 57' 34"	15' 41.17"	249° 46' 48"	0.70799
3	317° 02' 45"	-4° 59' 17"	321° 06' 16"	-20° 28' 26"	0° 57' 32"	15' 40.78"	249° 34' 04"	0.71206
4	317° 36' 15"	-5° 00' 04"	321° 40' 21"	-20° 18' 46"	0° 57' 31"	15' 40.39"	249° 21' 26"	0.71611
5	318° 09' 43"	-5° 00' 50"	322° 14' 20"	-20° 09' 00"	0° 57' 30"	15' 40.00"	249° 8' 54"	0.72014
6	318° 43' 10"	-5° 01' 34"	322° 48' 14"	-19° 59' 09"	0° 57' 28"	15' 39.61"	248° 56' 28"	0.72415
7	319° 16' 36"	-5° 02' 16"	323° 22' 02"	-19° 49' 11"	0° 57' 27"	15' 39.22"	248° 44' 09"	0.72813
8	319° 50' 00"	-5° 02' 56"	323° 55' 44"	-19° 39' 07"	0° 57' 25"	15' 38.84"	248° 31' 55"	0.73210
9	320° 23' 23"	-5° 03' 35"	324° 29' 20"	-19° 28' 57"	0° 57' 24"	15' 38.45"	248° 19' 47"	0.73604
10	320° 56' 44"	-5° 04' 12"	325° 02' 51"	-19° 18' 42"	0° 57' 22"	15' 38.07"	248° 7' 45"	0.73996
11	321° 30' 04"	-5° 04' 47"	325° 36' 15"	-19° 08' 21"	0° 57' 21"	15' 37.68"	247° 55' 49"	0.74386
12	322° 03' 22"	-5° 05' 20"	326° 09' 35"	-18° 57' 54"	0° 57' 20"	15' 37.30"	247° 43' 60"	0.74774
13	322° 36' 39"	-5° 05' 52"	326° 42' 48"	-18° 47' 22"	0° 57' 18"	15' 36.91"	247° 32' 16"	0.75159
14	323° 09' 54"	-5° 06' 21"	327° 15' 56"	-18° 36' 45"	0° 57' 17"	15' 36.53"	247° 20' 38"	0.75542
15	323° 43' 08"	-5° 06' 50"	327° 48' 58"	-18° 26' 02"	0° 57' 15"	15' 36.15"	247° 9' 06"	0.75923
16	324° 16' 21"	-5° 07' 16"	328° 21' 54"	-18° 15' 14"	0° 57' 14"	15' 35.77"	246° 57' 40"	0.76301
17	324° 49' 32"	-5° 07' 41"	328° 54' 45"	-18° 04' 21"	0° 57' 13"	15' 35.39"	246° 46' 20"	0.76677
18	325° 22' 42"	-5° 08' 03"	329° 27' 30"	-17° 53' 23"	0° 57' 11"	15' 35.01"	246° 35' 06"	0.77050
19	325° 55' 50"	-5° 08' 25"	330° 00' 10"	-17° 42' 20"	0° 57' 10"	15' 34.63"	246° 23' 58"	0.77421
20	326° 28' 57"	-5° 08' 44"	330° 32' 45"	-17° 31' 12"	0° 57' 08"	15' 34.25"	246° 12' 56"	0.77790
21	327° 02' 02"	-5° 09' 02"	331° 05' 14"	-17° 19' 59"	0° 57' 07"	15' 33.87"	246° 1' 59"	0.78156
22	327° 35' 06"	-5° 09' 18"	331° 37' 37"	-17° 08' 41"	0° 57' 06"	15' 33.50"	245° 51' 08"	0.78520
23	328° 08' 09"	-5° 09' 32"	332° 09' 55"	-16° 57' 19"	0° 57' 04"	15' 33.12"	245° 40' 23"	0.78881
24	328° 41' 10"	-5° 09' 45"	332° 42' 08"	-16° 45' 52"	0° 57' 03"	15' 32.75"	245° 29' 44"	0.79240

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	202° 51' 22"	-0.80"	201° 08' 01"	-8° 53' 02"	0.9969537	16' 02.56"	23° 26' 16"	14 m 24 s
1	202° 53' 50"	-0.80"	201° 10' 21"	-8° 53' 57"	0.9969417	16' 02.57"	23° 26' 16"	14 m 25 s
2	202° 56' 19"	-0.80"	201° 12' 40"	-8° 54' 52"	0.9969297	16' 02.59"	23° 26' 16"	14 m 25 s
3	202° 58' 48"	-0.80"	201° 15' 00"	-8° 55' 47"	0.9969176	16' 02.60"	23° 26' 16"	14 m 26 s
4	203° 01' 17"	-0.80"	201° 17' 20"	-8° 56' 42"	0.9969056	16' 02.61"	23° 26' 16"	14 m 26 s
5	203° 03' 45"	-0.80"	201° 19' 40"	-8° 57' 38"	0.9968936	16' 02.62"	23° 26' 16"	14 m 27 s
6	203° 06' 14"	-0.81"	201° 21' 60"	-8° 58' 33"	0.9968816	16' 02.63"	23° 26' 16"	14 m 27 s
7	203° 08' 43"	-0.81"	201° 24' 20"	-8° 59' 28"	0.9968696	16' 02.64"	23° 26' 16"	14 m 28 s
8	203° 11' 11"	-0.81"	201° 26' 39"	-9° 00' 23"	0.9968576	16' 02.66"	23° 26' 16"	14 m 28 s
9	203° 13' 40"	-0.81"	201° 28' 59"	-9° 01' 18"	0.9968456	16' 02.67"	23° 26' 16"	14 m 29 s
10	203° 16' 09"	-0.81"	201° 31' 19"	-9° 02' 13"	0.9968336	16' 02.68"	23° 26' 16"	14 m 29 s
11	203° 18' 38"	-0.81"	201° 33' 39"	-9° 03' 08"	0.9968216	16' 02.69"	23° 26' 16"	14 m 30 s
12	203° 21' 06"	-0.81"	201° 35' 59"	-9° 04' 03"	0.9968096	16' 02.70"	23° 26' 16"	14 m 30 s
13	203° 23' 35"	-0.81"	201° 38' 19"	-9° 04' 58"	0.9967976	16' 02.71"	23° 26' 16"	14 m 31 s
14	203° 26' 04"	-0.81"	201° 40' 39"	-9° 05' 53"	0.9967856	16' 02.72"	23° 26' 16"	14 m 32 s
15	203° 28' 33"	-0.81"	201° 42' 59"	-9° 06' 48"	0.9967737	16' 02.74"	23° 26' 16"	14 m 32 s
16	203° 31' 01"	-0.81"	201° 45' 19"	-9° 07' 43"	0.9967617	16' 02.75"	23° 26' 16"	14 m 33 s
17	203° 33' 30"	-0.81"	201° 47' 39"	-9° 08' 38"	0.9967497	16' 02.76"	23° 26' 16"	14 m 33 s
18	203° 35' 59"	-0.81"	201° 49' 59"	-9° 09' 33"	0.9967377	16' 02.77"	23° 26' 16"	14 m 34 s
19	203° 38' 27"	-0.81"	201° 52' 19"	-9° 10' 28"	0.9967258	16' 02.78"	23° 26' 16"	14 m 34 s
20	203° 40' 56"	-0.81"	201° 54' 39"	-9° 11' 23"	0.9967138	16' 02.79"	23° 26' 16"	14 m 35 s
21	203° 43' 25"	-0.81"	201° 56' 59"	-9° 12' 17"	0.9967019	16' 02.81"	23° 26' 16"	14 m 35 s
22	203° 45' 54"	-0.81"	201° 59' 19"	-9° 13' 12"	0.9966899	16' 02.82"	23° 26' 16"	14 m 36 s
23	203° 48' 23"	-0.81"	202° 01' 39"	-9° 14' 07"	0.9966779	16' 02.83"	23° 26' 16"	14 m 36 s
24	203° 50' 51"	-0.81"	202° 03' 59"	-9° 15' 02"	0.9966660	16' 02.84"	23° 26' 16"	14 m 37 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	328° 41' 10"	-5° 09' 45"	332° 42' 08"	-16° 45' 52"	0° 57' 03"	15' 32.75"	245° 29' 44"	0.79240
1	329° 14' 10"	-5° 09' 55"	333° 14' 16"	-16° 34' 21"	0° 57' 02"	15' 32.38"	245° 19' 10"	0.79596
2	329° 47' 08"	-5° 10' 04"	333° 46' 18"	-16° 22' 45"	0° 57' 00"	15' 32.00"	245° 8' 42"	0.79949
3	330° 20' 05"	-5° 10' 12"	334° 18' 15"	-16° 11' 05"	0° 56' 59"	15' 31.63"	244° 58' 19"	0.80300
4	330° 53' 00"	-5° 10' 17"	334° 50' 07"	-15° 59' 21"	0° 56' 57"	15' 31.26"	244° 48' 02"	0.80648
5	331° 25' 54"	-5° 10' 21"	335° 21' 54"	-15° 47' 32"	0° 56' 56"	15' 30.89"	244° 37' 50"	0.80994
6	331° 58' 47"	-5° 10' 24"	335° 53' 36"	-15° 35' 39"	0° 56' 55"	15' 30.52"	244° 27' 44"	0.81336
7	332° 31' 38"	-5° 10' 24"	336° 25' 12"	-15° 23' 43"	0° 56' 53"	15' 30.15"	244° 17' 43"	0.81677
8	333° 04' 28"	-5° 10' 23"	336° 56' 44"	-15° 11' 42"	0° 56' 52"	15' 29.79"	244° 7' 47"	0.82014
9	333° 37' 17"	-5° 10' 20"	337° 28' 11"	-14° 59' 38"	0° 56' 51"	15' 29.42"	243° 57' 56"	0.82349
10	334° 10' 04"	-5° 10' 15"	337° 59' 33"	-14° 47' 29"	0° 56' 49"	15' 29.06"	243° 48' 11"	0.82681
11	334° 42' 49"	-5° 10' 09"	338° 30' 50"	-14° 35' 17"	0° 56' 48"	15' 28.69"	243° 38' 30"	0.83010
12	335° 15' 34"	-5° 10' 01"	339° 02' 02"	-14° 23' 02"	0° 56' 47"	15' 28.33"	243° 28' 55"	0.83337
13	335° 48' 17"	-5° 09' 52"	339° 33' 09"	-14° 10' 42"	0° 56' 45"	15' 27.97"	243° 19' 24"	0.83660
14	336° 20' 58"	-5° 09' 40"	340° 04' 12"	-13° 58' 20"	0° 56' 44"	15' 27.61"	243° 9' 58"	0.83981
15	336° 53' 38"	-5° 09' 27"	340° 35' 10"	-13° 45' 53"	0° 56' 43"	15' 27.25"	243° 0' 37"	0.84299
16	337° 26' 17"	-5° 09' 13"	341° 06' 04"	-13° 33' 24"	0° 56' 41"	15' 26.89"	242° 51' 21"	0.84614
17	337° 58' 54"	-5° 08' 56"	341° 36' 53"	-13° 20' 51"	0° 56' 40"	15' 26.53"	242° 42' 09"	0.84926
18	338° 31' 30"	-5° 08' 38"	342° 07' 38"	-13° 08' 15"	0° 56' 39"	15' 26.17"	242° 33' 01"	0.85236
19	339° 04' 05"	-5° 08' 19"	342° 38' 18"	-12° 55' 36"	0° 56' 37"	15' 25.81"	242° 23' 58"	0.85542
20	339° 36' 38"	-5° 07' 57"	343° 08' 54"	-12° 42' 54"	0° 56' 36"	15' 25.46"	242° 14' 59"	0.85846
21	340° 09' 10"	-5° 07' 34"	343° 39' 25"	-12° 30' 08"	0° 56' 35"	15' 25.10"	242° 6' 04"	0.86146
22	340° 41' 41"	-5° 07' 10"	344° 09' 52"	-12° 17' 20"	0° 56' 34"	15' 24.75"	241° 57' 12"	0.86444
23	341° 14' 10"	-5° 06' 44"	344° 40' 15"	-12° 04' 29"	0° 56' 32"	15' 24.40"	241° 48' 25"	0.86739
24	341° 46' 38"	-5° 06' 16"	345° 10' 34"	-11° 51' 36"	0° 56' 31"	15' 24.05"	241° 39' 42"	0.87031

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	203° 50' 51"	-0.81"	202° 03' 59"	-9° 15' 02"	0.9966660	16' 02.84"	23° 26' 16"	14 m 37 s
1	203° 53' 20"	-0.81"	202° 06' 19"	-9° 15' 57"	0.9966540	16' 02.85"	23° 26' 16"	14 m 37 s
2	203° 55' 49"	-0.81"	202° 08' 40"	-9° 16' 52"	0.9966421	16' 02.86"	23° 26' 16"	14 m 38 s
3	203° 58' 18"	-0.81"	202° 10' 60"	-9° 17' 46"	0.9966302	16' 02.87"	23° 26' 16"	14 m 38 s
4	204° 00' 46"	-0.81"	202° 13' 20"	-9° 18' 41"	0.9966182	16' 02.89"	23° 26' 16"	14 m 39 s
5	204° 03' 15"	-0.81"	202° 15' 40"	-9° 19' 36"	0.9966063	16' 02.90"	23° 26' 16"	14 m 39 s
6	204° 05' 44"	-0.81"	202° 18' 00"	-9° 20' 31"	0.9965944	16' 02.91"	23° 26' 16"	14 m 40 s
7	204° 08' 13"	-0.81"	202° 20' 20"	-9° 21' 25"	0.9965824	16' 02.92"	23° 26' 16"	14 m 40 s
8	204° 10' 42"	-0.81"	202° 22' 41"	-9° 22' 20"	0.9965705	16' 02.93"	23° 26' 16"	14 m 41 s
9	204° 13' 10"	-0.81"	202° 25' 01"	-9° 23' 15"	0.9965586	16' 02.94"	23° 26' 16"	14 m 41 s
10	204° 15' 39"	-0.81"	202° 27' 21"	-9° 24' 10"	0.9965467	16' 02.96"	23° 26' 16"	14 m 42 s
11	204° 18' 08"	-0.81"	202° 29' 41"	-9° 25' 04"	0.9965348	16' 02.97"	23° 26' 16"	14 m 42 s
12	204° 20' 37"	-0.81"	202° 32' 02"	-9° 25' 59"	0.9965229	16' 02.98"	23° 26' 16"	14 m 43 s
13	204° 23' 06"	-0.81"	202° 34' 22"	-9° 26' 54"	0.9965110	16' 02.99"	23° 26' 16"	14 m 43 s
14	204° 25' 34"	-0.81"	202° 36' 42"	-9° 27' 48"	0.9964991	16' 03.00"	23° 26' 16"	14 m 44 s
15	204° 28' 03"	-0.81"	202° 39' 03"	-9° 28' 43"	0.9964872	16' 03.01"	23° 26' 16"	14 m 44 s
16	204° 30' 32"	-0.81"	202° 41' 23"	-9° 29' 38"	0.9964753	16' 03.02"	23° 26' 16"	14 m 45 s
17	204° 33' 01"	-0.80"	202° 43' 43"	-9° 30' 32"	0.9964634	16' 03.04"	23° 26' 16"	14 m 45 s
18	204° 35' 30"	-0.80"	202° 46' 04"	-9° 31' 27"	0.9964515	16' 03.05"	23° 26' 16"	14 m 46 s
19	204° 37' 59"	-0.80"	202° 48' 24"	-9° 32' 21"	0.9964396	16' 03.06"	23° 26' 16"	14 m 46 s
20	204° 40' 27"	-0.80"	202° 50' 45"	-9° 33' 16"	0.9964277	16' 03.07"	23° 26' 16"	14 m 47 s
21	204° 42' 56"	-0.80"	202° 53' 05"	-9° 34' 10"	0.9964159	16' 03.08"	23° 26' 16"	14 m 47 s
22	204° 45' 25"	-0.80"	202° 55' 25"	-9° 35' 05"	0.9964040	16' 03.09"	23° 26' 16"	14 m 48 s
23	204° 47' 54"	-0.80"	202° 57' 46"	-9° 35' 59"	0.9963921	16' 03.10"	23° 26' 16"	14 m 48 s
24	204° 50' 23"	-0.80"	203° 00' 06"	-9° 36' 54"	0.9963803	16' 03.12"	23° 26' 16"	14 m 49 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	341° 46' 38"	-5° 06' 16"	345° 10' 34"	-11° 51' 36"	0° 56' 31"	15' 24.05"	241° 39' 42"	0.87031
1	342° 19' 04"	-5° 05' 46"	345° 40' 49"	-11° 38' 39"	0° 56' 30"	15' 23.70"	241° 31' 01"	0.87319
2	342° 51' 29"	-5° 05' 15"	346° 10' 59"	-11° 25' 40"	0° 56' 28"	15' 23.35"	241° 22' 25"	0.87605
3	343° 23' 53"	-5° 04' 43"	346° 41' 06"	-11° 12' 39"	0° 56' 27"	15' 23.00"	241° 13' 51"	0.87888
4	343° 56' 15"	-5° 04' 08"	347° 11' 09"	-10° 59' 34"	0° 56' 26"	15' 22.65"	241° 5' 21"	0.88167
5	344° 28' 36"	-5° 03' 32"	347° 41' 07"	-10° 46' 28"	0° 56' 25"	15' 22.30"	240° 56' 54"	0.88444
6	345° 00' 55"	-5° 02' 55"	348° 11' 02"	-10° 33' 19"	0° 56' 23"	15' 21.96"	240° 48' 29"	0.88718
7	345° 33' 14"	-5° 02' 16"	348° 40' 54"	-10° 20' 08"	0° 56' 22"	15' 21.61"	240° 40' 07"	0.88988
8	346° 05' 30"	-5° 01' 35"	349° 10' 41"	-10° 06' 54"	0° 56' 21"	15' 21.27"	240° 31' 48"	0.89255
9	346° 37' 46"	-5° 00' 53"	349° 40' 25"	-9° 53' 39"	0° 56' 20"	15' 20.93"	240° 23' 30"	0.89520
10	347° 10' 00"	-5° 00' 09"	350° 10' 05"	-9° 40' 21"	0° 56' 18"	15' 20.58"	240° 15' 15"	0.89781
11	347° 42' 13"	-4° 59' 24"	350° 39' 42"	-9° 27' 01"	0° 56' 17"	15' 20.24"	240° 7' 01"	0.90039
12	348° 14' 24"	-4° 58' 37"	351° 09' 16"	-9° 13' 39"	0° 56' 16"	15' 19.90"	239° 58' 49"	0.90294
13	348° 46' 34"	-4° 57' 48"	351° 38' 45"	-9° 00' 16"	0° 56' 15"	15' 19.57"	239° 50' 38"	0.90545
14	349° 18' 43"	-4° 56' 58"	352° 08' 12"	-8° 46' 50"	0° 56' 13"	15' 19.23"	239° 42' 28"	0.90794
15	349° 50' 50"	-4° 56' 07"	352° 37' 35"	-8° 33' 23"	0° 56' 12"	15' 18.89"	239° 34' 19"	0.91039
16	350° 22' 57"	-4° 55' 14"	353° 06' 55"	-8° 19' 54"	0° 56' 11"	15' 18.56"	239° 26' 11"	0.91281
17	350° 55' 01"	-4° 54' 19"	353° 36' 12"	-8° 06' 24"	0° 56' 10"	15' 18.22"	239° 18' 03"	0.91520
18	351° 27' 05"	-4° 53' 23"	354° 05' 26"	-7° 52' 52"	0° 56' 08"	15' 17.89"	239° 9' 54"	0.91756
19	351° 59' 07"	-4° 52' 26"	354° 34' 36"	-7° 39' 18"	0° 56' 07"	15' 17.56"	239° 1' 45"	0.91989
20	352° 31' 07"	-4° 51' 27"	355° 03' 44"	-7° 25' 43"	0° 56' 06"	15' 17.22"	238° 53' 36"	0.92218
21	353° 03' 07"	-4° 50' 26"	355° 32' 49"	-7° 12' 07"	0° 56' 05"	15' 16.89"	238° 45' 25"	0.92444
22	353° 35' 05"	-4° 49' 24"	356° 01' 51"	-6° 58' 29"	0° 56' 04"	15' 16.56"	238° 37' 12"	0.92667
23	354° 07' 01"	-4° 48' 21"	356° 30' 50"	-6° 44' 50"	0° 56' 02"	15' 16.24"	238° 28' 58"	0.92886
24	354° 38' 57"	-4° 47' 16"	356° 59' 46"	-6° 31' 10"	0° 56' 01"	15' 15.91"	238° 20' 41"	0.93103

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	204° 50' 23"	-0.80"	203° 00' 06"	-9° 36' 54"	0.9963803	16' 03.12"	23° 26' 16"	14 m 49 s
1	204° 52' 52"	-0.79"	203° 02' 27"	-9° 37' 48"	0.9963684	16' 03.13"	23° 26' 16"	14 m 49 s
2	204° 55' 20"	-0.79"	203° 04' 47"	-9° 38' 43"	0.9963565	16' 03.14"	23° 26' 16"	14 m 50 s
3	204° 57' 49"	-0.79"	203° 07' 08"	-9° 39' 37"	0.9963447	16' 03.15"	23° 26' 16"	14 m 50 s
4	205° 00' 18"	-0.79"	203° 09' 28"	-9° 40' 32"	0.9963328	16' 03.16"	23° 26' 16"	14 m 51 s
5	205° 02' 47"	-0.79"	203° 11' 49"	-9° 41' 26"	0.9963210	16' 03.17"	23° 26' 16"	14 m 51 s
6	205° 05' 16"	-0.79"	203° 14' 10"	-9° 42' 21"	0.9963092	16' 03.18"	23° 26' 16"	14 m 52 s
7	205° 07' 45"	-0.79"	203° 16' 30"	-9° 43' 15"	0.9962973	16' 03.20"	23° 26' 16"	14 m 52 s
8	205° 10' 14"	-0.78"	203° 18' 51"	-9° 44' 09"	0.9962855	16' 03.21"	23° 26' 16"	14 m 53 s
9	205° 12' 42"	-0.78"	203° 21' 11"	-9° 45' 04"	0.9962737	16' 03.22"	23° 26' 16"	14 m 53 s
10	205° 15' 11"	-0.78"	203° 23' 32"	-9° 45' 58"	0.9962618	16' 03.23"	23° 26' 16"	14 m 54 s
11	205° 17' 40"	-0.78"	203° 25' 53"	-9° 46' 53"	0.9962500	16' 03.24"	23° 26' 16"	14 m 54 s
12	205° 20' 09"	-0.78"	203° 28' 13"	-9° 47' 47"	0.9962382	16' 03.25"	23° 26' 16"	14 m 55 s
13	205° 22' 38"	-0.77"	203° 30' 34"	-9° 48' 41"	0.9962264	16' 03.26"	23° 26' 16"	14 m 55 s
14	205° 25' 07"	-0.77"	203° 32' 55"	-9° 49' 35"	0.9962146	16' 03.28"	23° 26' 16"	14 m 56 s
15	205° 27' 36"	-0.77"	203° 35' 15"	-9° 50' 30"	0.9962028	16' 03.29"	23° 26' 16"	14 m 56 s
16	205° 30' 05"	-0.77"	203° 37' 36"	-9° 51' 24"	0.9961910	16' 03.30"	23° 26' 16"	14 m 57 s
17	205° 32' 34"	-0.77"	203° 39' 57"	-9° 52' 18"	0.9961792	16' 03.31"	23° 26' 16"	14 m 57 s
18	205° 35' 02"	-0.76"	203° 42' 18"	-9° 53' 12"	0.9961674	16' 03.32"	23° 26' 16"	14 m 58 s
19	205° 37' 31"	-0.76"	203° 44' 38"	-9° 54' 07"	0.9961556	16' 03.33"	23° 26' 16"	14 m 58 s
20	205° 40' 00"	-0.76"	203° 46' 59"	-9° 55' 01"	0.9961438	16' 03.34"	23° 26' 16"	14 m 59 s
21	205° 42' 29"	-0.76"	203° 49' 20"	-9° 55' 55"	0.9961320	16' 03.36"	23° 26' 16"	14 m 59 s
22	205° 44' 58"	-0.75"	203° 51' 41"	-9° 56' 49"	0.9961203	16' 03.37"	23° 26' 16"	14 m 60 s
23	205° 47' 27"	-0.75"	203° 54' 02"	-9° 57' 43"	0.9961085	16' 03.38"	23° 26' 16"	15 m 00 s
24	205° 49' 56"	-0.75"	203° 56' 23"	-9° 58' 38"	0.9960967	16' 03.39"	23° 26' 16"	15 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	354° 38' 57"	-4° 47' 16"	356° 59' 46"	-6° 31' 10"	0° 56' 01"	15' 15.91"	238° 20' 41"	0.93103
1	355° 10' 51"	-4° 46' 09"	357° 28' 40"	-6° 17' 29"	0° 55' 60"	15' 15.58"	238° 12' 22"	0.93316
2	355° 42' 44"	-4° 45' 01"	357° 57' 31"	-6° 03' 46"	0° 55' 59"	15' 15.26"	238° 3' 59"	0.93525
3	356° 14' 35"	-4° 43' 52"	358° 26' 19"	-5° 50' 03"	0° 55' 58"	15' 14.93"	237° 55' 32"	0.93732
4	356° 46' 25"	-4° 42' 41"	358° 55' 05"	-5° 36' 18"	0° 55' 56"	15' 14.61"	237° 47' 01"	0.93935
5	357° 18' 14"	-4° 41' 29"	359° 23' 48"	-5° 22' 33"	0° 55' 55"	15' 14.29"	237° 38' 24"	0.94135
6	357° 50' 01"	-4° 40' 16"	359° 52' 29"	-5° 08' 47"	0° 55' 54"	15' 13.97"	237° 29' 43"	0.94331
7	358° 21' 47"	-4° 39' 01"	0° 21' 08"	-4° 55' 00"	0° 55' 53"	15' 13.65"	237° 20' 54"	0.94524
8	358° 53' 32"	-4° 37' 45"	0° 49' 45"	-4° 41' 13"	0° 55' 52"	15' 13.33"	237° 11' 59"	0.94714
9	359° 25' 16"	-4° 36' 27"	1° 18' 19"	-4° 27' 25"	0° 55' 51"	15' 13.01"	237° 2' 56"	0.94901
10	359° 56' 58"	-4° 35' 08"	1° 46' 51"	-4° 13' 36"	0° 55' 49"	15' 12.69"	236° 53' 44"	0.95084
11	0° 28' 39"	-4° 33' 47"	2° 15' 21"	-3° 59' 46"	0° 55' 48"	15' 12.38"	236° 44' 23"	0.95264
12	1° 00' 18"	-4° 32' 26"	2° 43' 49"	-3° 45' 57"	0° 55' 47"	15' 12.06"	236° 34' 51"	0.95440
13	1° 31' 56"	-4° 31' 03"	3° 12' 15"	-3° 32' 06"	0° 55' 46"	15' 11.75"	236° 25' 08"	0.95613
14	2° 03' 33"	-4° 29' 38"	3° 40' 39"	-3° 18' 16"	0° 55' 45"	15' 11.44"	236° 15' 12"	0.95783
15	2° 35' 09"	-4° 28' 12"	4° 09' 01"	-3° 04' 25"	0° 55' 44"	15' 11.13"	236° 5' 02"	0.95950
16	3° 06' 43"	-4° 26' 45"	4° 37' 21"	-2° 50' 34"	0° 55' 42"	15' 10.82"	235° 54' 37"	0.96113
17	3° 38' 16"	-4° 25' 17"	5° 05' 40"	-2° 36' 42"	0° 55' 41"	15' 10.51"	235° 43' 56"	0.96272
18	4° 09' 48"	-4° 23' 47"	5° 33' 57"	-2° 22' 51"	0° 55' 40"	15' 10.20"	235° 32' 57"	0.96428
19	4° 41' 18"	-4° 22' 16"	6° 02' 12"	-2° 08' 59"	0° 55' 39"	15' 09.89"	235° 21' 38"	0.96581
20	5° 12' 48"	-4° 20' 44"	6° 30' 26"	-1° 55' 08"	0° 55' 38"	15' 09.59"	235° 9' 57"	0.96731
21	5° 44' 15"	-4° 19' 10"	6° 58' 38"	-1° 41' 16"	0° 55' 37"	15' 09.28"	234° 57' 53"	0.96877
22	6° 15' 42"	-4° 17' 36"	7° 26' 49"	-1° 27' 25"	0° 55' 36"	15' 08.98"	234° 45' 24"	0.97020
23	6° 47' 07"	-4° 15' 60"	7° 54' 58"	-1° 13' 33"	0° 55' 35"	15' 08.67"	234° 32' 27"	0.97159
24	7° 18' 31"	-4° 14' 22"	8° 23' 06"	0° -59' 42"	0° 55' 33"	15' 08.37"	234° 18' 59"	0.97295

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	205° 49' 56"	-0.75"	203° 56' 23"	-9° 58' 38"	0.9960967	16' 03.39"	23° 26' 16"	15 m 01 s
1	205° 52' 25"	-0.75"	203° 58' 43"	-9° 59' 32"	0.9960850	16' 03.40"	23° 26' 16"	15 m 01 s
2	205° 54' 54"	-0.74"	204° 01' 04"	-10° 00' 26"	0.9960732	16' 03.41"	23° 26' 16"	15 m 01 s
3	205° 57' 23"	-0.74"	204° 03' 25"	-10° 01' 20"	0.9960614	16' 03.42"	23° 26' 16"	15 m 02 s
4	205° 59' 52"	-0.74"	204° 05' 46"	-10° 02' 14"	0.9960497	16' 03.44"	23° 26' 16"	15 m 02 s
5	206° 02' 21"	-0.74"	204° 08' 07"	-10° 03' 08"	0.9960379	16' 03.45"	23° 26' 16"	15 m 03 s
6	206° 04' 50"	-0.73"	204° 10' 28"	-10° 04' 02"	0.9960262	16' 03.46"	23° 26' 16"	15 m 03 s
7	206° 07' 19"	-0.73"	204° 12' 49"	-10° 04' 56"	0.9960145	16' 03.47"	23° 26' 16"	15 m 04 s
8	206° 09' 47"	-0.73"	204° 15' 10"	-10° 05' 50"	0.9960027	16' 03.48"	23° 26' 16"	15 m 04 s
9	206° 12' 16"	-0.73"	204° 17' 31"	-10° 06' 44"	0.9959910	16' 03.49"	23° 26' 16"	15 m 05 s
10	206° 14' 45"	-0.72"	204° 19' 52"	-10° 07' 38"	0.9959793	16' 03.50"	23° 26' 16"	15 m 05 s
11	206° 17' 14"	-0.72"	204° 22' 13"	-10° 08' 32"	0.9959676	16' 03.52"	23° 26' 16"	15 m 06 s
12	206° 19' 43"	-0.72"	204° 24' 34"	-10° 09' 26"	0.9959558	16' 03.53"	23° 26' 16"	15 m 06 s
13	206° 22' 12"	-0.71"	204° 26' 55"	-10° 10' 20"	0.9959441	16' 03.54"	23° 26' 16"	15 m 06 s
14	206° 24' 41"	-0.71"	204° 29' 16"	-10° 11' 14"	0.9959324	16' 03.55"	23° 26' 16"	15 m 07 s
15	206° 27' 10"	-0.71"	204° 31' 37"	-10° 12' 08"	0.9959207	16' 03.56"	23° 26' 16"	15 m 07 s
16	206° 29' 39"	-0.70"	204° 33' 58"	-10° 13' 02"	0.9959090	16' 03.57"	23° 26' 16"	15 m 08 s
17	206° 32' 08"	-0.70"	204° 36' 20"	-10° 13' 56"	0.9958973	16' 03.58"	23° 26' 16"	15 m 08 s
18	206° 34' 37"	-0.70"	204° 38' 41"	-10° 14' 50"	0.9958856	16' 03.59"	23° 26' 16"	15 m 09 s
19	206° 37' 06"	-0.69"	204° 41' 02"	-10° 15' 43"	0.9958739	16' 03.61"	23° 26' 16"	15 m 09 s
20	206° 39' 35"	-0.69"	204° 43' 23"	-10° 16' 37"	0.9958622	16' 03.62"	23° 26' 16"	15 m 10 s
21	206° 42' 04"	-0.69"	204° 45' 44"	-10° 17' 31"	0.9958506	16' 03.63"	23° 26' 16"	15 m 10 s
22	206° 44' 33"	-0.68"	204° 48' 05"	-10° 18' 25"	0.9958389	16' 03.64"	23° 26' 16"	15 m 11 s
23	206° 47' 02"	-0.68"	204° 50' 27"	-10° 19' 19"	0.9958272	16' 03.65"	23° 26' 16"	15 m 11 s
24	206° 49' 31"	-0.68"	204° 52' 48"	-10° 20' 12"	0.9958155	16' 03.66"	23° 26' 16"	15 m 11 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	7° 18' 31"	-4° 14' 22"	8° 23' 06"	0°-59' 42"	0° 55' 33"	15' 08.37"	234° 18' 59"	0.97295
1	7° 49' 54"	-4° 12' 44"	8° 51' 13"	0°-45' 51"	0° 55' 32"	15' 08.07"	234° 4' 58"	0.97427
2	8° 21' 15"	-4° 11' 04"	9° 19' 19"	0°-32' 01"	0° 55' 31"	15' 07.77"	233° 50' 20"	0.97556
3	8° 52' 35"	-4° 09' 23"	9° 47' 23"	0°-18' 10"	0° 55' 30"	15' 07.48"	233° 35' 03"	0.97682
4	9° 23' 54"	-4° 07' 41"	10° 15' 26"	0° -4' 21"	0° 55' 29"	15' 07.18"	233° 19' 03"	0.97804
5	9° 55' 12"	-4° 05' 58"	10° 43' 29"	0° 09' 29"	0° 55' 28"	15' 06.88"	233° 2' 14"	0.97923
6	10° 26' 28"	-4° 04' 13"	11° 11' 30"	0° 23' 18"	0° 55' 27"	15' 06.59"	232° 44' 33"	0.98038
7	10° 57' 43"	-4° 02' 28"	11° 39' 30"	0° 37' 06"	0° 55' 26"	15' 06.30"	232° 25' 55"	0.98150
8	11° 28' 57"	-4° 00' 41"	12° 07' 30"	0° 50' 53"	0° 55' 25"	15' 06.00"	232° 6' 13"	0.98259
9	12° 00' 09"	-3° 58' 53"	12° 35' 28"	1° 04' 40"	0° 55' 24"	15' 05.71"	231° 45' 21"	0.98364
10	12° 31' 21"	-3° 57' 04"	13° 03' 26"	1° 18' 26"	0° 55' 23"	15' 05.42"	231° 23' 11"	0.98466
11	13° 02' 31"	-3° 55' 14"	13° 31' 23"	1° 32' 12"	0° 55' 22"	15' 05.14"	230° 59' 36"	0.98564
12	13° 33' 39"	-3° 53' 23"	13° 59' 20"	1° 45' 56"	0° 55' 21"	15' 04.85"	230° 34' 25"	0.98659
13	14° 04' 47"	-3° 51' 30"	14° 27' 16"	1° 59' 40"	0° 55' 20"	15' 04.56"	230° 7' 29"	0.98750
14	14° 35' 53"	-3° 49' 37"	14° 55' 11"	2° 13' 23"	0° 55' 18"	15' 04.28"	229° 38' 34"	0.98838
15	15° 06' 58"	-3° 47' 42"	15° 23' 06"	2° 27' 04"	0° 55' 17"	15' 04.00"	229° 7' 26"	0.98923
16	15° 38' 02"	-3° 45' 47"	15° 51' 01"	2° 40' 45"	0° 55' 16"	15' 03.71"	228° 33' 50"	0.99004
17	16° 09' 04"	-3° 43' 50"	16° 18' 55"	2° 54' 25"	0° 55' 15"	15' 03.43"	227° 57' 26"	0.99082
18	16° 40' 06"	-3° 41' 53"	16° 46' 49"	3° 08' 03"	0° 55' 14"	15' 03.15"	227° 17' 53"	0.99156
19	17° 11' 06"	-3° 39' 54"	17° 14' 42"	3° 21' 40"	0° 55' 13"	15' 02.88"	226° 34' 44"	0.99227
20	17° 42' 04"	-3° 37' 54"	17° 42' 36"	3° 35' 16"	0° 55' 12"	15' 02.60"	225° 47' 31"	0.99295
21	18° 13' 02"	-3° 35' 54"	18° 10' 29"	3° 48' 51"	0° 55' 11"	15' 02.32"	224° 55' 36"	0.99359
22	18° 43' 58"	-3° 33' 52"	18° 38' 22"	4° 02' 24"	0° 55' 10"	15' 02.05"	223° 58' 18"	0.99420
23	19° 14' 54"	-3° 31' 49"	19° 06' 15"	4° 15' 56"	0° 55' 09"	15' 01.78"	222° 54' 46"	0.99477
24	19° 45' 48"	-3° 29' 46"	19° 34' 08"	4° 29' 26"	0° 55' 08"	15' 01.50"	221° 43' 59"	0.99531

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	206° 49' 31"	-0.68"	204° 52' 48"	-10° 20' 12"	0.9958155	16' 03.66"	23° 26' 16"	15 m 11 s
1	206° 52' 00"	-0.67"	204° 55' 09"	-10° 21' 06"	0.9958039	16' 03.67"	23° 26' 16"	15 m 12 s
2	206° 54' 29"	-0.67"	204° 57' 30"	-10° 21' 60"	0.9957922	16' 03.68"	23° 26' 16"	15 m 12 s
3	206° 56' 58"	-0.67"	204° 59' 52"	-10° 22' 54"	0.9957806	16' 03.70"	23° 26' 16"	15 m 13 s
4	206° 59' 27"	-0.66"	205° 02' 13"	-10° 23' 47"	0.9957689	16' 03.71"	23° 26' 16"	15 m 13 s
5	207° 01' 56"	-0.66"	205° 04' 34"	-10° 24' 41"	0.9957573	16' 03.72"	23° 26' 16"	15 m 14 s
6	207° 04' 25"	-0.66"	205° 06' 56"	-10° 25' 35"	0.9957456	16' 03.73"	23° 26' 16"	15 m 14 s
7	207° 06' 54"	-0.65"	205° 09' 17"	-10° 26' 28"	0.9957340	16' 03.74"	23° 26' 16"	15 m 14 s
8	207° 09' 23"	-0.65"	205° 11' 39"	-10° 27' 22"	0.9957224	16' 03.75"	23° 26' 16"	15 m 15 s
9	207° 11' 52"	-0.64"	205° 13' 60"	-10° 28' 16"	0.9957107	16' 03.76"	23° 26' 16"	15 m 15 s
10	207° 14' 21"	-0.64"	205° 16' 21"	-10° 29' 09"	0.9956991	16' 03.78"	23° 26' 16"	15 m 16 s
11	207° 16' 50"	-0.64"	205° 18' 43"	-10° 30' 03"	0.9956875	16' 03.79"	23° 26' 16"	15 m 16 s
12	207° 19' 20"	-0.63"	205° 21' 04"	-10° 30' 56"	0.9956759	16' 03.80"	23° 26' 16"	15 m 17 s
13	207° 21' 49"	-0.63"	205° 23' 26"	-10° 31' 50"	0.9956643	16' 03.81"	23° 26' 16"	15 m 17 s
14	207° 24' 18"	-0.62"	205° 25' 47"	-10° 32' 43"	0.9956527	16' 03.82"	23° 26' 16"	15 m 17 s
15	207° 26' 47"	-0.62"	205° 28' 09"	-10° 33' 37"	0.9956411	16' 03.83"	23° 26' 16"	15 m 18 s
16	207° 29' 16"	-0.62"	205° 30' 30"	-10° 34' 31"	0.9956295	16' 03.84"	23° 26' 16"	15 m 18 s
17	207° 31' 45"	-0.61"	205° 32' 52"	-10° 35' 24"	0.9956179	16' 03.85"	23° 26' 16"	15 m 19 s
18	207° 34' 14"	-0.61"	205° 35' 13"	-10° 36' 17"	0.9956063	16' 03.86"	23° 26' 16"	15 m 19 s
19	207° 36' 43"	-0.60"	205° 37' 35"	-10° 37' 11"	0.9955947	16' 03.88"	23° 26' 16"	15 m 20 s
20	207° 39' 12"	-0.60"	205° 39' 56"	-10° 38' 04"	0.9955831	16' 03.89"	23° 26' 16"	15 m 20 s
21	207° 41' 41"	-0.59"	205° 42' 18"	-10° 38' 58"	0.9955715	16' 03.90"	23° 26' 16"	15 m 20 s
22	207° 44' 10"	-0.59"	205° 44' 40"	-10° 39' 51"	0.9955600	16' 03.91"	23° 26' 16"	15 m 21 s
23	207° 46' 39"	-0.59"	205° 47' 01"	-10° 40' 45"	0.9955484	16' 03.92"	23° 26' 16"	15 m 21 s
24	207° 49' 08"	-0.58"	205° 49' 23"	-10° 41' 38"	0.9955368	16' 03.93"	23° 26' 16"	15 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	19° 45' 48"	-3° 29' 46"	19° 34' 08"	4° 29' 26"	0° 55' 08"	15' 01.50"	221° 43' 59"	0.99531
1	20° 16' 40"	-3° 27' 41"	20° 02' 01"	4° 42' 55"	0° 55' 07"	15' 01.23"	220° 24' 44"	0.99582
2	20° 47' 32"	-3° 25' 35"	20° 29' 54"	4° 56' 22"	0° 55' 06"	15' 00.97"	218° 55' 31"	0.99629
3	21° 18' 22"	-3° 23' 29"	20° 57' 48"	5° 09' 48"	0° 55' 05"	15' 00.70"	217° 14' 29"	0.99672
4	21° 49' 11"	-3° 21' 22"	21° 25' 41"	5° 23' 12"	0° 55' 04"	15' 00.43"	215° 19' 25"	0.99713
5	22° 19' 59"	-3° 19' 13"	21° 53' 35"	5° 36' 34"	0° 55' 03"	15' 00.17"	213° 7' 32"	0.99750
6	22° 50' 46"	-3° 17' 04"	22° 21' 29"	5° 49' 55"	0° 55' 02"	14' 59.90"	210° 35' 25"	0.99783
7	23° 21' 31"	-3° 14' 54"	22° 49' 24"	6° 03' 14"	0° 55' 01"	14' 59.64"	207° 38' 55"	0.99814
8	23° 52' 16"	-3° 12' 43"	23° 17' 19"	6° 16' 30"	0° 55' 00"	14' 59.38"	204° 12' 57"	0.99840
9	24° 22' 59"	-3° 10' 31"	23° 45' 14"	6° 29' 45"	0° 54' 60"	14' 59.12"	200° 11' 35"	0.99864
10	24° 53' 41"	-3° 08' 18"	24° 13' 10"	6° 42' 58"	0° 54' 59"	14' 58.87"	195° 28' 09"	0.99884
11	25° 24' 22"	-3° 06' 05"	24° 41' 07"	6° 56' 09"	0° 54' 58"	14' 58.61"	189° 55' 54"	0.99901
12	25° 55' 01"	-3° 03' 50"	25° 09' 04"	7° 09' 18"	0° 54' 57"	14' 58.36"	183° 29' 21"	0.99914
13	26° 25' 40"	-3° 01' 35"	25° 37' 01"	7° 22' 25"	0° 54' 56"	14' 58.10"	176° 6' 48"	0.99924
14	26° 56' 17"	-2° 59' 19"	26° 04' 60"	7° 35' 30"	0° 54' 55"	14' 57.85"	167° 53' 23"	0.99931
15	27° 26' 54"	-2° 57' 03"	26° 32' 59"	7° 48' 32"	0° 54' 54"	14' 57.60"	159° 3' 38"	0.99934
16	27° 57' 29"	-2° 54' 45"	27° 00' 59"	8° 01' 32"	0° 54' 53"	14' 57.36"	150° 0' 46"	0.99934
17	28° 28' 03"	-2° 52' 27"	27° 28' 60"	8° 14' 30"	0° 54' 52"	14' 57.11"	141° 11' 39"	0.99931
18	28° 58' 35"	-2° 50' 08"	27° 57' 02"	8° 27' 26"	0° 54' 51"	14' 56.86"	132° 59' 24"	0.99924
19	29° 29' 07"	-2° 47' 48"	28° 25' 05"	8° 40' 19"	0° 54' 50"	14' 56.62"	125° 38' 23"	0.99914
20	29° 59' 38"	-2° 45' 27"	28° 53' 08"	8° 53' 09"	0° 54' 49"	14' 56.38"	119° 13' 37"	0.99901
21	30° 30' 07"	-2° 43' 06"	29° 21' 13"	9° 05' 57"	0° 54' 49"	14' 56.14"	113° 43' 16"	0.99884
22	31° 00' 35"	-2° 40' 44"	29° 49' 19"	9° 18' 43"	0° 54' 48"	14' 55.90"	109° 1' 51"	0.99864
23	31° 31' 03"	-2° 38' 21"	30° 17' 26"	9° 31' 26"	0° 54' 47"	14' 55.66"	105° 2' 36"	0.99841
24	32° 01' 29"	-2° 35' 58"	30° 45' 34"	9° 44' 06"	0° 54' 46"	14' 55.43"	101° 38' 52"	0.99815

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	207° 49' 08"	-0.58"	205° 49' 23"	-10° 41' 38"	0.9955368	16' 03.93"	23° 26' 16"	15 m 22 s
1	207° 51' 37"	-0.58"	205° 51' 45"	-10° 42' 31"	0.9955253	16' 03.94"	23° 26' 16"	15 m 22 s
2	207° 54' 07"	-0.57"	205° 54' 06"	-10° 43' 25"	0.9955137	16' 03.95"	23° 26' 16"	15 m 23 s
3	207° 56' 36"	-0.57"	205° 56' 28"	-10° 44' 18"	0.9955022	16' 03.97"	23° 26' 16"	15 m 23 s
4	207° 59' 05"	-0.56"	205° 58' 50"	-10° 45' 11"	0.9954906	16' 03.98"	23° 26' 16"	15 m 23 s
5	208° 01' 34"	-0.56"	206° 01' 12"	-10° 46' 05"	0.9954791	16' 03.99"	23° 26' 16"	15 m 24 s
6	208° 04' 03"	-0.55"	206° 03' 33"	-10° 46' 58"	0.9954675	16' 04.00"	23° 26' 16"	15 m 24 s
7	208° 06' 32"	-0.55"	206° 05' 55"	-10° 47' 51"	0.9954560	16' 04.01"	23° 26' 16"	15 m 25 s
8	208° 09' 01"	-0.55"	206° 08' 17"	-10° 48' 44"	0.9954445	16' 04.02"	23° 26' 16"	15 m 25 s
9	208° 11' 30"	-0.54"	206° 10' 39"	-10° 49' 38"	0.9954330	16' 04.03"	23° 26' 16"	15 m 25 s
10	208° 13' 59"	-0.54"	206° 13' 01"	-10° 50' 31"	0.9954214	16' 04.04"	23° 26' 16"	15 m 26 s
11	208° 16' 29"	-0.53"	206° 15' 22"	-10° 51' 24"	0.9954099	16' 04.06"	23° 26' 16"	15 m 26 s
12	208° 18' 58"	-0.53"	206° 17' 44"	-10° 52' 17"	0.9953984	16' 04.07"	23° 26' 16"	15 m 27 s
13	208° 21' 27"	-0.52"	206° 20' 06"	-10° 53' 10"	0.9953869	16' 04.08"	23° 26' 16"	15 m 27 s
14	208° 23' 56"	-0.52"	206° 22' 28"	-10° 54' 04"	0.9953754	16' 04.09"	23° 26' 16"	15 m 27 s
15	208° 26' 25"	-0.51"	206° 24' 50"	-10° 54' 57"	0.9953639	16' 04.10"	23° 26' 16"	15 m 28 s
16	208° 28' 54"	-0.51"	206° 27' 12"	-10° 55' 50"	0.9953524	16' 04.11"	23° 26' 16"	15 m 28 s
17	208° 31' 23"	-0.50"	206° 29' 34"	-10° 56' 43"	0.9953409	16' 04.12"	23° 26' 16"	15 m 29 s
18	208° 33' 53"	-0.50"	206° 31' 56"	-10° 57' 36"	0.9953294	16' 04.13"	23° 26' 16"	15 m 29 s
19	208° 36' 22"	-0.49"	206° 34' 18"	-10° 58' 29"	0.9953180	16' 04.14"	23° 26' 16"	15 m 29 s
20	208° 38' 51"	-0.49"	206° 36' 40"	-10° 59' 22"	0.9953065	16' 04.16"	23° 26' 16"	15 m 30 s
21	208° 41' 20"	-0.48"	206° 39' 02"	-11° 00' 15"	0.9952950	16' 04.17"	23° 26' 16"	15 m 30 s
22	208° 43' 49"	-0.48"	206° 41' 24"	-11° 01' 08"	0.9952835	16' 04.18"	23° 26' 16"	15 m 31 s
23	208° 46' 18"	-0.47"	206° 43' 46"	-11° 02' 01"	0.9952721	16' 04.19"	23° 26' 16"	15 m 31 s
24	208° 48' 48"	-0.47"	206° 46' 08"	-11° 02' 54"	0.9952606	16' 04.20"	23° 26' 16"	15 m 31 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	32° 01' 29"	-2° 35' 58"	30° 45' 34"	9° 44' 06"	0° 54' 46"	14' 55.43"	101° 38' 52"	0.99815
1	32° 31' 54"	-2° 33' 34"	31° 13' 43"	9° 56' 44"	0° 54' 45"	14' 55.20"	98° 44' 42"	0.99785
2	33° 02' 18"	-2° 31' 09"	31° 41' 54"	10° 09' 19"	0° 54' 44"	14' 54.97"	96° 15' 05"	0.99752
3	33° 32' 41"	-2° 28' 44"	32° 10' 06"	10° 21' 51"	0° 54' 43"	14' 54.74"	94° 5' 50"	0.99716
4	34° 03' 02"	-2° 26' 18"	32° 38' 19"	10° 34' 20"	0° 54' 43"	14' 54.51"	92° 13' 34"	0.99677
5	34° 33' 23"	-2° 23' 51"	33° 06' 34"	10° 46' 47"	0° 54' 42"	14' 54.28"	90° 35' 30"	0.99634
6	35° 03' 43"	-2° 21' 24"	33° 34' 50"	10° 59' 10"	0° 54' 41"	14' 54.06"	89° 9' 26"	0.99588
7	35° 34' 01"	-2° 18' 56"	34° 03' 08"	11° 11' 31"	0° 54' 40"	14' 53.84"	87° 53' 31"	0.99539
8	36° 04' 19"	-2° 16' 28"	34° 31' 27"	11° 23' 48"	0° 54' 39"	14' 53.61"	86° 46' 15"	0.99486
9	36° 34' 35"	-2° 13' 59"	34° 59' 48"	11° 36' 02"	0° 54' 39"	14' 53.40"	85° 46' 27"	0.99431
10	37° 04' 51"	-2° 11' 29"	35° 28' 10"	11° 48' 14"	0° 54' 38"	14' 53.18"	84° 53' 04"	0.99372
11	37° 35' 05"	-2° 08' 59"	35° 56' 34"	12° 00' 22"	0° 54' 37"	14' 52.96"	84° 5' 16"	0.99310
12	38° 05' 19"	-2° 06' 29"	36° 24' 60"	12° 12' 27"	0° 54' 36"	14' 52.75"	83° 22' 21"	0.99245
13	38° 35' 31"	-2° 03' 57"	36° 53' 27"	12° 24' 28"	0° 54' 35"	14' 52.54"	82° 43' 44"	0.99177
14	39° 05' 43"	-2° 01' 26"	37° 21' 56"	12° 36' 26"	0° 54' 35"	14' 52.33"	82° 8' 54"	0.99105
15	39° 35' 53"	-1° 58' 54"	37° 50' 27"	12° 48' 21"	0° 54' 34"	14' 52.12"	81° 37' 26"	0.99030
16	40° 06' 03"	-1° 56' 21"	38° 19' 00"	13° 00' 13"	0° 54' 33"	14' 51.92"	81° 8' 58"	0.98953
17	40° 36' 11"	-1° 53' 48"	38° 47' 35"	13° 12' 01"	0° 54' 32"	14' 51.72"	80° 43' 11"	0.98872
18	41° 06' 19"	-1° 51' 14"	39° 16' 11"	13° 23' 45"	0° 54' 32"	14' 51.52"	80° 19' 49"	0.98788
19	41° 36' 25"	-1° 48' 40"	39° 44' 50"	13° 35' 26"	0° 54' 31"	14' 51.32"	79° 58' 38"	0.98700
20	42° 06' 31"	-1° 46' 06"	40° 13' 31"	13° 47' 04"	0° 54' 30"	14' 51.12"	79° 39' 26"	0.98610
21	42° 36' 35"	-1° 43' 31"	40° 42' 13"	13° 58' 38"	0° 54' 29"	14' 50.93"	79° 22' 01"	0.98517
22	43° 06' 39"	-1° 40' 56"	41° 10' 58"	14° 10' 08"	0° 54' 29"	14' 50.73"	79° 6' 15"	0.98420
23	43° 36' 42"	-1° 38' 20"	41° 39' 44"	14° 21' 34"	0° 54' 28"	14' 50.54"	78° 51' 59"	0.98321
24	44° 06' 44"	-1° 35' 44"	42° 08' 33"	14° 32' 56"	0° 54' 27"	14' 50.35"	78° 39' 05"	0.98218

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	208° 48' 48"	-0.47"	206° 46' 08"	-11° 02' 54"	0.9952606	16' 04.20"	23° 26' 16"	15 m 31 s
1	208° 51' 17"	-0.46"	206° 48' 30"	-11° 03' 47"	0.9952492	16' 04.21"	23° 26' 16"	15 m 32 s
2	208° 53' 46"	-0.46"	206° 50' 52"	-11° 04' 40"	0.9952377	16' 04.22"	23° 26' 16"	15 m 32 s
3	208° 56' 15"	-0.45"	206° 53' 14"	-11° 05' 33"	0.9952263	16' 04.23"	23° 26' 16"	15 m 32 s
4	208° 58' 44"	-0.45"	206° 55' 37"	-11° 06' 26"	0.9952148	16' 04.24"	23° 26' 16"	15 m 33 s
5	209° 01' 13"	-0.44"	206° 57' 59"	-11° 07' 19"	0.9952034	16' 04.26"	23° 26' 16"	15 m 33 s
6	209° 03' 43"	-0.44"	207° 00' 21"	-11° 08' 12"	0.9951920	16' 04.27"	23° 26' 16"	15 m 34 s
7	209° 06' 12"	-0.43"	207° 02' 43"	-11° 09' 05"	0.9951805	16' 04.28"	23° 26' 16"	15 m 34 s
8	209° 08' 41"	-0.43"	207° 05' 05"	-11° 09' 57"	0.9951691	16' 04.29"	23° 26' 16"	15 m 34 s
9	209° 11' 10"	-0.42"	207° 07' 28"	-11° 10' 50"	0.9951577	16' 04.30"	23° 26' 16"	15 m 35 s
10	209° 13' 39"	-0.42"	207° 09' 50"	-11° 11' 43"	0.9951463	16' 04.31"	23° 26' 16"	15 m 35 s
11	209° 16' 09"	-0.41"	207° 12' 12"	-11° 12' 36"	0.9951349	16' 04.32"	23° 26' 16"	15 m 35 s
12	209° 18' 38"	-0.41"	207° 14' 34"	-11° 13' 29"	0.9951235	16' 04.33"	23° 26' 16"	15 m 36 s
13	209° 21' 07"	-0.40"	207° 16' 57"	-11° 14' 21"	0.9951121	16' 04.34"	23° 26' 16"	15 m 36 s
14	209° 23' 36"	-0.40"	207° 19' 19"	-11° 15' 14"	0.9951007	16' 04.35"	23° 26' 16"	15 m 37 s
15	209° 26' 06"	-0.39"	207° 21' 41"	-11° 16' 07"	0.9950893	16' 04.37"	23° 26' 16"	15 m 37 s
16	209° 28' 35"	-0.39"	207° 24' 04"	-11° 16' 59"	0.9950779	16' 04.38"	23° 26' 16"	15 m 37 s
17	209° 31' 04"	-0.38"	207° 26' 26"	-11° 17' 52"	0.9950665	16' 04.39"	23° 26' 16"	15 m 38 s
18	209° 33' 33"	-0.38"	207° 28' 48"	-11° 18' 45"	0.9950551	16' 04.40"	23° 26' 16"	15 m 38 s
19	209° 36' 03"	-0.37"	207° 31' 11"	-11° 19' 37"	0.9950438	16' 04.41"	23° 26' 16"	15 m 38 s
20	209° 38' 32"	-0.36"	207° 33' 33"	-11° 20' 30"	0.9950324	16' 04.42"	23° 26' 16"	15 m 39 s
21	209° 41' 01"	-0.36"	207° 35' 56"	-11° 21' 23"	0.9950210	16' 04.43"	23° 26' 16"	15 m 39 s
22	209° 43' 30"	-0.35"	207° 38' 18"	-11° 22' 15"	0.9950097	16' 04.44"	23° 26' 16"	15 m 39 s
23	209° 45' 60"	-0.35"	207° 40' 41"	-11° 23' 08"	0.9949983	16' 04.45"	23° 26' 16"	15 m 40 s
24	209° 48' 29"	-0.34"	207° 43' 03"	-11° 24' 00"	0.9949869	16' 04.46"	23° 26' 16"	15 m 40 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	44° 06' 44"	-1° 35' 44"	42° 08' 33"	14° 32' 56"	0° 54' 27"	14' 50.35"	78° 39' 05"	0.98218
1	44° 36' 44"	-1° 33' 07"	42° 37' 24"	14° 44' 15"	0° 54' 27"	14' 50.17"	78° 27' 28"	0.98113
2	45° 06' 44"	-1° 30' 30"	43° 06' 17"	14° 55' 30"	0° 54' 26"	14' 49.98"	78° 17' 01"	0.98004
3	45° 36' 44"	-1° 27' 53"	43° 35' 13"	15° 06' 41"	0° 54' 25"	14' 49.80"	78° 7' 38"	0.97892
4	46° 06' 42"	-1° 25' 15"	44° 04' 10"	15° 17' 48"	0° 54' 25"	14' 49.62"	77° 59' 17"	0.97778
5	46° 36' 39"	-1° 22' 38"	44° 33' 10"	15° 28' 51"	0° 54' 24"	14' 49.45"	77° 51' 51"	0.97660
6	47° 06' 36"	-1° 19' 59"	45° 02' 12"	15° 39' 50"	0° 54' 23"	14' 49.27"	77° 45' 18"	0.97539
7	47° 36' 31"	-1° 17' 21"	45° 31' 17"	15° 50' 44"	0° 54' 23"	14' 49.10"	77° 39' 34"	0.97416
8	48° 06' 26"	-1° 14' 42"	46° 00' 24"	16° 01' 35"	0° 54' 22"	14' 48.93"	77° 34' 36"	0.97289
9	48° 36' 20"	-1° 12' 03"	46° 29' 33"	16° 12' 21"	0° 54' 22"	14' 48.76"	77° 30' 21"	0.97159
10	49° 06' 13"	-1° 09' 23"	46° 58' 45"	16° 23' 03"	0° 54' 21"	14' 48.60"	77° 26' 46"	0.97027
11	49° 36' 05"	-1° 06' 44"	47° 27' 59"	16° 33' 41"	0° 54' 20"	14' 48.43"	77° 23' 50"	0.96891
12	50° 05' 57"	-1° 04' 04"	47° 57' 15"	16° 44' 15"	0° 54' 20"	14' 48.27"	77° 21' 29"	0.96753
13	50° 35' 47"	-1° 01' 24"	48° 26' 34"	16° 54' 44"	0° 54' 19"	14' 48.12"	77° 19' 43"	0.96611
14	51° 05' 37"	0°-58' 43"	48° 55' 56"	17° 05' 09"	0° 54' 19"	14' 47.96"	77° 18' 29"	0.96467
15	51° 35' 26"	0°-56' 03"	49° 25' 20"	17° 15' 29"	0° 54' 18"	14' 47.81"	77° 17' 45"	0.96320
16	52° 05' 15"	0°-53' 22"	49° 54' 47"	17° 25' 45"	0° 54' 17"	14' 47.66"	77° 17' 31"	0.96170
17	52° 35' 02"	0°-50' 41"	50° 24' 16"	17° 35' 56"	0° 54' 17"	14' 47.51"	77° 17' 44"	0.96017
18	53° 04' 49"	0°-47' 60"	50° 53' 48"	17° 46' 02"	0° 54' 16"	14' 47.36"	77° 18' 24"	0.95862
19	53° 34' 35"	0°-45' 19"	51° 23' 23"	17° 56' 04"	0° 54' 16"	14' 47.22"	77° 19' 29"	0.95703
20	54° 04' 21"	0°-42' 37"	51° 53' 00"	18° 06' 02"	0° 54' 15"	14' 47.08"	77° 20' 59"	0.95542
21	54° 34' 05"	0°-39' 55"	52° 22' 40"	18° 15' 54"	0° 54' 15"	14' 46.94"	77° 22' 51"	0.95377
22	55° 03' 49"	0°-37' 14"	52° 52' 23"	18° 25' 42"	0° 54' 14"	14' 46.81"	77° 25' 05"	0.95211
23	55° 33' 32"	0°-34' 32"	53° 22' 08"	18° 35' 25"	0° 54' 14"	14' 46.68"	77° 27' 41"	0.95041
24	56° 03' 15"	0°-31' 50"	53° 51' 56"	18° 45' 03"	0° 54' 13"	14' 46.55"	77° 30' 37"	0.94868

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	209° 48' 29"	-0.34"	207° 43' 03"	-11° 24' 00"	0.9949869	16' 04.46"	23° 26' 16"	15 m 40 s
1	209° 50' 58"	-0.34"	207° 45' 26"	-11° 24' 53"	0.9949756	16' 04.48"	23° 26' 16"	15 m 41 s
2	209° 53' 27"	-0.33"	207° 47' 48"	-11° 25' 46"	0.9949643	16' 04.49"	23° 26' 16"	15 m 41 s
3	209° 55' 57"	-0.33"	207° 50' 11"	-11° 26' 38"	0.9949529	16' 04.50"	23° 26' 16"	15 m 41 s
4	209° 58' 26"	-0.32"	207° 52' 33"	-11° 27' 31"	0.9949416	16' 04.51"	23° 26' 16"	15 m 42 s
5	210° 00' 55"	-0.32"	207° 54' 56"	-11° 28' 23"	0.9949302	16' 04.52"	23° 26' 16"	15 m 42 s
6	210° 03' 24"	-0.31"	207° 57' 19"	-11° 29' 15"	0.9949189	16' 04.53"	23° 26' 16"	15 m 42 s
7	210° 05' 54"	-0.31"	207° 59' 41"	-11° 30' 08"	0.9949076	16' 04.54"	23° 26' 16"	15 m 43 s
8	210° 08' 23"	-0.30"	208° 02' 04"	-11° 31' 00"	0.9948963	16' 04.55"	23° 26' 16"	15 m 43 s
9	210° 10' 52"	-0.29"	208° 04' 27"	-11° 31' 53"	0.9948850	16' 04.56"	23° 26' 16"	15 m 43 s
10	210° 13' 22"	-0.29"	208° 06' 49"	-11° 32' 45"	0.9948737	16' 04.57"	23° 26' 16"	15 m 44 s
11	210° 15' 51"	-0.28"	208° 09' 12"	-11° 33' 37"	0.9948623	16' 04.59"	23° 26' 16"	15 m 44 s
12	210° 18' 20"	-0.28"	208° 11' 35"	-11° 34' 30"	0.9948510	16' 04.60"	23° 26' 16"	15 m 44 s
13	210° 20' 50"	-0.27"	208° 13' 58"	-11° 35' 22"	0.9948397	16' 04.61"	23° 26' 16"	15 m 45 s
14	210° 23' 19"	-0.27"	208° 16' 20"	-11° 36' 14"	0.9948285	16' 04.62"	23° 26' 16"	15 m 45 s
15	210° 25' 48"	-0.26"	208° 18' 43"	-11° 37' 07"	0.9948172	16' 04.63"	23° 26' 16"	15 m 45 s
16	210° 28' 17"	-0.26"	208° 21' 06"	-11° 37' 59"	0.9948059	16' 04.64"	23° 26' 16"	15 m 46 s
17	210° 30' 47"	-0.25"	208° 23' 29"	-11° 38' 51"	0.9947946	16' 04.65"	23° 26' 16"	15 m 46 s
18	210° 33' 16"	-0.25"	208° 25' 52"	-11° 39' 43"	0.9947833	16' 04.66"	23° 26' 16"	15 m 46 s
19	210° 35' 45"	-0.24"	208° 28' 14"	-11° 40' 36"	0.9947721	16' 04.67"	23° 26' 16"	15 m 47 s
20	210° 38' 15"	-0.24"	208° 30' 37"	-11° 41' 28"	0.9947608	16' 04.68"	23° 26' 16"	15 m 47 s
21	210° 40' 44"	-0.23"	208° 33' 00"	-11° 42' 20"	0.9947495	16' 04.70"	23° 26' 16"	15 m 47 s
22	210° 43' 13"	-0.22"	208° 35' 23"	-11° 43' 12"	0.9947383	16' 04.71"	23° 26' 16"	15 m 48 s
23	210° 45' 43"	-0.22"	208° 37' 46"	-11° 44' 04"	0.9947270	16' 04.72"	23° 26' 16"	15 m 48 s
24	210° 48' 12"	-0.21"	208° 40' 09"	-11° 44' 56"	0.9947158	16' 04.73"	23° 26' 16"	15 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	56° 03' 15"	0°-31' 50"	53° 51' 56"	18° 45' 03"	0° 54' 13"	14' 46.55"	77° 30' 37"	0.94868
1	56° 32' 57"	0°-29' 08"	54° 21' 47"	18° 54' 36"	0° 54' 13"	14' 46.42"	77° 33' 53"	0.94693
2	57° 02' 38"	0°-26' 26"	54° 51' 40"	19° 04' 04"	0° 54' 12"	14' 46.30"	77° 37' 27"	0.94515
3	57° 32' 19"	0°-23' 43"	55° 21' 37"	19° 13' 27"	0° 54' 12"	14' 46.18"	77° 41' 20"	0.94334
4	58° 01' 59"	0°-21' 01"	55° 51' 36"	19° 22' 45"	0° 54' 12"	14' 46.06"	77° 45' 30"	0.94151
5	58° 31' 38"	0°-18' 19"	56° 21' 38"	19° 31' 58"	0° 54' 11"	14' 45.94"	77° 49' 57"	0.93964
6	59° 01' 17"	0°-15' 36"	56° 51' 42"	19° 41' 06"	0° 54' 11"	14' 45.83"	77° 54' 41"	0.93776
7	59° 30' 55"	0°-12' 54"	57° 21' 50"	19° 50' 08"	0° 54' 10"	14' 45.72"	77° 59' 40"	0.93584
8	60° 00' 33"	0°-10' 11"	57° 52' 00"	19° 59' 06"	0° 54' 10"	14' 45.62"	78° 4' 55"	0.93390
9	60° 30' 10"	0° -7' 29"	58° 22' 14"	20° 07' 58"	0° 54' 10"	14' 45.51"	78° 10' 24"	0.93193
10	60° 59' 46"	0° -4' 46"	58° 52' 30"	20° 16' 45"	0° 54' 09"	14' 45.41"	78° 16' 08"	0.92993
11	61° 29' 22"	0° -2' 04"	59° 22' 49"	20° 25' 26"	0° 54' 09"	14' 45.31"	78° 22' 06"	0.92791
12	61° 58' 57"	0° 00' 38"	59° 53' 10"	20° 34' 02"	0° 54' 09"	14' 45.22"	78° 28' 17"	0.92586
13	62° 28' 32"	0° 03' 21"	60° 23' 35"	20° 42' 33"	0° 54' 08"	14' 45.13"	78° 34' 42"	0.92379
14	62° 58' 07"	0° 06' 03"	60° 54' 02"	20° 50' 58"	0° 54' 08"	14' 45.04"	78° 41' 20"	0.92169
15	63° 27' 40"	0° 08' 45"	61° 24' 33"	20° 59' 18"	0° 54' 08"	14' 44.96"	78° 48' 09"	0.91957
16	63° 57' 14"	0° 11' 25"	61° 55' 07"	21° 07' 29"	0° 54' 07"	14' 44.87"	78° 55' 15"	0.91741
17	64° 26' 47"	0° 14' 07"	62° 25' 43"	21° 15' 38"	0° 54' 07"	14' 44.79"	79° 2' 29"	0.91524
18	64° 56' 19"	0° 16' 49"	62° 56' 22"	21° 23' 41"	0° 54' 07"	14' 44.72"	79° 9' 54"	0.91304
19	65° 25' 51"	0° 19' 31"	63° 27' 04"	21° 31' 38"	0° 54' 06"	14' 44.65"	79° 17' 31"	0.91081
20	65° 55' 23"	0° 22' 13"	63° 57' 49"	21° 39' 29"	0° 54' 06"	14' 44.58"	79° 25' 18"	0.90856
21	66° 24' 54"	0° 24' 55"	64° 28' 37"	21° 47' 15"	0° 54' 06"	14' 44.51"	79° 33' 16"	0.90628
22	66° 54' 25"	0° 27' 36"	64° 59' 27"	21° 54' 55"	0° 54' 06"	14' 44.45"	79° 41' 25"	0.90398
23	67° 23' 56"	0° 30' 18"	65° 30' 21"	22° 02' 29"	0° 54' 05"	14' 44.39"	79° 49' 44"	0.90166
24	67° 53' 26"	0° 32' 59"	66° 01' 17"	22° 09' 57"	0° 54' 05"	14' 44.33"	79° 58' 12"	0.89931

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	210° 48' 12"	-0.21"	208° 40' 09"	-11° 44' 56"	0.9947158	16' 04.73"	23° 26' 16"	15 m 48 s
1	210° 50' 42"	-0.21"	208° 42' 32"	-11° 45' 49"	0.9947045	16' 04.74"	23° 26' 16"	15 m 49 s
2	210° 53' 11"	-0.20"	208° 44' 55"	-11° 46' 41"	0.9946933	16' 04.75"	23° 26' 16"	15 m 49 s
3	210° 55' 40"	-0.20"	208° 47' 18"	-11° 47' 33"	0.9946820	16' 04.76"	23° 26' 16"	15 m 49 s
4	210° 58' 10"	-0.19"	208° 49' 41"	-11° 48' 25"	0.9946708	16' 04.77"	23° 26' 16"	15 m 50 s
5	211° 00' 39"	-0.19"	208° 52' 04"	-11° 49' 17"	0.9946596	16' 04.78"	23° 26' 16"	15 m 50 s
6	211° 03' 08"	-0.18"	208° 54' 27"	-11° 50' 09"	0.9946484	16' 04.79"	23° 26' 16"	15 m 50 s
7	211° 05' 38"	-0.18"	208° 56' 50"	-11° 51' 01"	0.9946371	16' 04.80"	23° 26' 16"	15 m 51 s
8	211° 08' 07"	-0.17"	208° 59' 13"	-11° 51' 53"	0.9946259	16' 04.81"	23° 26' 16"	15 m 51 s
9	211° 10' 36"	-0.17"	209° 01' 36"	-11° 52' 45"	0.9946147	16' 04.83"	23° 26' 16"	15 m 51 s
10	211° 13' 06"	-0.16"	209° 03' 59"	-11° 53' 37"	0.9946035	16' 04.84"	23° 26' 16"	15 m 52 s
11	211° 15' 35"	-0.16"	209° 06' 23"	-11° 54' 29"	0.9945923	16' 04.85"	23° 26' 16"	15 m 52 s
12	211° 18' 05"	-0.15"	209° 08' 46"	-11° 55' 21"	0.9945811	16' 04.86"	23° 26' 16"	15 m 52 s
13	211° 20' 34"	-0.14"	209° 11' 09"	-11° 56' 12"	0.9945699	16' 04.87"	23° 26' 16"	15 m 53 s
14	211° 23' 03"	-0.14"	209° 13' 32"	-11° 57' 04"	0.9945587	16' 04.88"	23° 26' 16"	15 m 53 s
15	211° 25' 33"	-0.13"	209° 15' 55"	-11° 57' 56"	0.9945475	16' 04.89"	23° 26' 16"	15 m 53 s
16	211° 28' 02"	-0.13"	209° 18' 19"	-11° 58' 48"	0.9945363	16' 04.90"	23° 26' 16"	15 m 54 s
17	211° 30' 32"	-0.12"	209° 20' 42"	-11° 59' 40"	0.9945252	16' 04.91"	23° 26' 16"	15 m 54 s
18	211° 33' 01"	-0.12"	209° 23' 05"	-12° 00' 32"	0.9945140	16' 04.92"	23° 26' 16"	15 m 54 s
19	211° 35' 31"	-0.11"	209° 25' 29"	-12° 01' 23"	0.9945028	16' 04.93"	23° 26' 16"	15 m 54 s
20	211° 37' 60"	-0.11"	209° 27' 52"	-12° 02' 15"	0.9944917	16' 04.95"	23° 26' 16"	15 m 55 s
21	211° 40' 29"	-0.10"	209° 30' 15"	-12° 03' 07"	0.9944805	16' 04.96"	23° 26' 16"	15 m 55 s
22	211° 42' 59"	-0.10"	209° 32' 39"	-12° 03' 59"	0.9944693	16' 04.97"	23° 26' 16"	15 m 55 s
23	211° 45' 28"	-0.09"	209° 35' 02"	-12° 04' 50"	0.9944582	16' 04.98"	23° 26' 16"	15 m 56 s
24	211° 47' 58"	-0.09"	209° 37' 25"	-12° 05' 42"	0.9944470	16' 04.99"	23° 26' 16"	15 m 56 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	67° 53' 26"	0° 32' 59"	66° 01' 17"	22° 09' 57"	0° 54' 05"	14' 44.33"	79° 58' 12"	0.89931
1	68° 22' 55"	0° 35' 40"	66° 32' 16"	22° 17' 19"	0° 54' 05"	14' 44.28"	80° 6' 51"	0.89693
2	68° 52' 25"	0° 38' 21"	67° 03' 18"	22° 24' 35"	0° 54' 05"	14' 44.23"	80° 15' 39"	0.89453
3	69° 21' 54"	0° 41' 02"	67° 34' 23"	22° 31' 45"	0° 54' 05"	14' 44.18"	80° 24' 36"	0.89211
4	69° 51' 23"	0° 43' 42"	68° 05' 31"	22° 38' 50"	0° 54' 05"	14' 44.14"	80° 33' 42"	0.88966
5	70° 20' 51"	0° 46' 22"	68° 36' 42"	22° 45' 48"	0° 54' 04"	14' 44.10"	80° 42' 57"	0.88719
6	70° 50' 19"	0° 49' 03"	69° 07' 55"	22° 52' 40"	0° 54' 04"	14' 44.06"	80° 52' 21"	0.88470
7	71° 19' 47"	0° 51' 42"	69° 39' 12"	22° 59' 25"	0° 54' 04"	14' 44.03"	81° 1' 53"	0.88218
8	71° 49' 15"	0° 54' 22"	70° 10' 31"	23° 06' 05"	0° 54' 04"	14' 44.00"	81° 11' 34"	0.87964
9	72° 18' 43"	0° 57' 01"	70° 41' 53"	23° 12' 38"	0° 54' 04"	14' 43.98"	81° 21' 22"	0.87708
10	72° 48' 10"	0° 59' 40"	71° 13' 17"	23° 19' 05"	0° 54' 04"	14' 43.95"	81° 31' 19"	0.87449
11	73° 17' 37"	1° 02' 19"	71° 44' 45"	23° 25' 26"	0° 54' 04"	14' 43.94"	81° 41' 23"	0.87188
12	73° 47' 04"	1° 04' 58"	72° 16' 15"	23° 31' 41"	0° 54' 04"	14' 43.92"	81° 51' 35"	0.86925
13	74° 16' 31"	1° 07' 36"	72° 47' 48"	23° 37' 49"	0° 54' 04"	14' 43.91"	82° 1' 55"	0.86660
14	74° 45' 57"	1° 10' 14"	73° 19' 24"	23° 43' 50"	0° 54' 04"	14' 43.90"	82° 12' 22"	0.86392
15	75° 15' 24"	1° 12' 52"	73° 51' 02"	23° 49' 45"	0° 54' 04"	14' 43.90"	82° 22' 56"	0.86122
16	75° 44' 50"	1° 15' 29"	74° 22' 43"	23° 55' 34"	0° 54' 04"	14' 43.90"	82° 33' 37"	0.85850
17	76° 14' 17"	1° 18' 06"	74° 54' 27"	24° 01' 16"	0° 54' 04"	14' 43.90"	82° 44' 25"	0.85576
18	76° 43' 43"	1° 20' 43"	75° 26' 13"	24° 06' 52"	0° 54' 04"	14' 43.91"	82° 55' 20"	0.85299
19	77° 13' 09"	1° 23' 19"	75° 58' 02"	24° 12' 21"	0° 54' 04"	14' 43.92"	83° 6' 21"	0.85021
20	77° 42' 35"	1° 25' 55"	76° 29' 54"	24° 17' 43"	0° 54' 04"	14' 43.94"	83° 17' 29"	0.84740
21	78° 12' 01"	1° 28' 30"	77° 01' 48"	24° 22' 59"	0° 54' 04"	14' 43.96"	83° 28' 43"	0.84457
22	78° 41' 27"	1° 31' 05"	77° 33' 44"	24° 28' 08"	0° 54' 04"	14' 43.98"	83° 40' 03"	0.84172
23	79° 10' 53"	1° 33' 40"	78° 05' 44"	24° 33' 10"	0° 54' 04"	14' 44.00"	83° 51' 29"	0.83885
24	79° 40' 19"	1° 36' 14"	78° 37' 45"	24° 38' 06"	0° 54' 04"	14' 44.03"	84° 3' 01"	0.83596

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	211° 47' 58"	-0.09"	209° 37' 25"	-12° 05' 42"	0.9944470	16' 04.99"	23° 26' 16"	15 m 56 s
1	211° 50' 27"	-0.08"	209° 39' 49"	-12° 06' 34"	0.9944359	16' 05.00"	23° 26' 16"	15 m 56 s
2	211° 52' 57"	-0.08"	209° 42' 12"	-12° 07' 25"	0.9944248	16' 05.01"	23° 26' 16"	15 m 57 s
3	211° 55' 26"	-0.07"	209° 44' 36"	-12° 08' 17"	0.9944136	16' 05.02"	23° 26' 16"	15 m 57 s
4	211° 57' 55"	-0.07"	209° 46' 59"	-12° 09' 08"	0.9944025	16' 05.03"	23° 26' 16"	15 m 57 s
5	212° 00' 25"	-0.06"	209° 49' 23"	-12° 09' 60"	0.9943914	16' 05.04"	23° 26' 16"	15 m 57 s
6	212° 02' 54"	-0.06"	209° 51' 46"	-12° 10' 52"	0.9943802	16' 05.05"	23° 26' 16"	15 m 58 s
7	212° 05' 24"	-0.05"	209° 54' 10"	-12° 11' 43"	0.9943691	16' 05.06"	23° 26' 16"	15 m 58 s
8	212° 07' 53"	-0.05"	209° 56' 33"	-12° 12' 35"	0.9943580	16' 05.07"	23° 26' 16"	15 m 58 s
9	212° 10' 23"	-0.04"	209° 58' 57"	-12° 13' 26"	0.9943469	16' 05.09"	23° 26' 16"	15 m 59 s
10	212° 12' 52"	-0.04"	210° 01' 20"	-12° 14' 18"	0.9943358	16' 05.10"	23° 26' 16"	15 m 59 s
11	212° 15' 22"	-0.03"	210° 03' 44"	-12° 15' 09"	0.9943247	16' 05.11"	23° 26' 16"	15 m 59 s
12	212° 17' 51"	-0.03"	210° 06' 08"	-12° 16' 01"	0.9943136	16' 05.12"	23° 26' 16"	15 m 59 s
13	212° 20' 21"	-0.02"	210° 08' 31"	-12° 16' 52"	0.9943025	16' 05.13"	23° 26' 16"	15 m 60 s
14	212° 22' 50"	-0.02"	210° 10' 55"	-12° 17' 43"	0.9942914	16' 05.14"	23° 26' 16"	15 m 60 s
15	212° 25' 20"	-0.01"	210° 13' 19"	-12° 18' 35"	0.9942803	16' 05.15"	23° 26' 16"	16 m 00 s
16	212° 27' 49"	-0.01"	210° 15' 42"	-12° 19' 26"	0.9942692	16' 05.16"	23° 26' 16"	16 m 01 s
17	212° 30' 19"	-0.00"	210° 18' 06"	-12° 20' 17"	0.9942582	16' 05.17"	23° 26' 16"	16 m 01 s
18	212° 32' 48"	0.00"	210° 20' 30"	-12° 21' 09"	0.9942471	16' 05.18"	23° 26' 16"	16 m 01 s
19	212° 35' 18"	0.01"	210° 22' 54"	-12° 22' 00"	0.9942360	16' 05.19"	23° 26' 16"	16 m 01 s
20	212° 37' 47"	0.01"	210° 25' 17"	-12° 22' 51"	0.9942249	16' 05.20"	23° 26' 16"	16 m 02 s
21	212° 40' 17"	0.02"	210° 27' 41"	-12° 23' 43"	0.9942139	16' 05.21"	23° 26' 16"	16 m 02 s
22	212° 42' 46"	0.02"	210° 30' 05"	-12° 24' 34"	0.9942028	16' 05.23"	23° 26' 16"	16 m 02 s
23	212° 45' 16"	0.03"	210° 32' 29"	-12° 25' 25"	0.9941918	16' 05.24"	23° 26' 16"	16 m 02 s
24	212° 47' 45"	0.03"	210° 34' 53"	-12° 26' 16"	0.9941807	16' 05.25"	23° 26' 16"	16 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	79° 40' 19"	1° 36' 14"	78° 37' 45"	24° 38' 06"	0° 54' 04"	14' 44.03"	84° 3' 01"	0.83596
1	80° 09' 45"	1° 38' 48"	79° 09' 49"	24° 42' 54"	0° 54' 04"	14' 44.07"	84° 14' 39"	0.83304
2	80° 39' 12"	1° 41' 22"	79° 41' 56"	24° 47' 36"	0° 54' 04"	14' 44.11"	84° 26' 23"	0.83011
3	81° 08' 38"	1° 43' 55"	80° 14' 05"	24° 52' 11"	0° 54' 05"	14' 44.15"	84° 38' 12"	0.82715
4	81° 38' 04"	1° 46' 27"	80° 46' 16"	24° 56' 40"	0° 54' 05"	14' 44.19"	84° 50' 06"	0.82418
5	82° 07' 31"	1° 48' 60"	81° 18' 30"	25° 01' 01"	0° 54' 05"	14' 44.24"	85° 2' 06"	0.82119
6	82° 36' 57"	1° 51' 31"	81° 50' 46"	25° 05' 15"	0° 54' 05"	14' 44.30"	85° 14' 11"	0.81817
7	83° 06' 24"	1° 54' 03"	82° 23' 04"	25° 09' 23"	0° 54' 05"	14' 44.36"	85° 26' 21"	0.81514
8	83° 35' 51"	1° 56' 33"	82° 55' 25"	25° 13' 23"	0° 54' 06"	14' 44.42"	85° 38' 36"	0.81208
9	84° 05' 18"	1° 59' 03"	83° 27' 48"	25° 17' 16"	0° 54' 06"	14' 44.48"	85° 50' 56"	0.80901
10	84° 34' 46"	2° 01' 33"	84° 00' 12"	25° 21' 03"	0° 54' 06"	14' 44.56"	86° 3' 20"	0.80592
11	85° 04' 13"	2° 04' 02"	84° 32' 40"	25° 24' 42"	0° 54' 06"	14' 44.63"	86° 15' 49"	0.80280
12	85° 33' 41"	2° 06' 31"	85° 05' 09"	25° 28' 14"	0° 54' 07"	14' 44.71"	86° 28' 23"	0.79967
13	86° 03' 09"	2° 08' 59"	85° 37' 40"	25° 31' 39"	0° 54' 07"	14' 44.79"	86° 41' 01"	0.79652
14	86° 32' 37"	2° 11' 27"	86° 10' 13"	25° 34' 57"	0° 54' 07"	14' 44.88"	86° 53' 43"	0.79335
15	87° 02' 06"	2° 13' 54"	86° 42' 48"	25° 38' 08"	0° 54' 08"	14' 44.97"	87° 6' 29"	0.79017
16	87° 31' 35"	2° 16' 20"	87° 15' 25"	25° 41' 11"	0° 54' 08"	14' 45.06"	87° 19' 19"	0.78696
17	88° 01' 04"	2° 18' 46"	87° 48' 04"	25° 44' 07"	0° 54' 08"	14' 45.16"	87° 32' 13"	0.78374
18	88° 30' 34"	2° 21' 12"	88° 20' 45"	25° 46' 56"	0° 54' 09"	14' 45.27"	87° 45' 11"	0.78049
19	89° 00' 04"	2° 23' 36"	88° 53' 28"	25° 49' 38"	0° 54' 09"	14' 45.37"	87° 58' 12"	0.77723
20	89° 29' 34"	2° 26' 01"	89° 26' 13"	25° 52' 12"	0° 54' 09"	14' 45.49"	88° 11' 17"	0.77396
21	89° 59' 05"	2° 28' 24"	89° 58' 59"	25° 54' 40"	0° 54' 10"	14' 45.60"	88° 24' 26"	0.77066
22	90° 28' 36"	2° 30' 47"	90° 31' 47"	25° 56' 59"	0° 54' 10"	14' 45.72"	88° 37' 37"	0.76735
23	90° 58' 08"	2° 33' 09"	91° 04' 36"	25° 59' 12"	0° 54' 11"	14' 45.85"	88° 50' 52"	0.76402
24	91° 27' 40"	2° 35' 31"	91° 37' 28"	26° 01' 17"	0° 54' 11"	14' 45.98"	89° 4' 10"	0.76067

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	212° 47' 45"	0.03"	210° 34' 53"	-12° 26' 16"	0.9941807	16' 05.25"	23° 26' 16"	16 m 03 s
1	212° 50' 15"	0.03"	210° 37' 17"	-12° 27' 08"	0.9941697	16' 05.26"	23° 26' 16"	16 m 03 s
2	212° 52' 44"	0.04"	210° 39' 41"	-12° 27' 59"	0.9941586	16' 05.27"	23° 26' 16"	16 m 03 s
3	212° 55' 14"	0.04"	210° 42' 04"	-12° 28' 50"	0.9941476	16' 05.28"	23° 26' 16"	16 m 04 s
4	212° 57' 43"	0.05"	210° 44' 28"	-12° 29' 41"	0.9941366	16' 05.29"	23° 26' 16"	16 m 04 s
5	213° 00' 13"	0.05"	210° 46' 52"	-12° 30' 32"	0.9941255	16' 05.30"	23° 26' 16"	16 m 04 s
6	213° 02' 43"	0.06"	210° 49' 16"	-12° 31' 23"	0.9941145	16' 05.31"	23° 26' 16"	16 m 04 s
7	213° 05' 12"	0.06"	210° 51' 40"	-12° 32' 14"	0.9941035	16' 05.32"	23° 26' 16"	16 m 05 s
8	213° 07' 42"	0.07"	210° 54' 04"	-12° 33' 05"	0.9940925	16' 05.33"	23° 26' 16"	16 m 05 s
9	213° 10' 11"	0.07"	210° 56' 28"	-12° 33' 56"	0.9940814	16' 05.34"	23° 26' 16"	16 m 05 s
10	213° 12' 41"	0.07"	210° 58' 52"	-12° 34' 47"	0.9940704	16' 05.35"	23° 26' 16"	16 m 05 s
11	213° 15' 10"	0.08"	211° 01' 17"	-12° 35' 38"	0.9940594	16' 05.36"	23° 26' 16"	16 m 06 s
12	213° 17' 40"	0.08"	211° 03' 41"	-12° 36' 29"	0.9940484	16' 05.38"	23° 26' 16"	16 m 06 s
13	213° 20' 10"	0.09"	211° 06' 05"	-12° 37' 20"	0.9940374	16' 05.39"	23° 26' 16"	16 m 06 s
14	213° 22' 39"	0.09"	211° 08' 29"	-12° 38' 11"	0.9940264	16' 05.40"	23° 26' 16"	16 m 06 s
15	213° 25' 09"	0.10"	211° 10' 53"	-12° 39' 02"	0.9940154	16' 05.41"	23° 26' 16"	16 m 07 s
16	213° 27' 38"	0.10"	211° 13' 17"	-12° 39' 53"	0.9940044	16' 05.42"	23° 26' 16"	16 m 07 s
17	213° 30' 08"	0.10"	211° 15' 41"	-12° 40' 44"	0.9939935	16' 05.43"	23° 26' 15"	16 m 07 s
18	213° 32' 37"	0.11"	211° 18' 06"	-12° 41' 35"	0.9939825	16' 05.44"	23° 26' 15"	16 m 07 s
19	213° 35' 07"	0.11"	211° 20' 30"	-12° 42' 26"	0.9939715	16' 05.45"	23° 26' 15"	16 m 08 s
20	213° 37' 37"	0.12"	211° 22' 54"	-12° 43' 16"	0.9939605	16' 05.46"	23° 26' 15"	16 m 08 s
21	213° 40' 06"	0.12"	211° 25' 18"	-12° 44' 07"	0.9939496	16' 05.47"	23° 26' 15"	16 m 08 s
22	213° 42' 36"	0.12"	211° 27' 43"	-12° 44' 58"	0.9939386	16' 05.48"	23° 26' 15"	16 m 08 s
23	213° 45' 06"	0.13"	211° 30' 07"	-12° 45' 49"	0.9939276	16' 05.49"	23° 26' 15"	16 m 09 s
24	213° 47' 35"	0.13"	211° 32' 31"	-12° 46' 39"	0.9939167	16' 05.50"	23° 26' 15"	16 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	91° 27' 40"	2° 35' 31"	91° 37' 28"	26° 01' 17"	0° 54' 11"	14' 45.98"	89° 4' 10"	0.76067
1	91° 57' 13"	2° 37' 52"	92° 10' 20"	26° 03' 14"	0° 54' 12"	14' 46.11"	89° 17' 31"	0.75730
2	92° 26' 46"	2° 40' 12"	92° 43' 15"	26° 05' 05"	0° 54' 12"	14' 46.25"	89° 30' 55"	0.75392
3	92° 56' 20"	2° 42' 32"	93° 16' 10"	26° 06' 47"	0° 54' 13"	14' 46.39"	89° 44' 22"	0.75052
4	93° 25' 54"	2° 44' 51"	93° 49' 08"	26° 08' 23"	0° 54' 13"	14' 46.54"	89° 57' 52"	0.74711
5	93° 55' 29"	2° 47' 09"	94° 22' 06"	26° 09' 50"	0° 54' 14"	14' 46.69"	90° 11' 24"	0.74368
6	94° 25' 04"	2° 49' 27"	94° 55' 06"	26° 11' 11"	0° 54' 14"	14' 46.84"	90° 24' 58"	0.74023
7	94° 54' 40"	2° 51' 44"	95° 28' 07"	26° 12' 24"	0° 54' 15"	14' 47.00"	90° 38' 35"	0.73676
8	95° 24' 17"	2° 53' 60"	96° 01' 09"	26° 13' 29"	0° 54' 16"	14' 47.17"	90° 52' 14"	0.73328
9	95° 53' 54"	2° 56' 15"	96° 34' 13"	26° 14' 27"	0° 54' 16"	14' 47.34"	91° 5' 55"	0.72979
10	96° 23' 32"	2° 58' 30"	97° 07' 18"	26° 15' 17"	0° 54' 17"	14' 47.51"	91° 19' 38"	0.72628
11	96° 53' 11"	3° 00' 44"	97° 40' 23"	26° 15' 60"	0° 54' 18"	14' 47.69"	91° 33' 23"	0.72275
12	97° 22' 50"	3° 02' 57"	98° 13' 30"	26° 16' 35"	0° 54' 18"	14' 47.87"	91° 47' 10"	0.71921
13	97° 52' 31"	3° 05' 09"	98° 46' 38"	26° 17' 02"	0° 54' 19"	14' 48.06"	92° 0' 59"	0.71565
14	98° 22' 11"	3° 07' 21"	99° 19' 47"	26° 17' 22"	0° 54' 20"	14' 48.25"	92° 14' 49"	0.71208
15	98° 51' 53"	3° 09' 32"	99° 52' 56"	26° 17' 35"	0° 54' 20"	14' 48.44"	92° 28' 41"	0.70849
16	99° 21' 36"	3° 11' 42"	100° 26' 07"	26° 17' 39"	0° 54' 21"	14' 48.64"	92° 42' 34"	0.70489
17	99° 51' 19"	3° 13' 51"	100° 59' 18"	26° 17' 36"	0° 54' 22"	14' 48.85"	92° 56' 29"	0.70128
18	100° 21' 03"	3° 15' 60"	101° 32' 30"	26° 17' 26"	0° 54' 23"	14' 49.06"	93° 10' 24"	0.69765
19	100° 50' 48"	3° 18' 08"	102° 05' 42"	26° 17' 08"	0° 54' 23"	14' 49.27"	93° 24' 21"	0.69400
20	101° 20' 34"	3° 20' 14"	102° 38' 56"	26° 16' 42"	0° 54' 24"	14' 49.49"	93° 38' 19"	0.69034
21	101° 50' 21"	3° 22' 20"	103° 12' 09"	26° 16' 08"	0° 54' 25"	14' 49.71"	93° 52' 17"	0.68667
22	102° 20' 08"	3° 24' 26"	103° 45' 24"	26° 15' 27"	0° 54' 26"	14' 49.94"	94° 6' 16"	0.68298
23	102° 49' 57"	3° 26' 30"	104° 18' 39"	26° 14' 39"	0° 54' 27"	14' 50.17"	94° 20' 16"	0.67929
24	103° 19' 47"	3° 28' 33"	104° 51' 54"	26° 13' 42"	0° 54' 28"	14' 50.41"	94° 34' 17"	0.67557

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	213° 47' 35"	0.13"	211° 32' 31"	-12° 46' 39"	0.9939167	16' 05.50"	23° 26' 15"	16 m 09 s
1	213° 50' 05"	0.14"	211° 34' 56"	-12° 47' 30"	0.9939057	16' 05.51"	23° 26' 15"	16 m 09 s
2	213° 52' 34"	0.14"	211° 37' 20"	-12° 48' 21"	0.9938948	16' 05.52"	23° 26' 15"	16 m 09 s
3	213° 55' 04"	0.14"	211° 39' 44"	-12° 49' 11"	0.9938838	16' 05.54"	23° 26' 15"	16 m 09 s
4	213° 57' 34"	0.15"	211° 42' 09"	-12° 50' 02"	0.9938729	16' 05.55"	23° 26' 15"	16 m 10 s
5	214° 00' 03"	0.15"	211° 44' 33"	-12° 50' 53"	0.9938620	16' 05.56"	23° 26' 15"	16 m 10 s
6	214° 02' 33"	0.15"	211° 46' 58"	-12° 51' 43"	0.9938510	16' 05.57"	23° 26' 15"	16 m 10 s
7	214° 05' 03"	0.16"	211° 49' 22"	-12° 52' 34"	0.9938401	16' 05.58"	23° 26' 16"	16 m 10 s
8	214° 07' 32"	0.16"	211° 51' 47"	-12° 53' 24"	0.9938292	16' 05.59"	23° 26' 16"	16 m 11 s
9	214° 10' 02"	0.16"	211° 54' 11"	-12° 54' 15"	0.9938182	16' 05.60"	23° 26' 16"	16 m 11 s
10	214° 12' 32"	0.17"	211° 56' 36"	-12° 55' 05"	0.9938073	16' 05.61"	23° 26' 16"	16 m 11 s
11	214° 15' 01"	0.17"	211° 59' 00"	-12° 55' 56"	0.9937964	16' 05.62"	23° 26' 16"	16 m 11 s
12	214° 17' 31"	0.17"	212° 01' 25"	-12° 56' 46"	0.9937855	16' 05.63"	23° 26' 16"	16 m 11 s
13	214° 20' 01"	0.18"	212° 03' 49"	-12° 57' 37"	0.9937746	16' 05.64"	23° 26' 16"	16 m 12 s
14	214° 22' 30"	0.18"	212° 06' 14"	-12° 58' 27"	0.9937637	16' 05.65"	23° 26' 16"	16 m 12 s
15	214° 24' 60"	0.18"	212° 08' 39"	-12° 59' 18"	0.9937528	16' 05.66"	23° 26' 16"	16 m 12 s
16	214° 27' 30"	0.19"	212° 11' 03"	-13° 00' 08"	0.9937419	16' 05.67"	23° 26' 16"	16 m 12 s
17	214° 29' 59"	0.19"	212° 13' 28"	-13° 00' 59"	0.9937310	16' 05.68"	23° 26' 16"	16 m 13 s
18	214° 32' 29"	0.19"	212° 15' 53"	-13° 01' 49"	0.9937201	16' 05.69"	23° 26' 16"	16 m 13 s
19	214° 34' 59"	0.20"	212° 18' 17"	-13° 02' 39"	0.9937092	16' 05.71"	23° 26' 16"	16 m 13 s
20	214° 37' 28"	0.20"	212° 20' 42"	-13° 03' 30"	0.9936983	16' 05.72"	23° 26' 16"	16 m 13 s
21	214° 39' 58"	0.20"	212° 23' 07"	-13° 04' 20"	0.9936874	16' 05.73"	23° 26' 16"	16 m 13 s
22	214° 42' 28"	0.21"	212° 25' 32"	-13° 05' 10"	0.9936766	16' 05.74"	23° 26' 16"	16 m 14 s
23	214° 44' 57"	0.21"	212° 27' 56"	-13° 06' 00"	0.9936657	16' 05.75"	23° 26' 16"	16 m 14 s
24	214° 47' 27"	0.21"	212° 30' 21"	-13° 06' 51"	0.9936548	16' 05.76"	23° 26' 16"	16 m 14 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	103° 19' 47"	3° 28' 33"	104° 51' 54"	26° 13' 42"	0° 54' 28"	14' 50.41"	94° 34' 17"	0.67557
1	103° 49' 37"	3° 30' 36"	105° 25' 10"	26° 12' 38"	0° 54' 28"	14' 50.65"	94° 48' 18"	0.67185
2	104° 19' 29"	3° 32' 37"	105° 58' 26"	26° 11' 26"	0° 54' 29"	14' 50.90"	95° 2' 20"	0.66811
3	104° 49' 21"	3° 34' 38"	106° 31' 42"	26° 10' 06"	0° 54' 30"	14' 51.15"	95° 16' 21"	0.66436
4	105° 19' 15"	3° 36' 38"	107° 04' 58"	26° 08' 39"	0° 54' 31"	14' 51.41"	95° 30' 23"	0.66059
5	105° 49' 10"	3° 38' 37"	107° 38' 15"	26° 07' 04"	0° 54' 32"	14' 51.67"	95° 44' 25"	0.65682
6	106° 19' 06"	3° 40' 35"	108° 11' 32"	26° 05' 22"	0° 54' 33"	14' 51.93"	95° 58' 27"	0.65303
7	106° 49' 03"	3° 42' 32"	108° 44' 49"	26° 03' 31"	0° 54' 34"	14' 52.20"	96° 12' 29"	0.64923
8	107° 19' 01"	3° 44' 28"	109° 18' 06"	26° 01' 34"	0° 54' 35"	14' 52.47"	96° 26' 30"	0.64541
9	107° 48' 60"	3° 46' 23"	109° 51' 22"	25° 59' 28"	0° 54' 36"	14' 52.75"	96° 40' 31"	0.64159
10	108° 19' 00"	3° 48' 18"	110° 24' 39"	25° 57' 15"	0° 54' 37"	14' 53.04"	96° 54' 32"	0.63775
11	108° 49' 02"	3° 50' 11"	110° 57' 56"	25° 54' 53"	0° 54' 38"	14' 53.33"	97° 8' 32"	0.63391
12	109° 19' 05"	3° 52' 03"	111° 31' 13"	25° 52' 25"	0° 54' 39"	14' 53.62"	97° 22' 32"	0.63005
13	109° 49' 09"	3° 53' 54"	112° 04' 29"	25° 49' 48"	0° 54' 40"	14' 53.92"	97° 36' 31"	0.62618
14	110° 19' 14"	3° 55' 45"	112° 37' 45"	25° 47' 04"	0° 54' 42"	14' 54.22"	97° 50' 29"	0.62230
15	110° 49' 21"	3° 57' 34"	113° 11' 01"	25° 44' 13"	0° 54' 43"	14' 54.52"	98° 4' 26"	0.61841
16	111° 19' 29"	3° 59' 22"	113° 44' 17"	25° 41' 13"	0° 54' 44"	14' 54.84"	98° 18' 22"	0.61450
17	111° 49' 38"	4° 01' 10"	114° 17' 32"	25° 38' 06"	0° 54' 45"	14' 55.15"	98° 32' 17"	0.61059
18	112° 19' 49"	4° 02' 56"	114° 50' 46"	25° 34' 51"	0° 54' 46"	14' 55.47"	98° 46' 11"	0.60667
19	112° 50' 01"	4° 04' 41"	115° 24' 01"	25° 31' 29"	0° 54' 47"	14' 55.80"	99° 0' 04"	0.60274
20	113° 20' 14"	4° 06' 25"	115° 57' 14"	25° 27' 59"	0° 54' 49"	14' 56.13"	99° 13' 55"	0.59880
21	113° 50' 29"	4° 08' 08"	116° 30' 27"	25° 24' 22"	0° 54' 50"	14' 56.46"	99° 27' 45"	0.59484
22	114° 20' 45"	4° 09' 50"	117° 03' 40"	25° 20' 36"	0° 54' 51"	14' 56.80"	99° 41' 33"	0.59088
23	114° 51' 03"	4° 11' 31"	117° 36' 52"	25° 16' 43"	0° 54' 52"	14' 57.15"	99° 55' 20"	0.58691
24	115° 21' 22"	4° 13' 11"	118° 10' 03"	25° 12' 43"	0° 54' 54"	14' 57.50"	100° 9' 04"	0.58293

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	214° 47' 27"	0.21"	212° 30' 21"	-13° 06' 51"	0.9936548	16' 05.76"	23° 26' 16"	16 m 14 s
1	214° 49' 57"	0.21"	212° 32' 46"	-13° 07' 41"	0.9936440	16' 05.77"	23° 26' 16"	16 m 14 s
2	214° 52' 27"	0.22"	212° 35' 11"	-13° 08' 31"	0.9936331	16' 05.78"	23° 26' 16"	16 m 14 s
3	214° 54' 56"	0.22"	212° 37' 36"	-13° 09' 21"	0.9936222	16' 05.79"	23° 26' 16"	16 m 15 s
4	214° 57' 26"	0.22"	212° 40' 01"	-13° 10' 11"	0.9936114	16' 05.80"	23° 26' 16"	16 m 15 s
5	214° 59' 56"	0.22"	212° 42' 26"	-13° 11' 01"	0.9936005	16' 05.81"	23° 26' 16"	16 m 15 s
6	215° 02' 26"	0.23"	212° 44' 50"	-13° 11' 52"	0.9935897	16' 05.82"	23° 26' 16"	16 m 15 s
7	215° 04' 55"	0.23"	212° 47' 15"	-13° 12' 42"	0.9935788	16' 05.83"	23° 26' 16"	16 m 15 s
8	215° 07' 25"	0.23"	212° 49' 40"	-13° 13' 32"	0.9935680	16' 05.84"	23° 26' 16"	16 m 16 s
9	215° 09' 55"	0.23"	212° 52' 05"	-13° 14' 22"	0.9935572	16' 05.85"	23° 26' 16"	16 m 16 s
10	215° 12' 24"	0.24"	212° 54' 30"	-13° 15' 12"	0.9935463	16' 05.86"	23° 26' 16"	16 m 16 s
11	215° 14' 54"	0.24"	212° 56' 55"	-13° 16' 02"	0.9935355	16' 05.87"	23° 26' 16"	16 m 16 s
12	215° 17' 24"	0.24"	212° 59' 20"	-13° 16' 52"	0.9935247	16' 05.88"	23° 26' 16"	16 m 16 s
13	215° 19' 54"	0.24"	213° 01' 46"	-13° 17' 42"	0.9935138	16' 05.89"	23° 26' 16"	16 m 17 s
14	215° 22' 24"	0.25"	213° 04' 11"	-13° 18' 32"	0.9935030	16' 05.91"	23° 26' 16"	16 m 17 s
15	215° 24' 53"	0.25"	213° 06' 36"	-13° 19' 21"	0.9934922	16' 05.92"	23° 26' 16"	16 m 17 s
16	215° 27' 23"	0.25"	213° 09' 01"	-13° 20' 11"	0.9934814	16' 05.93"	23° 26' 16"	16 m 17 s
17	215° 29' 53"	0.25"	213° 11' 26"	-13° 21' 01"	0.9934706	16' 05.94"	23° 26' 16"	16 m 17 s
18	215° 32' 23"	0.25"	213° 13' 51"	-13° 21' 51"	0.9934598	16' 05.95"	23° 26' 16"	16 m 17 s
19	215° 34' 52"	0.26"	213° 16' 16"	-13° 22' 41"	0.9934490	16' 05.96"	23° 26' 16"	16 m 18 s
20	215° 37' 22"	0.26"	213° 18' 42"	-13° 23' 31"	0.9934382	16' 05.97"	23° 26' 16"	16 m 18 s
21	215° 39' 52"	0.26"	213° 21' 07"	-13° 24' 20"	0.9934274	16' 05.98"	23° 26' 16"	16 m 18 s
22	215° 42' 22"	0.26"	213° 23' 32"	-13° 25' 10"	0.9934166	16' 05.99"	23° 26' 16"	16 m 18 s
23	215° 44' 52"	0.26"	213° 25' 57"	-13° 25' 60"	0.9934058	16' 06.00"	23° 26' 16"	16 m 18 s
24	215° 47' 21"	0.27"	213° 28' 23"	-13° 26' 50"	0.9933950	16' 06.01"	23° 26' 16"	16 m 19 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	115° 21' 22"	4° 13' 11"	118° 10' 03"	25° 12' 43"	0° 54' 54"	14' 57.50"	100° 9' 04"	0.58293
1	115° 51' 43"	4° 14' 49"	118° 43' 14"	25° 08' 35"	0° 54' 55"	14' 57.85"	100° 22' 48"	0.57895
2	116° 22' 05"	4° 16' 27"	119° 16' 23"	25° 04' 19"	0° 54' 56"	14' 58.21"	100° 36' 29"	0.57495
3	116° 52' 29"	4° 18' 04"	119° 49' 32"	24° 59' 56"	0° 54' 58"	14' 58.57"	100° 50' 08"	0.57095
4	117° 22' 54"	4° 19' 39"	120° 22' 41"	24° 55' 25"	0° 54' 59"	14' 58.94"	101° 3' 45"	0.56693
5	117° 53' 21"	4° 21' 13"	120° 55' 48"	24° 50' 47"	0° 55' 00"	14' 59.31"	101° 17' 20"	0.56291
6	118° 23' 50"	4° 22' 46"	121° 28' 54"	24° 46' 01"	0° 55' 02"	14' 59.69"	101° 30' 52"	0.55888
7	118° 54' 20"	4° 24' 18"	122° 01' 60"	24° 41' 08"	0° 55' 03"	15' 00.07"	101° 44' 23"	0.55485
8	119° 24' 51"	4° 25' 49"	122° 35' 04"	24° 36' 07"	0° 55' 04"	15' 00.45"	101° 57' 51"	0.55080
9	119° 55' 25"	4° 27' 18"	123° 08' 07"	24° 30' 59"	0° 55' 06"	15' 00.84"	102° 11' 16"	0.54675
10	120° 26' 00"	4° 28' 47"	123° 41' 10"	24° 25' 43"	0° 55' 07"	15' 01.24"	102° 24' 39"	0.54269
11	120° 56' 37"	4° 30' 14"	124° 14' 11"	24° 20' 20"	0° 55' 09"	15' 01.64"	102° 37' 59"	0.53863
12	121° 27' 16"	4° 31' 40"	124° 47' 11"	24° 14' 50"	0° 55' 10"	15' 02.04"	102° 51' 17"	0.53456
13	121° 57' 56"	4° 33' 05"	125° 20' 10"	24° 09' 12"	0° 55' 12"	15' 02.45"	103° 4' 31"	0.53048
14	122° 28' 38"	4° 34' 28"	125° 53' 08"	24° 03' 26"	0° 55' 13"	15' 02.86"	103° 17' 43"	0.52640
15	122° 59' 22"	4° 35' 50"	126° 26' 05"	23° 57' 34"	0° 55' 15"	15' 03.28"	103° 30' 52"	0.52231
16	123° 30' 08"	4° 37' 11"	126° 59' 01"	23° 51' 33"	0° 55' 16"	15' 03.70"	103° 43' 57"	0.51821
17	124° 00' 55"	4° 38' 31"	127° 31' 55"	23° 45' 26"	0° 55' 18"	15' 04.13"	103° 57' 00"	0.51411
18	124° 31' 45"	4° 39' 50"	128° 04' 48"	23° 39' 11"	0° 55' 19"	15' 04.56"	104° 9' 60"	0.51001
19	125° 02' 36"	4° 41' 07"	128° 37' 40"	23° 32' 49"	0° 55' 21"	15' 04.99"	104° 22' 56"	0.50590
20	125° 33' 29"	4° 42' 23"	129° 10' 30"	23° 26' 20"	0° 55' 23"	15' 05.43"	104° 35' 49"	0.50178
21	126° 04' 24"	4° 43' 38"	129° 43' 19"	23° 19' 43"	0° 55' 24"	15' 05.88"	104° 48' 38"	0.49766
22	126° 35' 21"	4° 44' 51"	130° 16' 07"	23° 12' 59"	0° 55' 26"	15' 06.32"	105° 1' 24"	0.49354
23	127° 06' 20"	4° 46' 03"	130° 48' 53"	23° 06' 08"	0° 55' 28"	15' 06.78"	105° 14' 06"	0.48941
24	127° 37' 21"	4° 47' 14"	131° 21' 38"	22° 59' 10"	0° 55' 29"	15' 07.23"	105° 26' 45"	0.48527

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Oblivity	Equation Of Time
0	215° 47' 21"	0.27"	213° 28' 23"	-13° 26' 50"	0.9933950	16' 06.01"	23° 26' 16"	16 m 19 s
1	215° 49' 51"	0.27"	213° 30' 48"	-13° 27' 39"	0.9933842	16' 06.02"	23° 26' 16"	16 m 19 s
2	215° 52' 21"	0.27"	213° 33' 13"	-13° 28' 29"	0.9933734	16' 06.03"	23° 26' 16"	16 m 19 s
3	215° 54' 51"	0.27"	213° 35' 39"	-13° 29' 19"	0.9933627	16' 06.04"	23° 26' 16"	16 m 19 s
4	215° 57' 21"	0.27"	213° 38' 04"	-13° 30' 08"	0.9933519	16' 06.05"	23° 26' 16"	16 m 19 s
5	215° 59' 50"	0.27"	213° 40' 29"	-13° 30' 58"	0.9933411	16' 06.06"	23° 26' 16"	16 m 19 s
6	216° 02' 20"	0.27"	213° 42' 55"	-13° 31' 47"	0.9933303	16' 06.07"	23° 26' 16"	16 m 20 s
7	216° 04' 50"	0.28"	213° 45' 20"	-13° 32' 37"	0.9933196	16' 06.08"	23° 26' 16"	16 m 20 s
8	216° 07' 20"	0.28"	213° 47' 46"	-13° 33' 27"	0.9933088	16' 06.09"	23° 26' 16"	16 m 20 s
9	216° 09' 50"	0.28"	213° 50' 11"	-13° 34' 16"	0.9932980	16' 06.10"	23° 26' 16"	16 m 20 s
10	216° 12' 20"	0.28"	213° 52' 37"	-13° 35' 06"	0.9932873	16' 06.12"	23° 26' 16"	16 m 20 s
11	216° 14' 49"	0.28"	213° 55' 02"	-13° 35' 55"	0.9932765	16' 06.13"	23° 26' 16"	16 m 20 s
12	216° 17' 19"	0.28"	213° 57' 28"	-13° 36' 45"	0.9932658	16' 06.14"	23° 26' 16"	16 m 21 s
13	216° 19' 49"	0.28"	213° 59' 53"	-13° 37' 34"	0.9932550	16' 06.15"	23° 26' 16"	16 m 21 s
14	216° 22' 19"	0.28"	214° 02' 19"	-13° 38' 23"	0.9932443	16' 06.16"	23° 26' 16"	16 m 21 s
15	216° 24' 49"	0.28"	214° 04' 44"	-13° 39' 13"	0.9932336	16' 06.17"	23° 26' 16"	16 m 21 s
16	216° 27' 19"	0.29"	214° 07' 10"	-13° 40' 02"	0.9932228	16' 06.18"	23° 26' 16"	16 m 21 s
17	216° 29' 49"	0.29"	214° 09' 36"	-13° 40' 51"	0.9932121	16' 06.19"	23° 26' 16"	16 m 21 s
18	216° 32' 18"	0.29"	214° 12' 01"	-13° 41' 41"	0.9932014	16' 06.20"	23° 26' 16"	16 m 21 s
19	216° 34' 48"	0.29"	214° 14' 27"	-13° 42' 30"	0.9931906	16' 06.21"	23° 26' 16"	16 m 22 s
20	216° 37' 18"	0.29"	214° 16' 53"	-13° 43' 19"	0.9931799	16' 06.22"	23° 26' 16"	16 m 22 s
21	216° 39' 48"	0.29"	214° 19' 19"	-13° 44' 09"	0.9931692	16' 06.23"	23° 26' 16"	16 m 22 s
22	216° 42' 18"	0.29"	214° 21' 44"	-13° 44' 58"	0.9931585	16' 06.24"	23° 26' 16"	16 m 22 s
23	216° 44' 48"	0.29"	214° 24' 10"	-13° 45' 47"	0.9931477	16' 06.25"	23° 26' 16"	16 m 22 s
24	216° 47' 18"	0.29"	214° 26' 36"	-13° 46' 36"	0.9931370	16' 06.26"	23° 26' 16"	16 m 22 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	127° 37' 21"	4° 47' 14"	131° 21' 38"	22° 59' 10"	0° 55' 29"	15' 07.23"	105° 26' 45"	0.48527
1	128° 08' 24"	4° 48' 23"	131° 54' 22"	22° 52' 05"	0° 55' 31"	15' 07.69"	105° 39' 20"	0.48114
2	128° 39' 29"	4° 49' 32"	132° 27' 04"	22° 44' 52"	0° 55' 33"	15' 08.16"	105° 51' 51"	0.47700
3	129° 10' 36"	4° 50' 38"	132° 59' 45"	22° 37' 33"	0° 55' 34"	15' 08.63"	106° 4' 19"	0.47286
4	129° 41' 46"	4° 51' 44"	133° 32' 24"	22° 30' 06"	0° 55' 36"	15' 09.10"	106° 16' 43"	0.46871
5	130° 12' 57"	4° 52' 48"	134° 05' 01"	22° 22' 32"	0° 55' 38"	15' 09.58"	106° 29' 02"	0.46456
6	130° 44' 10"	4° 53' 50"	134° 37' 38"	22° 14' 52"	0° 55' 40"	15' 10.06"	106° 41' 18"	0.46041
7	131° 15' 26"	4° 54' 52"	135° 10' 13"	22° 07' 04"	0° 55' 41"	15' 10.55"	106° 53' 30"	0.45626
8	131° 46' 43"	4° 55' 52"	135° 42' 46"	21° 59' 09"	0° 55' 43"	15' 11.04"	107° 5' 37"	0.45210
9	132° 18' 03"	4° 56' 50"	136° 15' 18"	21° 51' 08"	0° 55' 45"	15' 11.54"	107° 17' 40"	0.44794
10	132° 49' 25"	4° 57' 47"	136° 47' 48"	21° 42' 59"	0° 55' 47"	15' 12.03"	107° 29' 39"	0.44379
11	133° 20' 49"	4° 58' 43"	137° 20' 17"	21° 34' 44"	0° 55' 49"	15' 12.54"	107° 41' 34"	0.43963
12	133° 52' 15"	4° 59' 37"	137° 52' 44"	21° 26' 21"	0° 55' 51"	15' 13.04"	107° 53' 24"	0.43547
13	134° 23' 44"	5° 00' 30"	138° 25' 09"	21° 17' 52"	0° 55' 52"	15' 13.55"	108° 5' 10"	0.43131
14	134° 55' 14"	5° 01' 21"	138° 57' 34"	21° 09' 16"	0° 55' 54"	15' 14.07"	108° 16' 52"	0.42714
15	135° 26' 47"	5° 02' 11"	139° 29' 56"	21° 00' 34"	0° 55' 56"	15' 14.59"	108° 28' 29"	0.42298
16	135° 58' 23"	5° 02' 60"	140° 02' 17"	20° 51' 44"	0° 55' 58"	15' 15.11"	108° 40' 01"	0.41882
17	136° 30' 00"	5° 03' 46"	140° 34' 37"	20° 42' 48"	0° 56' 00"	15' 15.63"	108° 51' 29"	0.41466
18	137° 01' 40"	5° 04' 32"	141° 06' 55"	20° 33' 45"	0° 56' 02"	15' 16.16"	109° 2' 52"	0.41050
19	137° 33' 22"	5° 05' 16"	141° 39' 11"	20° 24' 36"	0° 56' 04"	15' 16.70"	109° 14' 10"	0.40634
20	138° 05' 07"	5° 05' 58"	142° 11' 26"	20° 15' 20"	0° 56' 06"	15' 17.24"	109° 25' 24"	0.40218
21	138° 36' 54"	5° 06' 39"	142° 43' 39"	20° 05' 57"	0° 56' 08"	15' 17.78"	109° 36' 32"	0.39802
22	139° 08' 43"	5° 07' 19"	143° 15' 51"	19° 56' 28"	0° 56' 10"	15' 18.32"	109° 47' 36"	0.39387
23	139° 40' 35"	5° 07' 57"	143° 48' 01"	19° 46' 53"	0° 56' 12"	15' 18.87"	109° 58' 35"	0.38972
24	140° 12' 29"	5° 08' 33"	144° 20' 10"	19° 37' 11"	0° 56' 14"	15' 19.42"	110° 9' 29"	0.38557

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	216° 47' 18"	0.29"	214° 26' 36"	-13° 46' 36"	0.9931370	16' 06.26"	23° 26' 16"	16 m 22 s
1	216° 49' 48"	0.29"	214° 29' 02"	-13° 47' 25"	0.9931263	16' 06.27"	23° 26' 16"	16 m 22 s
2	216° 52' 18"	0.29"	214° 31' 27"	-13° 48' 14"	0.9931156	16' 06.28"	23° 26' 16"	16 m 23 s
3	216° 54' 47"	0.29"	214° 33' 53"	-13° 49' 04"	0.9931049	16' 06.29"	23° 26' 16"	16 m 23 s
4	216° 57' 17"	0.29"	214° 36' 19"	-13° 49' 53"	0.9930942	16' 06.30"	23° 26' 16"	16 m 23 s
5	216° 59' 47"	0.29"	214° 38' 45"	-13° 50' 42"	0.9930835	16' 06.31"	23° 26' 16"	16 m 23 s
6	217° 02' 17"	0.29"	214° 41' 11"	-13° 51' 31"	0.9930728	16' 06.32"	23° 26' 16"	16 m 23 s
7	217° 04' 47"	0.29"	214° 43' 37"	-13° 52' 20"	0.9930621	16' 06.33"	23° 26' 16"	16 m 23 s
8	217° 07' 17"	0.29"	214° 46' 03"	-13° 53' 09"	0.9930514	16' 06.34"	23° 26' 16"	16 m 23 s
9	217° 09' 47"	0.29"	214° 48' 29"	-13° 53' 58"	0.9930407	16' 06.36"	23° 26' 16"	16 m 23 s
10	217° 12' 17"	0.29"	214° 50' 55"	-13° 54' 47"	0.9930300	16' 06.37"	23° 26' 16"	16 m 24 s
11	217° 14' 47"	0.29"	214° 53' 21"	-13° 55' 36"	0.9930194	16' 06.38"	23° 26' 16"	16 m 24 s
12	217° 17' 17"	0.29"	214° 55' 47"	-13° 56' 25"	0.9930087	16' 06.39"	23° 26' 16"	16 m 24 s
13	217° 19' 47"	0.29"	214° 58' 13"	-13° 57' 13"	0.9929980	16' 06.40"	23° 26' 16"	16 m 24 s
14	217° 22' 17"	0.29"	215° 00' 39"	-13° 58' 02"	0.9929873	16' 06.41"	23° 26' 16"	16 m 24 s
15	217° 24' 47"	0.29"	215° 03' 05"	-13° 58' 51"	0.9929767	16' 06.42"	23° 26' 16"	16 m 24 s
16	217° 27' 17"	0.29"	215° 05' 31"	-13° 59' 40"	0.9929660	16' 06.43"	23° 26' 16"	16 m 24 s
17	217° 29' 47"	0.29"	215° 07' 57"	-14° 00' 29"	0.9929553	16' 06.44"	23° 26' 16"	16 m 24 s
18	217° 32' 17"	0.29"	215° 10' 24"	-14° 01' 18"	0.9929446	16' 06.45"	23° 26' 16"	16 m 25 s
19	217° 34' 46"	0.29"	215° 12' 50"	-14° 02' 06"	0.9929340	16' 06.46"	23° 26' 16"	16 m 25 s
20	217° 37' 16"	0.29"	215° 15' 16"	-14° 02' 55"	0.9929233	16' 06.47"	23° 26' 16"	16 m 25 s
21	217° 39' 46"	0.29"	215° 17' 42"	-14° 03' 44"	0.9929127	16' 06.48"	23° 26' 16"	16 m 25 s
22	217° 42' 16"	0.29"	215° 20' 08"	-14° 04' 32"	0.9929020	16' 06.49"	23° 26' 16"	16 m 25 s
23	217° 44' 46"	0.29"	215° 22' 35"	-14° 05' 21"	0.9928914	16' 06.50"	23° 26' 16"	16 m 25 s
24	217° 47' 16"	0.29"	215° 25' 01"	-14° 06' 10"	0.9928807	16' 06.51"	23° 26' 16"	16 m 25 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	140° 12' 29"	5° 08' 33"	144° 20' 10"	19° 37' 11"	0° 56' 14"	15' 19.42"	110° 9' 29"	0.38557
1	140° 44' 26"	5° 09' 08"	144° 52' 17"	19° 27' 22"	0° 56' 16"	15' 19.98"	110° 20' 17"	0.38142
2	141° 16' 25"	5° 09' 41"	145° 24' 23"	19° 17' 27"	0° 56' 18"	15' 20.53"	110° 31' 01"	0.37727
3	141° 48' 27"	5° 10' 13"	145° 56' 27"	19° 07' 26"	0° 56' 20"	15' 21.10"	110° 41' 40"	0.37313
4	142° 20' 31"	5° 10' 43"	146° 28' 30"	18° 57' 18"	0° 56' 22"	15' 21.66"	110° 52' 13"	0.36899
5	142° 52' 37"	5° 11' 12"	147° 00' 31"	18° 47' 05"	0° 56' 24"	15' 22.23"	111° 2' 42"	0.36486
6	143° 24' 46"	5° 11' 39"	147° 32' 31"	18° 36' 44"	0° 56' 26"	15' 22.80"	111° 13' 05"	0.36073
7	143° 56' 58"	5° 12' 04"	148° 04' 30"	18° 26' 18"	0° 56' 29"	15' 23.38"	111° 23' 22"	0.35660
8	144° 29' 12"	5° 12' 28"	148° 36' 27"	18° 15' 46"	0° 56' 31"	15' 23.95"	111° 33' 35"	0.35248
9	145° 01' 29"	5° 12' 50"	149° 08' 22"	18° 05' 07"	0° 56' 33"	15' 24.54"	111° 43' 42"	0.34836
10	145° 33' 48"	5° 13' 10"	149° 40' 16"	17° 54' 22"	0° 56' 35"	15' 25.12"	111° 53' 43"	0.34425
11	146° 06' 10"	5° 13' 29"	150° 12' 09"	17° 43' 32"	0° 56' 37"	15' 25.71"	112° 3' 40"	0.34015
12	146° 38' 35"	5° 13' 46"	150° 44' 01"	17° 32' 35"	0° 56' 39"	15' 26.30"	112° 13' 31"	0.33605
13	147° 11' 02"	5° 14' 02"	151° 15' 51"	17° 21' 32"	0° 56' 41"	15' 26.89"	112° 23' 16"	0.33196
14	147° 43' 31"	5° 14' 16"	151° 47' 40"	17° 10' 23"	0° 56' 44"	15' 27.49"	112° 32' 56"	0.32787
15	148° 16' 04"	5° 14' 28"	152° 19' 27"	16° 59' 09"	0° 56' 46"	15' 28.08"	112° 42' 30"	0.32379
16	148° 48' 39"	5° 14' 39"	152° 51' 14"	16° 47' 48"	0° 56' 48"	15' 28.69"	112° 51' 58"	0.31972
17	149° 21' 16"	5° 14' 48"	153° 22' 59"	16° 36' 22"	0° 56' 50"	15' 29.29"	113° 1' 21"	0.31566
18	149° 53' 57"	5° 14' 55"	153° 54' 43"	16° 24' 50"	0° 56' 52"	15' 29.90"	113° 10' 39"	0.31160
19	150° 26' 40"	5° 15' 01"	154° 26' 26"	16° 13' 13"	0° 56' 55"	15' 30.51"	113° 19' 50"	0.30756
20	150° 59' 26"	5° 15' 04"	154° 58' 07"	16° 01' 29"	0° 56' 57"	15' 31.12"	113° 28' 56"	0.30352
21	151° 32' 14"	5° 15' 07"	155° 29' 48"	15° 49' 40"	0° 56' 59"	15' 31.73"	113° 37' 57"	0.29949
22	152° 05' 05"	5° 15' 07"	156° 01' 27"	15° 37' 46"	0° 57' 01"	15' 32.35"	113° 46' 51"	0.29547
23	152° 37' 59"	5° 15' 06"	156° 33' 05"	15° 25' 46"	0° 57' 04"	15' 32.97"	113° 55' 40"	0.29146
24	153° 10' 56"	5° 15' 03"	157° 04' 42"	15° 13' 40"	0° 57' 06"	15' 33.59"	114° 4' 23"	0.28746

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	217° 47' 16"	0.29"	215° 25' 01"	-14° 06' 10"	0.9928807	16' 06.51"	23° 26' 16"	16 m 25 s
1	217° 49' 46"	0.29"	215° 27' 27"	-14° 06' 58"	0.9928701	16' 06.52"	23° 26' 16"	16 m 25 s
2	217° 52' 16"	0.28"	215° 29' 54"	-14° 07' 47"	0.9928594	16' 06.53"	23° 26' 16"	16 m 25 s
3	217° 54' 46"	0.28"	215° 32' 20"	-14° 08' 35"	0.9928488	16' 06.54"	23° 26' 16"	16 m 26 s
4	217° 57' 16"	0.28"	215° 34' 46"	-14° 09' 24"	0.9928381	16' 06.55"	23° 26' 16"	16 m 26 s
5	217° 59' 46"	0.28"	215° 37' 13"	-14° 10' 12"	0.9928275	16' 06.56"	23° 26' 16"	16 m 26 s
6	218° 02' 16"	0.28"	215° 39' 39"	-14° 11' 01"	0.9928169	16' 06.57"	23° 26' 16"	16 m 26 s
7	218° 04' 46"	0.28"	215° 42' 05"	-14° 11' 49"	0.9928062	16' 06.58"	23° 26' 16"	16 m 26 s
8	218° 07' 16"	0.28"	215° 44' 32"	-14° 12' 38"	0.9927956	16' 06.59"	23° 26' 16"	16 m 26 s
9	218° 09' 46"	0.28"	215° 46' 58"	-14° 13' 26"	0.9927850	16' 06.60"	23° 26' 16"	16 m 26 s
10	218° 12' 16"	0.28"	215° 49' 25"	-14° 14' 15"	0.9927744	16' 06.61"	23° 26' 16"	16 m 26 s
11	218° 14' 46"	0.27"	215° 51' 51"	-14° 15' 03"	0.9927637	16' 06.62"	23° 26' 16"	16 m 26 s
12	218° 17' 16"	0.27"	215° 54' 18"	-14° 15' 51"	0.9927531	16' 06.64"	23° 26' 16"	16 m 26 s
13	218° 19' 47"	0.27"	215° 56' 44"	-14° 16' 40"	0.9927425	16' 06.65"	23° 26' 16"	16 m 26 s
14	218° 22' 17"	0.27"	215° 59' 11"	-14° 17' 28"	0.9927319	16' 06.66"	23° 26' 16"	16 m 27 s
15	218° 24' 47"	0.27"	216° 01' 38"	-14° 18' 16"	0.9927213	16' 06.67"	23° 26' 16"	16 m 27 s
16	218° 27' 17"	0.27"	216° 04' 04"	-14° 19' 05"	0.9927107	16' 06.68"	23° 26' 16"	16 m 27 s
17	218° 29' 47"	0.26"	216° 06' 31"	-14° 19' 53"	0.9927001	16' 06.69"	23° 26' 16"	16 m 27 s
18	218° 32' 17"	0.26"	216° 08' 58"	-14° 20' 41"	0.9926895	16' 06.70"	23° 26' 16"	16 m 27 s
19	218° 34' 47"	0.26"	216° 11' 24"	-14° 21' 29"	0.9926789	16' 06.71"	23° 26' 16"	16 m 27 s
20	218° 37' 17"	0.26"	216° 13' 51"	-14° 22' 17"	0.9926683	16' 06.72"	23° 26' 16"	16 m 27 s
21	218° 39' 47"	0.26"	216° 16' 18"	-14° 23' 05"	0.9926577	16' 06.73"	23° 26' 16"	16 m 27 s
22	218° 42' 17"	0.25"	216° 18' 44"	-14° 23' 54"	0.9926471	16' 06.74"	23° 26' 16"	16 m 27 s
23	218° 44' 47"	0.25"	216° 21' 11"	-14° 24' 42"	0.9926365	16' 06.75"	23° 26' 16"	16 m 27 s
24	218° 47' 17"	0.25"	216° 23' 38"	-14° 25' 30"	0.9926259	16' 06.76"	23° 26' 16"	16 m 27 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	153° 10' 56"	5° 15' 03"	157° 04' 42"	15° 13' 40"	0° 57' 06"	15' 33.59"	114° 4' 23"	0.28746
1	153° 43' 55"	5° 14' 58"	157° 36' 19"	15° 01' 29"	0° 57' 08"	15' 34.21"	114° 12' 60"	0.28347
2	154° 16' 57"	5° 14' 51"	158° 07' 54"	14° 49' 13"	0° 57' 11"	15' 34.83"	114° 21' 31"	0.27949
3	154° 50' 02"	5° 14' 43"	158° 39' 28"	14° 36' 51"	0° 57' 13"	15' 35.46"	114° 29' 56"	0.27552
4	155° 23' 10"	5° 14' 33"	159° 11' 02"	14° 24' 24"	0° 57' 15"	15' 36.09"	114° 38' 15"	0.27156
5	155° 56' 20"	5° 14' 21"	159° 42' 34"	14° 11' 52"	0° 57' 18"	15' 36.72"	114° 46' 29"	0.26762
6	156° 29' 34"	5° 14' 08"	160° 14' 06"	13° 59' 14"	0° 57' 20"	15' 37.35"	114° 54' 36"	0.26369
7	157° 02' 50"	5° 13' 52"	160° 45' 37"	13° 46' 32"	0° 57' 22"	15' 37.99"	115° 2' 38"	0.25977
8	157° 36' 09"	5° 13' 35"	161° 17' 07"	13° 33' 44"	0° 57' 24"	15' 38.62"	115° 10' 34"	0.25586
9	158° 09' 31"	5° 13' 16"	161° 48' 37"	13° 20' 51"	0° 57' 27"	15' 39.26"	115° 18' 23"	0.25197
10	158° 42' 55"	5° 12' 55"	162° 20' 06"	13° 07' 53"	0° 57' 29"	15' 39.90"	115° 26' 07"	0.24809
11	159° 16' 23"	5° 12' 33"	162° 51' 34"	12° 54' 51"	0° 57' 32"	15' 40.54"	115° 33' 45"	0.24423
12	159° 49' 53"	5° 12' 08"	163° 23' 01"	12° 41' 43"	0° 57' 34"	15' 41.18"	115° 41' 16"	0.24038
13	160° 23' 26"	5° 11' 42"	163° 54' 28"	12° 28' 31"	0° 57' 36"	15' 41.82"	115° 48' 42"	0.23654
14	160° 57' 02"	5° 11' 14"	164° 25' 55"	12° 15' 13"	0° 57' 39"	15' 42.46"	115° 56' 02"	0.23272
15	161° 30' 41"	5° 10' 45"	164° 57' 21"	12° 01' 51"	0° 57' 41"	15' 43.11"	116° 3' 15"	0.22892
16	162° 04' 22"	5° 10' 13"	165° 28' 47"	11° 48' 25"	0° 57' 43"	15' 43.75"	116° 10' 23"	0.22513
17	162° 38' 07"	5° 09' 39"	166° 00' 12"	11° 34' 53"	0° 57' 46"	15' 44.40"	116° 17' 24"	0.22136
18	163° 11' 54"	5° 09' 04"	166° 31' 37"	11° 21' 17"	0° 57' 48"	15' 45.05"	116° 24' 20"	0.21760
19	163° 45' 44"	5° 08' 27"	167° 03' 02"	11° 07' 37"	0° 57' 50"	15' 45.69"	116° 31' 09"	0.21387
20	164° 19' 37"	5° 07' 48"	167° 34' 26"	10° 53' 52"	0° 57' 53"	15' 46.34"	116° 37' 53"	0.21015
21	164° 53' 33"	5° 07' 07"	168° 05' 50"	10° 40' 03"	0° 57' 55"	15' 46.99"	116° 44' 30"	0.20645
22	165° 27' 32"	5° 06' 24"	168° 37' 15"	10° 26' 09"	0° 57' 58"	15' 47.64"	116° 51' 01"	0.20276
23	166° 01' 34"	5° 05' 40"	169° 08' 39"	10° 12' 12"	0° 57' 60"	15' 48.29"	116° 57' 27"	0.19910
24	166° 35' 39"	5° 04' 53"	169° 40' 03"	9° 58' 09"	0° 58' 02"	15' 48.94"	117° 3' 46"	0.19546

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	218° 47' 17"	0.25"	216° 23' 38"	-14° 25' 30"	0.9926259	16' 06.76"	23° 26' 16"	16 m 27 s
1	218° 49' 47"	0.25"	216° 26' 05"	-14° 26' 18"	0.9926153	16' 06.77"	23° 26' 16"	16 m 27 s
2	218° 52' 17"	0.25"	216° 28' 32"	-14° 27' 06"	0.9926047	16' 06.78"	23° 26' 16"	16 m 28 s
3	218° 54' 47"	0.24"	216° 30' 58"	-14° 27' 54"	0.9925941	16' 06.79"	23° 26' 16"	16 m 28 s
4	218° 57' 17"	0.24"	216° 33' 25"	-14° 28' 42"	0.9925835	16' 06.80"	23° 26' 16"	16 m 28 s
5	218° 59' 48"	0.24"	216° 35' 52"	-14° 29' 30"	0.9925729	16' 06.81"	23° 26' 16"	16 m 28 s
6	219° 02' 18"	0.24"	216° 38' 19"	-14° 30' 18"	0.9925624	16' 06.82"	23° 26' 16"	16 m 28 s
7	219° 04' 48"	0.24"	216° 40' 46"	-14° 31' 05"	0.9925518	16' 06.83"	23° 26' 16"	16 m 28 s
8	219° 07' 18"	0.23"	216° 43' 13"	-14° 31' 53"	0.9925412	16' 06.84"	23° 26' 16"	16 m 28 s
9	219° 09' 48"	0.23"	216° 45' 40"	-14° 32' 41"	0.9925306	16' 06.85"	23° 26' 16"	16 m 28 s
10	219° 12' 18"	0.23"	216° 48' 07"	-14° 33' 29"	0.9925201	16' 06.86"	23° 26' 16"	16 m 28 s
11	219° 14' 48"	0.23"	216° 50' 34"	-14° 34' 17"	0.9925095	16' 06.87"	23° 26' 16"	16 m 28 s
12	219° 17' 18"	0.22"	216° 53' 01"	-14° 35' 05"	0.9924989	16' 06.88"	23° 26' 16"	16 m 28 s
13	219° 19' 48"	0.22"	216° 55' 28"	-14° 35' 52"	0.9924884	16' 06.89"	23° 26' 16"	16 m 28 s
14	219° 22' 19"	0.22"	216° 57' 55"	-14° 36' 40"	0.9924778	16' 06.90"	23° 26' 16"	16 m 28 s
15	219° 24' 49"	0.21"	217° 00' 22"	-14° 37' 28"	0.9924673	16' 06.91"	23° 26' 16"	16 m 28 s
16	219° 27' 19"	0.21"	217° 02' 50"	-14° 38' 15"	0.9924567	16' 06.92"	23° 26' 16"	16 m 28 s
17	219° 29' 49"	0.21"	217° 05' 17"	-14° 39' 03"	0.9924461	16' 06.93"	23° 26' 16"	16 m 28 s
18	219° 32' 19"	0.21"	217° 07' 44"	-14° 39' 51"	0.9924356	16' 06.94"	23° 26' 16"	16 m 28 s
19	219° 34' 49"	0.20"	217° 10' 11"	-14° 40' 38"	0.9924250	16' 06.95"	23° 26' 16"	16 m 28 s
20	219° 37' 19"	0.20"	217° 12' 38"	-14° 41' 26"	0.9924145	16' 06.96"	23° 26' 16"	16 m 29 s
21	219° 39' 50"	0.20"	217° 15' 05"	-14° 42' 13"	0.9924039	16' 06.98"	23° 26' 16"	16 m 29 s
22	219° 42' 20"	0.19"	217° 17' 33"	-14° 43' 01"	0.9923934	16' 06.99"	23° 26' 16"	16 m 29 s
23	219° 44' 50"	0.19"	217° 19' 60"	-14° 43' 48"	0.9923828	16' 07.00"	23° 26' 16"	16 m 29 s
24	219° 47' 20"	0.19"	217° 22' 27"	-14° 44' 36"	0.9923723	16' 07.01"	23° 26' 16"	16 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	166° 35' 39"	5° 04' 53"	169° 40' 03"	9° 58' 09"	0° 58' 02"	15' 48.94"	117° 3' 46"	0.19546
1	167° 09' 46"	5° 04' 05"	170° 11' 27"	9° 44' 03"	0° 58' 05"	15' 49.59"	117° 9' 59"	0.19183
2	167° 43' 57"	5° 03' 15"	170° 42' 51"	9° 29' 53"	0° 58' 07"	15' 50.24"	117° 16' 06"	0.18823
3	168° 18' 10"	5° 02' 23"	171° 14' 15"	9° 15' 38"	0° 58' 10"	15' 50.89"	117° 22' 08"	0.18465
4	168° 52' 26"	5° 01' 29"	171° 45' 39"	9° 01' 20"	0° 58' 12"	15' 51.54"	117° 28' 03"	0.18109
5	169° 26' 45"	5° 00' 33"	172° 17' 04"	8° 46' 58"	0° 58' 14"	15' 52.19"	117° 33' 52"	0.17755
6	170° 01' 07"	4° 59' 35"	172° 48' 29"	8° 32' 32"	0° 58' 17"	15' 52.84"	117° 39' 36"	0.17403
7	170° 35' 32"	4° 58' 36"	173° 19' 54"	8° 18' 02"	0° 58' 19"	15' 53.49"	117° 45' 13"	0.17053
8	171° 09' 59"	4° 57' 34"	173° 51' 20"	8° 03' 28"	0° 58' 21"	15' 54.14"	117° 50' 45"	0.16706
9	171° 44' 30"	4° 56' 31"	174° 22' 46"	7° 48' 51"	0° 58' 24"	15' 54.79"	117° 56' 11"	0.16361
10	172° 19' 03"	4° 55' 26"	174° 54' 12"	7° 34' 10"	0° 58' 26"	15' 55.43"	118° 1' 31"	0.16018
11	172° 53' 39"	4° 54' 19"	175° 25' 39"	7° 19' 25"	0° 58' 29"	15' 56.08"	118° 6' 45"	0.15678
12	173° 28' 18"	4° 53' 10"	175° 57' 07"	7° 04' 37"	0° 58' 31"	15' 56.73"	118° 11' 54"	0.15340
13	174° 03' 00"	4° 51' 59"	176° 28' 35"	6° 49' 46"	0° 58' 33"	15' 57.37"	118° 16' 57"	0.15005
14	174° 37' 45"	4° 50' 46"	177° 00' 04"	6° 34' 52"	0° 58' 36"	15' 58.01"	118° 21' 54"	0.14673
15	175° 12' 32"	4° 49' 32"	177° 31' 34"	6° 19' 54"	0° 58' 38"	15' 58.66"	118° 26' 45"	0.14342
16	175° 47' 23"	4° 48' 15"	178° 03' 05"	6° 04' 53"	0° 58' 40"	15' 59.30"	118° 31' 32"	0.14015
17	176° 22' 16"	4° 46' 57"	178° 34' 37"	5° 49' 49"	0° 58' 43"	15' 59.94"	118° 36' 12"	0.13690
18	176° 57' 12"	4° 45' 36"	179° 06' 09"	5° 34' 41"	0° 58' 45"	16' 00.57"	118° 40' 48"	0.13368
19	177° 32' 11"	4° 44' 14"	179° 37' 43"	5° 19' 31"	0° 58' 47"	16' 01.21"	118° 45' 18"	0.13049
20	178° 07' 13"	4° 42' 50"	180° 09' 18"	5° 04' 18"	0° 58' 50"	16' 01.84"	118° 49' 42"	0.12733
21	178° 42' 17"	4° 41' 24"	180° 40' 53"	4° 49' 02"	0° 58' 52"	16' 02.48"	118° 54' 02"	0.12419
22	179° 17' 24"	4° 39' 56"	181° 12' 30"	4° 33' 44"	0° 58' 54"	16' 03.11"	118° 58' 16"	0.12108
23	179° 52' 34"	4° 38' 26"	181° 44' 09"	4° 18' 22"	0° 58' 57"	16' 03.74"	119° 2' 26"	0.11801
24	180° 27' 47"	4° 36' 55"	182° 15' 48"	4° 02' 59"	0° 58' 59"	16' 04.36"	119° 6' 31"	0.11496

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	219° 47' 20"	0.19"	217° 22' 27"	-14° 44' 36"	0.9923723	16' 07.01"	23° 26' 16"	16 m 29 s
1	219° 49' 50"	0.18"	217° 24' 55"	-14° 45' 23"	0.9923618	16' 07.02"	23° 26' 16"	16 m 29 s
2	219° 52' 20"	0.18"	217° 27' 22"	-14° 46' 11"	0.9923512	16' 07.03"	23° 26' 16"	16 m 29 s
3	219° 54' 50"	0.18"	217° 29' 49"	-14° 46' 58"	0.9923407	16' 07.04"	23° 26' 16"	16 m 29 s
4	219° 57' 21"	0.17"	217° 32' 17"	-14° 47' 46"	0.9923301	16' 07.05"	23° 26' 16"	16 m 29 s
5	219° 59' 51"	0.17"	217° 34' 44"	-14° 48' 33"	0.9923196	16' 07.06"	23° 26' 16"	16 m 29 s
6	220° 02' 21"	0.17"	217° 37' 12"	-14° 49' 20"	0.9923091	16' 07.07"	23° 26' 16"	16 m 29 s
7	220° 04' 51"	0.16"	217° 39' 39"	-14° 50' 08"	0.9922985	16' 07.08"	23° 26' 16"	16 m 29 s
8	220° 07' 21"	0.16"	217° 42' 06"	-14° 50' 55"	0.9922880	16' 07.09"	23° 26' 16"	16 m 29 s
9	220° 09' 52"	0.16"	217° 44' 34"	-14° 51' 42"	0.9922775	16' 07.10"	23° 26' 16"	16 m 29 s
10	220° 12' 22"	0.15"	217° 47' 01"	-14° 52' 29"	0.9922670	16' 07.11"	23° 26' 16"	16 m 29 s
11	220° 14' 52"	0.15"	217° 49' 29"	-14° 53' 17"	0.9922564	16' 07.12"	23° 26' 16"	16 m 29 s
12	220° 17' 22"	0.15"	217° 51' 57"	-14° 54' 04"	0.9922459	16' 07.13"	23° 26' 16"	16 m 29 s
13	220° 19' 52"	0.14"	217° 54' 24"	-14° 54' 51"	0.9922354	16' 07.14"	23° 26' 16"	16 m 29 s
14	220° 22' 23"	0.14"	217° 56' 52"	-14° 55' 38"	0.9922249	16' 07.15"	23° 26' 16"	16 m 29 s
15	220° 24' 53"	0.13"	217° 59' 19"	-14° 56' 25"	0.9922144	16' 07.16"	23° 26' 16"	16 m 29 s
16	220° 27' 23"	0.13"	218° 01' 47"	-14° 57' 12"	0.9922039	16' 07.17"	23° 26' 16"	16 m 29 s
17	220° 29' 53"	0.13"	218° 04' 15"	-14° 57' 59"	0.9921934	16' 07.18"	23° 26' 16"	16 m 29 s
18	220° 32' 23"	0.12"	218° 06' 42"	-14° 58' 46"	0.9921828	16' 07.19"	23° 26' 16"	16 m 29 s
19	220° 34' 54"	0.12"	218° 09' 10"	-14° 59' 33"	0.9921723	16' 07.20"	23° 26' 16"	16 m 29 s
20	220° 37' 24"	0.11"	218° 11' 38"	-15° 00' 20"	0.9921618	16' 07.21"	23° 26' 16"	16 m 29 s
21	220° 39' 54"	0.11"	218° 14' 05"	-15° 01' 07"	0.9921513	16' 07.22"	23° 26' 16"	16 m 29 s
22	220° 42' 24"	0.11"	218° 16' 33"	-15° 01' 54"	0.9921408	16' 07.23"	23° 26' 16"	16 m 29 s
23	220° 44' 55"	0.10"	218° 19' 01"	-15° 02' 41"	0.9921303	16' 07.24"	23° 26' 16"	16 m 29 s
24	220° 47' 25"	0.10"	218° 21' 29"	-15° 03' 28"	0.9921198	16' 07.25"	23° 26' 16"	16 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	180° 27' 47"	4° 36' 55"	182° 15' 48"	4° 02' 59"	0° 58' 59"	16' 04.36"	119° 6' 31"	0.11496
1	181° 03' 03"	4° 35' 21"	182° 47' 30"	3° 47' 32"	0° 59' 01"	16' 04.99"	119° 10' 31"	0.11194
2	181° 38' 21"	4° 33' 46"	183° 19' 12"	3° 32' 03"	0° 59' 04"	16' 05.61"	119° 14' 26"	0.10895
3	182° 13' 42"	4° 32' 09"	183° 50' 56"	3° 16' 32"	0° 59' 06"	16' 06.23"	119° 18' 17"	0.10600
4	182° 49' 06"	4° 30' 30"	184° 22' 42"	3° 00' 59"	0° 59' 08"	16' 06.84"	119° 22' 03"	0.10308
5	183° 24' 32"	4° 28' 49"	184° 54' 29"	2° 45' 23"	0° 59' 10"	16' 07.46"	119° 25' 46"	0.10018
6	184° 00' 01"	4° 27' 06"	185° 26' 18"	2° 29' 46"	0° 59' 13"	16' 08.07"	119° 29' 24"	0.09733
7	184° 35' 33"	4° 25' 21"	185° 58' 09"	2° 14' 06"	0° 59' 15"	16' 08.68"	119° 32' 58"	0.09450
8	185° 11' 07"	4° 23' 35"	186° 30' 02"	1° 58' 24"	0° 59' 17"	16' 09.28"	119° 36' 29"	0.09171
9	185° 46' 44"	4° 21' 46"	187° 01' 56"	1° 42' 41"	0° 59' 19"	16' 09.88"	119° 39' 57"	0.08895
10	186° 22' 24"	4° 19' 56"	187° 33' 53"	1° 26' 55"	0° 59' 21"	16' 10.48"	119° 43' 21"	0.08623
11	186° 58' 06"	4° 18' 04"	188° 05' 51"	1° 11' 08"	0° 59' 24"	16' 11.08"	119° 46' 42"	0.08354
12	187° 33' 51"	4° 16' 10"	188° 37' 52"	0° 55' 20"	0° 59' 26"	16' 11.67"	119° 50' 00"	0.08088
13	188° 09' 38"	4° 14' 15"	189° 09' 55"	0° 39' 29"	0° 59' 28"	16' 12.26"	119° 53' 16"	0.07826
14	188° 45' 29"	4° 12' 17"	189° 42' 00"	0° 23' 38"	0° 59' 30"	16' 12.84"	119° 56' 30"	0.07568
15	189° 21' 21"	4° 10' 18"	190° 14' 07"	0° 07' 45"	0° 59' 32"	16' 13.42"	119° 59' 42"	0.07314
16	189° 57' 16"	4° 08' 17"	190° 46' 17"	0° -8' 09"	0° 59' 34"	16' 14.00"	120° 2' 53"	0.07063
17	190° 33' 14"	4° 06' 14"	191° 18' 30"	0° -24' 04"	0° 59' 36"	16' 14.57"	120° 6' 03"	0.06816
18	191° 09' 14"	4° 04' 10"	191° 50' 44"	0° -40' 01"	0° 59' 39"	16' 15.14"	120° 9' 12"	0.06572
19	191° 45' 16"	4° 02' 03"	192° 23' 02"	0° -55' 58"	0° 59' 41"	16' 15.70"	120° 12' 20"	0.06333
20	192° 21' 21"	3° 59' 55"	192° 55' 22"	-1° 11' 56"	0° 59' 43"	16' 16.26"	120° 15' 29"	0.06097
21	192° 57' 29"	3° 57' 45"	193° 27' 44"	-1° 27' 55"	0° 59' 45"	16' 16.82"	120° 18' 39"	0.05865
22	193° 33' 38"	3° 55' 34"	194° 00' 10"	-1° 43' 55"	0° 59' 47"	16' 17.37"	120° 21' 51"	0.05637
23	194° 09' 51"	3° 53' 20"	194° 32' 38"	-1° 59' 55"	0° 59' 49"	16' 17.92"	120° 25' 04"	0.05413
24	194° 46' 05"	3° 51' 05"	195° 05' 09"	-2° 15' 56"	0° 59' 51"	16' 18.46"	120° 28' 20"	0.05193

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	220° 47' 25"	0.10"	218° 21' 29"	-15° 03' 28"	0.9921198	16' 07.25"	23° 26' 16"	16 m 29 s
1	220° 49' 55"	0.09"	218° 23' 57"	-15° 04' 15"	0.9921093	16' 07.26"	23° 26' 16"	16 m 29 s
2	220° 52' 25"	0.09"	218° 26' 25"	-15° 05' 02"	0.9920988	16' 07.27"	23° 26' 16"	16 m 29 s
3	220° 54' 56"	0.09"	218° 28' 52"	-15° 05' 48"	0.9920883	16' 07.28"	23° 26' 16"	16 m 29 s
4	220° 57' 26"	0.08"	218° 31' 20"	-15° 06' 35"	0.9920778	16' 07.29"	23° 26' 16"	16 m 29 s
5	220° 59' 56"	0.08"	218° 33' 48"	-15° 07' 22"	0.9920673	16' 07.30"	23° 26' 16"	16 m 29 s
6	221° 02' 26"	0.07"	218° 36' 16"	-15° 08' 09"	0.9920568	16' 07.31"	23° 26' 16"	16 m 29 s
7	221° 04' 57"	0.07"	218° 38' 44"	-15° 08' 55"	0.9920464	16' 07.32"	23° 26' 16"	16 m 29 s
8	221° 07' 27"	0.06"	218° 41' 12"	-15° 09' 42"	0.9920359	16' 07.33"	23° 26' 16"	16 m 29 s
9	221° 09' 57"	0.06"	218° 43' 40"	-15° 10' 29"	0.9920254	16' 07.34"	23° 26' 16"	16 m 29 s
10	221° 12' 28"	0.05"	218° 46' 08"	-15° 11' 15"	0.9920149	16' 07.35"	23° 26' 16"	16 m 29 s
11	221° 14' 58"	0.05"	218° 48' 36"	-15° 12' 02"	0.9920044	16' 07.36"	23° 26' 16"	16 m 29 s
12	221° 17' 28"	0.05"	218° 51' 04"	-15° 12' 48"	0.9919939	16' 07.37"	23° 26' 16"	16 m 29 s
13	221° 19' 58"	0.04"	218° 53' 32"	-15° 13' 35"	0.9919835	16' 07.39"	23° 26' 16"	16 m 29 s
14	221° 22' 29"	0.04"	218° 56' 01"	-15° 14' 22"	0.9919730	16' 07.40"	23° 26' 16"	16 m 29 s
15	221° 24' 59"	0.03"	218° 58' 29"	-15° 15' 08"	0.9919625	16' 07.41"	23° 26' 16"	16 m 29 s
16	221° 27' 29"	0.03"	219° 00' 57"	-15° 15' 54"	0.9919520	16' 07.42"	23° 26' 16"	16 m 29 s
17	221° 29' 60"	0.02"	219° 03' 25"	-15° 16' 41"	0.9919416	16' 07.43"	23° 26' 16"	16 m 29 s
18	221° 32' 30"	0.02"	219° 05' 53"	-15° 17' 27"	0.9919311	16' 07.44"	23° 26' 16"	16 m 29 s
19	221° 35' 00"	0.01"	219° 08' 21"	-15° 18' 14"	0.9919206	16' 07.45"	23° 26' 16"	16 m 29 s
20	221° 37' 31"	0.01"	219° 10' 50"	-15° 19' 00"	0.9919102	16' 07.46"	23° 26' 16"	16 m 29 s
21	221° 40' 01"	0.00"	219° 13' 18"	-15° 19' 46"	0.9918997	16' 07.47"	23° 26' 16"	16 m 29 s
22	221° 42' 31"	-0.00"	219° 15' 46"	-15° 20' 33"	0.9918892	16' 07.48"	23° 26' 16"	16 m 29 s
23	221° 45' 01"	-0.01"	219° 18' 15"	-15° 21' 19"	0.9918788	16' 07.49"	23° 26' 16"	16 m 29 s
24	221° 47' 32"	-0.01"	219° 20' 43"	-15° 22' 05"	0.9918683	16' 07.50"	23° 26' 16"	16 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	194° 46' 05"	3° 51' 05"	195° 05' 09"	-2° 15' 56"	0° 59' 51"	16' 18.46"	120° 28' 20"	0.05193
1	195° 22' 22"	3° 48' 49"	195° 37' 44"	-2° 31' 57"	0° 59' 53"	16' 18.99"	120° 31' 40"	0.04978
2	195° 58' 41"	3° 46' 30"	196° 10' 21"	-2° 47' 59"	0° 59' 55"	16' 19.52"	120° 35' 04"	0.04766
3	196° 35' 03"	3° 44' 10"	196° 43' 01"	-3° 04' 00"	0° 59' 57"	16' 20.05"	120° 38' 34"	0.04558
4	197° 11' 26"	3° 41' 48"	197° 15' 45"	-3° 20' 02"	0° 59' 58"	16' 20.57"	120° 42' 09"	0.04355
5	197° 47' 52"	3° 39' 25"	197° 48' 32"	-3° 36' 04"	1° 00' 00"	16' 21.09"	120° 45' 52"	0.04156
6	198° 24' 20"	3° 36' 60"	198° 21' 22"	-3° 52' 06"	1° 00' 02"	16' 21.60"	120° 49' 44"	0.03961
7	199° 00' 51"	3° 34' 33"	198° 54' 16"	-4° 08' 07"	1° 00' 04"	16' 22.10"	120° 53' 46"	0.03770
8	199° 37' 23"	3° 32' 05"	199° 27' 13"	-4° 24' 08"	1° 00' 06"	16' 22.60"	120° 57' 59"	0.03584
9	200° 13' 58"	3° 29' 35"	200° 00' 13"	-4° 40' 09"	1° 00' 08"	16' 23.09"	121° 2' 25"	0.03402
10	200° 50' 34"	3° 27' 03"	200° 33' 17"	-4° 56' 09"	1° 00' 09"	16' 23.58"	121° 7' 07"	0.03225
11	201° 27' 13"	3° 24' 30"	201° 06' 25"	-5° 12' 08"	1° 00' 11"	16' 24.06"	121° 12' 05"	0.03052
12	202° 03' 54"	3° 21' 55"	201° 39' 36"	-5° 28' 07"	1° 00' 13"	16' 24.54"	121° 17' 23"	0.02883
13	202° 40' 37"	3° 19' 19"	202° 12' 51"	-5° 44' 05"	1° 00' 15"	16' 25.01"	121° 23' 02"	0.02719
14	203° 17' 22"	3° 16' 42"	202° 46' 11"	-6° 00' 02"	1° 00' 16"	16' 25.47"	121° 29' 07"	0.02560
15	203° 54' 09"	3° 14' 02"	203° 19' 33"	-6° 15' 58"	1° 00' 18"	16' 25.92"	121° 35' 40"	0.02405
16	204° 30' 57"	3° 11' 22"	203° 53' 00"	-6° 31' 52"	1° 00' 20"	16' 26.37"	121° 42' 44"	0.02254
17	205° 07' 48"	3° 08' 39"	204° 26' 31"	-6° 47' 46"	1° 00' 21"	16' 26.82"	121° 50' 25"	0.02109
18	205° 44' 40"	3° 05' 56"	205° 00' 06"	-7° 03' 38"	1° 00' 23"	16' 27.25"	121° 58' 48"	0.01968
19	206° 21' 35"	3° 03' 10"	205° 33' 45"	-7° 19' 28"	1° 00' 25"	16' 27.68"	122° 7' 57"	0.01831
20	206° 58' 31"	3° 00' 24"	206° 07' 29"	-7° 35' 17"	1° 00' 26"	16' 28.11"	122° 17' 59"	0.01700
21	207° 35' 29"	2° 57' 36"	206° 41' 17"	-7° 51' 04"	1° 00' 28"	16' 28.52"	122° 29' 02"	0.01573
22	208° 12' 29"	2° 54' 47"	207° 15' 08"	-8° 06' 49"	1° 00' 29"	16' 28.93"	122° 41' 15"	0.01451
23	208° 49' 30"	2° 51' 56"	207° 49' 05"	-8° 22' 32"	1° 00' 31"	16' 29.34"	122° 54' 47"	0.01334
24	209° 26' 33"	2° 49' 04"	208° 23' 06"	-8° 38' 13"	1° 00' 32"	16' 29.73"	123° 9' 52"	0.01222

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	221° 47' 32"	-0.01"	219° 20' 43"	-15° 22' 05"	0.9918683	16' 07.50"	23° 26' 16"	16 m 29 s
1	221° 50' 02"	-0.02"	219° 23' 11"	-15° 22' 51"	0.9918578	16' 07.51"	23° 26' 16"	16 m 29 s
2	221° 52' 32"	-0.02"	219° 25' 40"	-15° 23' 38"	0.9918474	16' 07.52"	23° 26' 16"	16 m 29 s
3	221° 55' 03"	-0.03"	219° 28' 08"	-15° 24' 24"	0.9918369	16' 07.53"	23° 26' 16"	16 m 29 s
4	221° 57' 33"	-0.03"	219° 30' 36"	-15° 25' 10"	0.9918265	16' 07.54"	23° 26' 16"	16 m 29 s
5	222° 00' 03"	-0.04"	219° 33' 05"	-15° 25' 56"	0.9918160	16' 07.55"	23° 26' 16"	16 m 29 s
6	222° 02' 34"	-0.04"	219° 35' 33"	-15° 26' 42"	0.9918056	16' 07.56"	23° 26' 16"	16 m 29 s
7	222° 05' 04"	-0.05"	219° 38' 02"	-15° 27' 28"	0.9917951	16' 07.57"	23° 26' 16"	16 m 29 s
8	222° 07' 35"	-0.05"	219° 40' 30"	-15° 28' 14"	0.9917847	16' 07.58"	23° 26' 16"	16 m 29 s
9	222° 10' 05"	-0.06"	219° 42' 59"	-15° 29' 00"	0.9917742	16' 07.59"	23° 26' 16"	16 m 29 s
10	222° 12' 35"	-0.06"	219° 45' 27"	-15° 29' 46"	0.9917638	16' 07.60"	23° 26' 16"	16 m 29 s
11	222° 15' 06"	-0.07"	219° 47' 56"	-15° 30' 32"	0.9917533	16' 07.61"	23° 26' 16"	16 m 28 s
12	222° 17' 36"	-0.07"	219° 50' 24"	-15° 31' 18"	0.9917429	16' 07.62"	23° 26' 16"	16 m 28 s
13	222° 20' 06"	-0.08"	219° 52' 53"	-15° 32' 04"	0.9917325	16' 07.63"	23° 26' 16"	16 m 28 s
14	222° 22' 37"	-0.08"	219° 55' 22"	-15° 32' 50"	0.9917220	16' 07.64"	23° 26' 16"	16 m 28 s
15	222° 25' 07"	-0.09"	219° 57' 50"	-15° 33' 36"	0.9917116	16' 07.65"	23° 26' 16"	16 m 28 s
16	222° 27' 37"	-0.09"	220° 00' 19"	-15° 34' 22"	0.9917011	16' 07.66"	23° 26' 16"	16 m 28 s
17	222° 30' 08"	-0.10"	220° 02' 48"	-15° 35' 08"	0.9916907	16' 07.67"	23° 26' 16"	16 m 28 s
18	222° 32' 38"	-0.10"	220° 05' 16"	-15° 35' 53"	0.9916803	16' 07.68"	23° 26' 16"	16 m 28 s
19	222° 35' 09"	-0.11"	220° 07' 45"	-15° 36' 39"	0.9916698	16' 07.69"	23° 26' 16"	16 m 28 s
20	222° 37' 39"	-0.11"	220° 10' 14"	-15° 37' 25"	0.9916594	16' 07.70"	23° 26' 15"	16 m 28 s
21	222° 40' 09"	-0.12"	220° 12' 43"	-15° 38' 11"	0.9916490	16' 07.71"	23° 26' 15"	16 m 28 s
22	222° 42' 40"	-0.12"	220° 15' 12"	-15° 38' 56"	0.9916386	16' 07.72"	23° 26' 15"	16 m 28 s
23	222° 45' 10"	-0.13"	220° 17' 40"	-15° 39' 42"	0.9916281	16' 07.73"	23° 26' 15"	16 m 28 s
24	222° 47' 41"	-0.14"	220° 20' 09"	-15° 40' 27"	0.9916177	16' 07.74"	23° 26' 15"	16 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	209° 26' 33"	2° 49' 04"	208° 23' 06"	-8° 38' 13"	1° 00' 32"	16' 29.73"	123° 9' 52"	0.01222
1	210° 03' 38"	2° 46' 10"	208° 57' 11"	-8° 53' 52"	1° 00' 33"	16' 30.12"	123° 26' 44"	0.01114
2	210° 40' 44"	2° 43' 16"	209° 31' 21"	-9° 09' 29"	1° 00' 35"	16' 30.50"	123° 45' 39"	0.01012
3	211° 17' 52"	2° 40' 20"	210° 05' 35"	-9° 25' 03"	1° 00' 36"	16' 30.87"	124° 6' 59"	0.00914
4	211° 55' 01"	2° 37' 23"	210° 39' 55"	-9° 40' 34"	1° 00' 38"	16' 31.24"	124° 31' 10"	0.00821
5	212° 32' 12"	2° 34' 24"	211° 14' 18"	-9° 56' 03"	1° 00' 39"	16' 31.60"	124° 58' 42"	0.00734
6	213° 09' 25"	2° 31' 24"	211° 48' 47"	-10° 11' 29"	1° 00' 40"	16' 31.95"	125° 30' 15"	0.00651
7	213° 46' 38"	2° 28' 23"	212° 23' 21"	-10° 26' 52"	1° 00' 41"	16' 32.29"	126° 6' 39"	0.00573
8	214° 23' 54"	2° 25' 21"	212° 57' 59"	-10° 42' 12"	1° 00' 43"	16' 32.62"	126° 48' 55"	0.00501
9	215° 01' 10"	2° 22' 18"	213° 32' 42"	-10° 57' 29"	1° 00' 44"	16' 32.95"	127° 38' 25"	0.00433
10	215° 38' 28"	2° 19' 14"	214° 07' 31"	-11° 12' 42"	1° 00' 45"	16' 33.27"	128° 36' 57"	0.00371
11	216° 15' 48"	2° 16' 08"	214° 42' 24"	-11° 27' 52"	1° 00' 46"	16' 33.58"	129° 46' 53"	0.00313
12	216° 53' 08"	2° 13' 01"	215° 17' 22"	-11° 42' 59"	1° 00' 47"	16' 33.89"	131° 11' 30"	0.00261
13	217° 30' 30"	2° 09' 54"	215° 52' 26"	-11° 58' 01"	1° 00' 48"	16' 34.18"	132° 55' 21"	0.00214
14	218° 07' 53"	2° 06' 45"	216° 27' 34"	-12° 13' 00"	1° 00' 49"	16' 34.47"	135° 4' 59"	0.00172
15	218° 45' 17"	2° 03' 35"	217° 02' 48"	-12° 27' 55"	1° 00' 50"	16' 34.75"	137° 50' 04"	0.00135
16	219° 22' 42"	2° 00' 25"	217° 38' 07"	-12° 42' 46"	1° 00' 51"	16' 35.02"	141° 25' 10"	0.00103
17	220° 00' 08"	1° 57' 13"	218° 13' 32"	-12° 57' 33"	1° 00' 52"	16' 35.28"	146° 12' 53"	0.00077
18	220° 37' 36"	1° 54' 00"	218° 49' 01"	-13° 12' 15"	1° 00' 53"	16' 35.53"	152° 48' 16"	0.00056
19	221° 15' 04"	1° 50' 47"	219° 24' 36"	-13° 26' 53"	1° 00' 54"	16' 35.78"	162° 3' 29"	0.00040
20	221° 52' 33"	1° 47' 32"	220° 00' 17"	-13° 41' 27"	1° 00' 55"	16' 36.02"	175° 1' 21"	0.00029
21	222° 30' 01"	1° 44' 17"	220° 36' 01"	-13° 55' 54"	1° 00' 56"	16' 36.25"	192° 4' 27"	0.00023
22	223° 07' 33"	1° 41' 01"	221° 11' 52"	-14° 10' 18"	1° 00' 57"	16' 36.47"	211° 17' 54"	0.00023
23	223° 45' 04"	1° 37' 44"	221° 47' 49"	-14° 24' 37"	1° 00' 58"	16' 36.68"	228° 47' 55"	0.00028
24	224° 22' 37"	1° 34' 26"	222° 23' 51"	-14° 38' 51"	1° 00' 58"	16' 36.88"	242° 16' 27"	0.00038

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	222° 47' 41"	-0.14"	220° 20' 09"	-15° 40' 27"	0.9916177	16' 07.74"	23° 26' 15"	16 m 28 s
1	222° 50' 11"	-0.14"	220° 22' 38"	-15° 41' 13"	0.9916073	16' 07.75"	23° 26' 15"	16 m 28 s
2	222° 52' 41"	-0.15"	220° 25' 07"	-15° 41' 59"	0.9915969	16' 07.76"	23° 26' 15"	16 m 28 s
3	222° 55' 12"	-0.15"	220° 27' 36"	-15° 42' 44"	0.9915864	16' 07.77"	23° 26' 15"	16 m 28 s
4	222° 57' 42"	-0.16"	220° 30' 05"	-15° 43' 30"	0.9915760	16' 07.78"	23° 26' 15"	16 m 27 s
5	223° 00' 13"	-0.16"	220° 32' 34"	-15° 44' 15"	0.9915656	16' 07.79"	23° 26' 15"	16 m 27 s
6	223° 02' 43"	-0.17"	220° 35' 03"	-15° 45' 01"	0.9915552	16' 07.80"	23° 26' 15"	16 m 27 s
7	223° 05' 14"	-0.17"	220° 37' 32"	-15° 45' 46"	0.9915448	16' 07.81"	23° 26' 15"	16 m 27 s
8	223° 07' 44"	-0.18"	220° 40' 01"	-15° 46' 31"	0.9915344	16' 07.82"	23° 26' 15"	16 m 27 s
9	223° 10' 14"	-0.19"	220° 42' 30"	-15° 47' 17"	0.9915240	16' 07.83"	23° 26' 15"	16 m 27 s
10	223° 12' 45"	-0.19"	220° 44' 59"	-15° 48' 02"	0.9915136	16' 07.84"	23° 26' 15"	16 m 27 s
11	223° 15' 15"	-0.20"	220° 47' 28"	-15° 48' 47"	0.9915032	16' 07.85"	23° 26' 15"	16 m 27 s
12	223° 17' 46"	-0.20"	220° 49' 57"	-15° 49' 33"	0.9914928	16' 07.86"	23° 26' 15"	16 m 27 s
13	223° 20' 16"	-0.21"	220° 52' 26"	-15° 50' 18"	0.9914824	16' 07.87"	23° 26' 15"	16 m 27 s
14	223° 22' 47"	-0.21"	220° 54' 55"	-15° 51' 03"	0.9914720	16' 07.88"	23° 26' 15"	16 m 27 s
15	223° 25' 17"	-0.22"	220° 57' 25"	-15° 51' 48"	0.9914616	16' 07.89"	23° 26' 15"	16 m 27 s
16	223° 27' 48"	-0.22"	220° 59' 54"	-15° 52' 34"	0.9914512	16' 07.90"	23° 26' 15"	16 m 26 s
17	223° 30' 18"	-0.23"	221° 02' 23"	-15° 53' 19"	0.9914408	16' 07.91"	23° 26' 15"	16 m 26 s
18	223° 32' 48"	-0.24"	221° 04' 52"	-15° 54' 04"	0.9914304	16' 07.92"	23° 26' 15"	16 m 26 s
19	223° 35' 19"	-0.24"	221° 07' 22"	-15° 54' 49"	0.9914200	16' 07.93"	23° 26' 15"	16 m 26 s
20	223° 37' 49"	-0.25"	221° 09' 51"	-15° 55' 34"	0.9914096	16' 07.95"	23° 26' 15"	16 m 26 s
21	223° 40' 20"	-0.25"	221° 12' 20"	-15° 56' 19"	0.9913992	16' 07.96"	23° 26' 15"	16 m 26 s
22	223° 42' 50"	-0.26"	221° 14' 49"	-15° 57' 04"	0.9913888	16' 07.97"	23° 26' 15"	16 m 26 s
23	223° 45' 21"	-0.26"	221° 17' 19"	-15° 57' 49"	0.9913784	16' 07.98"	23° 26' 15"	16 m 26 s
24	223° 47' 51"	-0.27"	221° 19' 48"	-15° 58' 34"	0.9913680	16' 07.99"	23° 26' 15"	16 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	224° 22' 37"	1° 34' 26"	222° 23' 51"	-14° 38' 51"	1° 00' 58"	16' 36.88"	242° 16' 27"	0.00038
1	225° 00' 11"	1° 31' 08"	222° 59' 59"	-14° 52' 60"	1° 00' 59"	16' 37.07"	251° 55' 05"	0.00054
2	225° 37' 45"	1° 27' 48"	223° 36' 12"	-15° 07' 03"	1° 00' 60"	16' 37.26"	258° 45' 54"	0.00074
3	226° 15' 20"	1° 24' 28"	224° 12' 31"	-15° 21' 01"	1° 01' 00"	16' 37.44"	263° 43' 11"	0.00100
4	226° 52' 55"	1° 21' 08"	224° 48' 55"	-15° 34' 53"	1° 01' 01"	16' 37.60"	267° 23' 56"	0.00132
5	227° 30' 31"	1° 17' 46"	225° 25' 25"	-15° 48' 39"	1° 01' 02"	16' 37.76"	270° 12' 01"	0.00168
6	228° 08' 08"	1° 14' 24"	226° 02' 01"	-16° 02' 20"	1° 01' 02"	16' 37.91"	272° 22' 50"	0.00210
7	228° 45' 45"	1° 11' 02"	226° 38' 42"	-16° 15' 54"	1° 01' 03"	16' 38.05"	274° 6' 31"	0.00257
8	229° 23' 23"	1° 07' 39"	227° 15' 29"	-16° 29' 23"	1° 01' 03"	16' 38.19"	275° 29' 57"	0.00310
9	230° 01' 01"	1° 04' 15"	227° 52' 21"	-16° 42' 45"	1° 01' 04"	16' 38.31"	276° 37' 52"	0.00367
10	230° 38' 40"	1° 00' 51"	228° 29' 20"	-16° 56' 01"	1° 01' 04"	16' 38.42"	277° 33' 43"	0.00430
11	231° 16' 19"	0° 57' 26"	229° 06' 23"	-17° 09' 11"	1° 01' 04"	16' 38.53"	278° 19' 56"	0.00498
12	231° 53' 59"	0° 54' 01"	229° 43' 33"	-17° 22' 13"	1° 01' 05"	16' 38.63"	278° 58' 24"	0.00572
13	232° 31' 38"	0° 50' 35"	230° 20' 48"	-17° 35' 09"	1° 01' 05"	16' 38.72"	279° 30' 31"	0.00650
14	233° 09' 18"	0° 47' 10"	230° 58' 09"	-17° 47' 59"	1° 01' 05"	16' 38.79"	279° 57' 21"	0.00734
15	233° 46' 58"	0° 43' 43"	231° 35' 35"	-18° 00' 41"	1° 01' 06"	16' 38.86"	280° 19' 44"	0.00824
16	234° 24' 39"	0° 40' 16"	232° 13' 07"	-18° 13' 16"	1° 01' 06"	16' 38.93"	280° 38' 22"	0.00918
17	235° 02' 19"	0° 36' 49"	232° 50' 44"	-18° 25' 44"	1° 01' 06"	16' 38.98"	280° 53' 47"	0.01018
18	235° 39' 60"	0° 33' 22"	233° 28' 27"	-18° 38' 04"	1° 01' 06"	16' 39.02"	281° 6' 25"	0.01123
19	236° 17' 40"	0° 29' 55"	234° 06' 16"	-18° 50' 17"	1° 01' 06"	16' 39.05"	281° 16' 37"	0.01233
20	236° 55' 21"	0° 26' 27"	234° 44' 10"	-19° 02' 22"	1° 01' 06"	16' 39.08"	281° 24' 41"	0.01348
21	237° 33' 01"	0° 22' 59"	235° 22' 10"	-19° 14' 20"	1° 01' 06"	16' 39.10"	281° 30' 52"	0.01468
22	238° 10' 42"	0° 19' 31"	236° 00' 15"	-19° 26' 10"	1° 01' 06"	16' 39.10"	281° 35' 23"	0.01594
23	238° 48' 22"	0° 16' 02"	236° 38' 26"	-19° 37' 51"	1° 01' 06"	16' 39.10"	281° 38' 24"	0.01724
24	239° 26' 03"	0° 12' 34"	237° 16' 42"	-19° 49' 25"	1° 01' 06"	16' 39.09"	281° 40' 05"	0.01860

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	223° 47' 51"	-0.27"	221° 19' 48"	-15° 58' 34"	0.9913680	16' 07.99"	23° 26' 15"	16 m 26 s
1	223° 50' 22"	-0.27"	221° 22' 18"	-15° 59' 19"	0.9913577	16' 08.00"	23° 26' 15"	16 m 26 s
2	223° 52' 52"	-0.28"	221° 24' 47"	-16° 00' 04"	0.9913473	16' 08.01"	23° 26' 15"	16 m 26 s
3	223° 55' 23"	-0.29"	221° 27' 16"	-16° 00' 49"	0.9913369	16' 08.02"	23° 26' 15"	16 m 25 s
4	223° 57' 53"	-0.29"	221° 29' 46"	-16° 01' 34"	0.9913265	16' 08.03"	23° 26' 15"	16 m 25 s
5	224° 00' 24"	-0.30"	221° 32' 15"	-16° 02' 19"	0.9913162	16' 08.04"	23° 26' 15"	16 m 25 s
6	224° 02' 54"	-0.30"	221° 34' 45"	-16° 03' 03"	0.9913058	16' 08.05"	23° 26' 15"	16 m 25 s
7	224° 05' 25"	-0.31"	221° 37' 14"	-16° 03' 48"	0.9912954	16' 08.06"	23° 26' 15"	16 m 25 s
8	224° 07' 55"	-0.31"	221° 39' 44"	-16° 04' 33"	0.9912850	16' 08.07"	23° 26' 15"	16 m 25 s
9	224° 10' 26"	-0.32"	221° 42' 13"	-16° 05' 18"	0.9912747	16' 08.08"	23° 26' 15"	16 m 25 s
10	224° 12' 56"	-0.33"	221° 44' 43"	-16° 06' 02"	0.9912643	16' 08.09"	23° 26' 15"	16 m 25 s
11	224° 15' 27"	-0.33"	221° 47' 13"	-16° 06' 47"	0.9912540	16' 08.10"	23° 26' 15"	16 m 25 s
12	224° 17' 57"	-0.34"	221° 49' 42"	-16° 07' 32"	0.9912436	16' 08.11"	23° 26' 15"	16 m 24 s
13	224° 20' 28"	-0.34"	221° 52' 12"	-16° 08' 16"	0.9912332	16' 08.12"	23° 26' 15"	16 m 24 s
14	224° 22' 58"	-0.35"	221° 54' 42"	-16° 09' 01"	0.9912229	16' 08.13"	23° 26' 15"	16 m 24 s
15	224° 25' 29"	-0.35"	221° 57' 11"	-16° 09' 45"	0.9912125	16' 08.14"	23° 26' 15"	16 m 24 s
16	224° 27' 59"	-0.36"	221° 59' 41"	-16° 10' 30"	0.9912022	16' 08.15"	23° 26' 15"	16 m 24 s
17	224° 30' 30"	-0.36"	222° 02' 11"	-16° 11' 14"	0.9911918	16' 08.16"	23° 26' 15"	16 m 24 s
18	224° 33' 00"	-0.37"	222° 04' 41"	-16° 11' 59"	0.9911815	16' 08.17"	23° 26' 15"	16 m 24 s
19	224° 35' 31"	-0.38"	222° 07' 10"	-16° 12' 43"	0.9911711	16' 08.18"	23° 26' 15"	16 m 24 s
20	224° 38' 01"	-0.38"	222° 09' 40"	-16° 13' 28"	0.9911608	16' 08.19"	23° 26' 15"	16 m 23 s
21	224° 40' 32"	-0.39"	222° 12' 10"	-16° 14' 12"	0.9911504	16' 08.20"	23° 26' 15"	16 m 23 s
22	224° 43' 03"	-0.39"	222° 14' 40"	-16° 14' 56"	0.9911401	16' 08.21"	23° 26' 15"	16 m 23 s
23	224° 45' 33"	-0.40"	222° 17' 10"	-16° 15' 41"	0.9911298	16' 08.22"	23° 26' 15"	16 m 23 s
24	224° 48' 04"	-0.40"	222° 19' 40"	-16° 16' 25"	0.9911194	16' 08.23"	23° 26' 15"	16 m 23 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	239° 26' 03"	0° 12' 34"	237° 16' 42"	-19° 49' 25"	1° 01' 06"	16' 39.09"	281° 40' 05"	0.01860
1	240° 03' 43"	0° 09' 05"	237° 55' 04"	-20° 00' 50"	1° 01' 06"	16' 39.07"	281° 40' 32"	0.02001
2	240° 41' 23"	0° 05' 37"	238° 33' 30"	-20° 12' 08"	1° 01' 06"	16' 39.04"	281° 39' 54"	0.02147
3	241° 19' 03"	0° 02' 08"	239° 12' 03"	-20° 23' 16"	1° 01' 06"	16' 39.01"	281° 38' 15"	0.02298
4	241° 56' 42"	0° -1' 20"	239° 50' 40"	-20° 34' 16"	1° 01' 06"	16' 38.96"	281° 35' 41"	0.02454
5	242° 34' 21"	0° -4' 49"	240° 29' 22"	-20° 45' 08"	1° 01' 06"	16' 38.91"	281° 32' 16"	0.02615
6	243° 12' 00"	0° -8' 17"	241° 08' 10"	-20° 55' 50"	1° 01' 06"	16' 38.84"	281° 28' 04"	0.02781
7	243° 49' 38"	0° -11' 46"	241° 47' 03"	-21° 06' 24"	1° 01' 05"	16' 38.77"	281° 23' 09"	0.02952
8	244° 27' 16"	0° -15' 14"	242° 26' 01"	-21° 16' 49"	1° 01' 05"	16' 38.69"	281° 17' 33"	0.03128
9	245° 04' 54"	0° -18' 42"	243° 05' 04"	-21° 27' 05"	1° 01' 05"	16' 38.60"	281° 11' 20"	0.03309
10	245° 42' 31"	0° -22' 10"	243° 44' 11"	-21° 37' 11"	1° 01' 04"	16' 38.50"	281° 4' 32"	0.03495
11	246° 20' 07"	0° -25' 38"	244° 23' 24"	-21° 47' 08"	1° 01' 04"	16' 38.40"	280° 57' 11"	0.03686
12	246° 57' 43"	0° -29' 06"	245° 02' 41"	-21° 56' 56"	1° 01' 03"	16' 38.28"	280° 49' 20"	0.03881
13	247° 35' 18"	0° -32' 33"	245° 42' 03"	-22° 06' 34"	1° 01' 03"	16' 38.16"	280° 40' 59"	0.04082
14	248° 12' 53"	0° -35' 60"	246° 21' 30"	-22° 16' 03"	1° 01' 03"	16' 38.03"	280° 32' 12"	0.04287
15	248° 50' 27"	0° -39' 27"	247° 01' 01"	-22° 25' 22"	1° 01' 02"	16' 37.89"	280° 22' 58"	0.04497
16	249° 27' 60"	0° -42' 53"	247° 40' 37"	-22° 34' 31"	1° 01' 01"	16' 37.74"	280° 13' 20"	0.04711
17	250° 05' 32"	0° -46' 19"	248° 20' 17"	-22° 43' 30"	1° 01' 01"	16' 37.58"	280° 3' 19"	0.04930
18	250° 43' 04"	0° -49' 44"	249° 00' 01"	-22° 52' 19"	1° 01' 00"	16' 37.42"	279° 52' 56"	0.05154
19	251° 20' 34"	0° -53' 10"	249° 39' 49"	-23° 00' 58"	1° 00' 60"	16' 37.24"	279° 42' 12"	0.05383
20	251° 58' 04"	0° -56' 34"	250° 19' 42"	-23° 09' 27"	1° 00' 59"	16' 37.06"	279° 31' 08"	0.05616
21	252° 35' 33"	0° -59' 58"	250° 59' 38"	-23° 17' 46"	1° 00' 58"	16' 36.87"	279° 19' 46"	0.05854
22	253° 13' 01"	-1° 03' 22"	251° 39' 38"	-23° 25' 54"	1° 00' 58"	16' 36.68"	279° 8' 05"	0.06096
23	253° 50' 29"	-1° 06' 45"	252° 19' 42"	-23° 33' 52"	1° 00' 57"	16' 36.47"	278° 56' 08"	0.06342
24	254° 27' 52"	-1° 10' 08"	252° 59' 47"	-23° 41' 39"	1° 00' 56"	16' 36.26"	278° 43' 55"	0.06593

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	224° 48' 04"	-0.40"	222° 19' 40"	-16° 16' 25"	0.9911194	16' 08.23"	23° 26' 15"	16 m 23 s
1	224° 50' 34"	-0.41"	222° 22' 09"	-16° 17' 09"	0.9911091	16' 08.24"	23° 26' 15"	16 m 23 s
2	224° 53' 05"	-0.41"	222° 24' 39"	-16° 17' 53"	0.9910988	16' 08.25"	23° 26' 15"	16 m 23 s
3	224° 55' 35"	-0.42"	222° 27' 09"	-16° 18' 38"	0.9910884	16' 08.26"	23° 26' 15"	16 m 22 s
4	224° 58' 06"	-0.43"	222° 29' 39"	-16° 19' 22"	0.9910781	16' 08.27"	23° 26' 15"	16 m 22 s
5	225° 00' 36"	-0.43"	222° 32' 09"	-16° 20' 06"	0.9910678	16' 08.28"	23° 26' 15"	16 m 22 s
6	225° 03' 07"	-0.44"	222° 34' 39"	-16° 20' 50"	0.9910575	16' 08.29"	23° 26' 15"	16 m 22 s
7	225° 05' 38"	-0.44"	222° 37' 09"	-16° 21' 34"	0.9910471	16' 08.30"	23° 26' 15"	16 m 22 s
8	225° 08' 08"	-0.45"	222° 39' 39"	-16° 22' 18"	0.9910368	16' 08.31"	23° 26' 15"	16 m 22 s
9	225° 10' 39"	-0.45"	222° 42' 10"	-16° 23' 02"	0.9910265	16' 08.32"	23° 26' 15"	16 m 22 s
10	225° 13' 09"	-0.46"	222° 44' 40"	-16° 23' 46"	0.9910162	16' 08.33"	23° 26' 15"	16 m 21 s
11	225° 15' 40"	-0.46"	222° 47' 10"	-16° 24' 30"	0.9910059	16' 08.34"	23° 26' 15"	16 m 21 s
12	225° 18' 10"	-0.47"	222° 49' 40"	-16° 25' 14"	0.9909956	16' 08.35"	23° 26' 15"	16 m 21 s
13	225° 20' 41"	-0.47"	222° 52' 10"	-16° 25' 58"	0.9909853	16' 08.36"	23° 26' 15"	16 m 21 s
14	225° 23' 12"	-0.48"	222° 54' 40"	-16° 26' 42"	0.9909750	16' 08.37"	23° 26' 15"	16 m 21 s
15	225° 25' 42"	-0.49"	222° 57' 11"	-16° 27' 26"	0.9909647	16' 08.38"	23° 26' 15"	16 m 21 s
16	225° 28' 13"	-0.49"	222° 59' 41"	-16° 28' 10"	0.9909544	16' 08.39"	23° 26' 15"	16 m 21 s
17	225° 30' 43"	-0.50"	223° 02' 11"	-16° 28' 53"	0.9909441	16' 08.40"	23° 26' 15"	16 m 20 s
18	225° 33' 14"	-0.50"	223° 04' 41"	-16° 29' 37"	0.9909338	16' 08.41"	23° 26' 15"	16 m 20 s
19	225° 35' 45"	-0.51"	223° 07' 12"	-16° 30' 21"	0.9909235	16' 08.42"	23° 26' 15"	16 m 20 s
20	225° 38' 15"	-0.51"	223° 09' 42"	-16° 31' 05"	0.9909132	16' 08.43"	23° 26' 15"	16 m 20 s
21	225° 40' 46"	-0.52"	223° 12' 12"	-16° 31' 48"	0.9909029	16' 08.44"	23° 26' 15"	16 m 20 s
22	225° 43' 16"	-0.52"	223° 14' 43"	-16° 32' 32"	0.9908926	16' 08.45"	23° 26' 15"	16 m 20 s
23	225° 45' 47"	-0.53"	223° 17' 13"	-16° 33' 16"	0.9908823	16' 08.46"	23° 26' 15"	16 m 19 s
24	225° 48' 18"	-0.53"	223° 19' 43"	-16° 33' 59"	0.9908721	16' 08.47"	23° 26' 15"	16 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	254° 27' 52"	-1° 10' 08"	252° 59' 47"	-23° 41' 39"	1° 00' 56"	16' 36.26"	278° 43' 55"	0.06593
1	255° 05' 17"	-1° 13' 30"	253° 39' 58"	-23° 49' 15"	1° 00' 55"	16' 36.04"	278° 31' 25"	0.06849
2	255° 42' 41"	-1° 16' 51"	254° 20' 13"	-23° 56' 42"	1° 00' 54"	16' 35.81"	278° 18' 40"	0.07108
3	256° 20' 04"	-1° 20' 12"	255° 00' 31"	-24° 03' 57"	1° 00' 54"	16' 35.57"	278° 5' 41"	0.07373
4	256° 57' 26"	-1° 23' 32"	255° 40' 52"	-24° 11' 02"	1° 00' 53"	16' 35.33"	277° 52' 28"	0.07641
5	257° 34' 46"	-1° 26' 51"	256° 21' 16"	-24° 17' 55"	1° 00' 52"	16' 35.08"	277° 39' 02"	0.07914
6	258° 12' 06"	-1° 30' 10"	257° 01' 43"	-24° 24' 38"	1° 00' 51"	16' 34.82"	277° 25' 23"	0.08191
7	258° 49' 24"	-1° 33' 28"	257° 42' 13"	-24° 31' 10"	1° 00' 50"	16' 34.55"	277° 11' 32"	0.08472
8	259° 26' 41"	-1° 36' 45"	258° 22' 46"	-24° 37' 31"	1° 00' 49"	16' 34.28"	276° 57' 30"	0.08757
9	260° 03' 57"	-1° 40' 01"	259° 03' 21"	-24° 43' 41"	1° 00' 48"	16' 34.00"	276° 43' 17"	0.09046
10	260° 41' 11"	-1° 43' 17"	259° 43' 58"	-24° 49' 39"	1° 00' 47"	16' 33.71"	276° 28' 53"	0.09339
11	261° 18' 24"	-1° 46' 31"	260° 24' 38"	-24° 55' 26"	1° 00' 46"	16' 33.42"	276° 14' 18"	0.09637
12	261° 55' 36"	-1° 49' 45"	261° 05' 20"	-25° 01' 03"	1° 00' 44"	16' 33.12"	275° 59' 34"	0.09938
13	262° 32' 46"	-1° 52' 58"	261° 46' 04"	-25° 06' 27"	1° 00' 43"	16' 32.81"	275° 44' 41"	0.10243
14	263° 09' 55"	-1° 56' 10"	262° 26' 49"	-25° 11' 41"	1° 00' 42"	16' 32.49"	275° 29' 39"	0.10552
15	263° 47' 02"	-1° 59' 21"	263° 07' 37"	-25° 16' 43"	1° 00' 41"	16' 32.17"	275° 14' 28"	0.10865
16	264° 24' 08"	-2° 02' 31"	263° 48' 26"	-25° 21' 33"	1° 00' 40"	16' 31.84"	274° 59' 10"	0.11181
17	265° 01' 13"	-2° 05' 40"	264° 29' 16"	-25° 26' 12"	1° 00' 39"	16' 31.51"	274° 43' 43"	0.11501
18	265° 38' 16"	-2° 08' 48"	265° 10' 08"	-25° 30' 40"	1° 00' 37"	16' 31.17"	274° 28' 09"	0.11825
19	266° 15' 17"	-2° 11' 55"	265° 51' 00"	-25° 34' 56"	1° 00' 36"	16' 30.82"	274° 12' 29"	0.12153
20	266° 52' 17"	-2° 15' 01"	266° 31' 54"	-25° 39' 01"	1° 00' 35"	16' 30.47"	273° 56' 41"	0.12484
21	267° 29' 15"	-2° 18' 06"	267° 12' 48"	-25° 42' 54"	1° 00' 33"	16' 30.11"	273° 40' 47"	0.12818
22	268° 06' 12"	-2° 21' 10"	267° 53' 43"	-25° 46' 35"	1° 00' 32"	16' 29.74"	273° 24' 47"	0.13156
23	268° 43' 07"	-2° 24' 12"	268° 34' 39"	-25° 50' 05"	1° 00' 31"	16' 29.37"	273° 8' 42"	0.13498
24	269° 19' 60"	-2° 27' 14"	269° 15' 34"	-25° 53' 23"	1° 00' 29"	16' 28.99"	272° 52' 31"	0.13843

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	225° 48' 18"	-0.53"	223° 19' 43"	-16° 33' 59"	0.9908721	16' 08.47"	23° 26' 15"	16 m 19 s
1	225° 50' 48"	-0.54"	223° 22' 14"	-16° 34' 43"	0.9908618	16' 08.48"	23° 26' 15"	16 m 19 s
2	225° 53' 19"	-0.54"	223° 24' 44"	-16° 35' 26"	0.9908515	16' 08.49"	23° 26' 15"	16 m 19 s
3	225° 55' 49"	-0.55"	223° 27' 15"	-16° 36' 10"	0.9908413	16' 08.50"	23° 26' 15"	16 m 19 s
4	225° 58' 20"	-0.55"	223° 29' 45"	-16° 36' 53"	0.9908310	16' 08.51"	23° 26' 15"	16 m 18 s
5	226° 00' 51"	-0.56"	223° 32' 16"	-16° 37' 37"	0.9908207	16' 08.52"	23° 26' 15"	16 m 18 s
6	226° 03' 21"	-0.56"	223° 34' 46"	-16° 38' 20"	0.9908105	16' 08.53"	23° 26' 15"	16 m 18 s
7	226° 05' 52"	-0.57"	223° 37' 17"	-16° 39' 04"	0.9908002	16' 08.54"	23° 26' 15"	16 m 18 s
8	226° 08' 23"	-0.57"	223° 39' 48"	-16° 39' 47"	0.9907899	16' 08.55"	23° 26' 15"	16 m 18 s
9	226° 10' 53"	-0.58"	223° 42' 18"	-16° 40' 30"	0.9907797	16' 08.56"	23° 26' 15"	16 m 18 s
10	226° 13' 24"	-0.58"	223° 44' 49"	-16° 41' 14"	0.9907694	16' 08.57"	23° 26' 15"	16 m 17 s
11	226° 15' 55"	-0.59"	223° 47' 19"	-16° 41' 57"	0.9907592	16' 08.58"	23° 26' 15"	16 m 17 s
12	226° 18' 25"	-0.59"	223° 49' 50"	-16° 42' 40"	0.9907489	16' 08.59"	23° 26' 15"	16 m 17 s
13	226° 20' 56"	-0.60"	223° 52' 21"	-16° 43' 23"	0.9907387	16' 08.60"	23° 26' 15"	16 m 17 s
14	226° 23' 26"	-0.60"	223° 54' 51"	-16° 44' 07"	0.9907285	16' 08.61"	23° 26' 15"	16 m 17 s
15	226° 25' 57"	-0.61"	223° 57' 22"	-16° 44' 50"	0.9907182	16' 08.62"	23° 26' 15"	16 m 16 s
16	226° 28' 28"	-0.61"	223° 59' 53"	-16° 45' 33"	0.9907080	16' 08.63"	23° 26' 15"	16 m 16 s
17	226° 30' 58"	-0.62"	224° 02' 24"	-16° 46' 16"	0.9906978	16' 08.64"	23° 26' 15"	16 m 16 s
18	226° 33' 29"	-0.62"	224° 04' 55"	-16° 46' 59"	0.9906875	16' 08.65"	23° 26' 15"	16 m 16 s
19	226° 35' 60"	-0.63"	224° 07' 25"	-16° 47' 42"	0.9906773	16' 08.66"	23° 26' 15"	16 m 16 s
20	226° 38' 30"	-0.63"	224° 09' 56"	-16° 48' 25"	0.9906671	16' 08.67"	23° 26' 15"	16 m 15 s
21	226° 41' 01"	-0.64"	224° 12' 27"	-16° 49' 08"	0.9906569	16' 08.68"	23° 26' 15"	16 m 15 s
22	226° 43' 32"	-0.64"	224° 14' 58"	-16° 49' 51"	0.9906467	16' 08.69"	23° 26' 15"	16 m 15 s
23	226° 46' 02"	-0.65"	224° 17' 29"	-16° 50' 34"	0.9906365	16' 08.70"	23° 26' 15"	16 m 15 s
24	226° 48' 33"	-0.65"	224° 19' 60"	-16° 51' 17"	0.9906262	16' 08.71"	23° 26' 15"	16 m 15 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	269° 19' 60"	-2° 27' 14"	269° 15' 34"	-25° 53' 23"	1° 00' 29"	16' 28.99"	272° 52' 31"	0.13843
1	269° 56' 51"	-2° 30' 14"	269° 56' 30"	-25° 56' 29"	1° 00' 28"	16' 28.61"	272° 36' 15"	0.14191
2	270° 33' 41"	-2° 33' 13"	270° 37' 26"	-25° 59' 24"	1° 00' 27"	16' 28.22"	272° 19' 54"	0.14543
3	271° 10' 29"	-2° 36' 11"	271° 18' 22"	-26° 02' 07"	1° 00' 25"	16' 27.82"	272° 3' 29"	0.14897
4	271° 47' 15"	-2° 39' 08"	271° 59' 17"	-26° 04' 39"	1° 00' 24"	16' 27.42"	271° 47' 00"	0.15255
5	272° 23' 60"	-2° 42' 04"	272° 40' 12"	-26° 06' 59"	1° 00' 22"	16' 27.02"	271° 30' 27"	0.15616
6	273° 00' 43"	-2° 44' 58"	273° 21' 07"	-26° 09' 07"	1° 00' 21"	16' 26.60"	271° 13' 51"	0.15980
7	273° 37' 23"	-2° 47' 51"	274° 02' 00"	-26° 11' 04"	1° 00' 19"	16' 26.19"	270° 57' 11"	0.16348
8	274° 14' 02"	-2° 50' 42"	274° 42' 53"	-26° 12' 48"	1° 00' 18"	16' 25.77"	270° 40' 28"	0.16718
9	274° 50' 40"	-2° 53' 33"	275° 23' 44"	-26° 14' 22"	1° 00' 16"	16' 25.34"	270° 23' 43"	0.17091
10	275° 27' 15"	-2° 56' 22"	276° 04' 34"	-26° 15' 43"	1° 00' 14"	16' 24.91"	270° 6' 55"	0.17467
11	276° 03' 48"	-2° 59' 10"	276° 45' 23"	-26° 16' 53"	1° 00' 13"	16' 24.47"	269° 50' 05"	0.17845
12	276° 40' 20"	-3° 01' 56"	277° 26' 10"	-26° 17' 52"	1° 00' 11"	16' 24.03"	269° 33' 13"	0.18227
13	277° 16' 49"	-3° 04' 41"	278° 06' 55"	-26° 18' 39"	1° 00' 10"	16' 23.59"	269° 16' 20"	0.18611
14	277° 53' 17"	-3° 07' 24"	278° 47' 38"	-26° 19' 14"	1° 00' 08"	16' 23.14"	268° 59' 25"	0.18998
15	278° 29' 42"	-3° 10' 06"	279° 28' 19"	-26° 19' 38"	1° 00' 06"	16' 22.68"	268° 42' 29"	0.19388
16	279° 06' 06"	-3° 12' 47"	280° 08' 58"	-26° 19' 50"	1° 00' 05"	16' 22.22"	268° 25' 32"	0.19780
17	279° 42' 27"	-3° 15' 26"	280° 49' 35"	-26° 19' 51"	1° 00' 03"	16' 21.76"	268° 8' 35"	0.20174
18	280° 18' 46"	-3° 18' 04"	281° 30' 09"	-26° 19' 40"	1° 00' 01"	16' 21.29"	267° 51' 37"	0.20572
19	280° 55' 04"	-3° 20' 40"	282° 10' 41"	-26° 19' 18"	0° 59' 59"	16' 20.82"	267° 34' 39"	0.20971
20	281° 31' 19"	-3° 23' 15"	282° 51' 09"	-26° 18' 45"	0° 59' 58"	16' 20.35"	267° 17' 41"	0.21373
21	282° 07' 32"	-3° 25' 48"	283° 31' 35"	-26° 18' 00"	0° 59' 56"	16' 19.87"	267° 0' 43"	0.21777
22	282° 43' 44"	-3° 28' 20"	284° 11' 57"	-26° 17' 05"	0° 59' 54"	16' 19.38"	266° 43' 46"	0.22184
23	283° 19' 53"	-3° 30' 50"	284° 52' 16"	-26° 15' 58"	0° 59' 52"	16' 18.90"	266° 26' 50"	0.22592
24	283° 55' 60"	-3° 33' 19"	285° 32' 32"	-26° 14' 39"	0° 59' 51"	16' 18.41"	266° 9' 54"	0.23003

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	226° 48' 33"	-0.65"	224° 19' 60"	-16° 51' 17"	0.9906262	16' 08.71"	23° 26' 15"	16 m 15 s
1	226° 51' 04"	-0.65"	224° 22' 31"	-16° 51' 60"	0.9906160	16' 08.72"	23° 26' 15"	16 m 14 s
2	226° 53' 34"	-0.66"	224° 25' 02"	-16° 52' 42"	0.9906058	16' 08.73"	23° 26' 15"	16 m 14 s
3	226° 56' 05"	-0.66"	224° 27' 33"	-16° 53' 25"	0.9905956	16' 08.74"	23° 26' 15"	16 m 14 s
4	226° 58' 36"	-0.67"	224° 30' 04"	-16° 54' 08"	0.9905854	16' 08.75"	23° 26' 15"	16 m 14 s
5	227° 01' 07"	-0.67"	224° 32' 35"	-16° 54' 51"	0.9905753	16' 08.76"	23° 26' 15"	16 m 14 s
6	227° 03' 37"	-0.68"	224° 35' 06"	-16° 55' 34"	0.9905651	16' 08.77"	23° 26' 15"	16 m 13 s
7	227° 06' 08"	-0.68"	224° 37' 37"	-16° 56' 16"	0.9905549	16' 08.78"	23° 26' 15"	16 m 13 s
8	227° 08' 39"	-0.69"	224° 40' 08"	-16° 56' 59"	0.9905447	16' 08.79"	23° 26' 15"	16 m 13 s
9	227° 11' 09"	-0.69"	224° 42' 39"	-16° 57' 41"	0.9905345	16' 08.80"	23° 26' 15"	16 m 13 s
10	227° 13' 40"	-0.69"	224° 45' 10"	-16° 58' 24"	0.9905244	16' 08.81"	23° 26' 15"	16 m 12 s
11	227° 16' 11"	-0.70"	224° 47' 41"	-16° 59' 07"	0.9905142	16' 08.82"	23° 26' 15"	16 m 12 s
12	227° 18' 41"	-0.70"	224° 50' 13"	-16° 59' 49"	0.9905040	16' 08.83"	23° 26' 15"	16 m 12 s
13	227° 21' 12"	-0.71"	224° 52' 44"	-17° 00' 32"	0.9904939	16' 08.84"	23° 26' 15"	16 m 12 s
14	227° 23' 43"	-0.71"	224° 55' 15"	-17° 01' 14"	0.9904837	16' 08.85"	23° 26' 15"	16 m 12 s
15	227° 26' 14"	-0.71"	224° 57' 46"	-17° 01' 57"	0.9904735	16' 08.86"	23° 26' 15"	16 m 11 s
16	227° 28' 44"	-0.72"	225° 00' 18"	-17° 02' 39"	0.9904634	16' 08.87"	23° 26' 15"	16 m 11 s
17	227° 31' 15"	-0.72"	225° 02' 49"	-17° 03' 21"	0.9904532	16' 08.88"	23° 26' 15"	16 m 11 s
18	227° 33' 46"	-0.73"	225° 05' 20"	-17° 04' 04"	0.9904431	16' 08.89"	23° 26' 15"	16 m 11 s
19	227° 36' 16"	-0.73"	225° 07' 52"	-17° 04' 46"	0.9904329	16' 08.90"	23° 26' 15"	16 m 10 s
20	227° 38' 47"	-0.73"	225° 10' 23"	-17° 05' 28"	0.9904228	16' 08.91"	23° 26' 15"	16 m 10 s
21	227° 41' 18"	-0.74"	225° 12' 54"	-17° 06' 11"	0.9904127	16' 08.92"	23° 26' 15"	16 m 10 s
22	227° 43' 49"	-0.74"	225° 15' 26"	-17° 06' 53"	0.9904026	16' 08.93"	23° 26' 15"	16 m 10 s
23	227° 46' 19"	-0.74"	225° 17' 57"	-17° 07' 35"	0.9903924	16' 08.94"	23° 26' 15"	16 m 09 s
24	227° 48' 50"	-0.75"	225° 20' 29"	-17° 08' 17"	0.9903823	16' 08.95"	23° 26' 15"	16 m 09 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	283° 55' 60"	-3° 33' 19"	285° 32' 32"	-26° 14' 39"	0° 59' 51"	16' 18.41"	266° 9' 54"	0.23003
1	284° 32' 04"	-3° 35' 46"	286° 12' 44"	-26° 13' 10"	0° 59' 49"	16' 17.91"	265° 53' 00"	0.23416
2	285° 08' 07"	-3° 38' 12"	286° 52' 53"	-26° 11' 30"	0° 59' 47"	16' 17.42"	265° 36' 07"	0.23831
3	285° 44' 08"	-3° 40' 35"	287° 32' 57"	-26° 09' 38"	0° 59' 45"	16' 16.92"	265° 19' 16"	0.24248
4	286° 20' 06"	-3° 42' 58"	288° 12' 58"	-26° 07' 36"	0° 59' 43"	16' 16.42"	265° 2' 27"	0.24667
5	286° 56' 02"	-3° 45' 19"	288° 52' 55"	-26° 05' 23"	0° 59' 41"	16' 15.91"	264° 45' 40"	0.25088
6	287° 31' 56"	-3° 47' 38"	289° 32' 47"	-26° 02' 59"	0° 59' 39"	16' 15.40"	264° 28' 55"	0.25510
7	288° 07' 48"	-3° 49' 55"	290° 12' 35"	-26° 00' 24"	0° 59' 38"	16' 14.89"	264° 12' 12"	0.25935
8	288° 43' 38"	-3° 52' 11"	290° 52' 19"	-25° 57' 38"	0° 59' 36"	16' 14.38"	263° 55' 32"	0.26361
9	289° 19' 25"	-3° 54' 25"	291° 31' 58"	-25° 54' 42"	0° 59' 34"	16' 13.86"	263° 38' 55"	0.26789
10	289° 55' 10"	-3° 56' 38"	292° 11' 32"	-25° 51' 35"	0° 59' 32"	16' 13.34"	263° 22' 20"	0.27219
11	290° 30' 53"	-3° 58' 48"	292° 51' 01"	-25° 48' 18"	0° 59' 30"	16' 12.82"	263° 5' 49"	0.27650
12	291° 06' 34"	-4° 00' 58"	293° 30' 26"	-25° 44' 51"	0° 59' 28"	16' 12.29"	262° 49' 21"	0.28083
13	291° 42' 12"	-4° 03' 05"	294° 09' 45"	-25° 41' 13"	0° 59' 26"	16' 11.77"	262° 32' 57"	0.28517
14	292° 17' 48"	-4° 05' 11"	294° 48' 60"	-25° 37' 25"	0° 59' 24"	16' 11.24"	262° 16' 36"	0.28953
15	292° 53' 22"	-4° 07' 15"	295° 28' 09"	-25° 33' 26"	0° 59' 22"	16' 10.71"	262° 0' 19"	0.29390
16	293° 28' 53"	-4° 09' 17"	296° 07' 12"	-25° 29' 18"	0° 59' 20"	16' 10.17"	261° 44' 06"	0.29828
17	294° 04' 23"	-4° 11' 18"	296° 46' 11"	-25° 24' 59"	0° 59' 18"	16' 09.64"	261° 27' 58"	0.30268
18	294° 39' 50"	-4° 13' 17"	297° 25' 03"	-25° 20' 31"	0° 59' 16"	16' 09.10"	261° 11' 53"	0.30709
19	295° 15' 15"	-4° 15' 14"	298° 03' 51"	-25° 15' 52"	0° 59' 14"	16' 08.56"	260° 55' 53"	0.31151
20	295° 50' 37"	-4° 17' 09"	298° 42' 32"	-25° 11' 04"	0° 59' 12"	16' 08.02"	260° 39' 58"	0.31595
21	296° 25' 57"	-4° 19' 03"	299° 21' 07"	-25° 06' 07"	0° 59' 10"	16' 07.48"	260° 24' 07"	0.32039
22	297° 01' 15"	-4° 20' 54"	299° 59' 37"	-25° 00' 59"	0° 59' 08"	16' 06.94"	260° 8' 21"	0.32485
23	297° 36' 30"	-4° 22' 45"	300° 38' 01"	-24° 55' 42"	0° 59' 06"	16' 06.39"	259° 52' 40"	0.32931
24	298° 11' 43"	-4° 24' 33"	301° 16' 18"	-24° 50' 16"	0° 59' 04"	16' 05.85"	259° 37' 05"	0.33379

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	227° 48' 50"	-0.75"	225° 20' 29"	-17° 08' 17"	0.9903823	16' 08.95"	23° 26' 15"	16 m 09 s
1	227° 51' 21"	-0.75"	225° 23' 00"	-17° 08' 59"	0.9903722	16' 08.96"	23° 26' 15"	16 m 09 s
2	227° 53' 52"	-0.76"	225° 25' 32"	-17° 09' 41"	0.9903621	16' 08.97"	23° 26' 15"	16 m 09 s
3	227° 56' 22"	-0.76"	225° 28' 03"	-17° 10' 23"	0.9903520	16' 08.98"	23° 26' 15"	16 m 08 s
4	227° 58' 53"	-0.76"	225° 30' 35"	-17° 11' 05"	0.9903419	16' 08.99"	23° 26' 15"	16 m 08 s
5	228° 01' 24"	-0.77"	225° 33' 06"	-17° 11' 47"	0.9903318	16' 09.00"	23° 26' 15"	16 m 08 s
6	228° 03' 55"	-0.77"	225° 35' 38"	-17° 12' 29"	0.9903217	16' 09.01"	23° 26' 15"	16 m 08 s
7	228° 06' 25"	-0.77"	225° 38' 09"	-17° 13' 11"	0.9903116	16' 09.02"	23° 26' 15"	16 m 07 s
8	228° 08' 56"	-0.78"	225° 40' 41"	-17° 13' 53"	0.9903015	16' 09.03"	23° 26' 15"	16 m 07 s
9	228° 11' 27"	-0.78"	225° 43' 13"	-17° 14' 35"	0.9902914	16' 09.04"	23° 26' 15"	16 m 07 s
10	228° 13' 58"	-0.78"	225° 45' 44"	-17° 15' 17"	0.9902813	16' 09.05"	23° 26' 15"	16 m 07 s
11	228° 16' 28"	-0.79"	225° 48' 16"	-17° 15' 59"	0.9902712	16' 09.06"	23° 26' 15"	16 m 06 s
12	228° 18' 59"	-0.79"	225° 50' 48"	-17° 16' 41"	0.9902612	16' 09.07"	23° 26' 15"	16 m 06 s
13	228° 21' 30"	-0.79"	225° 53' 19"	-17° 17' 22"	0.9902511	16' 09.08"	23° 26' 15"	16 m 06 s
14	228° 24' 01"	-0.80"	225° 55' 51"	-17° 18' 04"	0.9902410	16' 09.09"	23° 26' 15"	16 m 06 s
15	228° 26' 32"	-0.80"	225° 58' 23"	-17° 18' 46"	0.9902310	16' 09.10"	23° 26' 15"	16 m 05 s
16	228° 29' 02"	-0.80"	226° 00' 55"	-17° 19' 28"	0.9902209	16' 09.11"	23° 26' 15"	16 m 05 s
17	228° 31' 33"	-0.80"	226° 03' 26"	-17° 20' 09"	0.9902109	16' 09.12"	23° 26' 15"	16 m 05 s
18	228° 34' 04"	-0.81"	226° 05' 58"	-17° 20' 51"	0.9902008	16' 09.13"	23° 26' 15"	16 m 05 s
19	228° 36' 35"	-0.81"	226° 08' 30"	-17° 21' 32"	0.9901908	16' 09.14"	23° 26' 15"	16 m 04 s
20	228° 39' 05"	-0.81"	226° 11' 02"	-17° 22' 14"	0.9901807	16' 09.15"	23° 26' 15"	16 m 04 s
21	228° 41' 36"	-0.82"	226° 13' 34"	-17° 22' 55"	0.9901707	16' 09.16"	23° 26' 15"	16 m 04 s
22	228° 44' 07"	-0.82"	226° 16' 06"	-17° 23' 37"	0.9901607	16' 09.17"	23° 26' 15"	16 m 04 s
23	228° 46' 38"	-0.82"	226° 18' 38"	-17° 24' 18"	0.9901507	16' 09.18"	23° 26' 15"	16 m 03 s
24	228° 49' 09"	-0.82"	226° 21' 10"	-17° 24' 60"	0.9901406	16' 09.19"	23° 26' 15"	16 m 03 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	298° 11' 43"	-4° 24' 33"	301° 16' 18"	-24° 50' 16"	0° 59' 04"	16' 05.85"	259° 37' 05"	0.33379
1	298° 46' 54"	-4° 26' 19"	301° 54' 30"	-24° 44' 40"	0° 59' 02"	16' 05.30"	259° 21' 34"	0.33827
2	299° 22' 03"	-4° 28' 04"	302° 32' 35"	-24° 38' 56"	0° 59' 00"	16' 04.75"	259° 6' 09"	0.34276
3	299° 57' 09"	-4° 29' 47"	303° 10' 34"	-24° 33' 01"	0° 58' 58"	16' 04.21"	258° 50' 49"	0.34727
4	300° 32' 13"	-4° 31' 28"	303° 48' 27"	-24° 26' 58"	0° 58' 56"	16' 03.66"	258° 35' 35"	0.35178
5	301° 07' 14"	-4° 33' 07"	304° 26' 14"	-24° 20' 46"	0° 58' 54"	16' 03.10"	258° 20' 27"	0.35629
6	301° 42' 14"	-4° 34' 45"	305° 03' 53"	-24° 14' 25"	0° 58' 52"	16' 02.55"	258° 5' 24"	0.36082
7	302° 17' 10"	-4° 36' 21"	305° 41' 27"	-24° 07' 56"	0° 58' 50"	16' 02.00"	257° 50' 28"	0.36535
8	302° 52' 05"	-4° 37' 55"	306° 18' 54"	-24° 01' 17"	0° 58' 48"	16' 01.45"	257° 35' 37"	0.36988
9	303° 26' 57"	-4° 39' 27"	306° 56' 14"	-23° 54' 30"	0° 58' 46"	16' 00.89"	257° 20' 53"	0.37443
10	304° 01' 47"	-4° 40' 57"	307° 33' 28"	-23° 47' 35"	0° 58' 44"	16' 00.34"	257° 6' 15"	0.37897
11	304° 36' 34"	-4° 42' 25"	308° 10' 35"	-23° 40' 31"	0° 58' 42"	15' 59.79"	256° 51' 43"	0.38352
12	305° 11' 20"	-4° 43' 52"	308° 47' 36"	-23° 33' 18"	0° 58' 40"	15' 59.23"	256° 37' 17"	0.38808
13	305° 46' 02"	-4° 45' 17"	309° 24' 29"	-23° 25' 58"	0° 58' 38"	15' 58.68"	256° 22' 58"	0.39264
14	306° 20' 43"	-4° 46' 40"	310° 01' 16"	-23° 18' 29"	0° 58' 36"	15' 58.12"	256° 8' 46"	0.39720
15	306° 55' 21"	-4° 48' 01"	310° 37' 56"	-23° 10' 53"	0° 58' 34"	15' 57.56"	255° 54' 40"	0.40177
16	307° 29' 57"	-4° 49' 20"	311° 14' 30"	-23° 03' 08"	0° 58' 32"	15' 57.01"	255° 40' 41"	0.40634
17	308° 04' 30"	-4° 50' 37"	311° 50' 56"	-22° 55' 16"	0° 58' 30"	15' 56.45"	255° 26' 48"	0.41091
18	308° 39' 01"	-4° 51' 53"	312° 27' 16"	-22° 47' 16"	0° 58' 28"	15' 55.90"	255° 13' 03"	0.41548
19	309° 13' 30"	-4° 53' 07"	313° 03' 29"	-22° 39' 08"	0° 58' 26"	15' 55.34"	254° 59' 24"	0.42006
20	309° 47' 57"	-4° 54' 19"	313° 39' 34"	-22° 30' 53"	0° 58' 24"	15' 54.79"	254° 45' 53"	0.42463
21	310° 22' 21"	-4° 55' 29"	314° 15' 33"	-22° 22' 31"	0° 58' 22"	15' 54.23"	254° 32' 28"	0.42921
22	310° 56' 42"	-4° 56' 37"	314° 51' 26"	-22° 14' 01"	0° 58' 20"	15' 53.68"	254° 19' 11"	0.43378
23	311° 31' 02"	-4° 57' 43"	315° 27' 11"	-22° 05' 24"	0° 58' 18"	15' 53.13"	254° 6' 01"	0.43836
24	312° 05' 19"	-4° 58' 48"	316° 02' 49"	-21° 56' 39"	0° 58' 16"	15' 52.57"	253° 52' 57"	0.44293

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	228° 49' 09"	-0.82"	226° 21' 10"	-17° 24' 60"	0.9901406	16' 09.19"	23° 26' 15"	16 m 03 s
1	228° 51' 39"	-0.83"	226° 23' 42"	-17° 25' 41"	0.9901306	16' 09.20"	23° 26' 15"	16 m 03 s
2	228° 54' 10"	-0.83"	226° 26' 14"	-17° 26' 22"	0.9901206	16' 09.21"	23° 26' 15"	16 m 02 s
3	228° 56' 41"	-0.83"	226° 28' 46"	-17° 27' 04"	0.9901106	16' 09.21"	23° 26' 15"	16 m 02 s
4	228° 59' 12"	-0.83"	226° 31' 18"	-17° 27' 45"	0.9901006	16' 09.22"	23° 26' 15"	16 m 02 s
5	229° 01' 43"	-0.84"	226° 33' 50"	-17° 28' 26"	0.9900906	16' 09.23"	23° 26' 15"	16 m 02 s
6	229° 04' 13"	-0.84"	226° 36' 22"	-17° 29' 08"	0.9900806	16' 09.24"	23° 26' 15"	16 m 01 s
7	229° 06' 44"	-0.84"	226° 38' 54"	-17° 29' 49"	0.9900706	16' 09.25"	23° 26' 15"	16 m 01 s
8	229° 09' 15"	-0.84"	226° 41' 26"	-17° 30' 30"	0.9900607	16' 09.26"	23° 26' 15"	16 m 01 s
9	229° 11' 46"	-0.85"	226° 43' 58"	-17° 31' 11"	0.9900507	16' 09.27"	23° 26' 15"	16 m 00 s
10	229° 14' 17"	-0.85"	226° 46' 30"	-17° 31' 52"	0.9900407	16' 09.28"	23° 26' 15"	16 m 00 s
11	229° 16' 48"	-0.85"	226° 49' 03"	-17° 32' 33"	0.9900308	16' 09.29"	23° 26' 15"	15 m 60 s
12	229° 19' 18"	-0.85"	226° 51' 35"	-17° 33' 14"	0.9900208	16' 09.30"	23° 26' 15"	15 m 60 s
13	229° 21' 49"	-0.85"	226° 54' 07"	-17° 33' 55"	0.9900108	16' 09.31"	23° 26' 15"	15 m 59 s
14	229° 24' 20"	-0.86"	226° 56' 39"	-17° 34' 36"	0.9900009	16' 09.32"	23° 26' 15"	15 m 59 s
15	229° 26' 51"	-0.86"	226° 59' 12"	-17° 35' 17"	0.9899909	16' 09.33"	23° 26' 15"	15 m 59 s
16	229° 29' 22"	-0.86"	227° 01' 44"	-17° 35' 58"	0.9899810	16' 09.34"	23° 26' 15"	15 m 58 s
17	229° 31' 53"	-0.86"	227° 04' 16"	-17° 36' 39"	0.9899711	16' 09.35"	23° 26' 15"	15 m 58 s
18	229° 34' 23"	-0.86"	227° 06' 49"	-17° 37' 20"	0.9899611	16' 09.36"	23° 26' 15"	15 m 58 s
19	229° 36' 54"	-0.86"	227° 09' 21"	-17° 38' 01"	0.9899512	16' 09.37"	23° 26' 15"	15 m 57 s
20	229° 39' 25"	-0.87"	227° 11' 53"	-17° 38' 41"	0.9899413	16' 09.38"	23° 26' 15"	15 m 57 s
21	229° 41' 56"	-0.87"	227° 14' 26"	-17° 39' 22"	0.9899314	16' 09.39"	23° 26' 15"	15 m 57 s
22	229° 44' 27"	-0.87"	227° 16' 58"	-17° 40' 03"	0.9899215	16' 09.40"	23° 26' 15"	15 m 56 s
23	229° 46' 58"	-0.87"	227° 19' 31"	-17° 40' 44"	0.9899116	16' 09.41"	23° 26' 15"	15 m 56 s
24	229° 49' 28"	-0.87"	227° 22' 03"	-17° 41' 24"	0.9899017	16' 09.42"	23° 26' 15"	15 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	312° 05' 19"	-4° 58' 48"	316° 02' 49"	-21° 56' 39"	0° 58' 16"	15' 52.57"	253° 52' 57"	0.44293
1	312° 39' 34"	-4° 59' 50"	316° 38' 20"	-21° 47' 48"	0° 58' 14"	15' 52.02"	253° 40' 02"	0.44751
2	313° 13' 47"	-5° 00' 51"	317° 13' 45"	-21° 38' 50"	0° 58' 12"	15' 51.47"	253° 27' 13"	0.45208
3	313° 47' 57"	-5° 01' 50"	317° 49' 02"	-21° 29' 45"	0° 58' 10"	15' 50.92"	253° 14' 32"	0.45665
4	314° 22' 05"	-5° 02' 47"	318° 24' 13"	-21° 20' 33"	0° 58' 08"	15' 50.36"	253° 1' 58"	0.46122
5	314° 56' 10"	-5° 03' 43"	318° 59' 16"	-21° 11' 14"	0° 58' 06"	15' 49.81"	252° 49' 31"	0.46578
6	315° 30' 14"	-5° 04' 36"	319° 34' 13"	-21° 01' 49"	0° 58' 04"	15' 49.27"	252° 37' 12"	0.47034
7	316° 04' 15"	-5° 05' 28"	320° 09' 03"	-20° 52' 18"	0° 58' 02"	15' 48.72"	252° 25' 01"	0.47490
8	316° 38' 13"	-5° 06' 17"	320° 43' 46"	-20° 42' 40"	0° 57' 60"	15' 48.17"	252° 12' 57"	0.47946
9	317° 12' 10"	-5° 07' 05"	321° 18' 22"	-20° 32' 56"	0° 57' 58"	15' 47.62"	252° 1' 00"	0.48401
10	317° 46' 04"	-5° 07' 51"	321° 52' 51"	-20° 23' 06"	0° 57' 56"	15' 47.08"	251° 49' 12"	0.48856
11	318° 19' 56"	-5° 08' 36"	322° 27' 14"	-20° 13' 09"	0° 57' 54"	15' 46.53"	251° 37' 30"	0.49310
12	318° 53' 46"	-5° 09' 18"	323° 01' 30"	-20° 03' 07"	0° 57' 52"	15' 45.99"	251° 25' 57"	0.49763
13	319° 27' 33"	-5° 09' 59"	323° 35' 39"	-19° 52' 59"	0° 57' 50"	15' 45.45"	251° 14' 31"	0.50217
14	320° 01' 18"	-5° 10' 37"	324° 09' 41"	-19° 42' 45"	0° 57' 48"	15' 44.91"	251° 3' 12"	0.50669
15	320° 35' 01"	-5° 11' 14"	324° 43' 37"	-19° 32' 25"	0° 57' 46"	15' 44.37"	250° 52' 01"	0.51121
16	321° 08' 42"	-5° 11' 49"	325° 17' 26"	-19° 21' 60"	0° 57' 44"	15' 43.83"	250° 40' 58"	0.51572
17	321° 42' 20"	-5° 12' 23"	325° 51' 08"	-19° 11' 29"	0° 57' 42"	15' 43.29"	250° 30' 03"	0.52023
18	322° 15' 57"	-5° 12' 54"	326° 24' 44"	-19° 00' 53"	0° 57' 40"	15' 42.76"	250° 19' 16"	0.52473
19	322° 49' 31"	-5° 13' 24"	326° 58' 13"	-18° 50' 11"	0° 57' 38"	15' 42.22"	250° 8' 36"	0.52922
20	323° 23' 02"	-5° 13' 51"	327° 31' 35"	-18° 39' 24"	0° 57' 36"	15' 41.69"	249° 58' 03"	0.53370
21	323° 56' 32"	-5° 14' 18"	328° 04' 52"	-18° 28' 32"	0° 57' 34"	15' 41.16"	249° 47' 39"	0.53817
22	324° 29' 59"	-5° 14' 42"	328° 38' 01"	-18° 17' 35"	0° 57' 32"	15' 40.63"	249° 37' 22"	0.54264
23	325° 03' 25"	-5° 15' 04"	329° 11' 05"	-18° 06' 34"	0° 57' 30"	15' 40.11"	249° 27' 13"	0.54710
24	325° 36' 48"	-5° 15' 25"	329° 44' 01"	-17° 55' 27"	0° 57' 28"	15' 39.58"	249° 17' 12"	0.55154

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	229° 49' 28"	-0.87"	227° 22' 03"	-17° 41' 24"	0.9899017	16' 09.42"	23° 26' 15"	15 m 56 s
1	229° 51' 59"	-0.87"	227° 24' 36"	-17° 42' 05"	0.9898918	16' 09.43"	23° 26' 15"	15 m 56 s
2	229° 54' 30"	-0.87"	227° 27' 08"	-17° 42' 46"	0.9898819	16' 09.44"	23° 26' 15"	15 m 55 s
3	229° 57' 01"	-0.88"	227° 29' 41"	-17° 43' 26"	0.9898720	16' 09.45"	23° 26' 15"	15 m 55 s
4	229° 59' 32"	-0.88"	227° 32' 13"	-17° 44' 07"	0.9898621	16' 09.46"	23° 26' 15"	15 m 55 s
5	230° 02' 03"	-0.88"	227° 34' 46"	-17° 44' 47"	0.9898523	16' 09.47"	23° 26' 15"	15 m 54 s
6	230° 04' 34"	-0.88"	227° 37' 19"	-17° 45' 28"	0.9898424	16' 09.48"	23° 26' 15"	15 m 54 s
7	230° 07' 04"	-0.88"	227° 39' 51"	-17° 46' 08"	0.9898325	16' 09.49"	23° 26' 15"	15 m 54 s
8	230° 09' 35"	-0.88"	227° 42' 24"	-17° 46' 48"	0.9898227	16' 09.50"	23° 26' 15"	15 m 53 s
9	230° 12' 06"	-0.88"	227° 44' 56"	-17° 47' 29"	0.9898128	16' 09.51"	23° 26' 15"	15 m 53 s
10	230° 14' 37"	-0.88"	227° 47' 29"	-17° 48' 09"	0.9898030	16' 09.52"	23° 26' 15"	15 m 53 s
11	230° 17' 08"	-0.88"	227° 50' 02"	-17° 48' 49"	0.9897932	16' 09.53"	23° 26' 15"	15 m 52 s
12	230° 19' 39"	-0.88"	227° 52' 35"	-17° 49' 30"	0.9897833	16' 09.54"	23° 26' 15"	15 m 52 s
13	230° 22' 10"	-0.89"	227° 55' 07"	-17° 50' 10"	0.9897735	16' 09.55"	23° 26' 15"	15 m 52 s
14	230° 24' 41"	-0.89"	227° 57' 40"	-17° 50' 50"	0.9897637	16' 09.55"	23° 26' 15"	15 m 51 s
15	230° 27' 12"	-0.89"	228° 00' 13"	-17° 51' 30"	0.9897539	16' 09.56"	23° 26' 15"	15 m 51 s
16	230° 29' 42"	-0.89"	228° 02' 46"	-17° 52' 10"	0.9897441	16' 09.57"	23° 26' 15"	15 m 51 s
17	230° 32' 13"	-0.89"	228° 05' 19"	-17° 52' 51"	0.9897343	16' 09.58"	23° 26' 15"	15 m 50 s
18	230° 34' 44"	-0.89"	228° 07' 52"	-17° 53' 31"	0.9897245	16' 09.59"	23° 26' 15"	15 m 50 s
19	230° 37' 15"	-0.89"	228° 10' 24"	-17° 54' 11"	0.9897147	16' 09.60"	23° 26' 15"	15 m 50 s
20	230° 39' 46"	-0.89"	228° 12' 57"	-17° 54' 51"	0.9897049	16' 09.61"	23° 26' 15"	15 m 49 s
21	230° 42' 17"	-0.89"	228° 15' 30"	-17° 55' 31"	0.9896951	16' 09.62"	23° 26' 15"	15 m 49 s
22	230° 44' 48"	-0.89"	228° 18' 03"	-17° 56' 11"	0.9896853	16' 09.63"	23° 26' 15"	15 m 49 s
23	230° 47' 19"	-0.89"	228° 20' 36"	-17° 56' 51"	0.9896756	16' 09.64"	23° 26' 15"	15 m 48 s
24	230° 49' 50"	-0.89"	228° 23' 09"	-17° 57' 30"	0.9896658	16' 09.65"	23° 26' 15"	15 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	325° 36' 48"	-5° 15' 25"	329° 44' 01"	-17° 55' 27"	0° 57' 28"	15' 39.58"	249° 17' 12"	0.55154
1	326° 10' 09"	-5° 15' 44"	330° 16' 52"	-17° 44' 15"	0° 57' 26"	15' 39.06"	249° 7' 19"	0.55598
2	326° 43' 27"	-5° 16' 01"	330° 49' 36"	-17° 32' 59"	0° 57' 24"	15' 38.53"	248° 57' 33"	0.56041
3	327° 16' 44"	-5° 16' 16"	331° 22' 15"	-17° 21' 38"	0° 57' 22"	15' 38.01"	248° 47' 55"	0.56483
4	327° 49' 58"	-5° 16' 29"	331° 54' 46"	-17° 10' 12"	0° 57' 20"	15' 37.49"	248° 38' 25"	0.56924
5	328° 23' 11"	-5° 16' 41"	332° 27' 12"	-16° 58' 42"	0° 57' 18"	15' 36.98"	248° 29' 02"	0.57364
6	328° 56' 21"	-5° 16' 51"	332° 59' 32"	-16° 47' 08"	0° 57' 17"	15' 36.46"	248° 19' 48"	0.57802
7	329° 29' 29"	-5° 16' 59"	333° 31' 46"	-16° 35' 29"	0° 57' 15"	15' 35.95"	248° 10' 40"	0.58240
8	330° 02' 35"	-5° 17' 05"	334° 03' 53"	-16° 23' 47"	0° 57' 13"	15' 35.44"	248° 1' 41"	0.58676
9	330° 35' 39"	-5° 17' 10"	334° 35' 55"	-16° 11' 60"	0° 57' 11"	15' 34.93"	247° 52' 50"	0.59111
10	331° 08' 40"	-5° 17' 13"	335° 07' 51"	-16° 00' 09"	0° 57' 09"	15' 34.42"	247° 44' 06"	0.59545
11	331° 41' 40"	-5° 17' 14"	335° 39' 41"	-15° 48' 14"	0° 57' 07"	15' 33.92"	247° 35' 29"	0.59978
12	332° 14' 38"	-5° 17' 13"	336° 11' 26"	-15° 36' 15"	0° 57' 05"	15' 33.42"	247° 27' 01"	0.60409
13	332° 47' 33"	-5° 17' 11"	336° 43' 05"	-15° 24' 12"	0° 57' 04"	15' 32.92"	247° 18' 40"	0.60839
14	333° 20' 27"	-5° 17' 07"	337° 14' 38"	-15° 12' 06"	0° 57' 02"	15' 32.42"	247° 10' 27"	0.61268
15	333° 53' 18"	-5° 17' 01"	337° 46' 05"	-14° 59' 56"	0° 56' 60"	15' 31.92"	247° 2' 21"	0.61695
16	334° 26' 08"	-5° 16' 53"	338° 17' 27"	-14° 47' 43"	0° 56' 58"	15' 31.43"	246° 54' 23"	0.62121
17	334° 58' 55"	-5° 16' 44"	338° 48' 44"	-14° 35' 26"	0° 56' 56"	15' 30.94"	246° 46' 33"	0.62546
18	335° 31' 40"	-5° 16' 33"	339° 19' 55"	-14° 23' 06"	0° 56' 54"	15' 30.45"	246° 38' 50"	0.62969
19	336° 04' 24"	-5° 16' 20"	339° 51' 01"	-14° 10' 42"	0° 56' 53"	15' 29.96"	246° 31' 15"	0.63391
20	336° 37' 05"	-5° 16' 06"	340° 22' 01"	-13° 58' 15"	0° 56' 51"	15' 29.47"	246° 23' 47"	0.63811
21	337° 09' 45"	-5° 15' 50"	340° 52' 57"	-13° 45' 45"	0° 56' 49"	15' 28.99"	246° 16' 27"	0.64230
22	337° 42' 22"	-5° 15' 32"	341° 23' 47"	-13° 33' 12"	0° 56' 47"	15' 28.51"	246° 9' 15"	0.64647
23	338° 14' 58"	-5° 15' 13"	341° 54' 32"	-13° 20' 35"	0° 56' 46"	15' 28.03"	246° 2' 10"	0.65063
24	338° 47' 31"	-5° 14' 52"	342° 25' 12"	-13° 07' 56"	0° 56' 44"	15' 27.56"	245° 55' 12"	0.65477

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	230° 49' 50"	-0.89"	228° 23' 09"	-17° 57' 30"	0.9896658	16' 09.65"	23° 26' 15"	15 m 48 s
1	230° 52' 21"	-0.89"	228° 25' 42"	-17° 58' 10"	0.9896561	16' 09.66"	23° 26' 15"	15 m 47 s
2	230° 54' 51"	-0.89"	228° 28' 15"	-17° 58' 50"	0.9896463	16' 09.67"	23° 26' 15"	15 m 47 s
3	230° 57' 22"	-0.89"	228° 30' 48"	-17° 59' 30"	0.9896366	16' 09.68"	23° 26' 15"	15 m 47 s
4	230° 59' 53"	-0.89"	228° 33' 21"	-18° 00' 10"	0.9896268	16' 09.69"	23° 26' 15"	15 m 46 s
5	231° 02' 24"	-0.89"	228° 35' 54"	-18° 00' 49"	0.9896171	16' 09.70"	23° 26' 15"	15 m 46 s
6	231° 04' 55"	-0.89"	228° 38' 28"	-18° 01' 29"	0.9896074	16' 09.71"	23° 26' 15"	15 m 46 s
7	231° 07' 26"	-0.89"	228° 41' 01"	-18° 02' 09"	0.9895977	16' 09.72"	23° 26' 15"	15 m 45 s
8	231° 09' 57"	-0.89"	228° 43' 34"	-18° 02' 48"	0.9895880	16' 09.73"	23° 26' 15"	15 m 45 s
9	231° 12' 28"	-0.89"	228° 46' 07"	-18° 03' 28"	0.9895783	16' 09.74"	23° 26' 15"	15 m 45 s
10	231° 14' 59"	-0.89"	228° 48' 40"	-18° 04' 07"	0.9895686	16' 09.75"	23° 26' 15"	15 m 44 s
11	231° 17' 30"	-0.89"	228° 51' 14"	-18° 04' 47"	0.9895589	16' 09.76"	23° 26' 15"	15 m 44 s
12	231° 20' 01"	-0.89"	228° 53' 47"	-18° 05' 26"	0.9895492	16' 09.76"	23° 26' 15"	15 m 44 s
13	231° 22' 32"	-0.89"	228° 56' 20"	-18° 06' 06"	0.9895395	16' 09.77"	23° 26' 15"	15 m 43 s
14	231° 25' 03"	-0.89"	228° 58' 53"	-18° 06' 45"	0.9895298	16' 09.78"	23° 26' 15"	15 m 43 s
15	231° 27' 34"	-0.89"	229° 01' 27"	-18° 07' 25"	0.9895202	16' 09.79"	23° 26' 15"	15 m 42 s
16	231° 30' 05"	-0.89"	229° 03' 60"	-18° 08' 04"	0.9895105	16' 09.80"	23° 26' 15"	15 m 42 s
17	231° 32' 36"	-0.88"	229° 06' 33"	-18° 08' 43"	0.9895008	16' 09.81"	23° 26' 15"	15 m 42 s
18	231° 35' 06"	-0.88"	229° 09' 07"	-18° 09' 23"	0.9894912	16' 09.82"	23° 26' 15"	15 m 41 s
19	231° 37' 37"	-0.88"	229° 11' 40"	-18° 10' 02"	0.9894816	16' 09.83"	23° 26' 15"	15 m 41 s
20	231° 40' 08"	-0.88"	229° 14' 14"	-18° 10' 41"	0.9894719	16' 09.84"	23° 26' 15"	15 m 41 s
21	231° 42' 39"	-0.88"	229° 16' 47"	-18° 11' 20"	0.9894623	16' 09.85"	23° 26' 15"	15 m 40 s
22	231° 45' 10"	-0.88"	229° 19' 20"	-18° 11' 59"	0.9894527	16' 09.86"	23° 26' 15"	15 m 40 s
23	231° 47' 41"	-0.88"	229° 21' 54"	-18° 12' 39"	0.9894431	16' 09.87"	23° 26' 15"	15 m 39 s
24	231° 50' 12"	-0.88"	229° 24' 27"	-18° 13' 18"	0.9894334	16' 09.88"	23° 26' 15"	15 m 39 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	338° 47' 31"	-5° 14' 52"	342° 25' 12"	-13° 07' 56"	0° 56' 44"	15' 27.56"	245° 55' 12"	0.65477
1	339° 20' 03"	-5° 14' 29"	342° 55' 47"	-12° 55' 14"	0° 56' 42"	15' 27.08"	245° 48' 22"	0.65889
2	339° 52' 32"	-5° 14' 04"	343° 26' 17"	-12° 42' 29"	0° 56' 40"	15' 26.61"	245° 41' 40"	0.66300
3	340° 25' 00"	-5° 13' 38"	343° 56' 43"	-12° 29' 42"	0° 56' 39"	15' 26.14"	245° 35' 04"	0.66709
4	340° 57' 26"	-5° 13' 11"	344° 27' 04"	-12° 16' 51"	0° 56' 37"	15' 25.68"	245° 28' 37"	0.67116
5	341° 29' 50"	-5° 12' 41"	344° 57' 20"	-12° 03' 58"	0° 56' 35"	15' 25.21"	245° 22' 16"	0.67522
6	342° 02' 12"	-5° 12' 10"	345° 27' 31"	-11° 51' 03"	0° 56' 34"	15' 24.75"	245° 16' 03"	0.67926
7	342° 34' 32"	-5° 11' 38"	345° 57' 38"	-11° 38' 05"	0° 56' 32"	15' 24.30"	245° 9' 58"	0.68328
8	343° 06' 50"	-5° 11' 04"	346° 27' 40"	-11° 25' 05"	0° 56' 30"	15' 23.84"	245° 3' 59"	0.68728
9	343° 39' 07"	-5° 10' 28"	346° 57' 38"	-11° 12' 02"	0° 56' 29"	15' 23.39"	244° 58' 08"	0.69127
10	344° 11' 21"	-5° 09' 50"	347° 27' 31"	-10° 58' 57"	0° 56' 27"	15' 22.93"	244° 52' 25"	0.69524
11	344° 43' 34"	-5° 09' 11"	347° 57' 21"	-10° 45' 50"	0° 56' 25"	15' 22.49"	244° 46' 48"	0.69919
12	345° 15' 45"	-5° 08' 31"	348° 27' 06"	-10° 32' 41"	0° 56' 24"	15' 22.04"	244° 41' 19"	0.70312
13	345° 47' 54"	-5° 07' 48"	348° 56' 47"	-10° 19' 30"	0° 56' 22"	15' 21.60"	244° 35' 57"	0.70703
14	346° 20' 02"	-5° 07' 05"	349° 26' 23"	-10° 06' 17"	0° 56' 20"	15' 21.16"	244° 30' 42"	0.71092
15	346° 52' 07"	-5° 06' 19"	349° 55' 56"	-9° 53' 02"	0° 56' 19"	15' 20.72"	244° 25' 35"	0.71480
16	347° 24' 11"	-5° 05' 33"	350° 25' 25"	-9° 39' 44"	0° 56' 17"	15' 20.28"	244° 20' 34"	0.71865
17	347° 56' 13"	-5° 04' 44"	350° 54' 50"	-9° 26' 26"	0° 56' 16"	15' 19.85"	244° 15' 41"	0.72249
18	348° 28' 13"	-5° 03' 54"	351° 24' 11"	-9° 13' 05"	0° 56' 14"	15' 19.42"	244° 10' 55"	0.72630
19	349° 00' 12"	-5° 03' 03"	351° 53' 29"	-8° 59' 43"	0° 56' 12"	15' 18.99"	244° 6' 15"	0.73009
20	349° 32' 09"	-5° 02' 10"	352° 22' 42"	-8° 46' 19"	0° 56' 11"	15' 18.57"	244° 1' 43"	0.73387
21	350° 04' 04"	-5° 01' 15"	352° 51' 53"	-8° 32' 53"	0° 56' 09"	15' 18.14"	243° 57' 18"	0.73762
22	350° 35' 57"	-5° 00' 19"	353° 20' 59"	-8° 19' 26"	0° 56' 08"	15' 17.72"	243° 53' 00"	0.74135
23	351° 07' 49"	-4° 59' 22"	353° 50' 02"	-8° 05' 58"	0° 56' 06"	15' 17.31"	243° 48' 49"	0.74507
24	351° 39' 39"	-4° 58' 23"	354° 19' 02"	-7° 52' 28"	0° 56' 05"	15' 16.89"	243° 44' 45"	0.74876

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	231° 50' 12"	-0.88"	229° 24' 27"	-18° 13' 18"	0.9894334	16' 09.88"	23° 26' 15"	15 m 39 s
1	231° 52' 43"	-0.88"	229° 27' 01"	-18° 13' 57"	0.9894238	16' 09.89"	23° 26' 15"	15 m 39 s
2	231° 55' 14"	-0.88"	229° 29' 35"	-18° 14' 36"	0.9894143	16' 09.90"	23° 26' 15"	15 m 38 s
3	231° 57' 45"	-0.87"	229° 32' 08"	-18° 15' 15"	0.9894047	16' 09.91"	23° 26' 15"	15 m 38 s
4	232° 00' 16"	-0.87"	229° 34' 42"	-18° 15' 54"	0.9893951	16' 09.92"	23° 26' 15"	15 m 37 s
5	232° 02' 47"	-0.87"	229° 37' 15"	-18° 16' 33"	0.9893855	16' 09.93"	23° 26' 15"	15 m 37 s
6	232° 05' 18"	-0.87"	229° 39' 49"	-18° 17' 11"	0.9893759	16' 09.93"	23° 26' 15"	15 m 37 s
7	232° 07' 49"	-0.87"	229° 42' 23"	-18° 17' 50"	0.9893664	16' 09.94"	23° 26' 15"	15 m 36 s
8	232° 10' 20"	-0.87"	229° 44' 56"	-18° 18' 29"	0.9893568	16' 09.95"	23° 26' 15"	15 m 36 s
9	232° 12' 51"	-0.87"	229° 47' 30"	-18° 19' 08"	0.9893473	16' 09.96"	23° 26' 15"	15 m 35 s
10	232° 15' 22"	-0.86"	229° 50' 04"	-18° 19' 47"	0.9893377	16' 09.97"	23° 26' 15"	15 m 35 s
11	232° 17' 53"	-0.86"	229° 52' 38"	-18° 20' 25"	0.9893282	16' 09.98"	23° 26' 15"	15 m 35 s
12	232° 20' 24"	-0.86"	229° 55' 11"	-18° 21' 04"	0.9893187	16' 09.99"	23° 26' 15"	15 m 34 s
13	232° 22' 55"	-0.86"	229° 57' 45"	-18° 21' 43"	0.9893092	16' 10.00"	23° 26' 15"	15 m 34 s
14	232° 25' 26"	-0.86"	230° 00' 19"	-18° 22' 21"	0.9892996	16' 10.01"	23° 26' 15"	15 m 33 s
15	232° 27' 57"	-0.85"	230° 02' 53"	-18° 22' 60"	0.9892901	16' 10.02"	23° 26' 15"	15 m 33 s
16	232° 30' 28"	-0.85"	230° 05' 27"	-18° 23' 39"	0.9892806	16' 10.03"	23° 26' 15"	15 m 33 s
17	232° 32' 59"	-0.85"	230° 08' 00"	-18° 24' 17"	0.9892711	16' 10.04"	23° 26' 15"	15 m 32 s
18	232° 35' 30"	-0.85"	230° 10' 34"	-18° 24' 56"	0.9892617	16' 10.05"	23° 26' 15"	15 m 32 s
19	232° 38' 01"	-0.85"	230° 13' 08"	-18° 25' 34"	0.9892522	16' 10.06"	23° 26' 15"	15 m 31 s
20	232° 40' 32"	-0.84"	230° 15' 42"	-18° 26' 12"	0.9892427	16' 10.07"	23° 26' 15"	15 m 31 s
21	232° 43' 03"	-0.84"	230° 18' 16"	-18° 26' 51"	0.9892333	16' 10.07"	23° 26' 15"	15 m 31 s
22	232° 45' 34"	-0.84"	230° 20' 50"	-18° 27' 29"	0.9892238	16' 10.08"	23° 26' 15"	15 m 30 s
23	232° 48' 05"	-0.84"	230° 23' 24"	-18° 28' 07"	0.9892143	16' 10.09"	23° 26' 15"	15 m 30 s
24	232° 50' 36"	-0.84"	230° 25' 58"	-18° 28' 46"	0.9892049	16' 10.10"	23° 26' 15"	15 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	351° 39' 39"	-4° 58' 23"	354° 19' 02"	-7° 52' 28"	0° 56' 05"	15' 16.89"	243° 44' 45"	0.74876
1	352° 11' 27"	-4° 57' 22"	354° 47' 58"	-7° 38' 57"	0° 56' 03"	15' 16.48"	243° 40' 48"	0.75243
2	352° 43' 14"	-4° 56' 20"	355° 16' 52"	-7° 25' 25"	0° 56' 02"	15' 16.07"	243° 36' 58"	0.75607
3	353° 14' 59"	-4° 55' 17"	355° 45' 42"	-7° 11' 51"	0° 56' 00"	15' 15.67"	243° 33' 14"	0.75970
4	353° 46' 42"	-4° 54' 12"	356° 14' 28"	-6° 58' 16"	0° 55' 59"	15' 15.26"	243° 29' 38"	0.76330
5	354° 18' 24"	-4° 53' 06"	356° 43' 12"	-6° 44' 41"	0° 55' 57"	15' 14.86"	243° 26' 08"	0.76689
6	354° 50' 04"	-4° 51' 58"	357° 11' 53"	-6° 31' 04"	0° 55' 56"	15' 14.46"	243° 22' 46"	0.77045
7	355° 21' 43"	-4° 50' 49"	357° 40' 31"	-6° 17' 26"	0° 55' 54"	15' 14.07"	243° 19' 30"	0.77399
8	355° 53' 19"	-4° 49' 38"	358° 09' 06"	-6° 03' 47"	0° 55' 53"	15' 13.67"	243° 16' 21"	0.77750
9	356° 24' 55"	-4° 48' 26"	358° 37' 38"	-5° 50' 08"	0° 55' 52"	15' 13.28"	243° 13' 18"	0.78099
10	356° 56' 28"	-4° 47' 13"	359° 06' 08"	-5° 36' 27"	0° 55' 50"	15' 12.90"	243° 10' 23"	0.78446
11	357° 28' 01"	-4° 45' 58"	359° 34' 35"	-5° 22' 46"	0° 55' 49"	15' 12.51"	243° 7' 34"	0.78791
12	357° 59' 31"	-4° 44' 42"	0° 02' 59"	-5° 09' 04"	0° 55' 47"	15' 12.13"	243° 4' 51"	0.79133
13	358° 31' 00"	-4° 43' 24"	0° 31' 21"	-4° 55' 22"	0° 55' 46"	15' 11.75"	243° 2' 16"	0.79473
14	359° 02' 28"	-4° 42' 05"	0° 59' 40"	-4° 41' 39"	0° 55' 44"	15' 11.37"	242° 59' 47"	0.79811
15	359° 33' 54"	-4° 40' 45"	1° 27' 57"	-4° 27' 55"	0° 55' 43"	15' 11.00"	242° 57' 25"	0.80146
16	0° 05' 19"	-4° 39' 24"	1° 56' 12"	-4° 14' 11"	0° 55' 42"	15' 10.63"	242° 55' 09"	0.80479
17	0° 36' 42"	-4° 38' 01"	2° 24' 25"	-4° 00' 27"	0° 55' 40"	15' 10.26"	242° 52' 60"	0.80809
18	1° 08' 03"	-4° 36' 36"	2° 52' 35"	-3° 46' 42"	0° 55' 39"	15' 09.89"	242° 50' 57"	0.81138
19	1° 39' 23"	-4° 35' 11"	3° 20' 43"	-3° 32' 57"	0° 55' 38"	15' 09.53"	242° 49' 01"	0.81463
20	2° 10' 42"	-4° 33' 44"	3° 48' 49"	-3° 19' 11"	0° 55' 36"	15' 09.17"	242° 47' 11"	0.81786
21	2° 41' 59"	-4° 32' 16"	4° 16' 53"	-3° 05' 25"	0° 55' 35"	15' 08.81"	242° 45' 28"	0.82107
22	3° 13' 15"	-4° 30' 46"	4° 44' 56"	-2° 51' 40"	0° 55' 34"	15' 08.45"	242° 43' 52"	0.82425
23	3° 44' 29"	-4° 29' 15"	5° 12' 56"	-2° 37' 54"	0° 55' 32"	15' 08.10"	242° 42' 22"	0.82741
24	4° 15' 42"	-4° 27' 43"	5° 40' 55"	-2° 24' 08"	0° 55' 31"	15' 07.75"	242° 40' 58"	0.83054

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	232° 50' 36"	-0.84"	230° 25' 58"	-18° 28' 46"	0.9892049	16' 10.10"	23° 26' 15"	15 m 29 s
1	232° 53' 07"	-0.83"	230° 28' 32"	-18° 29' 24"	0.9891955	16' 10.11"	23° 26' 15"	15 m 29 s
2	232° 55' 38"	-0.83"	230° 31' 06"	-18° 30' 02"	0.9891860	16' 10.12"	23° 26' 15"	15 m 28 s
3	232° 58' 09"	-0.83"	230° 33' 40"	-18° 30' 40"	0.9891766	16' 10.13"	23° 26' 15"	15 m 28 s
4	233° 00' 40"	-0.83"	230° 36' 15"	-18° 31' 18"	0.9891672	16' 10.14"	23° 26' 15"	15 m 28 s
5	233° 03' 11"	-0.82"	230° 38' 49"	-18° 31' 57"	0.9891578	16' 10.15"	23° 26' 15"	15 m 27 s
6	233° 05' 42"	-0.82"	230° 41' 23"	-18° 32' 35"	0.9891484	16' 10.16"	23° 26' 15"	15 m 27 s
7	233° 08' 14"	-0.82"	230° 43' 57"	-18° 33' 13"	0.9891390	16' 10.17"	23° 26' 15"	15 m 26 s
8	233° 10' 45"	-0.81"	230° 46' 31"	-18° 33' 51"	0.9891296	16' 10.18"	23° 26' 15"	15 m 26 s
9	233° 13' 16"	-0.81"	230° 49' 05"	-18° 34' 29"	0.9891202	16' 10.19"	23° 26' 15"	15 m 25 s
10	233° 15' 47"	-0.81"	230° 51' 40"	-18° 35' 07"	0.9891109	16' 10.19"	23° 26' 15"	15 m 25 s
11	233° 18' 18"	-0.81"	230° 54' 14"	-18° 35' 44"	0.9891015	16' 10.20"	23° 26' 15"	15 m 25 s
12	233° 20' 49"	-0.80"	230° 56' 48"	-18° 36' 22"	0.9890922	16' 10.21"	23° 26' 15"	15 m 24 s
13	233° 23' 20"	-0.80"	230° 59' 23"	-18° 37' 00"	0.9890828	16' 10.22"	23° 26' 15"	15 m 24 s
14	233° 25' 51"	-0.80"	231° 01' 57"	-18° 37' 38"	0.9890735	16' 10.23"	23° 26' 15"	15 m 23 s
15	233° 28' 22"	-0.79"	231° 04' 31"	-18° 38' 16"	0.9890641	16' 10.24"	23° 26' 15"	15 m 23 s
16	233° 30' 53"	-0.79"	231° 07' 06"	-18° 38' 53"	0.9890548	16' 10.25"	23° 26' 15"	15 m 22 s
17	233° 33' 24"	-0.79"	231° 09' 40"	-18° 39' 31"	0.9890455	16' 10.26"	23° 26' 15"	15 m 22 s
18	233° 35' 55"	-0.79"	231° 12' 14"	-18° 40' 09"	0.9890362	16' 10.27"	23° 26' 15"	15 m 21 s
19	233° 38' 26"	-0.78"	231° 14' 49"	-18° 40' 46"	0.9890269	16' 10.28"	23° 26' 15"	15 m 21 s
20	233° 40' 57"	-0.78"	231° 17' 23"	-18° 41' 24"	0.9890176	16' 10.29"	23° 26' 15"	15 m 21 s
21	233° 43' 28"	-0.78"	231° 19' 58"	-18° 42' 02"	0.9890083	16' 10.30"	23° 26' 15"	15 m 20 s
22	233° 45' 59"	-0.77"	231° 22' 32"	-18° 42' 39"	0.9889990	16' 10.30"	23° 26' 15"	15 m 20 s
23	233° 48' 31"	-0.77"	231° 25' 07"	-18° 43' 17"	0.9889897	16' 10.31"	23° 26' 15"	15 m 19 s
24	233° 51' 02"	-0.77"	231° 27' 41"	-18° 43' 54"	0.9889805	16' 10.32"	23° 26' 15"	15 m 19 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	4° 15' 42"	-4° 27' 43"	5° 40' 55"	-2° 24' 08"	0° 55' 31"	15' 07.75"	242° 40' 58"	0.83054
1	4° 46' 53"	-4° 26' 10"	6° 08' 52"	-2° 10' 22"	0° 55' 30"	15' 07.40"	242° 39' 40"	0.83365
2	5° 18' 03"	-4° 24' 36"	6° 36' 47"	-1° 56' 36"	0° 55' 29"	15' 07.06"	242° 38' 29"	0.83673
3	5° 49' 12"	-4° 22' 60"	7° 04' 41"	-1° 42' 50"	0° 55' 27"	15' 06.71"	242° 37' 25"	0.83979
4	6° 20' 19"	-4° 21' 23"	7° 32' 33"	-1° 29' 04"	0° 55' 26"	15' 06.37"	242° 36' 26"	0.84282
5	6° 51' 25"	-4° 19' 45"	8° 00' 24"	-1° 15' 18"	0° 55' 25"	15' 06.04"	242° 35' 34"	0.84582
6	7° 22' 30"	-4° 18' 05"	8° 28' 13"	-1° 01' 33"	0° 55' 24"	15' 05.70"	242° 34' 49"	0.84880
7	7° 53' 33"	-4° 16' 25"	8° 56' 01"	0°-47' 48"	0° 55' 22"	15' 05.37"	242° 34' 09"	0.85175
8	8° 24' 35"	-4° 14' 43"	9° 23' 48"	0°-34' 03"	0° 55' 21"	15' 05.04"	242° 33' 36"	0.85468
9	8° 55' 36"	-4° 12' 60"	9° 51' 34"	0°-20' 19"	0° 55' 20"	15' 04.71"	242° 33' 09"	0.85758
10	9° 26' 35"	-4° 11' 16"	10° 19' 18"	0° -6' 35"	0° 55' 19"	15' 04.39"	242° 32' 48"	0.86045
11	9° 57' 33"	-4° 09' 30"	10° 47' 01"	0° 07' 08"	0° 55' 18"	15' 04.07"	242° 32' 33"	0.86330
12	10° 28' 30"	-4° 07' 44"	11° 14' 44"	0° 20' 51"	0° 55' 17"	15' 03.75"	242° 32' 24"	0.86612
13	10° 59' 25"	-4° 05' 56"	11° 42' 25"	0° 34' 33"	0° 55' 15"	15' 03.43"	242° 32' 22"	0.86892
14	11° 30' 19"	-4° 04' 08"	12° 10' 06"	0° 48' 15"	0° 55' 14"	15' 03.12"	242° 32' 25"	0.87168
15	12° 01' 12"	-4° 02' 18"	12° 37' 46"	1° 01' 56"	0° 55' 13"	15' 02.81"	242° 32' 35"	0.87442
16	12° 32' 04"	-4° 00' 27"	13° 05' 25"	1° 15' 36"	0° 55' 12"	15' 02.50"	242° 32' 50"	0.87713
17	13° 02' 54"	-3° 58' 35"	13° 33' 03"	1° 29' 16"	0° 55' 11"	15' 02.20"	242° 33' 12"	0.87982
18	13° 33' 43"	-3° 56' 42"	14° 00' 41"	1° 42' 54"	0° 55' 10"	15' 01.89"	242° 33' 39"	0.88248
19	14° 04' 31"	-3° 54' 47"	14° 28' 18"	1° 56' 32"	0° 55' 09"	15' 01.59"	242° 34' 13"	0.88511
20	14° 35' 18"	-3° 52' 52"	14° 55' 54"	2° 10' 09"	0° 55' 07"	15' 01.29"	242° 34' 52"	0.88771
21	15° 06' 04"	-3° 50' 56"	15° 23' 31"	2° 23' 45"	0° 55' 06"	15' 01.00"	242° 35' 38"	0.89029
22	15° 36' 48"	-3° 48' 59"	15° 51' 06"	2° 37' 20"	0° 55' 05"	15' 00.70"	242° 36' 29"	0.89283
23	16° 07' 31"	-3° 47' 00"	16° 18' 42"	2° 50' 53"	0° 55' 04"	15' 00.41"	242° 37' 26"	0.89535
24	16° 38' 13"	-3° 45' 01"	16° 46' 17"	3° 04' 26"	0° 55' 03"	15' 00.13"	242° 38' 28"	0.89784

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	233° 51' 02"	-0.77"	231° 27' 41"	-18° 43' 54"	0.9889805	16' 10.32"	23° 26' 15"	15 m 19 s
1	233° 53' 33"	-0.76"	231° 30' 16"	-18° 44' 32"	0.9889712	16' 10.33"	23° 26' 15"	15 m 18 s
2	233° 56' 04"	-0.76"	231° 32' 51"	-18° 45' 09"	0.9889620	16' 10.34"	23° 26' 15"	15 m 18 s
3	233° 58' 35"	-0.75"	231° 35' 25"	-18° 45' 46"	0.9889527	16' 10.35"	23° 26' 15"	15 m 17 s
4	234° 01' 06"	-0.75"	231° 37' 60"	-18° 46' 24"	0.9889435	16' 10.36"	23° 26' 15"	15 m 17 s
5	234° 03' 37"	-0.75"	231° 40' 35"	-18° 47' 01"	0.9889342	16' 10.37"	23° 26' 15"	15 m 16 s
6	234° 06' 08"	-0.74"	231° 43' 09"	-18° 47' 38"	0.9889250	16' 10.38"	23° 26' 15"	15 m 16 s
7	234° 08' 39"	-0.74"	231° 45' 44"	-18° 48' 15"	0.9889158	16' 10.39"	23° 26' 15"	15 m 15 s
8	234° 11' 10"	-0.74"	231° 48' 19"	-18° 48' 52"	0.9889066	16' 10.39"	23° 26' 15"	15 m 15 s
9	234° 13' 42"	-0.73"	231° 50' 53"	-18° 49' 30"	0.9888974	16' 10.40"	23° 26' 15"	15 m 15 s
10	234° 16' 13"	-0.73"	231° 53' 28"	-18° 50' 07"	0.9888882	16' 10.41"	23° 26' 15"	15 m 14 s
11	234° 18' 44"	-0.72"	231° 56' 03"	-18° 50' 44"	0.9888790	16' 10.42"	23° 26' 15"	15 m 14 s
12	234° 21' 15"	-0.72"	231° 58' 38"	-18° 51' 21"	0.9888699	16' 10.43"	23° 26' 15"	15 m 13 s
13	234° 23' 46"	-0.72"	232° 01' 13"	-18° 51' 58"	0.9888607	16' 10.44"	23° 26' 15"	15 m 13 s
14	234° 26' 17"	-0.71"	232° 03' 47"	-18° 52' 35"	0.9888515	16' 10.45"	23° 26' 15"	15 m 12 s
15	234° 28' 48"	-0.71"	232° 06' 22"	-18° 53' 12"	0.9888424	16' 10.46"	23° 26' 15"	15 m 12 s
16	234° 31' 19"	-0.71"	232° 08' 57"	-18° 53' 49"	0.9888332	16' 10.47"	23° 26' 15"	15 m 11 s
17	234° 33' 50"	-0.70"	232° 11' 32"	-18° 54' 25"	0.9888241	16' 10.48"	23° 26' 15"	15 m 11 s
18	234° 36' 22"	-0.70"	232° 14' 07"	-18° 55' 02"	0.9888150	16' 10.48"	23° 26' 15"	15 m 10 s
19	234° 38' 53"	-0.69"	232° 16' 42"	-18° 55' 39"	0.9888058	16' 10.49"	23° 26' 15"	15 m 10 s
20	234° 41' 24"	-0.69"	232° 19' 17"	-18° 56' 16"	0.9887967	16' 10.50"	23° 26' 15"	15 m 09 s
21	234° 43' 55"	-0.68"	232° 21' 52"	-18° 56' 53"	0.9887876	16' 10.51"	23° 26' 15"	15 m 09 s
22	234° 46' 26"	-0.68"	232° 24' 27"	-18° 57' 29"	0.9887785	16' 10.52"	23° 26' 15"	15 m 08 s
23	234° 48' 57"	-0.68"	232° 27' 02"	-18° 58' 06"	0.9887694	16' 10.53"	23° 26' 15"	15 m 08 s
24	234° 51' 28"	-0.67"	232° 29' 37"	-18° 58' 43"	0.9887604	16' 10.54"	23° 26' 15"	15 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	16° 38' 13"	-3° 45' 01"	16° 46' 17"	3° 04' 26"	0° 55' 03"	15' 00.13"	242° 38' 28"	0.89784
1	17° 08' 54"	-3° 43' 00"	17° 13' 52"	3° 17' 58"	0° 55' 02"	14' 59.84"	242° 39' 37"	0.90031
2	17° 39' 34"	-3° 40' 59"	17° 41' 27"	3° 31' 28"	0° 55' 01"	14' 59.56"	242° 40' 51"	0.90274
3	18° 10' 12"	-3° 38' 57"	18° 09' 01"	3° 44' 57"	0° 55' 00"	14' 59.28"	242° 42' 11"	0.90515
4	18° 40' 50"	-3° 36' 53"	18° 36' 36"	3° 58' 25"	0° 54' 59"	14' 59.00"	242° 43' 36"	0.90753
5	19° 11' 26"	-3° 34' 49"	19° 04' 11"	4° 11' 51"	0° 54' 58"	14' 58.72"	242° 45' 07"	0.90988
6	19° 42' 01"	-3° 32' 43"	19° 31' 45"	4° 25' 16"	0° 54' 57"	14' 58.45"	242° 46' 44"	0.91220
7	20° 12' 36"	-3° 30' 37"	19° 59' 20"	4° 38' 40"	0° 54' 56"	14' 58.18"	242° 48' 26"	0.91449
8	20° 43' 09"	-3° 28' 30"	20° 26' 55"	4° 52' 02"	0° 54' 55"	14' 57.91"	242° 50' 13"	0.91675
9	21° 13' 41"	-3° 26' 22"	20° 54' 31"	5° 05' 23"	0° 54' 54"	14' 57.64"	242° 52' 06"	0.91899
10	21° 44' 11"	-3° 24' 13"	21° 22' 06"	5° 18' 42"	0° 54' 53"	14' 57.38"	242° 54' 05"	0.92119
11	22° 14' 41"	-3° 22' 03"	21° 49' 42"	5° 31' 59"	0° 54' 52"	14' 57.12"	242° 56' 08"	0.92337
12	22° 45' 10"	-3° 19' 52"	22° 17' 18"	5° 45' 15"	0° 54' 51"	14' 56.86"	242° 58' 17"	0.92552
13	23° 15' 38"	-3° 17' 40"	22° 44' 55"	5° 58' 29"	0° 54' 50"	14' 56.61"	243° 0' 32"	0.92763
14	23° 46' 05"	-3° 15' 28"	23° 12' 33"	6° 11' 41"	0° 54' 49"	14' 56.35"	243° 2' 51"	0.92972
15	24° 16' 30"	-3° 13' 14"	23° 40' 11"	6° 24' 52"	0° 54' 48"	14' 56.10"	243° 5' 16"	0.93178
16	24° 46' 55"	-3° 11' 00"	24° 07' 49"	6° 38' 00"	0° 54' 48"	14' 55.85"	243° 7' 45"	0.93381
17	25° 17' 19"	-3° 08' 45"	24° 35' 28"	6° 51' 07"	0° 54' 47"	14' 55.61"	243° 10' 20"	0.93581
18	25° 47' 41"	-3° 06' 29"	25° 03' 08"	7° 04' 12"	0° 54' 46"	14' 55.36"	243° 12' 59"	0.93778
19	26° 18' 03"	-3° 04' 12"	25° 30' 49"	7° 17' 14"	0° 54' 45"	14' 55.12"	243° 15' 43"	0.93972
20	26° 48' 24"	-3° 01' 55"	25° 58' 31"	7° 30' 15"	0° 54' 44"	14' 54.88"	243° 18' 33"	0.94163
21	27° 18' 44"	-2° 59' 37"	26° 26' 13"	7° 43' 14"	0° 54' 43"	14' 54.64"	243° 21' 26"	0.94351
22	27° 49' 03"	-2° 57' 18"	26° 53' 57"	7° 56' 10"	0° 54' 42"	14' 54.41"	243° 24' 25"	0.94537
23	28° 19' 20"	-2° 54' 58"	27° 21' 41"	8° 09' 04"	0° 54' 41"	14' 54.18"	243° 27' 27"	0.94719
24	28° 49' 37"	-2° 52' 37"	27° 49' 27"	8° 21' 56"	0° 54' 41"	14' 53.95"	243° 30' 35"	0.94898

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	234° 51' 28"	-0.67"	232° 29' 37"	-18° 58' 43"	0.9887604	16' 10.54"	23° 26' 15"	15 m 07 s
1	234° 53' 60"	-0.67"	232° 32' 12"	-18° 59' 19"	0.9887513	16' 10.55"	23° 26' 15"	15 m 07 s
2	234° 56' 31"	-0.66"	232° 34' 47"	-18° 59' 56"	0.9887422	16' 10.56"	23° 26' 15"	15 m 06 s
3	234° 59' 02"	-0.66"	232° 37' 22"	-19° 00' 32"	0.9887332	16' 10.57"	23° 26' 15"	15 m 06 s
4	235° 01' 33"	-0.65"	232° 39' 58"	-19° 01' 09"	0.9887241	16' 10.57"	23° 26' 15"	15 m 05 s
5	235° 04' 04"	-0.65"	232° 42' 33"	-19° 01' 45"	0.9887151	16' 10.58"	23° 26' 15"	15 m 05 s
6	235° 06' 35"	-0.64"	232° 45' 08"	-19° 02' 21"	0.9887060	16' 10.59"	23° 26' 15"	15 m 04 s
7	235° 09' 07"	-0.64"	232° 47' 43"	-19° 02' 58"	0.9886970	16' 10.60"	23° 26' 15"	15 m 04 s
8	235° 11' 38"	-0.64"	232° 50' 18"	-19° 03' 34"	0.9886880	16' 10.61"	23° 26' 15"	15 m 03 s
9	235° 14' 09"	-0.63"	232° 52' 54"	-19° 04' 10"	0.9886790	16' 10.62"	23° 26' 15"	15 m 03 s
10	235° 16' 40"	-0.63"	232° 55' 29"	-19° 04' 47"	0.9886700	16' 10.63"	23° 26' 15"	15 m 02 s
11	235° 19' 11"	-0.62"	232° 58' 04"	-19° 05' 23"	0.9886610	16' 10.64"	23° 26' 15"	15 m 02 s
12	235° 21' 42"	-0.62"	233° 00' 40"	-19° 05' 59"	0.9886520	16' 10.64"	23° 26' 15"	15 m 01 s
13	235° 24' 14"	-0.61"	233° 03' 15"	-19° 06' 35"	0.9886430	16' 10.65"	23° 26' 15"	15 m 01 s
14	235° 26' 45"	-0.61"	233° 05' 50"	-19° 07' 11"	0.9886340	16' 10.66"	23° 26' 15"	15 m 00 s
15	235° 29' 16"	-0.60"	233° 08' 26"	-19° 07' 48"	0.9886251	16' 10.67"	23° 26' 15"	14 m 60 s
16	235° 31' 47"	-0.60"	233° 11' 01"	-19° 08' 24"	0.9886161	16' 10.68"	23° 26' 15"	14 m 59 s
17	235° 34' 18"	-0.59"	233° 13' 37"	-19° 08' 60"	0.9886072	16' 10.69"	23° 26' 15"	14 m 59 s
18	235° 36' 50"	-0.59"	233° 16' 12"	-19° 09' 36"	0.9885982	16' 10.70"	23° 26' 15"	14 m 58 s
19	235° 39' 21"	-0.58"	233° 18' 47"	-19° 10' 11"	0.9885893	16' 10.71"	23° 26' 15"	14 m 58 s
20	235° 41' 52"	-0.58"	233° 21' 23"	-19° 10' 47"	0.9885804	16' 10.72"	23° 26' 15"	14 m 57 s
21	235° 44' 23"	-0.57"	233° 23' 59"	-19° 11' 23"	0.9885715	16' 10.72"	23° 26' 15"	14 m 57 s
22	235° 46' 54"	-0.57"	233° 26' 34"	-19° 11' 59"	0.9885626	16' 10.73"	23° 26' 15"	14 m 56 s
23	235° 49' 26"	-0.56"	233° 29' 10"	-19° 12' 35"	0.9885537	16' 10.74"	23° 26' 15"	14 m 56 s
24	235° 51' 57"	-0.56"	233° 31' 45"	-19° 13' 11"	0.9885448	16' 10.75"	23° 26' 15"	14 m 55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	28° 49' 37"	-2° 52' 37"	27° 49' 27"	8° 21' 56"	0° 54' 41"	14' 53.95"	243° 30' 35"	0.94898
1	29° 19' 53"	-2° 50' 16"	28° 17' 13"	8° 34' 46"	0° 54' 40"	14' 53.72"	243° 33' 46"	0.95074
2	29° 50' 09"	-2° 47' 54"	28° 45' 01"	8° 47' 34"	0° 54' 39"	14' 53.49"	243° 37' 02"	0.95247
3	30° 20' 23"	-2° 45' 31"	29° 12' 50"	9° 00' 19"	0° 54' 38"	14' 53.27"	243° 40' 22"	0.95417
4	30° 50' 36"	-2° 43' 07"	29° 40' 40"	9° 13' 01"	0° 54' 37"	14' 53.05"	243° 43' 45"	0.95584
5	31° 20' 49"	-2° 40' 43"	30° 08' 31"	9° 25' 42"	0° 54' 36"	14' 52.83"	243° 47' 13"	0.95748
6	31° 51' 00"	-2° 38' 18"	30° 36' 24"	9° 38' 19"	0° 54' 36"	14' 52.62"	243° 50' 44"	0.95909
7	32° 21' 11"	-2° 35' 53"	31° 04' 18"	9° 50' 55"	0° 54' 35"	14' 52.40"	243° 54' 18"	0.96067
8	32° 51' 21"	-2° 33' 26"	31° 32' 14"	10° 03' 27"	0° 54' 34"	14' 52.19"	243° 57' 56"	0.96222
9	33° 21' 30"	-2° 30' 59"	32° 00' 11"	10° 15' 57"	0° 54' 33"	14' 51.98"	244° 1' 37"	0.96374
10	33° 51' 38"	-2° 28' 32"	32° 28' 10"	10° 28' 24"	0° 54' 33"	14' 51.78"	244° 5' 21"	0.96522
11	34° 21' 45"	-2° 26' 04"	32° 56' 10"	10° 40' 49"	0° 54' 32"	14' 51.57"	244° 9' 07"	0.96668
12	34° 51' 51"	-2° 23' 35"	33° 24' 12"	10° 53' 10"	0° 54' 31"	14' 51.37"	244° 12' 56"	0.96810
13	35° 21' 57"	-2° 21' 06"	33° 52' 15"	11° 05' 29"	0° 54' 30"	14' 51.17"	244° 16' 47"	0.96950
14	35° 52' 02"	-2° 18' 36"	34° 20' 21"	11° 17' 45"	0° 54' 30"	14' 50.97"	244° 20' 40"	0.97086
15	36° 22' 06"	-2° 16' 05"	34° 48' 28"	11° 29' 58"	0° 54' 29"	14' 50.78"	244° 24' 35"	0.97220
16	36° 52' 09"	-2° 13' 34"	35° 16' 36"	11° 42' 09"	0° 54' 28"	14' 50.58"	244° 28' 31"	0.97350
17	37° 22' 12"	-2° 11' 02"	35° 44' 47"	11° 54' 16"	0° 54' 27"	14' 50.39"	244° 32' 28"	0.97477
18	37° 52' 13"	-2° 08' 30"	36° 12' 59"	12° 06' 20"	0° 54' 27"	14' 50.20"	244° 36' 25"	0.97601
19	38° 22' 14"	-2° 05' 57"	36° 41' 14"	12° 18' 20"	0° 54' 26"	14' 50.02"	244° 40' 22"	0.97722
20	38° 52' 15"	-2° 03' 24"	37° 09' 30"	12° 30' 18"	0° 54' 25"	14' 49.83"	244° 44' 18"	0.97840
21	39° 22' 14"	-2° 00' 50"	37° 37' 48"	12° 42' 13"	0° 54' 25"	14' 49.65"	244° 48' 14"	0.97955
22	39° 52' 13"	-1° 58' 16"	38° 06' 09"	12° 54' 04"	0° 54' 24"	14' 49.47"	244° 52' 08"	0.98066
23	40° 22' 11"	-1° 55' 41"	38° 34' 31"	13° 05' 52"	0° 54' 23"	14' 49.29"	244° 55' 59"	0.98175
24	40° 52' 08"	-1° 53' 06"	39° 02' 56"	13° 17' 37"	0° 54' 23"	14' 49.12"	244° 59' 47"	0.98280

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	235° 51' 57"	-0.56"	233° 31' 45"	-19° 13' 11"	0.9885448	16' 10.75"	23° 26' 15"	14 m 55 s
1	235° 54' 28"	-0.55"	233° 34' 21"	-19° 13' 46"	0.9885359	16' 10.76"	23° 26' 15"	14 m 55 s
2	235° 56' 59"	-0.55"	233° 36' 56"	-19° 14' 22"	0.9885270	16' 10.77"	23° 26' 15"	14 m 54 s
3	235° 59' 30"	-0.54"	233° 39' 32"	-19° 14' 58"	0.9885181	16' 10.78"	23° 26' 15"	14 m 53 s
4	236° 02' 02"	-0.54"	233° 42' 08"	-19° 15' 33"	0.9885093	16' 10.79"	23° 26' 15"	14 m 53 s
5	236° 04' 33"	-0.53"	233° 44' 43"	-19° 16' 09"	0.9885004	16' 10.79"	23° 26' 15"	14 m 52 s
6	236° 07' 04"	-0.53"	233° 47' 19"	-19° 16' 44"	0.9884916	16' 10.80"	23° 26' 15"	14 m 52 s
7	236° 09' 35"	-0.52"	233° 49' 55"	-19° 17' 20"	0.9884828	16' 10.81"	23° 26' 15"	14 m 51 s
8	236° 12' 07"	-0.52"	233° 52' 31"	-19° 17' 55"	0.9884739	16' 10.82"	23° 26' 15"	14 m 51 s
9	236° 14' 38"	-0.51"	233° 55' 06"	-19° 18' 31"	0.9884651	16' 10.83"	23° 26' 15"	14 m 50 s
10	236° 17' 09"	-0.51"	233° 57' 42"	-19° 19' 06"	0.9884563	16' 10.84"	23° 26' 15"	14 m 50 s
11	236° 19' 40"	-0.50"	234° 00' 18"	-19° 19' 42"	0.9884475	16' 10.85"	23° 26' 15"	14 m 49 s
12	236° 22' 11"	-0.50"	234° 02' 54"	-19° 20' 17"	0.9884387	16' 10.85"	23° 26' 15"	14 m 49 s
13	236° 24' 43"	-0.49"	234° 05' 30"	-19° 20' 52"	0.9884299	16' 10.86"	23° 26' 15"	14 m 48 s
14	236° 27' 14"	-0.49"	234° 08' 06"	-19° 21' 28"	0.9884211	16' 10.87"	23° 26' 15"	14 m 48 s
15	236° 29' 45"	-0.48"	234° 10' 42"	-19° 22' 03"	0.9884124	16' 10.88"	23° 26' 15"	14 m 47 s
16	236° 32' 16"	-0.48"	234° 13' 17"	-19° 22' 38"	0.9884036	16' 10.89"	23° 26' 15"	14 m 46 s
17	236° 34' 48"	-0.47"	234° 15' 53"	-19° 23' 13"	0.9883948	16' 10.90"	23° 26' 15"	14 m 46 s
18	236° 37' 19"	-0.47"	234° 18' 29"	-19° 23' 48"	0.9883861	16' 10.91"	23° 26' 15"	14 m 45 s
19	236° 39' 50"	-0.46"	234° 21' 05"	-19° 24' 23"	0.9883774	16' 10.91"	23° 26' 15"	14 m 45 s
20	236° 42' 21"	-0.46"	234° 23' 41"	-19° 24' 58"	0.9883686	16' 10.92"	23° 26' 15"	14 m 44 s
21	236° 44' 53"	-0.45"	234° 26' 17"	-19° 25' 33"	0.9883599	16' 10.93"	23° 26' 15"	14 m 44 s
22	236° 47' 24"	-0.44"	234° 28' 54"	-19° 26' 08"	0.9883512	16' 10.94"	23° 26' 15"	14 m 43 s
23	236° 49' 55"	-0.44"	234° 31' 30"	-19° 26' 43"	0.9883425	16' 10.95"	23° 26' 15"	14 m 43 s
24	236° 52' 27"	-0.43"	234° 34' 06"	-19° 27' 18"	0.9883338	16' 10.96"	23° 26' 15"	14 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	40° 52' 08"	-1° 53' 06"	39° 02' 56"	13° 17' 37"	0° 54' 23"	14' 49.12"	244° 59' 47"	0.98280
1	41° 22' 04"	-1° 50' 30"	39° 31' 23"	13° 29' 18"	0° 54' 22"	14' 48.95"	245° 3' 31"	0.98382
2	41° 52' 00"	-1° 47' 54"	39° 59' 52"	13° 40' 56"	0° 54' 22"	14' 48.77"	245° 7' 10"	0.98482
3	42° 21' 55"	-1° 45' 18"	40° 28' 23"	13° 52' 30"	0° 54' 21"	14' 48.61"	245° 10' 43"	0.98578
4	42° 51' 50"	-1° 42' 40"	40° 56' 56"	14° 04' 01"	0° 54' 20"	14' 48.44"	245° 14' 09"	0.98670
5	43° 21' 44"	-1° 40' 03"	41° 25' 32"	14° 15' 28"	0° 54' 20"	14' 48.28"	245° 17' 25"	0.98760
6	43° 51' 37"	-1° 37' 25"	41° 54' 10"	14° 26' 51"	0° 54' 19"	14' 48.11"	245° 20' 31"	0.98847
7	44° 21' 29"	-1° 34' 47"	42° 22' 50"	14° 38' 11"	0° 54' 19"	14' 47.95"	245° 23' 25"	0.98930
8	44° 51' 21"	-1° 32' 08"	42° 51' 33"	14° 49' 27"	0° 54' 18"	14' 47.80"	245° 26' 03"	0.99011
9	45° 21' 12"	-1° 29' 29"	43° 20' 18"	15° 00' 40"	0° 54' 17"	14' 47.64"	245° 28' 25"	0.99088
10	45° 51' 03"	-1° 26' 50"	43° 49' 06"	15° 11' 48"	0° 54' 17"	14' 47.49"	245° 30' 26"	0.99162
11	46° 20' 53"	-1° 24' 10"	44° 17' 56"	15° 22' 53"	0° 54' 16"	14' 47.34"	245° 32' 03"	0.99233
12	46° 50' 42"	-1° 21' 30"	44° 46' 49"	15° 33' 54"	0° 54' 16"	14' 47.19"	245° 33' 12"	0.99301
13	47° 20' 31"	-1° 18' 50"	45° 15' 45"	15° 44' 50"	0° 54' 15"	14' 47.04"	245° 33' 48"	0.99365
14	47° 50' 19"	-1° 16' 09"	45° 44' 42"	15° 55' 43"	0° 54' 15"	14' 46.90"	245° 33' 44"	0.99427
15	48° 20' 06"	-1° 13' 28"	46° 13' 43"	16° 06' 32"	0° 54' 14"	14' 46.76"	245° 32' 53"	0.99485
16	48° 49' 53"	-1° 10' 47"	46° 42' 46"	16° 17' 16"	0° 54' 14"	14' 46.62"	245° 31' 06"	0.99540
17	49° 19' 40"	-1° 08' 05"	47° 11' 52"	16° 27' 57"	0° 54' 13"	14' 46.48"	245° 28' 11"	0.99593
18	49° 49' 26"	-1° 05' 24"	47° 41' 01"	16° 38' 33"	0° 54' 13"	14' 46.34"	245° 23' 54"	0.99641
19	50° 19' 11"	-1° 02' 42"	48° 10' 12"	16° 49' 05"	0° 54' 12"	14' 46.21"	245° 17' 55"	0.99687
20	50° 48' 55"	0°-59' 59"	48° 39' 26"	16° 59' 33"	0° 54' 12"	14' 46.08"	245° 9' 51"	0.99730
21	51° 18' 40"	0°-57' 17"	49° 08' 43"	17° 09' 56"	0° 54' 11"	14' 45.95"	244° 59' 10"	0.99769
22	51° 48' 23"	0°-54' 34"	49° 38' 02"	17° 20' 15"	0° 54' 11"	14' 45.83"	244° 45' 06"	0.99806
23	52° 18' 06"	0°-51' 51"	50° 07' 25"	17° 30' 30"	0° 54' 10"	14' 45.70"	244° 26' 39"	0.99839
24	52° 47' 49"	0°-49' 08"	50° 36' 50"	17° 40' 40"	0° 54' 10"	14' 45.58"	244° 2' 22"	0.99869

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	236° 52' 27"	-0.43"	234° 34' 06"	-19° 27' 18"	0.9883338	16' 10.96"	23° 26' 15"	14 m 42 s
1	236° 54' 58"	-0.43"	234° 36' 42"	-19° 27' 53"	0.9883251	16' 10.97"	23° 26' 15"	14 m 41 s
2	236° 57' 29"	-0.42"	234° 39' 18"	-19° 28' 28"	0.9883164	16' 10.97"	23° 26' 15"	14 m 41 s
3	237° 00' 00"	-0.42"	234° 41' 54"	-19° 29' 03"	0.9883078	16' 10.98"	23° 26' 15"	14 m 40 s
4	237° 02' 32"	-0.41"	234° 44' 30"	-19° 29' 37"	0.9882991	16' 10.99"	23° 26' 15"	14 m 40 s
5	237° 05' 03"	-0.41"	234° 47' 07"	-19° 30' 12"	0.9882904	16' 11.00"	23° 26' 15"	14 m 39 s
6	237° 07' 34"	-0.40"	234° 49' 43"	-19° 30' 47"	0.9882818	16' 11.01"	23° 26' 15"	14 m 39 s
7	237° 10' 06"	-0.40"	234° 52' 19"	-19° 31' 21"	0.9882732	16' 11.02"	23° 26' 15"	14 m 38 s
8	237° 12' 37"	-0.39"	234° 54' 55"	-19° 31' 56"	0.9882645	16' 11.03"	23° 26' 15"	14 m 37 s
9	237° 15' 08"	-0.38"	234° 57' 32"	-19° 32' 30"	0.9882559	16' 11.03"	23° 26' 15"	14 m 37 s
10	237° 17' 39"	-0.38"	235° 00' 08"	-19° 33' 05"	0.9882473	16' 11.04"	23° 26' 15"	14 m 36 s
11	237° 20' 11"	-0.37"	235° 02' 44"	-19° 33' 40"	0.9882387	16' 11.05"	23° 26' 15"	14 m 36 s
12	237° 22' 42"	-0.37"	235° 05' 21"	-19° 34' 14"	0.9882301	16' 11.06"	23° 26' 15"	14 m 35 s
13	237° 25' 13"	-0.36"	235° 07' 57"	-19° 34' 48"	0.9882215	16' 11.07"	23° 26' 15"	14 m 35 s
14	237° 27' 45"	-0.36"	235° 10' 33"	-19° 35' 23"	0.9882129	16' 11.08"	23° 26' 15"	14 m 34 s
15	237° 30' 16"	-0.35"	235° 13' 10"	-19° 35' 57"	0.9882043	16' 11.08"	23° 26' 15"	14 m 33 s
16	237° 32' 47"	-0.35"	235° 15' 46"	-19° 36' 31"	0.9881958	16' 11.09"	23° 26' 15"	14 m 33 s
17	237° 35' 19"	-0.34"	235° 18' 23"	-19° 37' 06"	0.9881872	16' 11.10"	23° 26' 15"	14 m 32 s
18	237° 37' 50"	-0.34"	235° 20' 59"	-19° 37' 40"	0.9881787	16' 11.11"	23° 26' 15"	14 m 32 s
19	237° 40' 21"	-0.33"	235° 23' 36"	-19° 38' 14"	0.9881701	16' 11.12"	23° 26' 15"	14 m 31 s
20	237° 42' 53"	-0.32"	235° 26' 12"	-19° 38' 48"	0.9881616	16' 11.13"	23° 26' 15"	14 m 30 s
21	237° 45' 24"	-0.32"	235° 28' 49"	-19° 39' 22"	0.9881531	16' 11.13"	23° 26' 15"	14 m 30 s
22	237° 47' 55"	-0.31"	235° 31' 25"	-19° 39' 56"	0.9881445	16' 11.14"	23° 26' 15"	14 m 29 s
23	237° 50' 27"	-0.31"	235° 34' 02"	-19° 40' 31"	0.9881360	16' 11.15"	23° 26' 15"	14 m 29 s
24	237° 52' 58"	-0.30"	235° 36' 39"	-19° 41' 05"	0.9881275	16' 11.16"	23° 26' 15"	14 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	52° 47' 49"	0°-49' 08"	50° 36' 50"	17° 40' 40"	0° 54' 10"	14' 45.58"	244° 2' 22"	0.99869
1	53° 17' 31"	0°-46' 25"	51° 06' 18"	17° 50' 43"	0° 54' 09"	14' 45.46"	243° 30' 03"	0.99896
2	53° 47' 13"	0°-43' 41"	51° 35' 49"	18° 00' 46"	0° 54' 09"	14' 45.34"	242° 46' 22"	0.99920
3	54° 16' 54"	0°-40' 58"	52° 05' 23"	18° 10' 42"	0° 54' 09"	14' 45.23"	241° 45' 47"	0.99941
4	54° 46' 34"	0°-38' 14"	52° 34' 60"	18° 20' 34"	0° 54' 08"	14' 45.11"	240° 18' 37"	0.99958
5	55° 16' 15"	0°-35' 30"	53° 04' 40"	18° 30' 21"	0° 54' 08"	14' 45.00"	238° 6' 15"	0.99972
6	55° 45' 54"	0°-32' 46"	53° 34' 22"	18° 40' 03"	0° 54' 07"	14' 44.89"	234° 28' 09"	0.99984
7	56° 15' 34"	0°-30' 02"	54° 04' 08"	18° 49' 40"	0° 54' 07"	14' 44.79"	227° 38' 36"	0.99992
8	56° 45' 12"	0°-27' 18"	54° 33' 57"	18° 59' 13"	0° 54' 07"	14' 44.68"	211° 44' 28"	0.99997
9	57° 14' 51"	0°-24' 33"	55° 03' 48"	19° 08' 40"	0° 54' 06"	14' 44.58"	167° 24' 18"	0.99999
10	57° 44' 29"	0°-21' 49"	55° 33' 43"	19° 18' 03"	0° 54' 06"	14' 44.48"	116° 4' 34"	0.99997
11	58° 14' 06"	0°-19' 04"	56° 03' 40"	19° 27' 20"	0° 54' 05"	14' 44.39"	96° 37' 55"	0.99993
12	58° 43' 44"	0°-16' 20"	56° 33' 41"	19° 36' 33"	0° 54' 05"	14' 44.29"	88° 43' 39"	0.99986
13	59° 13' 20"	0°-13' 35"	57° 03' 45"	19° 45' 40"	0° 54' 05"	14' 44.20"	84° 40' 09"	0.99975
14	59° 42' 57"	0°-10' 51"	57° 33' 52"	19° 54' 43"	0° 54' 04"	14' 44.11"	82° 15' 54"	0.99961
15	60° 12' 33"	0° -8' 06"	58° 04' 01"	20° 03' 40"	0° 54' 04"	14' 44.02"	80° 42' 40"	0.99944
16	60° 42' 08"	0° -5' 22"	58° 34' 14"	20° 12' 32"	0° 54' 04"	14' 43.93"	79° 38' 57"	0.99924
17	61° 11' 43"	0° -2' 37"	59° 04' 30"	20° 21' 18"	0° 54' 03"	14' 43.85"	78° 53' 48"	0.99901
18	61° 41' 18"	0° 00' 08"	59° 34' 49"	20° 29' 60"	0° 54' 03"	14' 43.77"	78° 21' 07"	0.99875
19	62° 10' 53"	0° 02' 52"	60° 05' 11"	20° 38' 35"	0° 54' 03"	14' 43.69"	77° 57' 11"	0.99846
20	62° 40' 27"	0° 05' 37"	60° 35' 36"	20° 47' 06"	0° 54' 03"	14' 43.62"	77° 39' 38"	0.99814
21	63° 10' 01"	0° 08' 19"	61° 06' 05"	20° 55' 29"	0° 54' 02"	14' 43.54"	77° 27' 20"	0.99778
22	63° 39' 35"	0° 11' 03"	61° 36' 36"	21° 03' 48"	0° 54' 02"	14' 43.47"	77° 18' 19"	0.99740
23	64° 09' 08"	0° 13' 47"	62° 07' 11"	21° 12' 02"	0° 54' 02"	14' 43.40"	77° 12' 14"	0.99698
24	64° 38' 41"	0° 16' 32"	62° 37' 48"	21° 20' 11"	0° 54' 02"	14' 43.33"	77° 8' 31"	0.99653

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	237° 52' 58"	-0.30"	235° 36' 39"	-19° 41' 05"	0.9881275	16' 11.16"	23° 26' 15"	14 m 28 s
1	237° 55' 29"	-0.30"	235° 39' 15"	-19° 41' 39"	0.9881191	16' 11.17"	23° 26' 15"	14 m 28 s
2	237° 58' 01"	-0.29"	235° 41' 52"	-19° 42' 12"	0.9881106	16' 11.18"	23° 26' 15"	14 m 27 s
3	238° 00' 32"	-0.29"	235° 44' 28"	-19° 42' 46"	0.9881021	16' 11.19"	23° 26' 15"	14 m 26 s
4	238° 03' 03"	-0.28"	235° 47' 05"	-19° 43' 20"	0.9880936	16' 11.19"	23° 26' 15"	14 m 26 s
5	238° 05' 35"	-0.28"	235° 49' 42"	-19° 43' 54"	0.9880852	16' 11.20"	23° 26' 15"	14 m 25 s
6	238° 08' 06"	-0.27"	235° 52' 19"	-19° 44' 28"	0.9880767	16' 11.21"	23° 26' 15"	14 m 25 s
7	238° 10' 37"	-0.26"	235° 54' 55"	-19° 45' 02"	0.9880683	16' 11.22"	23° 26' 15"	14 m 24 s
8	238° 13' 09"	-0.26"	235° 57' 32"	-19° 45' 35"	0.9880598	16' 11.23"	23° 26' 15"	14 m 23 s
9	238° 15' 40"	-0.25"	236° 00' 09"	-19° 46' 09"	0.9880514	16' 11.23"	23° 26' 15"	14 m 23 s
10	238° 18' 11"	-0.25"	236° 02' 46"	-19° 46' 43"	0.9880430	16' 11.24"	23° 26' 15"	14 m 22 s
11	238° 20' 43"	-0.24"	236° 05' 23"	-19° 47' 16"	0.9880346	16' 11.25"	23° 26' 15"	14 m 21 s
12	238° 23' 14"	-0.24"	236° 07' 60"	-19° 47' 50"	0.9880262	16' 11.26"	23° 26' 15"	14 m 21 s
13	238° 25' 45"	-0.23"	236° 10' 36"	-19° 48' 23"	0.9880178	16' 11.27"	23° 26' 15"	14 m 20 s
14	238° 28' 17"	-0.23"	236° 13' 13"	-19° 48' 57"	0.9880094	16' 11.28"	23° 26' 15"	14 m 20 s
15	238° 30' 48"	-0.22"	236° 15' 50"	-19° 49' 30"	0.9880010	16' 11.28"	23° 26' 15"	14 m 19 s
16	238° 33' 20"	-0.22"	236° 18' 27"	-19° 50' 04"	0.9879927	16' 11.29"	23° 26' 15"	14 m 18 s
17	238° 35' 51"	-0.21"	236° 21' 04"	-19° 50' 37"	0.9879843	16' 11.30"	23° 26' 15"	14 m 18 s
18	238° 38' 22"	-0.20"	236° 23' 41"	-19° 51' 10"	0.9879760	16' 11.31"	23° 26' 15"	14 m 17 s
19	238° 40' 54"	-0.20"	236° 26' 18"	-19° 51' 44"	0.9879676	16' 11.32"	23° 26' 15"	14 m 17 s
20	238° 43' 25"	-0.19"	236° 28' 55"	-19° 52' 17"	0.9879593	16' 11.33"	23° 26' 15"	14 m 16 s
21	238° 45' 56"	-0.19"	236° 31' 32"	-19° 52' 50"	0.9879510	16' 11.33"	23° 26' 15"	14 m 15 s
22	238° 48' 28"	-0.18"	236° 34' 09"	-19° 53' 23"	0.9879426	16' 11.34"	23° 26' 15"	14 m 15 s
23	238° 50' 59"	-0.18"	236° 36' 47"	-19° 53' 56"	0.9879343	16' 11.35"	23° 26' 15"	14 m 14 s
24	238° 53' 31"	-0.17"	236° 39' 24"	-19° 54' 30"	0.9879260	16' 11.36"	23° 26' 15"	14 m 13 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	64° 38' 41"	0° 16' 32"	62° 37' 48"	21° 20' 11"	0° 54' 02"	14' 43.33"	77° 8' 31"	0.99653
1	65° 08' 14"	0° 19' 16"	63° 08' 29"	21° 28' 13"	0° 54' 01"	14' 43.27"	77° 6' 45"	0.99606
2	65° 37' 46"	0° 21' 60"	63° 39' 12"	21° 36' 10"	0° 54' 01"	14' 43.21"	77° 6' 36"	0.99555
3	66° 07' 18"	0° 24' 44"	64° 09' 59"	21° 44' 02"	0° 54' 01"	14' 43.15"	77° 7' 49"	0.99501
4	66° 36' 50"	0° 27' 27"	64° 40' 48"	21° 51' 47"	0° 54' 01"	14' 43.09"	77° 10' 11"	0.99444
5	67° 06' 22"	0° 30' 11"	65° 11' 41"	21° 59' 27"	0° 54' 00"	14' 43.03"	77° 13' 33"	0.99384
6	67° 35' 53"	0° 32' 54"	65° 42' 37"	22° 07' 01"	0° 54' 00"	14' 42.98"	77° 17' 46"	0.99321
7	68° 05' 24"	0° 35' 38"	66° 13' 35"	22° 14' 29"	0° 54' 00"	14' 42.93"	77° 22' 45"	0.99255
8	68° 34' 55"	0° 38' 21"	66° 44' 37"	22° 21' 51"	0° 53' 60"	14' 42.88"	77° 28' 24"	0.99185
9	69° 04' 26"	0° 41' 04"	67° 15' 42"	22° 29' 07"	0° 53' 60"	14' 42.84"	77° 34' 38"	0.99113
10	69° 33' 56"	0° 43' 46"	67° 46' 50"	22° 36' 17"	0° 53' 60"	14' 42.80"	77° 41' 25"	0.99038
11	70° 03' 27"	0° 46' 29"	68° 18' 01"	22° 43' 21"	0° 53' 59"	14' 42.76"	77° 48' 40"	0.98960
12	70° 32' 57"	0° 49' 11"	68° 49' 14"	22° 50' 19"	0° 53' 59"	14' 42.72"	77° 56' 20"	0.98878
13	71° 02' 27"	0° 51' 53"	69° 20' 31"	22° 57' 11"	0° 53' 59"	14' 42.68"	78° 4' 25"	0.98794
14	71° 31' 57"	0° 54' 35"	69° 51' 51"	23° 03' 56"	0° 53' 59"	14' 42.65"	78° 12' 51"	0.98707
15	72° 01' 26"	0° 57' 17"	70° 23' 13"	23° 10' 36"	0° 53' 59"	14' 42.62"	78° 21' 36"	0.98617
16	72° 30' 56"	0° 59' 58"	70° 54' 38"	23° 17' 09"	0° 53' 59"	14' 42.59"	78° 30' 40"	0.98523
17	73° 00' 25"	1° 02' 39"	71° 26' 07"	23° 23' 36"	0° 53' 59"	14' 42.57"	78° 40' 01"	0.98427
18	73° 29' 54"	1° 05' 19"	71° 57' 38"	23° 29' 56"	0° 53' 59"	14' 42.54"	78° 49' 38"	0.98328
19	73° 59' 23"	1° 07' 60"	72° 29' 12"	23° 36' 10"	0° 53' 59"	14' 42.52"	78° 59' 29"	0.98225
20	74° 28' 52"	1° 10' 40"	73° 00' 49"	23° 42' 18"	0° 53' 59"	14' 42.50"	79° 9' 34"	0.98120
21	74° 58' 21"	1° 13' 20"	73° 32' 28"	23° 48' 19"	0° 53' 58"	14' 42.49"	79° 19' 52"	0.98012
22	75° 27' 50"	1° 15' 59"	74° 04' 10"	23° 54' 13"	0° 53' 58"	14' 42.48"	79° 30' 22"	0.97901
23	75° 57' 19"	1° 18' 38"	74° 35' 55"	24° 00' 02"	0° 53' 58"	14' 42.47"	79° 41' 03"	0.97787
24	76° 26' 48"	1° 21' 17"	75° 07' 43"	24° 05' 43"	0° 53' 58"	14' 42.46"	79° 51' 55"	0.97670

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	238° 53' 31"	-0.17"	236° 39' 24"	-19° 54' 30"	0.9879260	16' 11.36"	23° 26' 15"	14 m 13 s
1	238° 56' 02"	-0.17"	236° 42' 01"	-19° 55' 03"	0.9879177	16' 11.37"	23° 26' 15"	14 m 13 s
2	238° 58' 33"	-0.16"	236° 44' 38"	-19° 55' 36"	0.9879095	16' 11.37"	23° 26' 15"	14 m 12 s
3	239° 01' 05"	-0.16"	236° 47' 15"	-19° 56' 09"	0.9879012	16' 11.38"	23° 26' 15"	14 m 11 s
4	239° 03' 36"	-0.15"	236° 49' 52"	-19° 56' 42"	0.9878929	16' 11.39"	23° 26' 15"	14 m 11 s
5	239° 06' 08"	-0.15"	236° 52' 30"	-19° 57' 15"	0.9878847	16' 11.40"	23° 26' 15"	14 m 10 s
6	239° 08' 39"	-0.14"	236° 55' 07"	-19° 57' 47"	0.9878764	16' 11.41"	23° 26' 15"	14 m 10 s
7	239° 11' 11"	-0.14"	236° 57' 44"	-19° 58' 20"	0.9878682	16' 11.42"	23° 26' 15"	14 m 09 s
8	239° 13' 42"	-0.13"	237° 00' 21"	-19° 58' 53"	0.9878599	16' 11.42"	23° 26' 15"	14 m 08 s
9	239° 16' 13"	-0.13"	237° 02' 59"	-19° 59' 26"	0.9878517	16' 11.43"	23° 26' 15"	14 m 08 s
10	239° 18' 45"	-0.12"	237° 05' 36"	-19° 59' 59"	0.9878435	16' 11.44"	23° 26' 15"	14 m 07 s
11	239° 21' 16"	-0.12"	237° 08' 13"	-20° 00' 31"	0.9878353	16' 11.45"	23° 26' 15"	14 m 06 s
12	239° 23' 48"	-0.11"	237° 10' 51"	-20° 01' 04"	0.9878271	16' 11.46"	23° 26' 15"	14 m 06 s
13	239° 26' 19"	-0.11"	237° 13' 28"	-20° 01' 37"	0.9878189	16' 11.46"	23° 26' 15"	14 m 05 s
14	239° 28' 51"	-0.10"	237° 16' 06"	-20° 02' 09"	0.9878107	16' 11.47"	23° 26' 15"	14 m 04 s
15	239° 31' 22"	-0.09"	237° 18' 43"	-20° 02' 42"	0.9878025	16' 11.48"	23° 26' 15"	14 m 04 s
16	239° 33' 53"	-0.09"	237° 21' 20"	-20° 03' 14"	0.9877943	16' 11.49"	23° 26' 15"	14 m 03 s
17	239° 36' 25"	-0.08"	237° 23' 58"	-20° 03' 47"	0.9877862	16' 11.50"	23° 26' 15"	14 m 02 s
18	239° 38' 56"	-0.08"	237° 26' 35"	-20° 04' 19"	0.9877780	16' 11.50"	23° 26' 15"	14 m 02 s
19	239° 41' 28"	-0.07"	237° 29' 13"	-20° 04' 52"	0.9877699	16' 11.51"	23° 26' 15"	14 m 01 s
20	239° 43' 59"	-0.07"	237° 31' 50"	-20° 05' 24"	0.9877617	16' 11.52"	23° 26' 15"	14 m 01 s
21	239° 46' 31"	-0.07"	237° 34' 28"	-20° 05' 56"	0.9877536	16' 11.53"	23° 26' 15"	13 m 60 s
22	239° 49' 02"	-0.06"	237° 37' 06"	-20° 06' 29"	0.9877455	16' 11.54"	23° 26' 15"	13 m 59 s
23	239° 51' 34"	-0.06"	237° 39' 43"	-20° 07' 01"	0.9877374	16' 11.54"	23° 26' 15"	13 m 59 s
24	239° 54' 05"	-0.05"	237° 42' 21"	-20° 07' 33"	0.9877293	16' 11.55"	23° 26' 15"	13 m 58 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	76° 26' 48"	1° 21' 17"	75° 07' 43"	24° 05' 43"	0° 53' 58"	14' 42.46"	79° 51' 55"	0.97670
1	76° 56' 16"	1° 23' 55"	75° 39' 34"	24° 11' 18"	0° 53' 58"	14' 42.46"	80° 2' 58"	0.97550
2	77° 25' 45"	1° 26' 33"	76° 11' 27"	24° 16' 46"	0° 53' 58"	14' 42.45"	80° 14' 10"	0.97427
3	77° 55' 13"	1° 29' 11"	76° 43' 22"	24° 22' 08"	0° 53' 58"	14' 42.45"	80° 25' 31"	0.97301
4	78° 24' 42"	1° 31' 48"	77° 15' 21"	24° 27' 23"	0° 53' 58"	14' 42.46"	80° 37' 01"	0.97172
5	78° 54' 10"	1° 34' 25"	77° 47' 21"	24° 32' 31"	0° 53' 58"	14' 42.46"	80° 48' 39"	0.97041
6	79° 23' 39"	1° 37' 01"	78° 19' 25"	24° 37' 33"	0° 53' 58"	14' 42.47"	81° 0' 25"	0.96906
7	79° 53' 07"	1° 39' 37"	78° 51' 30"	24° 42' 27"	0° 53' 58"	14' 42.48"	81° 12' 19"	0.96769
8	80° 22' 36"	1° 42' 13"	79° 23' 39"	24° 47' 15"	0° 53' 59"	14' 42.50"	81° 24' 20"	0.96629
9	80° 52' 05"	1° 44' 48"	79° 55' 49"	24° 51' 56"	0° 53' 59"	14' 42.52"	81° 36' 28"	0.96485
10	81° 21' 33"	1° 47' 22"	80° 28' 02"	24° 56' 30"	0° 53' 59"	14' 42.54"	81° 48' 43"	0.96339
11	81° 51' 02"	1° 49' 56"	81° 00' 17"	25° 00' 57"	0° 53' 59"	14' 42.56"	82° 1' 04"	0.96190
12	82° 20' 31"	1° 52' 30"	81° 32' 35"	25° 05' 17"	0° 53' 59"	14' 42.58"	82° 13' 32"	0.96039
13	82° 49' 59"	1° 55' 03"	82° 04' 55"	25° 09' 30"	0° 53' 59"	14' 42.61"	82° 26' 05"	0.95884
14	83° 19' 28"	1° 57' 36"	82° 37' 17"	25° 13' 36"	0° 53' 59"	14' 42.64"	82° 38' 44"	0.95727
15	83° 48' 57"	2° 00' 08"	83° 09' 41"	25° 17' 35"	0° 53' 59"	14' 42.68"	82° 51' 28"	0.95567
16	84° 18' 26"	2° 02' 39"	83° 42' 07"	25° 21' 27"	0° 53' 59"	14' 42.71"	83° 4' 18"	0.95403
17	84° 47' 56"	2° 05' 10"	84° 14' 36"	25° 25' 11"	0° 53' 59"	14' 42.75"	83° 17' 13"	0.95238
18	85° 17' 25"	2° 07' 41"	84° 47' 06"	25° 28' 49"	0° 53' 60"	14' 42.80"	83° 30' 12"	0.95069
19	85° 46' 54"	2° 10' 11"	85° 19' 39"	25° 32' 20"	0° 53' 60"	14' 42.84"	83° 43' 16"	0.94898
20	86° 16' 24"	2° 12' 40"	85° 52' 13"	25° 35' 43"	0° 53' 60"	14' 42.89"	83° 56' 25"	0.94723
21	86° 45' 54"	2° 15' 09"	86° 24' 49"	25° 38' 59"	0° 54' 00"	14' 42.94"	84° 9' 38"	0.94546
22	87° 15' 24"	2° 17' 37"	86° 57' 27"	25° 42' 08"	0° 54' 00"	14' 42.99"	84° 22' 55"	0.94367
23	87° 44' 54"	2° 20' 04"	87° 30' 07"	25° 45' 09"	0° 54' 01"	14' 43.05"	84° 36' 16"	0.94184
24	88° 14' 24"	2° 22' 31"	88° 02' 49"	25° 48' 04"	0° 54' 01"	14' 43.11"	84° 49' 41"	0.93999

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	239° 54' 05"	-0.05"	237° 42' 21"	-20° 07' 33"	0.9877293	16' 11.55"	23° 26' 15"	13 m 58 s
1	239° 56' 37"	-0.05"	237° 44' 59"	-20° 08' 05"	0.9877212	16' 11.56"	23° 26' 15"	13 m 57 s
2	239° 59' 08"	-0.04"	237° 47' 36"	-20° 08' 37"	0.9877131	16' 11.57"	23° 26' 15"	13 m 57 s
3	240° 01' 39"	-0.04"	237° 50' 14"	-20° 09' 09"	0.9877050	16' 11.58"	23° 26' 15"	13 m 56 s
4	240° 04' 11"	-0.03"	237° 52' 52"	-20° 09' 41"	0.9876970	16' 11.58"	23° 26' 15"	13 m 55 s
5	240° 06' 42"	-0.03"	237° 55' 29"	-20° 10' 13"	0.9876889	16' 11.59"	23° 26' 15"	13 m 55 s
6	240° 09' 14"	-0.02"	237° 58' 07"	-20° 10' 45"	0.9876808	16' 11.60"	23° 26' 15"	13 m 54 s
7	240° 11' 45"	-0.02"	238° 00' 45"	-20° 11' 17"	0.9876728	16' 11.61"	23° 26' 15"	13 m 53 s
8	240° 14' 17"	-0.01"	238° 03' 23"	-20° 11' 49"	0.9876648	16' 11.62"	23° 26' 15"	13 m 53 s
9	240° 16' 48"	-0.01"	238° 06' 00"	-20° 12' 21"	0.9876567	16' 11.62"	23° 26' 15"	13 m 52 s
10	240° 19' 20"	-0.00"	238° 08' 38"	-20° 12' 53"	0.9876487	16' 11.63"	23° 26' 15"	13 m 51 s
11	240° 21' 51"	0.00"	238° 11' 16"	-20° 13' 25"	0.9876407	16' 11.64"	23° 26' 15"	13 m 50 s
12	240° 24' 23"	0.01"	238° 13' 54"	-20° 13' 56"	0.9876327	16' 11.65"	23° 26' 15"	13 m 50 s
13	240° 26' 54"	0.01"	238° 16' 32"	-20° 14' 28"	0.9876247	16' 11.65"	23° 26' 15"	13 m 49 s
14	240° 29' 26"	0.01"	238° 19' 10"	-20° 14' 60"	0.9876167	16' 11.66"	23° 26' 15"	13 m 48 s
15	240° 31' 57"	0.02"	238° 21' 48"	-20° 15' 31"	0.9876087	16' 11.67"	23° 26' 15"	13 m 48 s
16	240° 34' 29"	0.02"	238° 24' 26"	-20° 16' 03"	0.9876008	16' 11.68"	23° 26' 15"	13 m 47 s
17	240° 37' 00"	0.03"	238° 27' 04"	-20° 16' 34"	0.9875928	16' 11.69"	23° 26' 15"	13 m 46 s
18	240° 39' 32"	0.03"	238° 29' 42"	-20° 17' 06"	0.9875848	16' 11.69"	23° 26' 15"	13 m 46 s
19	240° 42' 03"	0.04"	238° 32' 20"	-20° 17' 37"	0.9875769	16' 11.70"	23° 26' 15"	13 m 45 s
20	240° 44' 35"	0.04"	238° 34' 58"	-20° 18' 09"	0.9875690	16' 11.71"	23° 26' 15"	13 m 44 s
21	240° 47' 06"	0.04"	238° 37' 36"	-20° 18' 40"	0.9875610	16' 11.72"	23° 26' 15"	13 m 44 s
22	240° 49' 38"	0.05"	238° 40' 14"	-20° 19' 12"	0.9875531	16' 11.72"	23° 26' 15"	13 m 43 s
23	240° 52' 09"	0.05"	238° 42' 52"	-20° 19' 43"	0.9875452	16' 11.73"	23° 26' 15"	13 m 42 s
24	240° 54' 41"	0.06"	238° 45' 30"	-20° 20' 14"	0.9875373	16' 11.74"	23° 26' 15"	13 m 42 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	88° 14' 24"	2° 22' 31"	88° 02' 49"	25° 48' 04"	0° 54' 01"	14' 43.11"	84° 49' 41"	0.93999
1	88° 43' 55"	2° 24' 58"	88° 35' 32"	25° 50' 51"	0° 54' 01"	14' 43.17"	85° 3' 09"	0.93811
2	89° 13' 26"	2° 27' 23"	89° 08' 17"	25° 53' 30"	0° 54' 01"	14' 43.24"	85° 16' 41"	0.93620
3	89° 42' 57"	2° 29' 48"	89° 41' 04"	25° 56' 03"	0° 54' 02"	14' 43.31"	85° 30' 17"	0.93427
4	90° 12' 28"	2° 32' 13"	90° 13' 52"	25° 58' 28"	0° 54' 02"	14' 43.38"	85° 43' 55"	0.93231
5	90° 41' 60"	2° 34' 37"	90° 46' 41"	26° 00' 45"	0° 54' 02"	14' 43.46"	85° 57' 37"	0.93032
6	91° 11' 32"	2° 36' 60"	91° 19' 32"	26° 02' 55"	0° 54' 02"	14' 43.54"	86° 11' 22"	0.92830
7	91° 41' 04"	2° 39' 22"	91° 52' 24"	26° 04' 58"	0° 54' 03"	14' 43.62"	86° 25' 09"	0.92626
8	92° 10' 36"	2° 41' 44"	92° 25' 18"	26° 06' 53"	0° 54' 03"	14' 43.70"	86° 38' 59"	0.92419
9	92° 40' 09"	2° 44' 05"	92° 58' 13"	26° 08' 41"	0° 54' 03"	14' 43.79"	86° 52' 51"	0.92210
10	93° 09' 42"	2° 46' 25"	93° 31' 09"	26° 10' 21"	0° 54' 04"	14' 43.88"	87° 6' 46"	0.91998
11	93° 39' 16"	2° 48' 45"	94° 04' 06"	26° 11' 54"	0° 54' 04"	14' 43.98"	87° 20' 44"	0.91783
12	94° 08' 49"	2° 51' 04"	94° 37' 05"	26° 13' 20"	0° 54' 04"	14' 44.07"	87° 34' 43"	0.91566
13	94° 38' 23"	2° 53' 22"	95° 10' 04"	26° 14' 38"	0° 54' 05"	14' 44.17"	87° 48' 44"	0.91346
14	95° 07' 58"	2° 55' 39"	95° 43' 05"	26° 15' 48"	0° 54' 05"	14' 44.28"	88° 2' 47"	0.91123
15	95° 37' 33"	2° 57' 56"	96° 16' 06"	26° 16' 51"	0° 54' 05"	14' 44.38"	88° 16' 52"	0.90898
16	96° 07' 08"	3° 00' 12"	96° 49' 08"	26° 17' 46"	0° 54' 06"	14' 44.49"	88° 30' 59"	0.90670
17	96° 36' 44"	3° 02' 27"	97° 22' 11"	26° 18' 34"	0° 54' 06"	14' 44.61"	88° 45' 07"	0.90440
18	97° 06' 20"	3° 04' 41"	97° 55' 15"	26° 19' 14"	0° 54' 07"	14' 44.73"	88° 59' 17"	0.90207
19	97° 35' 57"	3° 06' 55"	98° 28' 20"	26° 19' 46"	0° 54' 07"	14' 44.85"	89° 13' 27"	0.89972
20	98° 05' 34"	3° 09' 07"	99° 01' 25"	26° 20' 11"	0° 54' 08"	14' 44.97"	89° 27' 39"	0.89734
21	98° 35' 11"	3° 11' 19"	99° 34' 31"	26° 20' 29"	0° 54' 08"	14' 45.10"	89° 41' 52"	0.89494
22	99° 04' 49"	3° 13' 30"	100° 07' 37"	26° 20' 38"	0° 54' 09"	14' 45.23"	89° 56' 06"	0.89251
23	99° 34' 28"	3° 15' 41"	100° 40' 44"	26° 20' 41"	0° 54' 09"	14' 45.36"	90° 10' 21"	0.89005
24	100° 04' 07"	3° 17' 50"	101° 13' 51"	26° 20' 35"	0° 54' 10"	14' 45.50"	90° 24' 37"	0.88757

23 November 2021

DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	240° 54' 41"	0.06"	238° 45' 30"	-20° 20' 14"	0.9875373	16' 11.74"	23° 26' 15"	13 m 42 s
1	240° 57' 13"	0.06"	238° 48' 08"	-20° 20' 45"	0.9875294	16' 11.75"	23° 26' 15"	13 m 41 s
2	240° 59' 44"	0.07"	238° 50' 46"	-20° 21' 17"	0.9875215	16' 11.76"	23° 26' 15"	13 m 40 s
3	241° 02' 16"	0.07"	238° 53' 25"	-20° 21' 48"	0.9875136	16' 11.76"	23° 26' 15"	13 m 39 s
4	241° 04' 47"	0.07"	238° 56' 03"	-20° 22' 19"	0.9875057	16' 11.77"	23° 26' 15"	13 m 39 s
5	241° 07' 19"	0.08"	238° 58' 41"	-20° 22' 50"	0.9874979	16' 11.78"	23° 26' 15"	13 m 38 s
6	241° 09' 50"	0.08"	239° 01' 19"	-20° 23' 21"	0.9874900	16' 11.79"	23° 26' 15"	13 m 37 s
7	241° 12' 22"	0.08"	239° 03' 58"	-20° 23' 52"	0.9874822	16' 11.79"	23° 26' 15"	13 m 37 s
8	241° 14' 53"	0.09"	239° 06' 36"	-20° 24' 23"	0.9874743	16' 11.80"	23° 26' 15"	13 m 36 s
9	241° 17' 25"	0.09"	239° 09' 14"	-20° 24' 54"	0.9874665	16' 11.81"	23° 26' 15"	13 m 35 s
10	241° 19' 56"	0.10"	239° 11' 53"	-20° 25' 25"	0.9874587	16' 11.82"	23° 26' 15"	13 m 35 s
11	241° 22' 28"	0.10"	239° 14' 31"	-20° 25' 56"	0.9874509	16' 11.83"	23° 26' 15"	13 m 34 s
12	241° 24' 60"	0.10"	239° 17' 09"	-20° 26' 27"	0.9874430	16' 11.83"	23° 26' 15"	13 m 33 s
13	241° 27' 31"	0.11"	239° 19' 48"	-20° 26' 57"	0.9874352	16' 11.84"	23° 26' 15"	13 m 32 s
14	241° 30' 03"	0.11"	239° 22' 26"	-20° 27' 28"	0.9874274	16' 11.85"	23° 26' 15"	13 m 32 s
15	241° 32' 34"	0.11"	239° 25' 04"	-20° 27' 59"	0.9874197	16' 11.86"	23° 26' 15"	13 m 31 s
16	241° 35' 06"	0.12"	239° 27' 43"	-20° 28' 29"	0.9874119	16' 11.86"	23° 26' 15"	13 m 30 s
17	241° 37' 37"	0.12"	239° 30' 21"	-20° 28' 60"	0.9874041	16' 11.87"	23° 26' 15"	13 m 30 s
18	241° 40' 09"	0.12"	239° 32' 60"	-20° 29' 31"	0.9873964	16' 11.88"	23° 26' 15"	13 m 29 s
19	241° 42' 41"	0.13"	239° 35' 38"	-20° 30' 01"	0.9873886	16' 11.89"	23° 26' 15"	13 m 28 s
20	241° 45' 12"	0.13"	239° 38' 17"	-20° 30' 32"	0.9873809	16' 11.89"	23° 26' 15"	13 m 27 s
21	241° 47' 44"	0.13"	239° 40' 56"	-20° 31' 02"	0.9873731	16' 11.90"	23° 26' 15"	13 m 27 s
22	241° 50' 15"	0.14"	239° 43' 34"	-20° 31' 32"	0.9873654	16' 11.91"	23° 26' 15"	13 m 26 s
23	241° 52' 47"	0.14"	239° 46' 13"	-20° 32' 03"	0.9873577	16' 11.92"	23° 26' 15"	13 m 25 s
24	241° 55' 19"	0.14"	239° 48' 51"	-20° 32' 33"	0.9873500	16' 11.92"	23° 26' 15"	13 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	100° 04' 07"	3° 17' 50"	101° 13' 51"	26° 20' 35"	0° 54' 10"	14' 45.50"	90° 24' 37"	0.88757
1	100° 33' 46"	3° 19' 58"	101° 46' 58"	26° 20' 22"	0° 54' 10"	14' 45.64"	90° 38' 53"	0.88507
2	101° 03' 26"	3° 22' 06"	102° 20' 06"	26° 20' 01"	0° 54' 11"	14' 45.78"	90° 53' 10"	0.88254
3	101° 33' 07"	3° 24' 13"	102° 53' 14"	26° 19' 33"	0° 54' 11"	14' 45.93"	91° 7' 27"	0.87999
4	102° 02' 48"	3° 26' 19"	103° 26' 23"	26° 18' 57"	0° 54' 12"	14' 46.08"	91° 21' 44"	0.87741
5	102° 32' 30"	3° 28' 24"	103° 59' 31"	26° 18' 14"	0° 54' 12"	14' 46.23"	91° 36' 01"	0.87481
6	103° 02' 12"	3° 30' 28"	104° 32' 39"	26° 17' 22"	0° 54' 13"	14' 46.39"	91° 50' 19"	0.87218
7	103° 31' 55"	3° 32' 31"	105° 05' 48"	26° 16' 24"	0° 54' 13"	14' 46.55"	92° 4' 36"	0.86953
8	104° 01' 39"	3° 34' 34"	105° 38' 56"	26° 15' 17"	0° 54' 14"	14' 46.72"	92° 18' 54"	0.86686
9	104° 31' 23"	3° 36' 35"	106° 12' 04"	26° 14' 03"	0° 54' 15"	14' 46.88"	92° 33' 11"	0.86416
10	105° 01' 08"	3° 38' 35"	106° 45' 13"	26° 12' 41"	0° 54' 15"	14' 47.06"	92° 47' 27"	0.86144
11	105° 30' 53"	3° 40' 35"	107° 18' 21"	26° 11' 12"	0° 54' 16"	14' 47.23"	93° 1' 44"	0.85869
12	106° 00' 40"	3° 42' 33"	107° 51' 28"	26° 09' 35"	0° 54' 17"	14' 47.41"	93° 15' 59"	0.85592
13	106° 30' 27"	3° 44' 31"	108° 24' 35"	26° 07' 51"	0° 54' 17"	14' 47.59"	93° 30' 14"	0.85313
14	107° 00' 14"	3° 46' 28"	108° 57' 42"	26° 05' 58"	0° 54' 18"	14' 47.78"	93° 44' 28"	0.85032
15	107° 30' 03"	3° 48' 23"	109° 30' 49"	26° 03' 59"	0° 54' 19"	14' 47.97"	93° 58' 42"	0.84748
16	107° 59' 52"	3° 50' 18"	110° 03' 55"	26° 01' 51"	0° 54' 19"	14' 48.16"	94° 12' 54"	0.84462
17	108° 29' 42"	3° 52' 12"	110° 37' 00"	25° 59' 36"	0° 54' 20"	14' 48.36"	94° 27' 05"	0.84173
18	108° 59' 32"	3° 54' 04"	111° 10' 05"	25° 57' 14"	0° 54' 21"	14' 48.56"	94° 41' 15"	0.83883
19	109° 29' 24"	3° 55' 56"	111° 43' 09"	25° 54' 44"	0° 54' 22"	14' 48.77"	94° 55' 24"	0.83590
20	109° 59' 16"	3° 57' 46"	112° 16' 13"	25° 52' 06"	0° 54' 22"	14' 48.98"	95° 9' 32"	0.83294
21	110° 29' 09"	3° 59' 36"	112° 49' 16"	25° 49' 21"	0° 54' 23"	14' 49.19"	95° 23' 38"	0.82997
22	110° 59' 03"	4° 01' 25"	113° 22' 18"	25° 46' 28"	0° 54' 24"	14' 49.40"	95° 37' 42"	0.82697
23	111° 28' 58"	4° 03' 12"	113° 55' 19"	25° 43' 28"	0° 54' 25"	14' 49.62"	95° 51' 45"	0.82396
24	111° 58' 53"	4° 04' 58"	114° 28' 19"	25° 40' 20"	0° 54' 25"	14' 49.85"	96° 5' 46"	0.82092

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	241° 55' 19"	0.14"	239° 48' 51"	-20° 32' 33"	0.9873500	16' 11.92"	23° 26' 15"	13 m 24 s
1	241° 57' 50"	0.15"	239° 51' 30"	-20° 33' 03"	0.9873423	16' 11.93"	23° 26' 15"	13 m 24 s
2	242° 00' 22"	0.15"	239° 54' 09"	-20° 33' 34"	0.9873346	16' 11.94"	23° 26' 15"	13 m 23 s
3	242° 02' 53"	0.15"	239° 56' 47"	-20° 34' 04"	0.9873269	16' 11.95"	23° 26' 15"	13 m 22 s
4	242° 05' 25"	0.16"	239° 59' 26"	-20° 34' 34"	0.9873192	16' 11.96"	23° 26' 15"	13 m 22 s
5	242° 07' 57"	0.16"	240° 02' 05"	-20° 35' 04"	0.9873115	16' 11.96"	23° 26' 15"	13 m 21 s
6	242° 10' 28"	0.16"	240° 04' 43"	-20° 35' 34"	0.9873039	16' 11.97"	23° 26' 15"	13 m 20 s
7	242° 12' 60"	0.17"	240° 07' 22"	-20° 36' 04"	0.9872962	16' 11.98"	23° 26' 15"	13 m 19 s
8	242° 15' 31"	0.17"	240° 10' 01"	-20° 36' 34"	0.9872886	16' 11.99"	23° 26' 15"	13 m 19 s
9	242° 18' 03"	0.17"	240° 12' 40"	-20° 37' 04"	0.9872809	16' 11.99"	23° 26' 15"	13 m 18 s
10	242° 20' 35"	0.17"	240° 15' 19"	-20° 37' 34"	0.9872733	16' 12.00"	23° 26' 15"	13 m 17 s
11	242° 23' 06"	0.18"	240° 17' 57"	-20° 38' 04"	0.9872657	16' 12.01"	23° 26' 15"	13 m 16 s
12	242° 25' 38"	0.18"	240° 20' 36"	-20° 38' 34"	0.9872580	16' 12.02"	23° 26' 15"	13 m 16 s
13	242° 28' 10"	0.18"	240° 23' 15"	-20° 39' 04"	0.9872504	16' 12.02"	23° 26' 15"	13 m 15 s
14	242° 30' 41"	0.18"	240° 25' 54"	-20° 39' 34"	0.9872428	16' 12.03"	23° 26' 15"	13 m 14 s
15	242° 33' 13"	0.19"	240° 28' 33"	-20° 40' 03"	0.9872352	16' 12.04"	23° 26' 15"	13 m 13 s
16	242° 35' 45"	0.19"	240° 31' 12"	-20° 40' 33"	0.9872277	16' 12.05"	23° 26' 15"	13 m 13 s
17	242° 38' 16"	0.19"	240° 33' 51"	-20° 41' 03"	0.9872201	16' 12.05"	23° 26' 15"	13 m 12 s
18	242° 40' 48"	0.19"	240° 36' 30"	-20° 41' 32"	0.9872125	16' 12.06"	23° 26' 15"	13 m 11 s
19	242° 43' 19"	0.20"	240° 39' 09"	-20° 42' 02"	0.9872049	16' 12.07"	23° 26' 15"	13 m 10 s
20	242° 45' 51"	0.20"	240° 41' 48"	-20° 42' 32"	0.9871974	16' 12.08"	23° 26' 15"	13 m 10 s
21	242° 48' 23"	0.20"	240° 44' 27"	-20° 43' 01"	0.9871898	16' 12.08"	23° 26' 15"	13 m 09 s
22	242° 50' 54"	0.20"	240° 47' 06"	-20° 43' 31"	0.9871823	16' 12.09"	23° 26' 15"	13 m 08 s
23	242° 53' 26"	0.20"	240° 49' 45"	-20° 43' 60"	0.9871748	16' 12.10"	23° 26' 15"	13 m 07 s
24	242° 55' 58"	0.21"	240° 52' 24"	-20° 44' 29"	0.9871673	16' 12.10"	23° 26' 15"	13 m 07 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	111° 58' 53"	4° 04' 58"	114° 28' 19"	25° 40' 20"	0° 54' 25"	14' 49.85"	96° 5' 46"	0.82092
1	112° 28' 50"	4° 06' 44"	115° 01' 18"	25° 37' 05"	0° 54' 26"	14' 50.07"	96° 19' 45"	0.81786
2	112° 58' 47"	4° 08' 28"	115° 34' 17"	25° 33' 43"	0° 54' 27"	14' 50.30"	96° 33' 43"	0.81477
3	113° 28' 45"	4° 10' 11"	116° 07' 14"	25° 30' 12"	0° 54' 28"	14' 50.54"	96° 47' 38"	0.81167
4	113° 58' 45"	4° 11' 53"	116° 40' 10"	25° 26' 35"	0° 54' 29"	14' 50.78"	97° 1' 31"	0.80854
5	114° 28' 45"	4° 13' 34"	117° 13' 05"	25° 22' 50"	0° 54' 30"	14' 51.02"	97° 15' 22"	0.80539
6	114° 58' 46"	4° 15' 14"	117° 45' 59"	25° 18' 57"	0° 54' 31"	14' 51.27"	97° 29' 11"	0.80223
7	115° 28' 48"	4° 16' 53"	118° 18' 52"	25° 14' 57"	0° 54' 32"	14' 51.52"	97° 42' 57"	0.79904
8	115° 58' 51"	4° 18' 31"	118° 51' 43"	25° 10' 50"	0° 54' 33"	14' 51.77"	97° 56' 41"	0.79583
9	116° 28' 55"	4° 20' 07"	119° 24' 34"	25° 06' 35"	0° 54' 34"	14' 52.03"	98° 10' 22"	0.79260
10	116° 59' 00"	4° 21' 43"	119° 57' 22"	25° 02' 13"	0° 54' 34"	14' 52.29"	98° 24' 01"	0.78934
11	117° 29' 06"	4° 23' 17"	120° 30' 10"	24° 57' 44"	0° 54' 35"	14' 52.56"	98° 37' 37"	0.78607
12	117° 59' 13"	4° 24' 50"	121° 02' 56"	24° 53' 07"	0° 54' 36"	14' 52.83"	98° 51' 10"	0.78278
13	118° 29' 22"	4° 26' 22"	121° 35' 40"	24° 48' 23"	0° 54' 37"	14' 53.10"	99° 4' 40"	0.77947
14	118° 59' 31"	4° 27' 53"	122° 08' 24"	24° 43' 32"	0° 54' 38"	14' 53.38"	99° 18' 07"	0.77614
15	119° 29' 42"	4° 29' 22"	122° 41' 05"	24° 38' 33"	0° 54' 39"	14' 53.66"	99° 31' 31"	0.77279
16	119° 59' 53"	4° 30' 50"	123° 13' 45"	24° 33' 28"	0° 54' 41"	14' 53.95"	99° 44' 53"	0.76941
17	120° 30' 06"	4° 32' 18"	123° 46' 24"	24° 28' 15"	0° 54' 42"	14' 54.24"	99° 58' 10"	0.76602
18	121° 00' 20"	4° 33' 44"	124° 19' 00"	24° 22' 54"	0° 54' 43"	14' 54.53"	100° 11' 25"	0.76261
19	121° 30' 35"	4° 35' 08"	124° 51' 36"	24° 17' 27"	0° 54' 44"	14' 54.83"	100° 24' 36"	0.75919
20	122° 00' 51"	4° 36' 32"	125° 24' 09"	24° 11' 53"	0° 54' 45"	14' 55.13"	100° 37' 44"	0.75574
21	122° 31' 09"	4° 37' 54"	125° 56' 41"	24° 06' 11"	0° 54' 46"	14' 55.44"	100° 50' 49"	0.75227
22	123° 01' 27"	4° 39' 15"	126° 29' 11"	24° 00' 22"	0° 54' 47"	14' 55.75"	101° 3' 49"	0.74878
23	123° 31' 47"	4° 40' 35"	127° 01' 39"	23° 54' 27"	0° 54' 48"	14' 56.06"	101° 16' 46"	0.74528
24	124° 02' 08"	4° 41' 53"	127° 34' 06"	23° 48' 24"	0° 54' 49"	14' 56.38"	101° 29' 40"	0.74176

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	242° 55' 58"	0.21"	240° 52' 24"	-20° 44' 29"	0.9871673	16' 12.10"	23° 26' 15"	13 m 07 s
1	242° 58' 29"	0.21"	240° 55' 03"	-20° 44' 59"	0.9871597	16' 12.11"	23° 26' 15"	13 m 06 s
2	243° 01' 01"	0.21"	240° 57' 42"	-20° 45' 28"	0.9871522	16' 12.12"	23° 26' 15"	13 m 05 s
3	243° 03' 33"	0.21"	241° 00' 22"	-20° 45' 57"	0.9871447	16' 12.13"	23° 26' 15"	13 m 04 s
4	243° 06' 04"	0.21"	241° 03' 01"	-20° 46' 26"	0.9871372	16' 12.13"	23° 26' 15"	13 m 04 s
5	243° 08' 36"	0.22"	241° 05' 40"	-20° 46' 56"	0.9871298	16' 12.14"	23° 26' 15"	13 m 03 s
6	243° 11' 08"	0.22"	241° 08' 19"	-20° 47' 25"	0.9871223	16' 12.15"	23° 26' 15"	13 m 02 s
7	243° 13' 39"	0.22"	241° 10' 58"	-20° 47' 54"	0.9871148	16' 12.16"	23° 26' 15"	13 m 01 s
8	243° 16' 11"	0.22"	241° 13' 38"	-20° 48' 23"	0.9871074	16' 12.16"	23° 26' 15"	13 m 00 s
9	243° 18' 43"	0.22"	241° 16' 17"	-20° 48' 52"	0.9870999	16' 12.17"	23° 26' 15"	12 m 60 s
10	243° 21' 15"	0.22"	241° 18' 56"	-20° 49' 21"	0.9870925	16' 12.18"	23° 26' 15"	12 m 59 s
11	243° 23' 46"	0.23"	241° 21' 36"	-20° 49' 50"	0.9870850	16' 12.19"	23° 26' 15"	12 m 58 s
12	243° 26' 18"	0.23"	241° 24' 15"	-20° 50' 19"	0.9870776	16' 12.19"	23° 26' 15"	12 m 57 s
13	243° 28' 50"	0.23"	241° 26' 54"	-20° 50' 48"	0.9870702	16' 12.20"	23° 26' 15"	12 m 57 s
14	243° 31' 21"	0.23"	241° 29' 34"	-20° 51' 16"	0.9870627	16' 12.21"	23° 26' 15"	12 m 56 s
15	243° 33' 53"	0.23"	241° 32' 13"	-20° 51' 45"	0.9870553	16' 12.21"	23° 26' 15"	12 m 55 s
16	243° 36' 25"	0.23"	241° 34' 53"	-20° 52' 14"	0.9870479	16' 12.22"	23° 26' 15"	12 m 54 s
17	243° 38' 56"	0.23"	241° 37' 32"	-20° 52' 43"	0.9870405	16' 12.23"	23° 26' 15"	12 m 54 s
18	243° 41' 28"	0.24"	241° 40' 11"	-20° 53' 11"	0.9870332	16' 12.24"	23° 26' 15"	12 m 53 s
19	243° 43' 60"	0.24"	241° 42' 51"	-20° 53' 40"	0.9870258	16' 12.24"	23° 26' 15"	12 m 52 s
20	243° 46' 32"	0.24"	241° 45' 30"	-20° 54' 09"	0.9870184	16' 12.25"	23° 26' 15"	12 m 51 s
21	243° 49' 03"	0.24"	241° 48' 10"	-20° 54' 37"	0.9870111	16' 12.26"	23° 26' 15"	12 m 50 s
22	243° 51' 35"	0.24"	241° 50' 49"	-20° 55' 06"	0.9870037	16' 12.27"	23° 26' 15"	12 m 50 s
23	243° 54' 07"	0.24"	241° 53' 29"	-20° 55' 34"	0.9869964	16' 12.27"	23° 26' 15"	12 m 49 s
24	243° 56' 39"	0.24"	241° 56' 09"	-20° 56' 02"	0.9869890	16' 12.28"	23° 26' 15"	12 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	124° 02' 08"	4° 41' 53"	127° 34' 06"	23° 48' 24"	0° 54' 49"	14' 56.38"	101° 29' 40"	0.74176
1	124° 32' 31"	4° 43' 11"	128° 06' 30"	23° 42' 14"	0° 54' 51"	14' 56.70"	101° 42' 29"	0.73822
2	125° 02' 54"	4° 44' 27"	128° 38' 53"	23° 35' 57"	0° 54' 52"	14' 57.02"	101° 55' 15"	0.73466
3	125° 33' 20"	4° 45' 41"	129° 11' 14"	23° 29' 34"	0° 54' 53"	14' 57.35"	102° 7' 57"	0.73108
4	126° 03' 46"	4° 46' 55"	129° 43' 33"	23° 23' 03"	0° 54' 54"	14' 57.69"	102° 20' 35"	0.72748
5	126° 34' 14"	4° 48' 07"	130° 15' 51"	23° 16' 26"	0° 54' 56"	14' 58.03"	102° 33' 08"	0.72387
6	127° 04' 43"	4° 49' 18"	130° 48' 06"	23° 09' 41"	0° 54' 57"	14' 58.37"	102° 45' 38"	0.72024
7	127° 35' 13"	4° 50' 27"	131° 20' 19"	23° 02' 50"	0° 54' 58"	14' 58.72"	102° 58' 03"	0.71660
8	128° 05' 45"	4° 51' 35"	131° 52' 31"	22° 55' 52"	0° 54' 59"	14' 59.07"	103° 10' 24"	0.71293
9	128° 36' 18"	4° 52' 42"	132° 24' 40"	22° 48' 47"	0° 55' 01"	14' 59.42"	103° 22' 41"	0.70925
10	129° 06' 53"	4° 53' 48"	132° 56' 48"	22° 41' 35"	0° 55' 02"	14' 59.78"	103° 34' 53"	0.70555
11	129° 37' 29"	4° 54' 52"	133° 28' 53"	22° 34' 17"	0° 55' 03"	15' 00.14"	103° 47' 01"	0.70184
12	130° 08' 07"	4° 55' 55"	134° 00' 57"	22° 26' 52"	0° 55' 05"	15' 00.51"	103° 59' 05"	0.69811
13	130° 38' 46"	4° 56' 56"	134° 32' 59"	22° 19' 20"	0° 55' 06"	15' 00.88"	104° 11' 03"	0.69436
14	131° 09' 26"	4° 57' 56"	135° 04' 58"	22° 11' 42"	0° 55' 07"	15' 01.26"	104° 22' 58"	0.69059
15	131° 40' 08"	4° 58' 55"	135° 36' 56"	22° 03' 57"	0° 55' 09"	15' 01.63"	104° 34' 47"	0.68682
16	132° 10' 52"	4° 59' 52"	136° 08' 51"	21° 56' 06"	0° 55' 10"	15' 02.02"	104° 46' 32"	0.68302
17	132° 41' 37"	5° 00' 48"	136° 40' 45"	21° 48' 08"	0° 55' 12"	15' 02.40"	104° 58' 12"	0.67921
18	133° 12' 24"	5° 01' 43"	137° 12' 36"	21° 40' 03"	0° 55' 13"	15' 02.80"	105° 9' 47"	0.67538
19	133° 43' 12"	5° 02' 36"	137° 44' 25"	21° 31' 52"	0° 55' 14"	15' 03.19"	105° 21' 17"	0.67154
20	134° 14' 02"	5° 03' 28"	138° 16' 13"	21° 23' 35"	0° 55' 16"	15' 03.59"	105° 32' 42"	0.66769
21	134° 44' 54"	5° 04' 18"	138° 47' 58"	21° 15' 11"	0° 55' 17"	15' 04.00"	105° 44' 02"	0.66381
22	135° 15' 47"	5° 05' 07"	139° 19' 41"	21° 06' 41"	0° 55' 19"	15' 04.40"	105° 55' 17"	0.65993
23	135° 46' 42"	5° 05' 55"	139° 51' 23"	20° 58' 04"	0° 55' 20"	15' 04.81"	106° 6' 27"	0.65603
24	136° 17' 38"	5° 06' 41"	140° 23' 02"	20° 49' 21"	0° 55' 22"	15' 05.23"	106° 17' 32"	0.65211

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	243° 56' 39"	0.24"	241° 56' 09"	-20° 56' 02"	0.9869890	16' 12.28"	23° 26' 15"	12 m 48 s
1	243° 59' 10"	0.24"	241° 58' 48"	-20° 56' 31"	0.9869817	16' 12.29"	23° 26' 15"	12 m 47 s
2	244° 01' 42"	0.24"	242° 01' 28"	-20° 56' 59"	0.9869744	16' 12.29"	23° 26' 15"	12 m 46 s
3	244° 04' 14"	0.24"	242° 04' 07"	-20° 57' 27"	0.9869670	16' 12.30"	23° 26' 15"	12 m 46 s
4	244° 06' 45"	0.24"	242° 06' 47"	-20° 57' 56"	0.9869597	16' 12.31"	23° 26' 15"	12 m 45 s
5	244° 09' 17"	0.24"	242° 09' 27"	-20° 58' 24"	0.9869524	16' 12.32"	23° 26' 15"	12 m 44 s
6	244° 11' 49"	0.24"	242° 12' 06"	-20° 58' 52"	0.9869451	16' 12.32"	23° 26' 15"	12 m 43 s
7	244° 14' 21"	0.25"	242° 14' 46"	-20° 59' 20"	0.9869378	16' 12.33"	23° 26' 15"	12 m 42 s
8	244° 16' 52"	0.25"	242° 17' 26"	-20° 59' 48"	0.9869306	16' 12.34"	23° 26' 15"	12 m 42 s
9	244° 19' 24"	0.25"	242° 20' 06"	-21° 00' 16"	0.9869233	16' 12.35"	23° 26' 15"	12 m 41 s
10	244° 21' 56"	0.25"	242° 22' 45"	-21° 00' 44"	0.9869160	16' 12.35"	23° 26' 15"	12 m 40 s
11	244° 24' 28"	0.25"	242° 25' 25"	-21° 01' 12"	0.9869088	16' 12.36"	23° 26' 15"	12 m 39 s
12	244° 26' 60"	0.25"	242° 28' 05"	-21° 01' 40"	0.9869015	16' 12.37"	23° 26' 15"	12 m 38 s
13	244° 29' 31"	0.25"	242° 30' 45"	-21° 02' 08"	0.9868943	16' 12.37"	23° 26' 15"	12 m 38 s
14	244° 32' 03"	0.25"	242° 33' 25"	-21° 02' 36"	0.9868870	16' 12.38"	23° 26' 15"	12 m 37 s
15	244° 34' 35"	0.25"	242° 36' 05"	-21° 03' 04"	0.9868798	16' 12.39"	23° 26' 15"	12 m 36 s
16	244° 37' 07"	0.25"	242° 38' 45"	-21° 03' 32"	0.9868726	16' 12.40"	23° 26' 15"	12 m 35 s
17	244° 39' 38"	0.25"	242° 41' 24"	-21° 03' 59"	0.9868654	16' 12.40"	23° 26' 15"	12 m 34 s
18	244° 42' 10"	0.25"	242° 44' 04"	-21° 04' 27"	0.9868582	16' 12.41"	23° 26' 15"	12 m 34 s
19	244° 44' 42"	0.25"	242° 46' 44"	-21° 04' 55"	0.9868510	16' 12.42"	23° 26' 15"	12 m 33 s
20	244° 47' 14"	0.25"	242° 49' 24"	-21° 05' 22"	0.9868438	16' 12.42"	23° 26' 15"	12 m 32 s
21	244° 49' 46"	0.25"	242° 52' 04"	-21° 05' 50"	0.9868366	16' 12.43"	23° 26' 15"	12 m 31 s
22	244° 52' 17"	0.25"	242° 54' 44"	-21° 06' 17"	0.9868294	16' 12.44"	23° 26' 15"	12 m 30 s
23	244° 54' 49"	0.25"	242° 57' 24"	-21° 06' 45"	0.9868222	16' 12.44"	23° 26' 15"	12 m 29 s
24	244° 57' 21"	0.24"	243° 00' 04"	-21° 07' 12"	0.9868151	16' 12.45"	23° 26' 15"	12 m 29 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	136° 17' 38"	5° 06' 41"	140° 23' 02"	20° 49' 21"	0° 55' 22"	15' 05.23"	106° 17' 32"	0.65211
1	136° 48' 36"	5° 07' 25"	140° 54' 39"	20° 40' 32"	0° 55' 23"	15' 05.65"	106° 28' 31"	0.64818
2	137° 19' 36"	5° 08' 08"	141° 26' 14"	20° 31' 37"	0° 55' 25"	15' 06.07"	106° 39' 26"	0.64424
3	137° 50' 38"	5° 08' 50"	141° 57' 47"	20° 22' 36"	0° 55' 27"	15' 06.50"	106° 50' 15"	0.64029
4	138° 21' 41"	5° 09' 30"	142° 29' 19"	20° 13' 28"	0° 55' 28"	15' 06.94"	107° 0' 58"	0.63632
5	138° 52' 47"	5° 10' 09"	143° 00' 48"	20° 04' 14"	0° 55' 30"	15' 07.37"	107° 11' 36"	0.63233
6	139° 23' 54"	5° 10' 46"	143° 32' 15"	19° 54' 54"	0° 55' 31"	15' 07.81"	107° 22' 09"	0.62834
7	139° 55' 02"	5° 11' 22"	144° 03' 40"	19° 45' 28"	0° 55' 33"	15' 08.26"	107° 32' 36"	0.62433
8	140° 26' 13"	5° 11' 57"	144° 35' 03"	19° 35' 56"	0° 55' 35"	15' 08.70"	107° 42' 58"	0.62030
9	140° 57' 25"	5° 12' 29"	145° 06' 25"	19° 26' 18"	0° 55' 36"	15' 09.16"	107° 53' 13"	0.61627
10	141° 28' 39"	5° 13' 01"	145° 37' 44"	19° 16' 35"	0° 55' 38"	15' 09.61"	108° 3' 24"	0.61222
11	141° 59' 56"	5° 13' 30"	146° 09' 01"	19° 06' 45"	0° 55' 40"	15' 10.07"	108° 13' 28"	0.60816
12	142° 31' 13"	5° 13' 59"	146° 40' 17"	18° 56' 49"	0° 55' 41"	15' 10.54"	108° 23' 27"	0.60409
13	143° 02' 33"	5° 14' 25"	147° 11' 30"	18° 46' 48"	0° 55' 43"	15' 11.01"	108° 33' 20"	0.60001
14	143° 33' 55"	5° 14' 51"	147° 42' 42"	18° 36' 41"	0° 55' 45"	15' 11.48"	108° 43' 08"	0.59592
15	144° 05' 19"	5° 15' 14"	148° 13' 52"	18° 26' 28"	0° 55' 47"	15' 11.95"	108° 52' 49"	0.59181
16	144° 36' 45"	5° 15' 36"	148° 45' 00"	18° 16' 09"	0° 55' 48"	15' 12.43"	109° 2' 25"	0.58769
17	145° 08' 12"	5° 15' 57"	149° 16' 07"	18° 05' 45"	0° 55' 50"	15' 12.92"	109° 11' 54"	0.58357
18	145° 39' 42"	5° 16' 16"	149° 47' 11"	17° 55' 15"	0° 55' 52"	15' 13.41"	109° 21' 18"	0.57943
19	146° 11' 14"	5° 16' 33"	150° 18' 14"	17° 44' 39"	0° 55' 54"	15' 13.90"	109° 30' 36"	0.57528
20	146° 42' 47"	5° 16' 49"	150° 49' 15"	17° 33' 58"	0° 55' 56"	15' 14.39"	109° 39' 47"	0.57112
21	147° 14' 23"	5° 17' 03"	151° 20' 14"	17° 23' 12"	0° 55' 57"	15' 14.89"	109° 48' 53"	0.56696
22	147° 46' 01"	5° 17' 16"	151° 51' 12"	17° 12' 19"	0° 55' 59"	15' 15.40"	109° 57' 52"	0.56278
23	148° 17' 41"	5° 17' 27"	152° 22' 08"	17° 01' 22"	0° 56' 01"	15' 15.90"	110° 6' 45"	0.55859
24	148° 49' 23"	5° 17' 37"	152° 53' 03"	16° 50' 19"	0° 56' 03"	15' 16.41"	110° 15' 32"	0.55439

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	244° 57' 21"	0.24"	243° 00' 04"	-21° 07' 12"	0.9868151	16' 12.45"	23° 26' 15"	12 m 29 s
1	244° 59' 53"	0.24"	243° 02' 44"	-21° 07' 40"	0.9868079	16' 12.46"	23° 26' 15"	12 m 28 s
2	245° 02' 25"	0.24"	243° 05' 24"	-21° 08' 07"	0.9868008	16' 12.47"	23° 26' 15"	12 m 27 s
3	245° 04' 56"	0.24"	243° 08' 05"	-21° 08' 34"	0.9867936	16' 12.47"	23° 26' 15"	12 m 26 s
4	245° 07' 28"	0.24"	243° 10' 45"	-21° 09' 01"	0.9867865	16' 12.48"	23° 26' 15"	12 m 25 s
5	245° 09' 60"	0.24"	243° 13' 25"	-21° 09' 29"	0.9867794	16' 12.49"	23° 26' 15"	12 m 25 s
6	245° 12' 32"	0.24"	243° 16' 05"	-21° 09' 56"	0.9867722	16' 12.49"	23° 26' 15"	12 m 24 s
7	245° 15' 04"	0.24"	243° 18' 45"	-21° 10' 23"	0.9867651	16' 12.50"	23° 26' 15"	12 m 23 s
8	245° 17' 35"	0.24"	243° 21' 25"	-21° 10' 50"	0.9867580	16' 12.51"	23° 26' 15"	12 m 22 s
9	245° 20' 07"	0.24"	243° 24' 06"	-21° 11' 17"	0.9867509	16' 12.51"	23° 26' 15"	12 m 21 s
10	245° 22' 39"	0.24"	243° 26' 46"	-21° 11' 44"	0.9867438	16' 12.52"	23° 26' 15"	12 m 20 s
11	245° 25' 11"	0.24"	243° 29' 26"	-21° 12' 11"	0.9867367	16' 12.53"	23° 26' 15"	12 m 20 s
12	245° 27' 43"	0.24"	243° 32' 06"	-21° 12' 38"	0.9867297	16' 12.54"	23° 26' 15"	12 m 19 s
13	245° 30' 15"	0.23"	243° 34' 47"	-21° 13' 05"	0.9867226	16' 12.54"	23° 26' 15"	12 m 18 s
14	245° 32' 46"	0.23"	243° 37' 27"	-21° 13' 32"	0.9867155	16' 12.55"	23° 26' 15"	12 m 17 s
15	245° 35' 18"	0.23"	243° 40' 07"	-21° 13' 59"	0.9867085	16' 12.56"	23° 26' 15"	12 m 16 s
16	245° 37' 50"	0.23"	243° 42' 48"	-21° 14' 25"	0.9867014	16' 12.56"	23° 26' 15"	12 m 15 s
17	245° 40' 22"	0.23"	243° 45' 28"	-21° 14' 52"	0.9866944	16' 12.57"	23° 26' 15"	12 m 15 s
18	245° 42' 54"	0.23"	243° 48' 08"	-21° 15' 19"	0.9866873	16' 12.58"	23° 26' 15"	12 m 14 s
19	245° 45' 26"	0.23"	243° 50' 49"	-21° 15' 45"	0.9866803	16' 12.58"	23° 26' 15"	12 m 13 s
20	245° 47' 57"	0.22"	243° 53' 29"	-21° 16' 12"	0.9866733	16' 12.59"	23° 26' 15"	12 m 12 s
21	245° 50' 29"	0.22"	243° 56' 10"	-21° 16' 39"	0.9866662	16' 12.60"	23° 26' 15"	12 m 11 s
22	245° 53' 01"	0.22"	243° 58' 50"	-21° 17' 05"	0.9866592	16' 12.61"	23° 26' 15"	12 m 10 s
23	245° 55' 33"	0.22"	244° 01' 31"	-21° 17' 32"	0.9866522	16' 12.61"	23° 26' 15"	12 m 09 s
24	245° 58' 05"	0.22"	244° 04' 11"	-21° 17' 58"	0.9866452	16' 12.62"	23° 26' 15"	12 m 09 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	148° 49' 23"	5° 17' 37"	152° 53' 03"	16° 50' 19"	0° 56' 03"	15' 16.41"	110° 15' 32"	0.55439
1	149° 21' 07"	5° 17' 45"	153° 23' 55"	16° 39' 11"	0° 56' 05"	15' 16.93"	110° 24' 13"	0.55019
2	149° 52' 53"	5° 17' 51"	153° 54' 47"	16° 27' 57"	0° 56' 07"	15' 17.45"	110° 32' 47"	0.54597
3	150° 24' 41"	5° 17' 56"	154° 25' 36"	16° 16' 38"	0° 56' 09"	15' 17.97"	110° 41' 16"	0.54175
4	150° 56' 32"	5° 17' 59"	154° 56' 25"	16° 05' 14"	0° 56' 11"	15' 18.49"	110° 49' 37"	0.53752
5	151° 28' 24"	5° 18' 00"	155° 27' 12"	15° 53' 45"	0° 56' 13"	15' 19.02"	110° 57' 53"	0.53328
6	152° 00' 19"	5° 17' 60"	155° 57' 57"	15° 42' 11"	0° 56' 15"	15' 19.55"	111° 6' 02"	0.52903
7	152° 32' 16"	5° 17' 58"	156° 28' 41"	15° 30' 31"	0° 56' 16"	15' 20.09"	111° 14' 04"	0.52478
8	153° 04' 16"	5° 17' 55"	156° 59' 24"	15° 18' 47"	0° 56' 18"	15' 20.63"	111° 22' 01"	0.52052
9	153° 36' 17"	5° 17' 49"	157° 30' 05"	15° 06' 57"	0° 56' 20"	15' 21.17"	111° 29' 50"	0.51625
10	154° 08' 21"	5° 17' 43"	158° 00' 45"	14° 55' 03"	0° 56' 22"	15' 21.72"	111° 37' 33"	0.51198
11	154° 40' 27"	5° 17' 34"	158° 31' 24"	14° 43' 03"	0° 56' 24"	15' 22.27"	111° 45' 10"	0.50769
12	155° 12' 35"	5° 17' 24"	159° 02' 02"	14° 30' 59"	0° 56' 27"	15' 22.82"	111° 52' 40"	0.50341
13	155° 44' 46"	5° 17' 12"	159° 32' 39"	14° 18' 49"	0° 56' 29"	15' 23.38"	112° 0' 03"	0.49911
14	156° 16' 59"	5° 16' 59"	160° 03' 14"	14° 06' 35"	0° 56' 31"	15' 23.94"	112° 7' 19"	0.49481
15	156° 49' 14"	5° 16' 44"	160° 33' 49"	13° 54' 17"	0° 56' 33"	15' 24.51"	112° 14' 29"	0.49051
16	157° 21' 32"	5° 16' 27"	161° 04' 22"	13° 41' 53"	0° 56' 35"	15' 25.07"	112° 21' 32"	0.48620
17	157° 53' 52"	5° 16' 08"	161° 34' 54"	13° 29' 25"	0° 56' 37"	15' 25.64"	112° 28' 29"	0.48188
18	158° 26' 14"	5° 15' 48"	162° 05' 26"	13° 16' 52"	0° 56' 39"	15' 26.22"	112° 35' 18"	0.47756
19	158° 58' 39"	5° 15' 26"	162° 35' 57"	13° 04' 15"	0° 56' 41"	15' 26.79"	112° 42' 01"	0.47324
20	159° 31' 06"	5° 15' 03"	163° 06' 26"	12° 51' 33"	0° 56' 43"	15' 27.37"	112° 48' 37"	0.46891
21	160° 03' 35"	5° 14' 37"	163° 36' 56"	12° 38' 47"	0° 56' 45"	15' 27.96"	112° 55' 05"	0.46458
22	160° 36' 07"	5° 14' 10"	164° 07' 24"	12° 25' 56"	0° 56' 48"	15' 28.54"	113° 1' 27"	0.46025
23	161° 08' 42"	5° 13' 42"	164° 37' 51"	12° 13' 01"	0° 56' 50"	15' 29.13"	113° 7' 42"	0.45591
24	161° 41' 19"	5° 13' 11"	165° 08' 18"	12° 00' 01"	0° 56' 52"	15' 29.72"	113° 13' 50"	0.45157

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	245° 58' 05"	0.22"	244° 04' 11"	-21° 17' 58"	0.9866452	16' 12.62"	23° 26' 15"	12 m 09 s
1	246° 00' 37"	0.22"	244° 06' 52"	-21° 18' 24"	0.9866382	16' 12.63"	23° 26' 15"	12 m 08 s
2	246° 03' 09"	0.21"	244° 09' 32"	-21° 18' 51"	0.9866313	16' 12.63"	23° 26' 15"	12 m 07 s
3	246° 05' 41"	0.21"	244° 12' 13"	-21° 19' 17"	0.9866243	16' 12.64"	23° 26' 15"	12 m 06 s
4	246° 08' 12"	0.21"	244° 14' 53"	-21° 19' 43"	0.9866173	16' 12.65"	23° 26' 15"	12 m 05 s
5	246° 10' 44"	0.21"	244° 17' 34"	-21° 20' 10"	0.9866103	16' 12.65"	23° 26' 15"	12 m 04 s
6	246° 13' 16"	0.21"	244° 20' 15"	-21° 20' 36"	0.9866034	16' 12.66"	23° 26' 15"	12 m 03 s
7	246° 15' 48"	0.20"	244° 22' 55"	-21° 21' 02"	0.9865964	16' 12.67"	23° 26' 15"	12 m 03 s
8	246° 18' 20"	0.20"	244° 25' 36"	-21° 21' 28"	0.9865895	16' 12.67"	23° 26' 15"	12 m 02 s
9	246° 20' 52"	0.20"	244° 28' 17"	-21° 21' 54"	0.9865825	16' 12.68"	23° 26' 15"	12 m 01 s
10	246° 23' 24"	0.20"	244° 30' 57"	-21° 22' 20"	0.9865756	16' 12.69"	23° 26' 15"	12 m 00 s
11	246° 25' 56"	0.20"	244° 33' 38"	-21° 22' 46"	0.9865687	16' 12.69"	23° 26' 15"	11 m 59 s
12	246° 28' 28"	0.19"	244° 36' 19"	-21° 23' 12"	0.9865618	16' 12.70"	23° 26' 15"	11 m 58 s
13	246° 30' 59"	0.19"	244° 38' 59"	-21° 23' 38"	0.9865549	16' 12.71"	23° 26' 15"	11 m 57 s
14	246° 33' 31"	0.19"	244° 41' 40"	-21° 24' 04"	0.9865480	16' 12.72"	23° 26' 15"	11 m 57 s
15	246° 36' 03"	0.19"	244° 44' 21"	-21° 24' 30"	0.9865411	16' 12.72"	23° 26' 15"	11 m 56 s
16	246° 38' 35"	0.18"	244° 47' 02"	-21° 24' 55"	0.9865342	16' 12.73"	23° 26' 15"	11 m 55 s
17	246° 41' 07"	0.18"	244° 49' 43"	-21° 25' 21"	0.9865273	16' 12.74"	23° 26' 15"	11 m 54 s
18	246° 43' 39"	0.18"	244° 52' 23"	-21° 25' 47"	0.9865204	16' 12.74"	23° 26' 15"	11 m 53 s
19	246° 46' 11"	0.18"	244° 55' 04"	-21° 26' 12"	0.9865135	16' 12.75"	23° 26' 15"	11 m 52 s
20	246° 48' 43"	0.17"	244° 57' 45"	-21° 26' 38"	0.9865067	16' 12.76"	23° 26' 15"	11 m 51 s
21	246° 51' 15"	0.17"	245° 00' 26"	-21° 27' 04"	0.9864998	16' 12.76"	23° 26' 15"	11 m 50 s
22	246° 53' 47"	0.17"	245° 03' 07"	-21° 27' 29"	0.9864929	16' 12.77"	23° 26' 15"	11 m 50 s
23	246° 56' 19"	0.17"	245° 05' 48"	-21° 27' 55"	0.9864861	16' 12.78"	23° 26' 15"	11 m 49 s
24	246° 58' 50"	0.16"	245° 08' 29"	-21° 28' 20"	0.9864792	16' 12.78"	23° 26' 15"	11 m 48 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	161° 41' 19"	5° 13' 11"	165° 08' 18"	12° 00' 01"	0° 56' 52"	15' 29.72"	113° 13' 50"	0.45157
1	162° 13' 58"	5° 12' 39"	165° 38' 45"	11° 46' 57"	0° 56' 54"	15' 30.32"	113° 19' 51"	0.44723
2	162° 46' 40"	5° 12' 05"	166° 09' 11"	11° 33' 49"	0° 56' 56"	15' 30.91"	113° 25' 45"	0.44288
3	163° 19' 25"	5° 11' 29"	166° 39' 36"	11° 20' 37"	0° 56' 58"	15' 31.52"	113° 31' 32"	0.43854
4	163° 52' 12"	5° 10' 52"	167° 10' 01"	11° 07' 20"	0° 57' 01"	15' 32.12"	113° 37' 12"	0.43419
5	164° 25' 01"	5° 10' 13"	167° 40' 26"	10° 53' 60"	0° 57' 03"	15' 32.72"	113° 42' 44"	0.42984
6	164° 57' 53"	5° 09' 32"	168° 10' 50"	10° 40' 35"	0° 57' 05"	15' 33.33"	113° 48' 10"	0.42549
7	165° 30' 48"	5° 08' 49"	168° 41' 14"	10° 27' 07"	0° 57' 07"	15' 33.94"	113° 53' 28"	0.42114
8	166° 03' 45"	5° 08' 05"	169° 11' 38"	10° 13' 34"	0° 57' 10"	15' 34.56"	113° 58' 39"	0.41678
9	166° 36' 44"	5° 07' 19"	169° 42' 02"	9° 59' 57"	0° 57' 12"	15' 35.17"	114° 3' 42"	0.41243
10	167° 09' 47"	5° 06' 31"	170° 12' 25"	9° 46' 17"	0° 57' 14"	15' 35.79"	114° 8' 39"	0.40808
11	167° 42' 52"	5° 05' 41"	170° 42' 49"	9° 32' 33"	0° 57' 16"	15' 36.41"	114° 13' 27"	0.40373
12	168° 15' 59"	5° 04' 50"	171° 13' 12"	9° 18' 45"	0° 57' 19"	15' 37.04"	114° 18' 09"	0.39938
13	168° 49' 09"	5° 03' 57"	171° 43' 36"	9° 04' 53"	0° 57' 21"	15' 37.66"	114° 22' 43"	0.39504
14	169° 22' 22"	5° 03' 02"	172° 13' 60"	8° 50' 58"	0° 57' 23"	15' 38.29"	114° 27' 10"	0.39069
15	169° 55' 37"	5° 02' 05"	172° 44' 24"	8° 36' 59"	0° 57' 26"	15' 38.92"	114° 31' 29"	0.38635
16	170° 28' 55"	5° 01' 07"	173° 14' 48"	8° 22' 57"	0° 57' 28"	15' 39.55"	114° 35' 40"	0.38200
17	171° 02' 16"	5° 00' 06"	173° 45' 13"	8° 08' 51"	0° 57' 30"	15' 40.19"	114° 39' 45"	0.37767
18	171° 35' 40"	4° 59' 04"	174° 15' 38"	7° 54' 41"	0° 57' 33"	15' 40.82"	114° 43' 41"	0.37333
19	172° 09' 06"	4° 58' 01"	174° 46' 03"	7° 40' 28"	0° 57' 35"	15' 41.46"	114° 47' 30"	0.36900
20	172° 42' 35"	4° 56' 55"	175° 16' 29"	7° 26' 12"	0° 57' 37"	15' 42.10"	114° 51' 11"	0.36467
21	173° 16' 06"	4° 55' 48"	175° 46' 56"	7° 11' 53"	0° 57' 40"	15' 42.74"	114° 54' 45"	0.36035
22	173° 49' 40"	4° 54' 39"	176° 17' 23"	6° 57' 30"	0° 57' 42"	15' 43.38"	114° 58' 10"	0.35603
23	174° 23' 17"	4° 53' 28"	176° 47' 51"	6° 43' 04"	0° 57' 44"	15' 44.03"	115° 1' 28"	0.35172
24	174° 56' 57"	4° 52' 15"	177° 18' 20"	6° 28' 35"	0° 57' 47"	15' 44.67"	115° 4' 38"	0.34741

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	246° 58' 50"	0.16"	245° 08' 29"	-21° 28' 20"	0.9864792	16' 12.78"	23° 26' 15"	11 m 48 s
1	247° 01' 22"	0.16"	245° 11' 10"	-21° 28' 45"	0.9864724	16' 12.79"	23° 26' 15"	11 m 47 s
2	247° 03' 54"	0.16"	245° 13' 51"	-21° 29' 11"	0.9864656	16' 12.80"	23° 26' 15"	11 m 46 s
3	247° 06' 26"	0.15"	245° 16' 32"	-21° 29' 36"	0.9864588	16' 12.80"	23° 26' 15"	11 m 45 s
4	247° 08' 58"	0.15"	245° 19' 13"	-21° 30' 01"	0.9864519	16' 12.81"	23° 26' 15"	11 m 44 s
5	247° 11' 30"	0.15"	245° 21' 54"	-21° 30' 26"	0.9864451	16' 12.82"	23° 26' 15"	11 m 43 s
6	247° 14' 02"	0.14"	245° 24' 35"	-21° 30' 52"	0.9864383	16' 12.82"	23° 26' 15"	11 m 43 s
7	247° 16' 34"	0.14"	245° 27' 16"	-21° 31' 17"	0.9864315	16' 12.83"	23° 26' 15"	11 m 42 s
8	247° 19' 06"	0.14"	245° 29' 57"	-21° 31' 42"	0.9864247	16' 12.84"	23° 26' 15"	11 m 41 s
9	247° 21' 38"	0.13"	245° 32' 38"	-21° 32' 07"	0.9864179	16' 12.84"	23° 26' 15"	11 m 40 s
10	247° 24' 10"	0.13"	245° 35' 19"	-21° 32' 32"	0.9864112	16' 12.85"	23° 26' 15"	11 m 39 s
11	247° 26' 42"	0.13"	245° 38' 01"	-21° 32' 57"	0.9864044	16' 12.86"	23° 26' 15"	11 m 38 s
12	247° 29' 14"	0.12"	245° 40' 42"	-21° 33' 22"	0.9863976	16' 12.86"	23° 26' 15"	11 m 37 s
13	247° 31' 46"	0.12"	245° 43' 23"	-21° 33' 47"	0.9863909	16' 12.87"	23° 26' 15"	11 m 36 s
14	247° 34' 18"	0.12"	245° 46' 04"	-21° 34' 12"	0.9863841	16' 12.88"	23° 26' 15"	11 m 35 s
15	247° 36' 50"	0.11"	245° 48' 45"	-21° 34' 36"	0.9863774	16' 12.88"	23° 26' 15"	11 m 35 s
16	247° 39' 22"	0.11"	245° 51' 27"	-21° 35' 01"	0.9863706	16' 12.89"	23° 26' 15"	11 m 34 s
17	247° 41' 54"	0.11"	245° 54' 08"	-21° 35' 26"	0.9863639	16' 12.90"	23° 26' 15"	11 m 33 s
18	247° 44' 26"	0.10"	245° 56' 49"	-21° 35' 50"	0.9863571	16' 12.90"	23° 26' 15"	11 m 32 s
19	247° 46' 58"	0.10"	245° 59' 30"	-21° 36' 15"	0.9863504	16' 12.91"	23° 26' 15"	11 m 31 s
20	247° 49' 30"	0.10"	246° 02' 12"	-21° 36' 40"	0.9863437	16' 12.92"	23° 26' 15"	11 m 30 s
21	247° 52' 02"	0.09"	246° 04' 53"	-21° 37' 04"	0.9863370	16' 12.92"	23° 26' 15"	11 m 29 s
22	247° 54' 34"	0.09"	246° 07' 34"	-21° 37' 29"	0.9863303	16' 12.93"	23° 26' 15"	11 m 28 s
23	247° 57' 06"	0.08"	246° 10' 16"	-21° 37' 53"	0.9863236	16' 12.94"	23° 26' 15"	11 m 27 s
24	247° 59' 38"	0.08"	246° 12' 57"	-21° 38' 17"	0.9863169	16' 12.94"	23° 26' 15"	11 m 26 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	174° 56' 57"	4° 52' 15"	177° 18' 20"	6° 28' 35"	0° 57' 47"	15' 44.67"	115° 4' 38"	0.34741
1	175° 30' 40"	4° 51' 01"	177° 48' 49"	6° 14' 04"	0° 57' 49"	15' 45.32"	115° 7' 41"	0.34310
2	176° 04' 25"	4° 49' 45"	178° 19' 20"	5° 59' 29"	0° 57' 51"	15' 45.97"	115° 10' 35"	0.33881
3	176° 38' 13"	4° 48' 27"	178° 49' 51"	5° 44' 51"	0° 57' 54"	15' 46.62"	115° 13' 22"	0.33452
4	177° 12' 03"	4° 47' 07"	179° 20' 24"	5° 30' 10"	0° 57' 56"	15' 47.27"	115° 16' 00"	0.33024
5	177° 45' 57"	4° 45' 45"	179° 50' 57"	5° 15' 26"	0° 57' 59"	15' 47.93"	115° 18' 31"	0.32596
6	178° 19' 53"	4° 44' 22"	180° 21' 32"	5° 00' 40"	0° 58' 01"	15' 48.58"	115° 20' 53"	0.32169
7	178° 53' 52"	4° 42' 57"	180° 52' 08"	4° 45' 51"	0° 58' 03"	15' 49.23"	115° 23' 07"	0.31743
8	179° 27' 54"	4° 41' 30"	181° 22' 45"	4° 30' 59"	0° 58' 06"	15' 49.89"	115° 25' 14"	0.31318
9	180° 01' 59"	4° 40' 01"	181° 53' 24"	4° 16' 05"	0° 58' 08"	15' 50.55"	115° 27' 12"	0.30894
10	180° 36' 06"	4° 38' 31"	182° 24' 04"	4° 01' 08"	0° 58' 11"	15' 51.20"	115° 29' 02"	0.30471
11	181° 10' 16"	4° 36' 59"	182° 54' 46"	3° 46' 09"	0° 58' 13"	15' 51.86"	115° 30' 43"	0.30049
12	181° 44' 30"	4° 35' 25"	183° 25' 29"	3° 31' 08"	0° 58' 16"	15' 52.52"	115° 32' 17"	0.29627
13	182° 18' 45"	4° 33' 49"	183° 56' 14"	3° 16' 04"	0° 58' 18"	15' 53.18"	115° 33' 42"	0.29207
14	182° 53' 04"	4° 32' 11"	184° 27' 01"	3° 00' 58"	0° 58' 20"	15' 53.84"	115° 34' 58"	0.28788
15	183° 27' 26"	4° 30' 32"	184° 57' 49"	2° 45' 49"	0° 58' 23"	15' 54.50"	115° 36' 06"	0.28370
16	184° 01' 50"	4° 28' 51"	185° 28' 40"	2° 30' 39"	0° 58' 25"	15' 55.16"	115° 37' 06"	0.27954
17	184° 36' 17"	4° 27' 08"	185° 59' 32"	2° 15' 27"	0° 58' 28"	15' 55.82"	115° 37' 57"	0.27538
18	185° 10' 47"	4° 25' 24"	186° 30' 26"	2° 00' 12"	0° 58' 30"	15' 56.48"	115° 38' 40"	0.27124
19	185° 45' 20"	4° 23' 38"	187° 01' 23"	1° 44' 56"	0° 58' 32"	15' 57.14"	115° 39' 14"	0.26711
20	186° 19' 56"	4° 21' 49"	187° 32' 22"	1° 29' 38"	0° 58' 35"	15' 57.80"	115° 39' 39"	0.26300
21	186° 54' 34"	4° 19' 60"	188° 03' 23"	1° 14' 18"	0° 58' 37"	15' 58.46"	115° 39' 55"	0.25889
22	187° 29' 15"	4° 18' 08"	188° 34' 26"	0° 58' 56"	0° 58' 40"	15' 59.12"	115° 40' 03"	0.25481
23	188° 03' 60"	4° 16' 15"	189° 05' 32"	0° 43' 33"	0° 58' 42"	15' 59.78"	115° 40' 02"	0.25074
24	188° 38' 47"	4° 14' 20"	189° 36' 40"	0° 28' 08"	0° 58' 45"	16' 00.43"	115° 39' 52"	0.24668

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	247° 59' 38"	0.08"	246° 12' 57"	-21° 38' 17"	0.9863169	16' 12.94"	23° 26' 15"	11 m 26 s
1	248° 02' 10"	0.08"	246° 15' 39"	-21° 38' 42"	0.9863102	16' 12.95"	23° 26' 15"	11 m 25 s
2	248° 04' 42"	0.07"	246° 18' 20"	-21° 39' 06"	0.9863035	16' 12.96"	23° 26' 15"	11 m 25 s
3	248° 07' 14"	0.07"	246° 21' 01"	-21° 39' 30"	0.9862968	16' 12.96"	23° 26' 15"	11 m 24 s
4	248° 09' 46"	0.06"	246° 23' 43"	-21° 39' 55"	0.9862901	16' 12.97"	23° 26' 15"	11 m 23 s
5	248° 12' 18"	0.06"	246° 26' 24"	-21° 40' 19"	0.9862835	16' 12.98"	23° 26' 15"	11 m 22 s
6	248° 14' 50"	0.06"	246° 29' 06"	-21° 40' 43"	0.9862768	16' 12.98"	23° 26' 15"	11 m 21 s
7	248° 17' 22"	0.05"	246° 31' 47"	-21° 41' 07"	0.9862701	16' 12.99"	23° 26' 15"	11 m 20 s
8	248° 19' 54"	0.05"	246° 34' 29"	-21° 41' 31"	0.9862635	16' 13.00"	23° 26' 15"	11 m 19 s
9	248° 22' 26"	0.04"	246° 37' 11"	-21° 41' 55"	0.9862568	16' 13.00"	23° 26' 15"	11 m 18 s
10	248° 24' 58"	0.04"	246° 39' 52"	-21° 42' 19"	0.9862502	16' 13.01"	23° 26' 15"	11 m 17 s
11	248° 27' 30"	0.04"	246° 42' 34"	-21° 42' 43"	0.9862436	16' 13.02"	23° 26' 15"	11 m 16 s
12	248° 30' 02"	0.03"	246° 45' 15"	-21° 43' 07"	0.9862369	16' 13.02"	23° 26' 15"	11 m 15 s
13	248° 32' 34"	0.03"	246° 47' 57"	-21° 43' 31"	0.9862303	16' 13.03"	23° 26' 15"	11 m 15 s
14	248° 35' 06"	0.02"	246° 50' 39"	-21° 43' 55"	0.9862237	16' 13.03"	23° 26' 15"	11 m 14 s
15	248° 37' 38"	0.02"	246° 53' 20"	-21° 44' 18"	0.9862171	16' 13.04"	23° 26' 15"	11 m 13 s
16	248° 40' 10"	0.01"	246° 56' 02"	-21° 44' 42"	0.9862105	16' 13.05"	23° 26' 15"	11 m 12 s
17	248° 42' 42"	0.01"	246° 58' 44"	-21° 45' 06"	0.9862039	16' 13.05"	23° 26' 15"	11 m 11 s
18	248° 45' 14"	0.00"	247° 01' 25"	-21° 45' 29"	0.9861973	16' 13.06"	23° 26' 15"	11 m 10 s
19	248° 47' 46"	0.00"	247° 04' 07"	-21° 45' 53"	0.9861907	16' 13.07"	23° 26' 15"	11 m 09 s
20	248° 50' 18"	-0.00"	247° 06' 49"	-21° 46' 17"	0.9861841	16' 13.07"	23° 26' 15"	11 m 08 s
21	248° 52' 50"	-0.01"	247° 09' 30"	-21° 46' 40"	0.9861775	16' 13.08"	23° 26' 15"	11 m 07 s
22	248° 55' 22"	-0.01"	247° 12' 12"	-21° 47' 04"	0.9861710	16' 13.09"	23° 26' 15"	11 m 06 s
23	248° 57' 54"	-0.02"	247° 14' 54"	-21° 47' 27"	0.9861644	16' 13.09"	23° 26' 15"	11 m 05 s
24	249° 00' 26"	-0.02"	247° 17' 36"	-21° 47' 50"	0.9861578	16' 13.10"	23° 26' 15"	11 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	188° 38' 47"	4° 14' 20"	189° 36' 40"	0° 28' 08"	0° 58' 45"	16' 00.43"	115° 39' 52"	0.24668
1	189° 13' 36"	4° 12' 23"	190° 07' 50"	0° 12' 42"	0° 58' 47"	16' 01.09"	115° 39' 33"	0.24264
2	189° 48' 29"	4° 10' 25"	190° 39' 04"	0° -2' 46"	0° 58' 49"	16' 01.75"	115° 39' 06"	0.23862
3	190° 23' 25"	4° 08' 25"	191° 10' 20"	0° -18' 15"	0° 58' 52"	16' 02.41"	115° 38' 29"	0.23461
4	190° 58' 23"	4° 06' 23"	191° 41' 39"	0° -33' 45"	0° 58' 54"	16' 03.06"	115° 37' 43"	0.23062
5	191° 33' 24"	4° 04' 19"	192° 13' 00"	0° -49' 16"	0° 58' 57"	16' 03.71"	115° 36' 48"	0.22665
6	192° 08' 28"	4° 02' 14"	192° 44' 25"	-1° 04' 49"	0° 58' 59"	16' 04.37"	115° 35' 43"	0.22270
7	192° 43' 35"	4° 00' 07"	193° 15' 53"	-1° 20' 22"	0° 59' 01"	16' 05.02"	115° 34' 30"	0.21877
8	193° 18' 44"	3° 57' 59"	193° 47' 23"	-1° 35' 56"	0° 59' 04"	16' 05.67"	115° 33' 07"	0.21485
9	193° 53' 57"	3° 55' 48"	194° 18' 57"	-1° 51' 32"	0° 59' 06"	16' 06.32"	115° 31' 35"	0.21096
10	194° 29' 12"	3° 53' 36"	194° 50' 34"	-2° 07' 08"	0° 59' 09"	16' 06.96"	115° 29' 53"	0.20708
11	195° 04' 30"	3° 51' 23"	195° 22' 15"	-2° 22' 44"	0° 59' 11"	16' 07.61"	115° 28' 02"	0.20323
12	195° 39' 51"	3° 49' 07"	195° 53' 59"	-2° 38' 21"	0° 59' 13"	16' 08.25"	115° 26' 01"	0.19940
13	196° 15' 15"	3° 46' 51"	196° 25' 46"	-2° 53' 59"	0° 59' 16"	16' 08.90"	115° 23' 50"	0.19559
14	196° 50' 41"	3° 44' 32"	196° 57' 37"	-3° 09' 37"	0° 59' 18"	16' 09.54"	115° 21' 30"	0.19180
15	197° 26' 10"	3° 42' 12"	197° 29' 31"	-3° 25' 16"	0° 59' 20"	16' 10.17"	115° 19' 00"	0.18803
16	198° 01' 42"	3° 39' 50"	198° 01' 29"	-3° 40' 54"	0° 59' 23"	16' 10.81"	115° 16' 20"	0.18429
17	198° 37' 17"	3° 37' 27"	198° 33' 31"	-3° 56' 33"	0° 59' 25"	16' 11.44"	115° 13' 30"	0.18057
18	199° 12' 54"	3° 35' 02"	199° 05' 37"	-4° 12' 12"	0° 59' 27"	16' 12.07"	115° 10' 31"	0.17687
19	199° 48' 34"	3° 32' 35"	199° 37' 47"	-4° 27' 51"	0° 59' 30"	16' 12.70"	115° 7' 21"	0.17320
20	200° 24' 17"	3° 30' 07"	200° 10' 01"	-4° 43' 30"	0° 59' 32"	16' 13.32"	115° 4' 01"	0.16956
21	201° 00' 03"	3° 27' 38"	200° 42' 19"	-4° 59' 09"	0° 59' 34"	16' 13.95"	115° 0' 31"	0.16594
22	201° 35' 51"	3° 25' 06"	201° 14' 41"	-5° 14' 47"	0° 59' 36"	16' 14.57"	114° 56' 50"	0.16235
23	202° 11' 42"	3° 22' 34"	201° 47' 07"	-5° 30' 25"	0° 59' 39"	16' 15.18"	114° 52' 59"	0.15878
24	202° 47' 36"	3° 19' 59"	202° 19' 37"	-5° 46' 02"	0° 59' 41"	16' 15.80"	114° 48' 58"	0.15524

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	249° 00' 26"	-0.02"	247° 17' 36"	-21° 47' 50"	0.9861578	16' 13.10"	23° 26' 15"	11 m 04 s
1	249° 02' 58"	-0.03"	247° 20' 18"	-21° 48' 14"	0.9861513	16' 13.11"	23° 26' 15"	11 m 03 s
2	249° 05' 30"	-0.03"	247° 22' 60"	-21° 48' 37"	0.9861447	16' 13.11"	23° 26' 15"	11 m 02 s
3	249° 08' 02"	-0.04"	247° 25' 41"	-21° 49' 00"	0.9861382	16' 13.12"	23° 26' 15"	11 m 01 s
4	249° 10' 34"	-0.04"	247° 28' 23"	-21° 49' 23"	0.9861316	16' 13.13"	23° 26' 15"	11 m 01 s
5	249° 13' 07"	-0.05"	247° 31' 05"	-21° 49' 47"	0.9861251	16' 13.13"	23° 26' 15"	10 m 60 s
6	249° 15' 39"	-0.05"	247° 33' 47"	-21° 50' 10"	0.9861186	16' 13.14"	23° 26' 15"	10 m 59 s
7	249° 18' 11"	-0.06"	247° 36' 29"	-21° 50' 33"	0.9861120	16' 13.15"	23° 26' 15"	10 m 58 s
8	249° 20' 43"	-0.06"	247° 39' 11"	-21° 50' 56"	0.9861055	16' 13.15"	23° 26' 15"	10 m 57 s
9	249° 23' 15"	-0.07"	247° 41' 53"	-21° 51' 19"	0.9860990	16' 13.16"	23° 26' 15"	10 m 56 s
10	249° 25' 47"	-0.07"	247° 44' 35"	-21° 51' 42"	0.9860925	16' 13.16"	23° 26' 15"	10 m 55 s
11	249° 28' 19"	-0.08"	247° 47' 17"	-21° 52' 05"	0.9860860	16' 13.17"	23° 26' 15"	10 m 54 s
12	249° 30' 51"	-0.08"	247° 49' 59"	-21° 52' 27"	0.9860795	16' 13.18"	23° 26' 15"	10 m 53 s
13	249° 33' 23"	-0.09"	247° 52' 41"	-21° 52' 50"	0.9860730	16' 13.18"	23° 26' 15"	10 m 52 s
14	249° 35' 55"	-0.09"	247° 55' 23"	-21° 53' 13"	0.9860665	16' 13.19"	23° 26' 15"	10 m 51 s
15	249° 38' 27"	-0.10"	247° 58' 05"	-21° 53' 36"	0.9860600	16' 13.20"	23° 26' 15"	10 m 50 s
16	249° 40' 59"	-0.10"	248° 00' 47"	-21° 53' 58"	0.9860535	16' 13.20"	23° 26' 15"	10 m 49 s
17	249° 43' 32"	-0.11"	248° 03' 29"	-21° 54' 21"	0.9860471	16' 13.21"	23° 26' 15"	10 m 48 s
18	249° 46' 04"	-0.11"	248° 06' 11"	-21° 54' 44"	0.9860406	16' 13.22"	23° 26' 15"	10 m 47 s
19	249° 48' 36"	-0.12"	248° 08' 54"	-21° 55' 06"	0.9860341	16' 13.22"	23° 26' 15"	10 m 46 s
20	249° 51' 08"	-0.12"	248° 11' 36"	-21° 55' 29"	0.9860277	16' 13.23"	23° 26' 15"	10 m 45 s
21	249° 53' 40"	-0.13"	248° 14' 18"	-21° 55' 51"	0.9860212	16' 13.23"	23° 26' 15"	10 m 44 s
22	249° 56' 12"	-0.13"	248° 17' 00"	-21° 56' 13"	0.9860148	16' 13.24"	23° 26' 15"	10 m 43 s
23	249° 58' 44"	-0.14"	248° 19' 42"	-21° 56' 36"	0.9860083	16' 13.25"	23° 26' 15"	10 m 43 s
24	250° 01' 16"	-0.14"	248° 22' 25"	-21° 56' 58"	0.9860019	16' 13.25"	23° 26' 15"	10 m 42 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	202° 47' 36"	3° 19' 59"	202° 19' 37"	-5° 46' 02"	0° 59' 41"	16' 15.80"	114° 48' 58"	0.15524
1	203° 23' 33"	3° 17' 24"	202° 52' 12"	-6° 01' 39"	0° 59' 43"	16' 16.41"	114° 44' 46"	0.15173
2	203° 59' 32"	3° 14' 46"	203° 24' 52"	-6° 17' 15"	0° 59' 45"	16' 17.01"	114° 40' 23"	0.14824
3	204° 35' 34"	3° 12' 08"	203° 57' 36"	-6° 32' 50"	0° 59' 48"	16' 17.62"	114° 35' 50"	0.14479
4	205° 11' 38"	3° 09' 27"	204° 30' 24"	-6° 48' 24"	0° 59' 50"	16' 18.21"	114° 31' 06"	0.14136
5	205° 47' 45"	3° 06' 46"	205° 03' 18"	-7° 03' 57"	0° 59' 52"	16' 18.81"	114° 26' 11"	0.13796
6	206° 23' 55"	3° 04' 03"	205° 36' 16"	-7° 19' 30"	0° 59' 54"	16' 19.40"	114° 21' 05"	0.13460
7	207° 00' 07"	3° 01' 18"	206° 09' 19"	-7° 35' 01"	0° 59' 56"	16' 19.99"	114° 15' 47"	0.13126
8	207° 36' 22"	2° 58' 32"	206° 42' 26"	-7° 50' 30"	0° 59' 58"	16' 20.57"	114° 10' 19"	0.12795
9	208° 12' 39"	2° 55' 45"	207° 15' 39"	-8° 05' 58"	1° 00' 01"	16' 21.15"	114° 4' 39"	0.12468
10	208° 48' 59"	2° 52' 56"	207° 48' 57"	-8° 21' 25"	1° 00' 03"	16' 21.73"	113° 58' 48"	0.12144
11	209° 25' 21"	2° 50' 06"	208° 22' 20"	-8° 36' 50"	1° 00' 05"	16' 22.30"	113° 52' 45"	0.11823
12	210° 01' 46"	2° 47' 14"	208° 55' 48"	-8° 52' 14"	1° 00' 07"	16' 22.86"	113° 46' 30"	0.11505
13	210° 38' 14"	2° 44' 22"	209° 29' 21"	-9° 07' 35"	1° 00' 09"	16' 23.42"	113° 40' 04"	0.11191
14	211° 14' 44"	2° 41' 27"	210° 03' 00"	-9° 22' 54"	1° 00' 11"	16' 23.98"	113° 33' 25"	0.10880
15	211° 51' 16"	2° 38' 32"	210° 36' 44"	-9° 38' 12"	1° 00' 13"	16' 24.53"	113° 26' 35"	0.10573
16	212° 27' 51"	2° 35' 35"	211° 10' 34"	-9° 53' 27"	1° 00' 15"	16' 25.08"	113° 19' 32"	0.10269
17	213° 04' 28"	2° 32' 37"	211° 44' 29"	-10° 08' 40"	1° 00' 17"	16' 25.62"	113° 12' 17"	0.09969
18	213° 41' 08"	2° 29' 38"	212° 18' 30"	-10° 23' 50"	1° 00' 19"	16' 26.15"	113° 4' 49"	0.09672
19	214° 17' 50"	2° 26' 38"	212° 52' 36"	-10° 38' 58"	1° 00' 21"	16' 26.69"	112° 57' 08"	0.09379
20	214° 54' 34"	2° 23' 36"	213° 26' 48"	-10° 54' 03"	1° 00' 23"	16' 27.21"	112° 49' 15"	0.09090
21	215° 31' 21"	2° 20' 33"	214° 01' 06"	-11° 09' 06"	1° 00' 25"	16' 27.73"	112° 41' 09"	0.08804
22	216° 08' 10"	2° 17' 29"	214° 35' 30"	-11° 24' 05"	1° 00' 27"	16' 28.24"	112° 32' 49"	0.08522
23	216° 45' 01"	2° 14' 24"	215° 09' 60"	-11° 39' 02"	1° 00' 28"	16' 28.75"	112° 24' 16"	0.08244
24	217° 21' 54"	2° 11' 18"	215° 44' 35"	-11° 53' 55"	1° 00' 30"	16' 29.25"	112° 15' 29"	0.07970

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	250° 01' 16"	-0.14"	248° 22' 25"	-21° 56' 58"	0.9860019	16' 13.25"	23° 26' 15"	10 m 42 s
1	250° 03' 48"	-0.15"	248° 25' 07"	-21° 57' 20"	0.9859955	16' 13.26"	23° 26' 15"	10 m 41 s
2	250° 06' 21"	-0.15"	248° 27' 49"	-21° 57' 43"	0.9859890	16' 13.27"	23° 26' 15"	10 m 40 s
3	250° 08' 53"	-0.16"	248° 30' 31"	-21° 58' 05"	0.9859826	16' 13.27"	23° 26' 15"	10 m 39 s
4	250° 11' 25"	-0.16"	248° 33' 14"	-21° 58' 27"	0.9859762	16' 13.28"	23° 26' 15"	10 m 38 s
5	250° 13' 57"	-0.17"	248° 35' 56"	-21° 58' 49"	0.9859698	16' 13.29"	23° 26' 15"	10 m 37 s
6	250° 16' 29"	-0.17"	248° 38' 38"	-21° 59' 11"	0.9859634	16' 13.29"	23° 26' 15"	10 m 36 s
7	250° 19' 01"	-0.18"	248° 41' 21"	-21° 59' 33"	0.9859570	16' 13.30"	23° 26' 15"	10 m 35 s
8	250° 21' 33"	-0.18"	248° 44' 03"	-21° 59' 55"	0.9859506	16' 13.30"	23° 26' 15"	10 m 34 s
9	250° 24' 05"	-0.19"	248° 46' 45"	-22° 00' 17"	0.9859442	16' 13.31"	23° 26' 15"	10 m 33 s
10	250° 26' 38"	-0.20"	248° 49' 28"	-22° 00' 39"	0.9859378	16' 13.32"	23° 26' 15"	10 m 32 s
11	250° 29' 10"	-0.20"	248° 52' 10"	-22° 01' 01"	0.9859314	16' 13.32"	23° 26' 15"	10 m 31 s
12	250° 31' 42"	-0.21"	248° 54' 52"	-22° 01' 23"	0.9859251	16' 13.33"	23° 26' 15"	10 m 30 s
13	250° 34' 14"	-0.21"	248° 57' 35"	-22° 01' 44"	0.9859187	16' 13.34"	23° 26' 15"	10 m 29 s
14	250° 36' 46"	-0.22"	249° 00' 17"	-22° 02' 06"	0.9859123	16' 13.34"	23° 26' 15"	10 m 28 s
15	250° 39' 18"	-0.22"	249° 02' 60"	-22° 02' 28"	0.9859060	16' 13.35"	23° 26' 15"	10 m 27 s
16	250° 41' 50"	-0.23"	249° 05' 42"	-22° 02' 49"	0.9858996	16' 13.35"	23° 26' 15"	10 m 26 s
17	250° 44' 23"	-0.23"	249° 08' 25"	-22° 03' 11"	0.9858933	16' 13.36"	23° 26' 15"	10 m 25 s
18	250° 46' 55"	-0.24"	249° 11' 07"	-22° 03' 32"	0.9858869	16' 13.37"	23° 26' 15"	10 m 24 s
19	250° 49' 27"	-0.24"	249° 13' 50"	-22° 03' 54"	0.9858806	16' 13.37"	23° 26' 15"	10 m 23 s
20	250° 51' 59"	-0.25"	249° 16' 32"	-22° 04' 15"	0.9858742	16' 13.38"	23° 26' 15"	10 m 22 s
21	250° 54' 31"	-0.26"	249° 19' 15"	-22° 04' 37"	0.9858679	16' 13.39"	23° 26' 15"	10 m 21 s
22	250° 57' 03"	-0.26"	249° 21' 58"	-22° 04' 58"	0.9858616	16' 13.39"	23° 26' 15"	10 m 20 s
23	250° 59' 35"	-0.27"	249° 24' 40"	-22° 05' 19"	0.9858552	16' 13.40"	23° 26' 15"	10 m 19 s
24	251° 02' 08"	-0.27"	249° 27' 23"	-22° 05' 41"	0.9858489	16' 13.40"	23° 26' 15"	10 m 18 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	217° 21' 54"	2° 11' 18"	215° 44' 35"	-11° 53' 55"	1° 00' 30"	16' 29.25"	112° 15' 29"	0.07970
1	217° 58' 50"	2° 08' 11"	216° 19' 17"	-12° 08' 45"	1° 00' 32"	16' 29.75"	112° 6' 28"	0.07700
2	218° 35' 48"	2° 05' 02"	216° 54' 05"	-12° 23' 32"	1° 00' 34"	16' 30.24"	111° 57' 13"	0.07434
3	219° 12' 48"	2° 01' 53"	217° 28' 59"	-12° 38' 15"	1° 00' 36"	16' 30.72"	111° 47' 43"	0.07172
4	219° 49' 50"	1° 58' 42"	218° 03' 59"	-12° 52' 55"	1° 00' 37"	16' 31.20"	111° 37' 59"	0.06914
5	220° 26' 55"	1° 55' 31"	218° 39' 05"	-13° 07' 30"	1° 00' 39"	16' 31.67"	111° 28' 00"	0.06660
6	221° 04' 01"	1° 52' 18"	219° 14' 18"	-13° 22' 02"	1° 00' 41"	16' 32.13"	111° 17' 46"	0.06410
7	221° 41' 10"	1° 49' 05"	219° 49' 37"	-13° 36' 30"	1° 00' 43"	16' 32.58"	111° 7' 16"	0.06164
8	222° 18' 20"	1° 45' 50"	220° 25' 02"	-13° 50' 54"	1° 00' 44"	16' 33.03"	110° 56' 30"	0.05923
9	222° 55' 33"	1° 42' 35"	221° 00' 34"	-14° 05' 13"	1° 00' 46"	16' 33.48"	110° 45' 27"	0.05686
10	223° 32' 48"	1° 39' 18"	221° 36' 12"	-14° 19' 28"	1° 00' 47"	16' 33.91"	110° 34' 08"	0.05453
11	224° 10' 04"	1° 36' 01"	222° 11' 57"	-14° 33' 38"	1° 00' 49"	16' 34.34"	110° 22' 32"	0.05224
12	224° 47' 23"	1° 32' 43"	222° 47' 48"	-14° 47' 44"	1° 00' 51"	16' 34.76"	110° 10' 38"	0.05000
13	225° 24' 43"	1° 29' 24"	223° 23' 46"	-15° 01' 45"	1° 00' 52"	16' 35.18"	109° 58' 25"	0.04781
14	226° 02' 05"	1° 26' 05"	223° 59' 50"	-15° 15' 41"	1° 00' 54"	16' 35.58"	109° 45' 54"	0.04566
15	226° 39' 29"	1° 22' 44"	224° 36' 01"	-15° 29' 32"	1° 00' 55"	16' 35.98"	109° 33' 03"	0.04355
16	227° 16' 55"	1° 19' 23"	225° 12' 19"	-15° 43' 18"	1° 00' 56"	16' 36.37"	109° 19' 52"	0.04149
17	227° 54' 23"	1° 16' 01"	225° 48' 44"	-15° 56' 58"	1° 00' 58"	16' 36.75"	109° 6' 20"	0.03948
18	228° 31' 52"	1° 12' 38"	226° 25' 15"	-16° 10' 33"	1° 00' 59"	16' 37.13"	108° 52' 26"	0.03751
19	229° 09' 23"	1° 09' 15"	227° 01' 53"	-16° 24' 03"	1° 01' 01"	16' 37.50"	108° 38' 09"	0.03559
20	229° 46' 56"	1° 05' 51"	227° 38' 38"	-16° 37' 26"	1° 01' 02"	16' 37.86"	108° 23' 28"	0.03372
21	230° 24' 30"	1° 02' 27"	228° 15' 30"	-16° 50' 44"	1° 01' 03"	16' 38.21"	108° 8' 22"	0.03189
22	231° 02' 06"	0° 59' 02"	228° 52' 28"	-17° 03' 56"	1° 01' 04"	16' 38.55"	107° 52' 50"	0.03012
23	231° 39' 44"	0° 55' 36"	229° 29' 33"	-17° 17' 01"	1° 01' 06"	16' 38.88"	107° 36' 50"	0.02839
24	232° 17' 23"	0° 52' 09"	230° 06' 45"	-17° 30' 01"	1° 01' 07"	16' 39.21"	107° 20' 21"	0.02671

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	251° 02' 08"	-0.27"	249° 27' 23"	-22° 05' 41"	0.9858489	16' 13.40"	23° 26' 15"	10 m 18 s
1	251° 04' 40"	-0.28"	249° 30' 05"	-22° 06' 02"	0.9858426	16' 13.41"	23° 26' 15"	10 m 17 s
2	251° 07' 12"	-0.28"	249° 32' 48"	-22° 06' 23"	0.9858363	16' 13.42"	23° 26' 15"	10 m 16 s
3	251° 09' 44"	-0.29"	249° 35' 31"	-22° 06' 44"	0.9858300	16' 13.42"	23° 26' 15"	10 m 15 s
4	251° 12' 16"	-0.29"	249° 38' 13"	-22° 07' 05"	0.9858237	16' 13.43"	23° 26' 15"	10 m 14 s
5	251° 14' 49"	-0.30"	249° 40' 56"	-22° 07' 26"	0.9858174	16' 13.44"	23° 26' 15"	10 m 13 s
6	251° 17' 21"	-0.31"	249° 43' 39"	-22° 07' 47"	0.9858111	16' 13.44"	23° 26' 15"	10 m 12 s
7	251° 19' 53"	-0.31"	249° 46' 22"	-22° 08' 08"	0.9858048	16' 13.45"	23° 26' 15"	10 m 11 s
8	251° 22' 25"	-0.32"	249° 49' 04"	-22° 08' 29"	0.9857986	16' 13.45"	23° 26' 15"	10 m 10 s
9	251° 24' 57"	-0.32"	249° 51' 47"	-22° 08' 50"	0.9857923	16' 13.46"	23° 26' 15"	10 m 09 s
10	251° 27' 29"	-0.33"	249° 54' 30"	-22° 09' 11"	0.9857860	16' 13.47"	23° 26' 15"	10 m 08 s
11	251° 30' 02"	-0.33"	249° 57' 13"	-22° 09' 32"	0.9857798	16' 13.47"	23° 26' 15"	10 m 07 s
12	251° 32' 34"	-0.34"	249° 59' 55"	-22° 09' 52"	0.9857735	16' 13.48"	23° 26' 15"	10 m 06 s
13	251° 35' 06"	-0.34"	250° 02' 38"	-22° 10' 13"	0.9857672	16' 13.49"	23° 26' 15"	10 m 05 s
14	251° 37' 38"	-0.35"	250° 05' 21"	-22° 10' 34"	0.9857610	16' 13.49"	23° 26' 15"	10 m 04 s
15	251° 40' 10"	-0.36"	250° 08' 04"	-22° 10' 54"	0.9857548	16' 13.50"	23° 26' 15"	10 m 03 s
16	251° 42' 43"	-0.36"	250° 10' 47"	-22° 11' 15"	0.9857485	16' 13.50"	23° 26' 15"	10 m 02 s
17	251° 45' 15"	-0.37"	250° 13' 30"	-22° 11' 35"	0.9857423	16' 13.51"	23° 26' 15"	10 m 01 s
18	251° 47' 47"	-0.37"	250° 16' 13"	-22° 11' 56"	0.9857361	16' 13.52"	23° 26' 15"	10 m 00 s
19	251° 50' 19"	-0.38"	250° 18' 55"	-22° 12' 16"	0.9857298	16' 13.52"	23° 26' 15"	9 m 59 s
20	251° 52' 51"	-0.38"	250° 21' 38"	-22° 12' 37"	0.9857236	16' 13.53"	23° 26' 15"	9 m 58 s
21	251° 55' 24"	-0.39"	250° 24' 21"	-22° 12' 57"	0.9857174	16' 13.53"	23° 26' 15"	9 m 57 s
22	251° 57' 56"	-0.39"	250° 27' 04"	-22° 13' 17"	0.9857112	16' 13.54"	23° 26' 15"	9 m 56 s
23	252° 00' 28"	-0.40"	250° 29' 47"	-22° 13' 38"	0.9857050	16' 13.55"	23° 26' 15"	9 m 55 s
24	252° 03' 00"	-0.41"	250° 32' 30"	-22° 13' 58"	0.9856988	16' 13.55"	23° 26' 15"	9 m 54 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	232° 17' 23"	0° 52' 09"	230° 06' 45"	-17° 30' 01"	1° 01' 07"	16' 39.21"	107° 20' 21"	0.02671
1	232° 55' 03"	0° 48' 43"	230° 44' 04"	-17° 42' 53"	1° 01' 08"	16' 39.53"	107° 3' 20"	0.02507
2	233° 32' 45"	0° 45' 15"	231° 21' 30"	-17° 55' 40"	1° 01' 09"	16' 39.84"	106° 45' 45"	0.02349
3	234° 10' 29"	0° 41' 48"	231° 59' 03"	-18° 08' 19"	1° 01' 10"	16' 40.14"	106° 27' 35"	0.02196
4	234° 48' 13"	0° 38' 20"	232° 36' 42"	-18° 20' 52"	1° 01' 11"	16' 40.43"	106° 8' 46"	0.02047
5	235° 25' 59"	0° 34' 51"	233° 14' 29"	-18° 33' 18"	1° 01' 12"	16' 40.71"	105° 49' 15"	0.01904
6	236° 03' 47"	0° 31' 22"	233° 52' 22"	-18° 45' 37"	1° 01' 13"	16' 40.98"	105° 28' 59"	0.01766
7	236° 41' 35"	0° 27' 53"	234° 30' 22"	-18° 57' 48"	1° 01' 14"	16' 41.25"	105° 7' 52"	0.01632
8	237° 19' 25"	0° 24' 23"	235° 08' 29"	-19° 09' 52"	1° 01' 15"	16' 41.51"	104° 45' 51"	0.01504
9	237° 57' 16"	0° 20' 53"	235° 46' 42"	-19° 21' 49"	1° 01' 16"	16' 41.75"	104° 22' 49"	0.01381
10	238° 35' 09"	0° 17' 23"	236° 25' 03"	-19° 33' 38"	1° 01' 17"	16' 41.99"	103° 58' 39"	0.01263
11	239° 13' 02"	0° 13' 53"	237° 03' 30"	-19° 45' 19"	1° 01' 18"	16' 42.22"	103° 33' 13"	0.01151
12	239° 50' 56"	0° 10' 22"	237° 42' 04"	-19° 56' 52"	1° 01' 19"	16' 42.44"	103° 6' 21"	0.01043
13	240° 28' 52"	0° 06' 52"	238° 20' 44"	-20° 08' 18"	1° 01' 19"	16' 42.65"	102° 37' 51"	0.00941
14	241° 06' 48"	0° 03' 21"	238° 59' 31"	-20° 19' 35"	1° 01' 20"	16' 42.85"	102° 7' 27"	0.00844
15	241° 44' 45"	0° 00' -10"	239° 38' 25"	-20° 30' 44"	1° 01' 21"	16' 43.04"	101° 34' 52"	0.00752
16	242° 22' 44"	0° -3' 41"	240° 17' 25"	-20° 41' 44"	1° 01' 22"	16' 43.22"	100° 59' 42"	0.00665
17	243° 00' 43"	0° -7' 12"	240° 56' 32"	-20° 52' 36"	1° 01' 22"	16' 43.39"	100° 21' 28"	0.00584
18	243° 38' 43"	0° -10' 43"	241° 35' 46"	-21° 03' 19"	1° 01' 23"	16' 43.56"	99° 39' 31"	0.00508
19	244° 16' 44"	0° -14' 15"	242° 15' 05"	-21° 13' 53"	1° 01' 23"	16' 43.71"	98° 53' 03"	0.00437
20	244° 54' 45"	0° -17' 46"	242° 54' 31"	-21° 24' 19"	1° 01' 24"	16' 43.85"	98° 0' 58"	0.00372
21	245° 32' 47"	0° -21' 17"	243° 34' 04"	-21° 34' 35"	1° 01' 24"	16' 43.99"	97° 1' 44"	0.00312
22	246° 10' 50"	0° -24' 47"	244° 13' 42"	-21° 44' 42"	1° 01' 25"	16' 44.11"	95° 53' 15"	0.00257
23	246° 48' 53"	0° -28' 18"	244° 53' 27"	-21° 54' 40"	1° 01' 25"	16' 44.23"	94° 32' 29"	0.00208
24	247° 26' 57"	0° -31' 49"	245° 33' 18"	-22° 04' 28"	1° 01' 26"	16' 44.33"	92° 54' 52"	0.00164

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	252° 03' 00"	-0.41"	250° 32' 30"	-22° 13' 58"	0.9856988	16' 13.55"	23° 26' 15"	9 m 54 s
1	252° 05' 32"	-0.41"	250° 35' 13"	-22° 14' 18"	0.9856926	16' 13.56"	23° 26' 15"	9 m 53 s
2	252° 08' 05"	-0.42"	250° 37' 56"	-22° 14' 38"	0.9856864	16' 13.57"	23° 26' 15"	9 m 52 s
3	252° 10' 37"	-0.42"	250° 40' 39"	-22° 14' 58"	0.9856802	16' 13.57"	23° 26' 15"	9 m 51 s
4	252° 13' 09"	-0.43"	250° 43' 22"	-22° 15' 18"	0.9856740	16' 13.58"	23° 26' 15"	9 m 50 s
5	252° 15' 41"	-0.43"	250° 46' 05"	-22° 15' 38"	0.9856678	16' 13.58"	23° 26' 15"	9 m 49 s
6	252° 18' 14"	-0.44"	250° 48' 49"	-22° 15' 58"	0.9856617	16' 13.59"	23° 26' 15"	9 m 48 s
7	252° 20' 46"	-0.44"	250° 51' 32"	-22° 16' 18"	0.9856555	16' 13.60"	23° 26' 15"	9 m 47 s
8	252° 23' 18"	-0.45"	250° 54' 15"	-22° 16' 38"	0.9856493	16' 13.60"	23° 26' 15"	9 m 46 s
9	252° 25' 50"	-0.45"	250° 56' 58"	-22° 16' 57"	0.9856432	16' 13.61"	23° 26' 15"	9 m 45 s
10	252° 28' 23"	-0.46"	250° 59' 41"	-22° 17' 17"	0.9856370	16' 13.61"	23° 26' 15"	9 m 44 s
11	252° 30' 55"	-0.46"	251° 02' 24"	-22° 17' 37"	0.9856309	16' 13.62"	23° 26' 15"	9 m 43 s
12	252° 33' 27"	-0.47"	251° 05' 07"	-22° 17' 57"	0.9856247	16' 13.63"	23° 26' 15"	9 m 42 s
13	252° 35' 59"	-0.48"	251° 07' 51"	-22° 18' 16"	0.9856186	16' 13.63"	23° 26' 15"	9 m 41 s
14	252° 38' 31"	-0.48"	251° 10' 34"	-22° 18' 36"	0.9856125	16' 13.64"	23° 26' 15"	9 m 40 s
15	252° 41' 04"	-0.49"	251° 13' 17"	-22° 18' 55"	0.9856063	16' 13.64"	23° 26' 15"	9 m 39 s
16	252° 43' 36"	-0.49"	251° 16' 00"	-22° 19' 15"	0.9856002	16' 13.65"	23° 26' 15"	9 m 38 s
17	252° 46' 08"	-0.50"	251° 18' 43"	-22° 19' 34"	0.9855941	16' 13.66"	23° 26' 15"	9 m 37 s
18	252° 48' 40"	-0.50"	251° 21' 27"	-22° 19' 54"	0.9855880	16' 13.66"	23° 26' 15"	9 m 36 s
19	252° 51' 13"	-0.51"	251° 24' 10"	-22° 20' 13"	0.9855819	16' 13.67"	23° 26' 15"	9 m 35 s
20	252° 53' 45"	-0.51"	251° 26' 53"	-22° 20' 32"	0.9855758	16' 13.67"	23° 26' 15"	9 m 34 s
21	252° 56' 17"	-0.52"	251° 29' 37"	-22° 20' 51"	0.9855697	16' 13.68"	23° 26' 15"	9 m 33 s
22	252° 58' 49"	-0.52"	251° 32' 20"	-22° 21' 11"	0.9855636	16' 13.69"	23° 26' 15"	9 m 32 s
23	253° 01' 22"	-0.53"	251° 35' 03"	-22° 21' 30"	0.9855575	16' 13.69"	23° 26' 15"	9 m 31 s
24	253° 03' 54"	-0.53"	251° 37' 47"	-22° 21' 49"	0.9855514	16' 13.70"	23° 26' 15"	9 m 30 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	247° 26' 57"	0°-31' 49"	245° 33' 18"	-22° 04' 28"	1° 01' 26"	16' 44.33"	92° 54' 52"	0.00164
1	248° 05' 02"	0°-35' 19"	246° 13' 15"	-22° 14' 07"	1° 01' 26"	16' 44.43"	90° 53' 20"	0.00126
2	248° 43' 07"	0°-38' 49"	246° 53' 18"	-22° 23' 36"	1° 01' 26"	16' 44.51"	88° 16' 13"	0.00092
3	249° 21' 12"	0°-42' 19"	247° 33' 26"	-22° 32' 55"	1° 01' 27"	16' 44.59"	84° 43' 12"	0.00065
4	249° 59' 18"	0°-45' 49"	248° 13' 40"	-22° 42' 05"	1° 01' 27"	16' 44.65"	79° 35' 58"	0.00043
5	250° 37' 24"	0°-49' 18"	248° 54' 00"	-22° 51' 04"	1° 01' 27"	16' 44.71"	71° 36' 02"	0.00026
6	251° 15' 31"	0°-52' 47"	249° 34' 26"	-22° 59' 53"	1° 01' 27"	16' 44.75"	57° 53' 49"	0.00014
7	251° 53' 37"	0°-56' 16"	250° 14' 57"	-23° 08' 32"	1° 01' 27"	16' 44.79"	33° 28' 29"	0.00008
8	252° 31' 44"	0°-59' 44"	250° 55' 33"	-23° 17' 01"	1° 01' 27"	16' 44.81"	359° 25' 12"	0.00008
9	253° 09' 51"	-1° 03' 11"	251° 36' 14"	-23° 25' 19"	1° 01' 27"	16' 44.83"	332° 20' 29"	0.00013
10	253° 47' 57"	-1° 06' 38"	252° 16' 59"	-23° 33' 26"	1° 01' 28"	16' 44.84"	316° 53' 21"	0.00023
11	254° 26' 04"	-1° 10' 05"	252° 57' 50"	-23° 41' 23"	1° 01' 27"	16' 44.83"	308° 0' 18"	0.00039
12	255° 04' 11"	-1° 13' 31"	253° 38' 47"	-23° 49' 10"	1° 01' 27"	16' 44.82"	302° 24' 50"	0.00060
13	255° 42' 19"	-1° 16' 57"	254° 19' 48"	-23° 56' 45"	1° 01' 27"	16' 44.80"	298° 35' 09"	0.00086
14	256° 20' 24"	-1° 20' 22"	255° 00' 51"	-24° 04' 09"	1° 01' 27"	16' 44.76"	295° 47' 16"	0.00118
15	256° 58' 31"	-1° 23' 46"	255° 42' 01"	-24° 11' 22"	1° 01' 27"	16' 44.72"	293° 37' 47"	0.00156
16	257° 36' 38"	-1° 27' 10"	256° 23' 16"	-24° 18' 25"	1° 01' 27"	16' 44.67"	291° 53' 56"	0.00199
17	258° 14' 45"	-1° 30' 33"	257° 04' 35"	-24° 25' 16"	1° 01' 27"	16' 44.60"	290° 27' 53"	0.00247
18	258° 52' 51"	-1° 33' 56"	257° 45' 58"	-24° 31' 55"	1° 01' 26"	16' 44.53"	289° 14' 41"	0.00300
19	259° 30' 58"	-1° 37' 17"	258° 27' 24"	-24° 38' 24"	1° 01' 26"	16' 44.45"	288° 11' 01"	0.00359
20	260° 09' 04"	-1° 40' 38"	259° 08' 55"	-24° 44' 41"	1° 01' 26"	16' 44.35"	287° 14' 38"	0.00424
21	260° 47' 10"	-1° 43' 59"	259° 50' 29"	-24° 50' 46"	1° 01' 25"	16' 44.25"	286° 23' 54"	0.00493
22	261° 25' 15"	-1° 47' 18"	260° 32' 07"	-24° 56' 40"	1° 01' 25"	16' 44.14"	285° 37' 40"	0.00569
23	262° 03' 20"	-1° 50' 36"	261° 13' 48"	-25° 02' 22"	1° 01' 25"	16' 44.02"	284° 55' 03"	0.00649
24	262° 41' 25"	-1° 53' 54"	261° 55' 32"	-25° 07' 52"	1° 01' 24"	16' 43.89"	284° 15' 23"	0.00735

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	253° 03' 54"	-0.53"	251° 37' 47"	-22° 21' 49"	0.9855514	16' 13.70"	23° 26' 15"	9 m 30 s
1	253° 06' 26"	-0.54"	251° 40' 30"	-22° 22' 08"	0.9855453	16' 13.70"	23° 26' 15"	9 m 29 s
2	253° 08' 59"	-0.54"	251° 43' 13"	-22° 22' 27"	0.9855393	16' 13.71"	23° 26' 15"	9 m 28 s
3	253° 11' 31"	-0.55"	251° 45' 57"	-22° 22' 46"	0.9855332	16' 13.72"	23° 26' 15"	9 m 27 s
4	253° 14' 03"	-0.55"	251° 48' 40"	-22° 23' 05"	0.9855271	16' 13.72"	23° 26' 15"	9 m 26 s
5	253° 16' 35"	-0.56"	251° 51' 23"	-22° 23' 24"	0.9855211	16' 13.73"	23° 26' 15"	9 m 25 s
6	253° 19' 08"	-0.56"	251° 54' 07"	-22° 23' 43"	0.9855150	16' 13.73"	23° 26' 15"	9 m 24 s
7	253° 21' 40"	-0.57"	251° 56' 50"	-22° 24' 01"	0.9855090	16' 13.74"	23° 26' 15"	9 m 23 s
8	253° 24' 12"	-0.57"	251° 59' 34"	-22° 24' 20"	0.9855029	16' 13.75"	23° 26' 15"	9 m 21 s
9	253° 26' 44"	-0.58"	252° 02' 17"	-22° 24' 39"	0.9854969	16' 13.75"	23° 26' 15"	9 m 20 s
10	253° 29' 17"	-0.58"	252° 05' 01"	-22° 24' 58"	0.9854909	16' 13.76"	23° 26' 15"	9 m 19 s
11	253° 31' 49"	-0.59"	252° 07' 44"	-22° 25' 16"	0.9854848	16' 13.76"	23° 26' 15"	9 m 18 s
12	253° 34' 21"	-0.59"	252° 10' 28"	-22° 25' 35"	0.9854788	16' 13.77"	23° 26' 15"	9 m 17 s
13	253° 36' 54"	-0.60"	252° 13' 11"	-22° 25' 53"	0.9854728	16' 13.78"	23° 26' 15"	9 m 16 s
14	253° 39' 26"	-0.60"	252° 15' 55"	-22° 26' 12"	0.9854668	16' 13.78"	23° 26' 15"	9 m 15 s
15	253° 41' 58"	-0.61"	252° 18' 38"	-22° 26' 30"	0.9854608	16' 13.79"	23° 26' 15"	9 m 14 s
16	253° 44' 30"	-0.61"	252° 21' 22"	-22° 26' 49"	0.9854548	16' 13.79"	23° 26' 15"	9 m 13 s
17	253° 47' 03"	-0.62"	252° 24' 06"	-22° 27' 07"	0.9854488	16' 13.80"	23° 26' 15"	9 m 12 s
18	253° 49' 35"	-0.62"	252° 26' 49"	-22° 27' 25"	0.9854428	16' 13.81"	23° 26' 15"	9 m 11 s
19	253° 52' 07"	-0.63"	252° 29' 33"	-22° 27' 43"	0.9854368	16' 13.81"	23° 26' 15"	9 m 10 s
20	253° 54' 40"	-0.63"	252° 32' 16"	-22° 28' 02"	0.9854308	16' 13.82"	23° 26' 15"	9 m 09 s
21	253° 57' 12"	-0.64"	252° 35' 00"	-22° 28' 20"	0.9854248	16' 13.82"	23° 26' 15"	9 m 08 s
22	253° 59' 44"	-0.64"	252° 37' 44"	-22° 28' 38"	0.9854189	16' 13.83"	23° 26' 15"	9 m 07 s
23	254° 02' 16"	-0.65"	252° 40' 27"	-22° 28' 56"	0.9854129	16' 13.84"	23° 26' 15"	9 m 06 s
24	254° 04' 49"	-0.65"	252° 43' 11"	-22° 29' 14"	0.9854069	16' 13.84"	23° 26' 15"	9 m 05 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	262° 41' 25"	-1° 53' 54"	261° 55' 32"	-25° 07' 52"	1° 01' 24"	16' 43.89"	284° 15' 23"	0.00735
1	263° 19' 28"	-1° 57' 11"	262° 37' 19"	-25° 13' 11"	1° 01' 24"	16' 43.75"	283° 38' 10"	0.00826
2	263° 57' 32"	-2° 00' 26"	263° 19' 08"	-25° 18' 18"	1° 01' 23"	16' 43.59"	283° 2' 58"	0.00922
3	264° 35' 35"	-2° 03' 41"	264° 01' 01"	-25° 23' 12"	1° 01' 22"	16' 43.43"	282° 29' 30"	0.01023
4	265° 13' 37"	-2° 06' 55"	264° 42' 56"	-25° 27' 55"	1° 01' 22"	16' 43.26"	281° 57' 28"	0.01130
5	265° 51' 38"	-2° 10' 08"	265° 24' 53"	-25° 32' 26"	1° 01' 21"	16' 43.09"	281° 26' 42"	0.01242
6	266° 29' 39"	-2° 13' 20"	266° 06' 52"	-25° 36' 45"	1° 01' 20"	16' 42.90"	280° 57' 01"	0.01360
7	267° 07' 38"	-2° 16' 31"	266° 48' 53"	-25° 40' 51"	1° 01' 20"	16' 42.70"	280° 28' 16"	0.01482
8	267° 45' 37"	-2° 19' 40"	267° 30' 56"	-25° 44' 46"	1° 01' 19"	16' 42.49"	280° 0' 20"	0.01610
9	268° 23' 36"	-2° 22' 49"	268° 13' 00"	-25° 48' 28"	1° 01' 18"	16' 42.27"	279° 33' 07"	0.01742
10	269° 01' 33"	-2° 25' 56"	268° 55' 06"	-25° 51' 58"	1° 01' 17"	16' 42.05"	279° 6' 32"	0.01880
11	269° 39' 29"	-2° 29' 02"	269° 37' 13"	-25° 55' 16"	1° 01' 16"	16' 41.81"	278° 40' 31"	0.02023
12	270° 17' 24"	-2° 32' 07"	270° 19' 20"	-25° 58' 21"	1° 01' 16"	16' 41.57"	278° 14' 60"	0.02171
13	270° 55' 18"	-2° 35' 11"	271° 01' 29"	-26° 01' 15"	1° 01' 15"	16' 41.32"	277° 49' 56"	0.02324
14	271° 33' 12"	-2° 38' 14"	271° 43' 38"	-26° 03' 55"	1° 01' 14"	16' 41.06"	277° 25' 17"	0.02482
15	272° 11' 04"	-2° 41' 15"	272° 25' 48"	-26° 06' 24"	1° 01' 13"	16' 40.78"	277° 1' 00"	0.02645
16	272° 48' 54"	-2° 44' 15"	273° 07' 58"	-26° 08' 40"	1° 01' 12"	16' 40.51"	276° 37' 03"	0.02813
17	273° 26' 44"	-2° 47' 14"	273° 50' 08"	-26° 10' 44"	1° 01' 11"	16' 40.22"	276° 13' 25"	0.02986
18	274° 04' 32"	-2° 50' 11"	274° 32' 17"	-26° 12' 35"	1° 01' 09"	16' 39.92"	275° 50' 04"	0.03163
19	274° 42' 20"	-2° 53' 08"	275° 14' 26"	-26° 14' 15"	1° 01' 08"	16' 39.61"	275° 26' 58"	0.03346
20	275° 20' 05"	-2° 56' 02"	275° 56' 35"	-26° 15' 41"	1° 01' 07"	16' 39.30"	275° 4' 07"	0.03533
21	275° 57' 50"	-2° 58' 55"	276° 38' 43"	-26° 16' 56"	1° 01' 06"	16' 38.98"	274° 41' 29"	0.03725
22	276° 35' 33"	-3° 01' 47"	277° 20' 50"	-26° 17' 58"	1° 01' 05"	16' 38.65"	274° 19' 04"	0.03922
23	277° 13' 14"	-3° 04' 38"	278° 02' 56"	-26° 18' 47"	1° 01' 04"	16' 38.31"	273° 56' 51"	0.04124
24	277° 50' 55"	-3° 07' 27"	278° 45' 00"	-26° 19' 25"	1° 01' 02"	16' 37.96"	273° 34' 49"	0.04330

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	254° 04' 49"	-0.65"	252° 43' 11"	-22° 29' 14"	0.9854069	16' 13.84"	23° 26' 15"	9 m 05 s
1	254° 07' 21"	-0.66"	252° 45' 55"	-22° 29' 32"	0.9854010	16' 13.85"	23° 26' 15"	9 m 04 s
2	254° 09' 53"	-0.66"	252° 48' 38"	-22° 29' 50"	0.9853950	16' 13.85"	23° 26' 15"	9 m 03 s
3	254° 12' 26"	-0.67"	252° 51' 22"	-22° 30' 08"	0.9853891	16' 13.86"	23° 26' 15"	9 m 02 s
4	254° 14' 58"	-0.67"	252° 54' 06"	-22° 30' 26"	0.9853831	16' 13.86"	23° 26' 15"	9 m 00 s
5	254° 17' 30"	-0.67"	252° 56' 50"	-22° 30' 43"	0.9853772	16' 13.87"	23° 26' 15"	8 m 59 s
6	254° 20' 03"	-0.68"	252° 59' 33"	-22° 31' 01"	0.9853713	16' 13.88"	23° 26' 15"	8 m 58 s
7	254° 22' 35"	-0.68"	253° 02' 17"	-22° 31' 19"	0.9853653	16' 13.88"	23° 26' 15"	8 m 57 s
8	254° 25' 07"	-0.69"	253° 05' 01"	-22° 31' 37"	0.9853594	16' 13.89"	23° 26' 15"	8 m 56 s
9	254° 27' 40"	-0.69"	253° 07' 45"	-22° 31' 54"	0.9853535	16' 13.89"	23° 26' 15"	8 m 55 s
10	254° 30' 12"	-0.70"	253° 10' 29"	-22° 32' 12"	0.9853476	16' 13.90"	23° 26' 15"	8 m 54 s
11	254° 32' 44"	-0.70"	253° 13' 12"	-22° 32' 29"	0.9853417	16' 13.91"	23° 26' 15"	8 m 53 s
12	254° 35' 17"	-0.71"	253° 15' 56"	-22° 32' 47"	0.9853358	16' 13.91"	23° 26' 15"	8 m 52 s
13	254° 37' 49"	-0.71"	253° 18' 40"	-22° 33' 04"	0.9853299	16' 13.92"	23° 26' 15"	8 m 51 s
14	254° 40' 21"	-0.71"	253° 21' 24"	-22° 33' 22"	0.9853240	16' 13.92"	23° 26' 15"	8 m 50 s
15	254° 42' 53"	-0.72"	253° 24' 08"	-22° 33' 39"	0.9853181	16' 13.93"	23° 26' 15"	8 m 49 s
16	254° 45' 26"	-0.72"	253° 26' 52"	-22° 33' 56"	0.9853122	16' 13.93"	23° 26' 15"	8 m 48 s
17	254° 47' 58"	-0.73"	253° 29' 36"	-22° 34' 13"	0.9853064	16' 13.94"	23° 26' 15"	8 m 47 s
18	254° 50' 30"	-0.73"	253° 32' 20"	-22° 34' 31"	0.9853005	16' 13.95"	23° 26' 15"	8 m 46 s
19	254° 53' 03"	-0.73"	253° 35' 04"	-22° 34' 48"	0.9852946	16' 13.95"	23° 26' 15"	8 m 45 s
20	254° 55' 35"	-0.74"	253° 37' 47"	-22° 35' 05"	0.9852888	16' 13.96"	23° 26' 15"	8 m 43 s
21	254° 58' 07"	-0.74"	253° 40' 31"	-22° 35' 22"	0.9852829	16' 13.96"	23° 26' 15"	8 m 42 s
22	255° 00' 40"	-0.75"	253° 43' 15"	-22° 35' 39"	0.9852771	16' 13.97"	23° 26' 15"	8 m 41 s
23	255° 03' 12"	-0.75"	253° 45' 59"	-22° 35' 56"	0.9852713	16' 13.98"	23° 26' 15"	8 m 40 s
24	255° 05' 44"	-0.75"	253° 48' 43"	-22° 36' 13"	0.9852654	16' 13.98"	23° 26' 15"	8 m 39 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	277° 50' 55"	-3° 07' 27"	278° 45' 00"	-26° 19' 25"	1° 01' 02"	16' 37.96"	273° 34' 49"	0.04330
1	278° 28' 33"	-3° 10' 14"	279° 27' 03"	-26° 19' 50"	1° 01' 01"	16' 37.61"	273° 12' 57"	0.04541
2	279° 06' 10"	-3° 13' 00"	280° 09' 05"	-26° 20' 03"	1° 00' 60"	16' 37.24"	272° 51' 16"	0.04756
3	279° 43' 46"	-3° 15' 45"	280° 51' 04"	-26° 20' 03"	1° 00' 58"	16' 36.87"	272° 29' 45"	0.04976
4	280° 21' 20"	-3° 18' 28"	281° 33' 01"	-26° 19' 52"	1° 00' 57"	16' 36.49"	272° 8' 22"	0.05201
5	280° 58' 52"	-3° 21' 09"	282° 14' 56"	-26° 19' 28"	1° 00' 55"	16' 36.11"	271° 47' 09"	0.05430
6	281° 36' 22"	-3° 23' 49"	282° 56' 49"	-26° 18' 52"	1° 00' 54"	16' 35.71"	271° 26' 05"	0.05664
7	282° 13' 51"	-3° 26' 27"	283° 38' 38"	-26° 18' 03"	1° 00' 53"	16' 35.31"	271° 5' 09"	0.05901
8	282° 51' 18"	-3° 29' 04"	284° 20' 25"	-26° 17' 03"	1° 00' 51"	16' 34.90"	270° 44' 21"	0.06144
9	283° 28' 43"	-3° 31' 39"	285° 02' 09"	-26° 15' 51"	1° 00' 50"	16' 34.49"	270° 23' 42"	0.06390
10	284° 06' 07"	-3° 34' 12"	285° 43' 50"	-26° 14' 27"	1° 00' 48"	16' 34.06"	270° 3' 10"	0.06641
11	284° 43' 28"	-3° 36' 44"	286° 25' 27"	-26° 12' 51"	1° 00' 46"	16' 33.63"	269° 42' 46"	0.06896
12	285° 20' 48"	-3° 39' 14"	287° 07' 01"	-26° 11' 02"	1° 00' 45"	16' 33.19"	269° 22' 30"	0.07155
13	285° 58' 06"	-3° 41' 42"	287° 48' 31"	-26° 09' 03"	1° 00' 43"	16' 32.75"	269° 2' 22"	0.07418
14	286° 35' 21"	-3° 44' 08"	288° 29' 57"	-26° 06' 51"	1° 00' 41"	16' 32.30"	268° 42' 21"	0.07686
15	287° 12' 35"	-3° 46' 33"	289° 11' 19"	-26° 04' 28"	1° 00' 40"	16' 31.84"	268° 22' 28"	0.07957
16	287° 49' 47"	-3° 48' 56"	289° 52' 37"	-26° 01' 53"	1° 00' 38"	16' 31.38"	268° 2' 42"	0.08233
17	288° 26' 57"	-3° 51' 18"	290° 33' 51"	-25° 59' 06"	1° 00' 36"	16' 30.91"	267° 43' 04"	0.08512
18	289° 04' 04"	-3° 53' 37"	291° 14' 59"	-25° 56' 08"	1° 00' 35"	16' 30.43"	267° 23' 33"	0.08796
19	289° 41' 10"	-3° 55' 55"	291° 56' 04"	-25° 52' 59"	1° 00' 33"	16' 29.95"	267° 4' 10"	0.09083
20	290° 18' 13"	-3° 58' 11"	292° 37' 03"	-25° 49' 38"	1° 00' 31"	16' 29.46"	266° 44' 54"	0.09374
21	290° 55' 14"	-4° 00' 26"	293° 17' 57"	-25° 46' 06"	1° 00' 29"	16' 28.96"	266° 25' 46"	0.09669
22	291° 32' 13"	-4° 02' 38"	293° 58' 46"	-25° 42' 23"	1° 00' 27"	16' 28.46"	266° 6' 45"	0.09967
23	292° 09' 10"	-4° 04' 49"	294° 39' 30"	-25° 38' 29"	1° 00' 26"	16' 27.95"	265° 47' 52"	0.10269
24	292° 46' 04"	-4° 06' 57"	295° 20' 09"	-25° 34' 23"	1° 00' 24"	16' 27.44"	265° 29' 07"	0.10575

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	255° 05' 44"	-0.75"	253° 48' 43"	-22° 36' 13"	0.9852654	16' 13.98"	23° 26' 15"	8 m 39 s
1	255° 08' 17"	-0.76"	253° 51' 27"	-22° 36' 30"	0.9852596	16' 13.99"	23° 26' 15"	8 m 38 s
2	255° 10' 49"	-0.76"	253° 54' 11"	-22° 36' 47"	0.9852538	16' 13.99"	23° 26' 15"	8 m 37 s
3	255° 13' 21"	-0.76"	253° 56' 55"	-22° 37' 03"	0.9852480	16' 14.00"	23° 26' 15"	8 m 36 s
4	255° 15' 54"	-0.77"	253° 59' 39"	-22° 37' 20"	0.9852422	16' 14.00"	23° 26' 15"	8 m 35 s
5	255° 18' 26"	-0.77"	254° 02' 24"	-22° 37' 37"	0.9852364	16' 14.01"	23° 26' 15"	8 m 34 s
6	255° 20' 59"	-0.78"	254° 05' 08"	-22° 37' 53"	0.9852306	16' 14.02"	23° 26' 15"	8 m 33 s
7	255° 23' 31"	-0.78"	254° 07' 52"	-22° 38' 10"	0.9852248	16' 14.02"	23° 26' 15"	8 m 32 s
8	255° 26' 03"	-0.78"	254° 10' 36"	-22° 38' 27"	0.9852190	16' 14.03"	23° 26' 15"	8 m 31 s
9	255° 28' 36"	-0.79"	254° 13' 20"	-22° 38' 43"	0.9852132	16' 14.03"	23° 26' 15"	8 m 29 s
10	255° 31' 08"	-0.79"	254° 16' 04"	-22° 38' 59"	0.9852074	16' 14.04"	23° 26' 15"	8 m 28 s
11	255° 33' 40"	-0.79"	254° 18' 48"	-22° 39' 16"	0.9852016	16' 14.04"	23° 26' 15"	8 m 27 s
12	255° 36' 13"	-0.80"	254° 21' 32"	-22° 39' 32"	0.9851959	16' 14.05"	23° 26' 15"	8 m 26 s
13	255° 38' 45"	-0.80"	254° 24' 16"	-22° 39' 49"	0.9851901	16' 14.06"	23° 26' 15"	8 m 25 s
14	255° 41' 17"	-0.80"	254° 27' 01"	-22° 40' 05"	0.9851844	16' 14.06"	23° 26' 15"	8 m 24 s
15	255° 43' 50"	-0.81"	254° 29' 45"	-22° 40' 21"	0.9851786	16' 14.07"	23° 26' 15"	8 m 23 s
16	255° 46' 22"	-0.81"	254° 32' 29"	-22° 40' 37"	0.9851729	16' 14.07"	23° 26' 15"	8 m 22 s
17	255° 48' 54"	-0.81"	254° 35' 13"	-22° 40' 53"	0.9851672	16' 14.08"	23° 26' 15"	8 m 21 s
18	255° 51' 27"	-0.81"	254° 37' 57"	-22° 41' 09"	0.9851614	16' 14.08"	23° 26' 15"	8 m 20 s
19	255° 53' 59"	-0.82"	254° 40' 42"	-22° 41' 26"	0.9851557	16' 14.09"	23° 26' 15"	8 m 19 s
20	255° 56' 31"	-0.82"	254° 43' 26"	-22° 41' 42"	0.9851500	16' 14.10"	23° 26' 15"	8 m 17 s
21	255° 59' 04"	-0.82"	254° 46' 10"	-22° 41' 57"	0.9851443	16' 14.10"	23° 26' 15"	8 m 16 s
22	256° 01' 36"	-0.83"	254° 48' 54"	-22° 42' 13"	0.9851386	16' 14.11"	23° 26' 15"	8 m 15 s
23	256° 04' 09"	-0.83"	254° 51' 39"	-22° 42' 29"	0.9851329	16' 14.11"	23° 26' 15"	8 m 14 s
24	256° 06' 41"	-0.83"	254° 54' 23"	-22° 42' 45"	0.9851272	16' 14.12"	23° 26' 15"	8 m 13 s

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Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	292° 46' 04"	-4° 06' 57"	295° 20' 09"	-25° 34' 23"	1° 00' 24"	16' 27.44"	265° 29' 07"	0.10575
1	293° 22' 57"	-4° 09' 04"	296° 00' 42"	-25° 30' 07"	1° 00' 22"	16' 26.92"	265° 10' 29"	0.10884
2	293° 59' 47"	-4° 11' 09"	296° 41' 09"	-25° 25' 40"	1° 00' 20"	16' 26.40"	264° 51' 59"	0.11197
3	294° 36' 34"	-4° 13' 12"	297° 21' 30"	-25° 21' 02"	1° 00' 18"	16' 25.87"	264° 33' 37"	0.11514
4	295° 13' 20"	-4° 15' 14"	298° 01' 46"	-25° 16' 14"	1° 00' 16"	16' 25.33"	264° 15' 23"	0.11834
5	295° 50' 02"	-4° 17' 13"	298° 41' 55"	-25° 11' 15"	1° 00' 14"	16' 24.79"	263° 57' 17"	0.12157
6	296° 26' 43"	-4° 19' 11"	299° 21' 59"	-25° 06' 05"	1° 00' 12"	16' 24.25"	263° 39' 18"	0.12483
7	297° 03' 21"	-4° 21' 06"	300° 01' 56"	-25° 00' 45"	1° 00' 10"	16' 23.70"	263° 21' 28"	0.12813
8	297° 39' 57"	-4° 22' 60"	300° 41' 46"	-24° 55' 15"	1° 00' 08"	16' 23.15"	263° 3' 45"	0.13146
9	298° 16' 30"	-4° 24' 52"	301° 21' 30"	-24° 49' 35"	1° 00' 06"	16' 22.59"	262° 46' 11"	0.13482
10	298° 53' 01"	-4° 26' 42"	302° 01' 08"	-24° 43' 45"	1° 00' 04"	16' 22.02"	262° 28' 45"	0.13821
11	299° 29' 29"	-4° 28' 29"	302° 40' 39"	-24° 37' 45"	1° 00' 02"	16' 21.46"	262° 11' 27"	0.14164
12	300° 05' 54"	-4° 30' 15"	303° 20' 03"	-24° 31' 34"	0° 59' 60"	16' 20.88"	261° 54' 18"	0.14509
13	300° 42' 17"	-4° 31' 59"	303° 59' 20"	-24° 25' 15"	0° 59' 57"	16' 20.31"	261° 37' 16"	0.14858
14	301° 18' 38"	-4° 33' 41"	304° 38' 30"	-24° 18' 45"	0° 59' 55"	16' 19.73"	261° 20' 24"	0.15209
15	301° 54' 56"	-4° 35' 22"	305° 17' 34"	-24° 12' 06"	0° 59' 53"	16' 19.14"	261° 3' 39"	0.15563
16	302° 31' 11"	-4° 36' 60"	305° 56' 30"	-24° 05' 18"	0° 59' 51"	16' 18.56"	260° 47' 04"	0.15920
17	303° 07' 24"	-4° 38' 36"	306° 35' 19"	-23° 58' 20"	0° 59' 49"	16' 17.97"	260° 30' 36"	0.16280
18	303° 43' 34"	-4° 40' 10"	307° 14' 01"	-23° 51' 13"	0° 59' 47"	16' 17.37"	260° 14' 18"	0.16642
19	304° 19' 42"	-4° 41' 42"	307° 52' 35"	-23° 43' 57"	0° 59' 45"	16' 16.77"	259° 58' 08"	0.17007
20	304° 55' 46"	-4° 43' 13"	308° 31' 02"	-23° 36' 32"	0° 59' 42"	16' 16.17"	259° 42' 07"	0.17375
21	305° 31' 48"	-4° 44' 41"	309° 09' 22"	-23° 28' 58"	0° 59' 40"	16' 15.57"	259° 26' 15"	0.17746
22	306° 07' 48"	-4° 46' 07"	309° 47' 34"	-23° 21' 16"	0° 59' 38"	16' 14.96"	259° 10' 31"	0.18118
23	306° 43' 44"	-4° 47' 31"	310° 25' 39"	-23° 13' 24"	0° 59' 36"	16' 14.35"	258° 54' 57"	0.18494
24	307° 19' 38"	-4° 48' 54"	311° 03' 36"	-23° 05' 25"	0° 59' 33"	16' 13.73"	258° 39' 31"	0.18872

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	256° 06' 41"	-0.83"	254° 54' 23"	-22° 42' 45"	0.9851272	16' 14.12"	23° 26' 15"	8 m 13 s
1	256° 09' 13"	-0.83"	254° 57' 07"	-22° 43' 01"	0.9851215	16' 14.12"	23° 26' 15"	8 m 12 s
2	256° 11' 46"	-0.84"	254° 59' 52"	-22° 43' 17"	0.9851158	16' 14.13"	23° 26' 15"	8 m 11 s
3	256° 14' 18"	-0.84"	255° 02' 36"	-22° 43' 32"	0.9851101	16' 14.13"	23° 26' 15"	8 m 10 s
4	256° 16' 50"	-0.84"	255° 05' 20"	-22° 43' 48"	0.9851045	16' 14.14"	23° 26' 15"	8 m 09 s
5	256° 19' 23"	-0.84"	255° 08' 05"	-22° 44' 03"	0.9850988	16' 14.15"	23° 26' 15"	8 m 08 s
6	256° 21' 55"	-0.85"	255° 10' 49"	-22° 44' 19"	0.9850932	16' 14.15"	23° 26' 15"	8 m 07 s
7	256° 24' 28"	-0.85"	255° 13' 33"	-22° 44' 34"	0.9850875	16' 14.16"	23° 26' 15"	8 m 05 s
8	256° 26' 60"	-0.85"	255° 16' 18"	-22° 44' 50"	0.9850819	16' 14.16"	23° 26' 15"	8 m 04 s
9	256° 29' 32"	-0.85"	255° 19' 02"	-22° 45' 05"	0.9850762	16' 14.17"	23° 26' 15"	8 m 03 s
10	256° 32' 05"	-0.86"	255° 21' 47"	-22° 45' 21"	0.9850706	16' 14.17"	23° 26' 15"	8 m 02 s
11	256° 34' 37"	-0.86"	255° 24' 31"	-22° 45' 36"	0.9850650	16' 14.18"	23° 26' 15"	8 m 01 s
12	256° 37' 09"	-0.86"	255° 27' 15"	-22° 45' 51"	0.9850594	16' 14.18"	23° 26' 15"	7 m 59 s
13	256° 39' 42"	-0.86"	255° 29' 60"	-22° 46' 06"	0.9850537	16' 14.19"	23° 26' 15"	7 m 58 s
14	256° 42' 14"	-0.87"	255° 32' 44"	-22° 46' 21"	0.9850481	16' 14.20"	23° 26' 15"	7 m 57 s
15	256° 44' 47"	-0.87"	255° 35' 29"	-22° 46' 37"	0.9850425	16' 14.20"	23° 26' 15"	7 m 55 s
16	256° 47' 19"	-0.87"	255° 38' 13"	-22° 46' 52"	0.9850370	16' 14.21"	23° 26' 15"	7 m 54 s
17	256° 49' 51"	-0.87"	255° 40' 58"	-22° 47' 07"	0.9850314	16' 14.21"	23° 26' 15"	7 m 53 s
18	256° 52' 24"	-0.87"	255° 43' 42"	-22° 47' 22"	0.9850258	16' 14.22"	23° 26' 15"	7 m 52 s
19	256° 54' 56"	-0.88"	255° 46' 27"	-22° 47' 37"	0.9850202	16' 14.22"	23° 26' 15"	7 m 51 s
20	256° 57' 29"	-0.88"	255° 49' 11"	-22° 47' 51"	0.9850147	16' 14.23"	23° 26' 15"	7 m 50 s
21	257° 00' 01"	-0.88"	255° 51' 56"	-22° 48' 06"	0.9850091	16' 14.23"	23° 26' 15"	7 m 49 s
22	257° 02' 33"	-0.88"	255° 54' 40"	-22° 48' 21"	0.9850035	16' 14.24"	23° 26' 15"	7 m 48 s
23	257° 05' 06"	-0.88"	255° 57' 25"	-22° 48' 36"	0.9849980	16' 14.25"	23° 26' 15"	7 m 47 s
24	257° 07' 38"	-0.88"	256° 00' 09"	-22° 48' 50"	0.9849925	16' 14.25"	23° 26' 15"	7 m 47 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	307° 19' 38"	-4° 48' 54"	311° 03' 36"	-23° 05' 25"	0° 59' 33"	16' 13.73"	258° 39' 31"	0.18872
1	307° 55' 30"	-4° 50' 14"	311° 41' 26"	-22° 57' 17"	0° 59' 31"	16' 13.12"	258° 24' 15"	0.19252
2	308° 31' 18"	-4° 51' 32"	312° 19' 07"	-22° 49' 00"	0° 59' 29"	16' 12.50"	258° 9' 07"	0.19634
3	309° 07' 04"	-4° 52' 49"	312° 56' 42"	-22° 40' 36"	0° 59' 27"	16' 11.88"	257° 54' 08"	0.20019
4	309° 42' 47"	-4° 54' 03"	313° 34' 08"	-22° 32' 03"	0° 59' 24"	16' 11.25"	257° 39' 19"	0.20406
5	310° 18' 27"	-4° 55' 15"	314° 11' 27"	-22° 23' 22"	0° 59' 22"	16' 10.63"	257° 24' 38"	0.20795
6	310° 54' 04"	-4° 56' 26"	314° 48' 38"	-22° 14' 34"	0° 59' 20"	16' 10.00"	257° 10' 07"	0.21186
7	311° 29' 39"	-4° 57' 34"	315° 25' 42"	-22° 05' 38"	0° 59' 17"	16' 09.37"	256° 55' 45"	0.21579
8	312° 05' 10"	-4° 58' 40"	316° 02' 37"	-21° 56' 34"	0° 59' 15"	16' 08.73"	256° 41' 32"	0.21974
9	312° 40' 39"	-4° 59' 45"	316° 39' 25"	-21° 47' 23"	0° 59' 13"	16' 08.10"	256° 27' 29"	0.22372
10	313° 16' 05"	-5° 00' 47"	317° 16' 05"	-21° 38' 05"	0° 59' 10"	16' 07.46"	256° 13' 34"	0.22771
11	313° 51' 28"	-5° 01' 47"	317° 52' 37"	-21° 28' 39"	0° 59' 08"	16' 06.83"	255° 59' 49"	0.23172
12	314° 26' 49"	-5° 02' 46"	318° 29' 02"	-21° 19' 06"	0° 59' 06"	16' 06.19"	255° 46' 13"	0.23575
13	315° 02' 06"	-5° 03' 42"	319° 05' 19"	-21° 09' 27"	0° 59' 03"	16' 05.55"	255° 32' 47"	0.23979
14	315° 37' 21"	-5° 04' 36"	319° 41' 27"	-20° 59' 40"	0° 59' 01"	16' 04.90"	255° 19' 29"	0.24386
15	316° 12' 33"	-5° 05' 29"	320° 17' 28"	-20° 49' 46"	0° 58' 59"	16' 04.26"	255° 6' 21"	0.24794
16	316° 47' 42"	-5° 06' 19"	320° 53' 22"	-20° 39' 46"	0° 58' 56"	16' 03.62"	254° 53' 23"	0.25204
17	317° 22' 48"	-5° 07' 07"	321° 29' 07"	-20° 29' 40"	0° 58' 54"	16' 02.97"	254° 40' 34"	0.25615
18	317° 57' 51"	-5° 07' 54"	322° 04' 45"	-20° 19' 26"	0° 58' 51"	16' 02.32"	254° 27' 54"	0.26028
19	318° 32' 51"	-5° 08' 38"	322° 40' 15"	-20° 09' 07"	0° 58' 49"	16' 01.68"	254° 15' 23"	0.26442
20	319° 07' 48"	-5° 09' 21"	323° 15' 37"	-19° 58' 41"	0° 58' 47"	16' 01.03"	254° 3' 02"	0.26858
21	319° 42' 43"	-5° 10' 01"	323° 50' 52"	-19° 48' 09"	0° 58' 44"	16' 00.38"	253° 50' 50"	0.27275
22	320° 17' 35"	-5° 10' 40"	324° 25' 59"	-19° 37' 32"	0° 58' 42"	15' 59.73"	253° 38' 48"	0.27693
23	320° 52' 23"	-5° 11' 17"	325° 00' 58"	-19° 26' 48"	0° 58' 40"	15' 59.08"	253° 26' 55"	0.28113
24	321° 27' 09"	-5° 11' 51"	325° 35' 50"	-19° 15' 59"	0° 58' 37"	15' 58.43"	253° 15' 11"	0.28534

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	257° 07' 38"	-0.88"	256° 00' 09"	-22° 48' 50"	0.9849925	16' 14.25"	23° 26' 15"	7 m 47 s
1	257° 10' 11"	-0.89"	256° 02' 54"	-22° 49' 05"	0.9849869	16' 14.26"	23° 26' 15"	7 m 45 s
2	257° 12' 43"	-0.89"	256° 05' 39"	-22° 49' 20"	0.9849814	16' 14.26"	23° 26' 15"	7 m 44 s
3	257° 15' 15"	-0.89"	256° 08' 23"	-22° 49' 34"	0.9849759	16' 14.27"	23° 26' 15"	7 m 43 s
4	257° 17' 48"	-0.89"	256° 11' 08"	-22° 49' 49"	0.9849704	16' 14.27"	23° 26' 15"	7 m 42 s
5	257° 20' 20"	-0.89"	256° 13' 52"	-22° 50' 03"	0.9849649	16' 14.28"	23° 26' 15"	7 m 41 s
6	257° 22' 53"	-0.89"	256° 16' 37"	-22° 50' 18"	0.9849594	16' 14.28"	23° 26' 15"	7 m 40 s
7	257° 25' 25"	-0.89"	256° 19' 22"	-22° 50' 32"	0.9849539	16' 14.29"	23° 26' 15"	7 m 39 s
8	257° 27' 57"	-0.89"	256° 22' 06"	-22° 50' 46"	0.9849484	16' 14.29"	23° 26' 15"	7 m 38 s
9	257° 30' 30"	-0.90"	256° 24' 51"	-22° 51' 01"	0.9849429	16' 14.30"	23° 26' 15"	7 m 37 s
10	257° 33' 02"	-0.90"	256° 27' 36"	-22° 51' 15"	0.9849375	16' 14.31"	23° 26' 15"	7 m 35 s
11	257° 35' 35"	-0.90"	256° 30' 20"	-22° 51' 29"	0.9849320	16' 14.31"	23° 26' 15"	7 m 34 s
12	257° 38' 07"	-0.90"	256° 33' 05"	-22° 51' 43"	0.9849265	16' 14.32"	23° 26' 15"	7 m 33 s
13	257° 40' 39"	-0.90"	256° 35' 50"	-22° 51' 57"	0.9849211	16' 14.32"	23° 26' 15"	7 m 32 s
14	257° 43' 12"	-0.90"	256° 38' 34"	-22° 52' 11"	0.9849156	16' 14.33"	23° 26' 15"	7 m 31 s
15	257° 45' 44"	-0.90"	256° 41' 19"	-22° 52' 25"	0.9849102	16' 14.33"	23° 26' 15"	7 m 30 s
16	257° 48' 17"	-0.90"	256° 44' 04"	-22° 52' 39"	0.9849048	16' 14.34"	23° 26' 15"	7 m 29 s
17	257° 50' 49"	-0.90"	256° 46' 49"	-22° 52' 53"	0.9848994	16' 14.34"	23° 26' 15"	7 m 28 s
18	257° 53' 22"	-0.90"	256° 49' 33"	-22° 53' 07"	0.9848939	16' 14.35"	23° 26' 15"	7 m 26 s
19	257° 55' 54"	-0.90"	256° 52' 18"	-22° 53' 21"	0.9848885	16' 14.35"	23° 26' 15"	7 m 25 s
20	257° 58' 26"	-0.90"	256° 55' 03"	-22° 53' 34"	0.9848831	16' 14.36"	23° 26' 15"	7 m 24 s
21	258° 00' 59"	-0.91"	256° 57' 48"	-22° 53' 48"	0.9848778	16' 14.36"	23° 26' 15"	7 m 23 s
22	258° 03' 31"	-0.91"	257° 00' 33"	-22° 54' 02"	0.9848724	16' 14.37"	23° 26' 15"	7 m 22 s
23	258° 06' 04"	-0.91"	257° 03' 17"	-22° 54' 15"	0.9848670	16' 14.38"	23° 26' 15"	7 m 21 s
24	258° 08' 36"	-0.91"	257° 06' 02"	-22° 54' 29"	0.9848616	16' 14.38"	23° 26' 15"	7 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	321° 27' 09"	-5° 11' 51"	325° 35' 50"	-19° 15' 59"	0° 58' 37"	15' 58.43"	253° 15' 11"	0.28534
1	322° 01' 52"	-5° 12' 24"	326° 10' 34"	-19° 05' 04"	0° 58' 35"	15' 57.78"	253° 3' 37"	0.28956
2	322° 36' 32"	-5° 12' 55"	326° 45' 10"	-18° 54' 03"	0° 58' 32"	15' 57.13"	252° 52' 12"	0.29380
3	323° 11' 09"	-5° 13' 23"	327° 19' 39"	-18° 42' 57"	0° 58' 30"	15' 56.48"	252° 40' 56"	0.29804
4	323° 45' 43"	-5° 13' 50"	327° 54' 01"	-18° 31' 45"	0° 58' 28"	15' 55.83"	252° 29' 49"	0.30230
5	324° 20' 15"	-5° 14' 15"	328° 28' 15"	-18° 20' 29"	0° 58' 25"	15' 55.18"	252° 18' 52"	0.30657
6	324° 54' 43"	-5° 14' 38"	329° 02' 22"	-18° 09' 07"	0° 58' 23"	15' 54.53"	252° 8' 05"	0.31085
7	325° 29' 09"	-5° 14' 59"	329° 36' 21"	-17° 57' 40"	0° 58' 21"	15' 53.88"	251° 57' 26"	0.31513
8	326° 03' 31"	-5° 15' 18"	330° 10' 13"	-17° 46' 08"	0° 58' 18"	15' 53.23"	251° 46' 57"	0.31943
9	326° 37' 51"	-5° 15' 36"	330° 43' 58"	-17° 34' 32"	0° 58' 16"	15' 52.59"	251° 36' 37"	0.32373
10	327° 12' 08"	-5° 15' 51"	331° 17' 36"	-17° 22' 51"	0° 58' 13"	15' 51.94"	251° 26' 26"	0.32804
11	327° 46' 22"	-5° 16' 04"	331° 51' 06"	-17° 11' 05"	0° 58' 11"	15' 51.29"	251° 16' 25"	0.33236
12	328° 20' 33"	-5° 16' 16"	332° 24' 30"	-16° 59' 14"	0° 58' 09"	15' 50.64"	251° 6' 32"	0.33669
13	328° 54' 42"	-5° 16' 26"	332° 57' 46"	-16° 47' 20"	0° 58' 06"	15' 50.00"	250° 56' 49"	0.34103
14	329° 28' 47"	-5° 16' 33"	333° 30' 56"	-16° 35' 20"	0° 58' 04"	15' 49.35"	250° 47' 15"	0.34537
15	330° 02' 50"	-5° 16' 39"	334° 03' 58"	-16° 23' 17"	0° 58' 02"	15' 48.71"	250° 37' 50"	0.34972
16	330° 36' 49"	-5° 16' 44"	334° 36' 54"	-16° 11' 10"	0° 57' 59"	15' 48.07"	250° 28' 34"	0.35407
17	331° 10' 46"	-5° 16' 46"	335° 09' 42"	-15° 58' 58"	0° 57' 57"	15' 47.43"	250° 19' 28"	0.35843
18	331° 44' 40"	-5° 16' 46"	335° 42' 24"	-15° 46' 43"	0° 57' 54"	15' 46.79"	250° 10' 30"	0.36279
19	332° 18' 31"	-5° 16' 45"	336° 14' 60"	-15° 34' 23"	0° 57' 52"	15' 46.15"	250° 1' 42"	0.36716
20	332° 52' 20"	-5° 16' 41"	336° 47' 28"	-15° 22' 00"	0° 57' 50"	15' 45.51"	249° 53' 02"	0.37153
21	333° 26' 05"	-5° 16' 36"	337° 19' 51"	-15° 09' 34"	0° 57' 47"	15' 44.87"	249° 44' 31"	0.37591
22	333° 59' 48"	-5° 16' 29"	337° 52' 06"	-14° 57' 04"	0° 57' 45"	15' 44.24"	249° 36' 10"	0.38029
23	334° 33' 28"	-5° 16' 21"	338° 24' 15"	-14° 44' 30"	0° 57' 43"	15' 43.61"	249° 27' 57"	0.38467
24	335° 07' 05"	-5° 16' 10"	338° 56' 18"	-14° 31' 53"	0° 57' 40"	15' 42.97"	249° 19' 53"	0.38906

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	258° 08' 36"	-0.91"	257° 06' 02"	-22° 54' 29"	0.9848616	16' 14.38"	23° 26' 15"	7 m 20 s
1	258° 11' 09"	-0.91"	257° 08' 47"	-22° 54' 42"	0.9848563	16' 14.39"	23° 26' 15"	7 m 19 s
2	258° 13' 41"	-0.91"	257° 11' 32"	-22° 54' 56"	0.9848509	16' 14.39"	23° 26' 15"	7 m 17 s
3	258° 16' 13"	-0.91"	257° 14' 17"	-22° 55' 09"	0.9848456	16' 14.40"	23° 26' 15"	7 m 16 s
4	258° 18' 46"	-0.91"	257° 17' 02"	-22° 55' 23"	0.9848402	16' 14.40"	23° 26' 15"	7 m 15 s
5	258° 21' 18"	-0.91"	257° 19' 46"	-22° 55' 36"	0.9848349	16' 14.41"	23° 26' 15"	7 m 14 s
6	258° 23' 51"	-0.91"	257° 22' 31"	-22° 55' 49"	0.9848296	16' 14.41"	23° 26' 15"	7 m 13 s
7	258° 26' 23"	-0.91"	257° 25' 16"	-22° 56' 03"	0.9848242	16' 14.42"	23° 26' 15"	7 m 12 s
8	258° 28' 56"	-0.91"	257° 28' 01"	-22° 56' 16"	0.9848189	16' 14.42"	23° 26' 15"	7 m 11 s
9	258° 31' 28"	-0.91"	257° 30' 46"	-22° 56' 29"	0.9848136	16' 14.43"	23° 26' 15"	7 m 09 s
10	258° 34' 00"	-0.91"	257° 33' 31"	-22° 56' 42"	0.9848083	16' 14.43"	23° 26' 15"	7 m 08 s
11	258° 36' 33"	-0.91"	257° 36' 16"	-22° 56' 55"	0.9848030	16' 14.44"	23° 26' 15"	7 m 07 s
12	258° 39' 05"	-0.91"	257° 39' 01"	-22° 57' 08"	0.9847978	16' 14.44"	23° 26' 15"	7 m 06 s
13	258° 41' 38"	-0.91"	257° 41' 46"	-22° 57' 21"	0.9847925	16' 14.45"	23° 26' 15"	7 m 05 s
14	258° 44' 10"	-0.91"	257° 44' 31"	-22° 57' 34"	0.9847872	16' 14.45"	23° 26' 15"	7 m 04 s
15	258° 46' 43"	-0.91"	257° 47' 16"	-22° 57' 47"	0.9847820	16' 14.46"	23° 26' 15"	7 m 03 s
16	258° 49' 15"	-0.90"	257° 50' 01"	-22° 57' 59"	0.9847767	16' 14.46"	23° 26' 15"	7 m 01 s
17	258° 51' 47"	-0.90"	257° 52' 46"	-22° 58' 12"	0.9847715	16' 14.47"	23° 26' 15"	7 m 00 s
18	258° 54' 20"	-0.90"	257° 55' 31"	-22° 58' 25"	0.9847662	16' 14.47"	23° 26' 15"	6 m 59 s
19	258° 56' 52"	-0.90"	257° 58' 16"	-22° 58' 38"	0.9847610	16' 14.48"	23° 26' 15"	6 m 58 s
20	258° 59' 25"	-0.90"	258° 01' 01"	-22° 58' 50"	0.9847558	16' 14.49"	23° 26' 15"	6 m 57 s
21	259° 01' 57"	-0.90"	258° 03' 46"	-22° 59' 03"	0.9847506	16' 14.49"	23° 26' 15"	6 m 56 s
22	259° 04' 30"	-0.90"	258° 06' 31"	-22° 59' 15"	0.9847454	16' 14.50"	23° 26' 15"	6 m 55 s
23	259° 07' 02"	-0.90"	258° 09' 16"	-22° 59' 28"	0.9847402	16' 14.50"	23° 26' 15"	6 m 53 s
24	259° 09' 35"	-0.90"	258° 12' 01"	-22° 59' 40"	0.9847350	16' 14.51"	23° 26' 15"	6 m 52 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	335° 07' 05"	-5° 16' 10"	338° 56' 18"	-14° 31' 53"	0° 57' 40"	15' 42.97"	249° 19' 53"	0.38906
1	335° 40' 39"	-5° 15' 58"	339° 28' 15"	-14° 19' 12"	0° 57' 38"	15' 42.34"	249° 11' 58"	0.39345
2	336° 14' 11"	-5° 15' 44"	340° 00' 05"	-14° 06' 29"	0° 57' 36"	15' 41.72"	249° 4' 12"	0.39784
3	336° 47' 39"	-5° 15' 28"	340° 31' 49"	-13° 53' 42"	0° 57' 34"	15' 41.09"	248° 56' 35"	0.40223
4	337° 21' 05"	-5° 15' 10"	341° 03' 27"	-13° 40' 52"	0° 57' 31"	15' 40.47"	248° 49' 06"	0.40662
5	337° 54' 29"	-5° 14' 51"	341° 34' 59"	-13° 27' 59"	0° 57' 29"	15' 39.84"	248° 41' 47"	0.41102
6	338° 27' 49"	-5° 14' 30"	342° 06' 26"	-13° 15' 04"	0° 57' 27"	15' 39.22"	248° 34' 36"	0.41541
7	339° 01' 07"	-5° 14' 07"	342° 37' 46"	-13° 02' 05"	0° 57' 24"	15' 38.61"	248° 27' 33"	0.41980
8	339° 34' 22"	-5° 13' 43"	343° 09' 00"	-12° 49' 04"	0° 57' 22"	15' 37.99"	248° 20' 40"	0.42420
9	340° 07' 34"	-5° 13' 16"	343° 40' 09"	-12° 36' 01"	0° 57' 20"	15' 37.38"	248° 13' 55"	0.42859
10	340° 40' 44"	-5° 12' 48"	344° 11' 12"	-12° 22' 54"	0° 57' 18"	15' 36.76"	248° 7' 18"	0.43299
11	341° 13' 51"	-5° 12' 19"	344° 42' 09"	-12° 09' 46"	0° 57' 15"	15' 36.15"	248° 0' 50"	0.43738
12	341° 46' 55"	-5° 11' 47"	345° 13' 01"	-11° 56' 34"	0° 57' 13"	15' 35.55"	247° 54' 31"	0.44177
13	342° 19' 57"	-5° 11' 14"	345° 43' 48"	-11° 43' 21"	0° 57' 11"	15' 34.94"	247° 48' 20"	0.44616
14	342° 52' 56"	-5° 10' 39"	346° 14' 29"	-11° 30' 05"	0° 57' 09"	15' 34.34"	247° 42' 18"	0.45054
15	343° 25' 52"	-5° 10' 03"	346° 45' 05"	-11° 16' 47"	0° 57' 07"	15' 33.74"	247° 36' 24"	0.45493
16	343° 58' 46"	-5° 09' 25"	347° 15' 35"	-11° 03' 27"	0° 57' 04"	15' 33.14"	247° 30' 38"	0.45931
17	344° 31' 37"	-5° 08' 45"	347° 46' 01"	-10° 50' 05"	0° 57' 02"	15' 32.55"	247° 25' 01"	0.46369
18	345° 04' 25"	-5° 08' 04"	348° 16' 21"	-10° 36' 42"	0° 57' 00"	15' 31.96"	247° 19' 32"	0.46806
19	345° 37' 11"	-5° 07' 21"	348° 46' 37"	-10° 23' 16"	0° 56' 58"	15' 31.37"	247° 14' 12"	0.47243
20	346° 09' 55"	-5° 06' 37"	349° 16' 47"	-10° 09' 48"	0° 56' 56"	15' 30.78"	247° 8' 59"	0.47680
21	346° 42' 35"	-5° 05' 50"	349° 46' 53"	-9° 56' 19"	0° 56' 54"	15' 30.20"	247° 3' 55"	0.48116
22	347° 15' 14"	-5° 05' 03"	350° 16' 54"	-9° 42' 48"	0° 56' 51"	15' 29.62"	246° 58' 60"	0.48552
23	347° 47' 49"	-5° 04' 13"	350° 46' 50"	-9° 29' 15"	0° 56' 49"	15' 29.04"	246° 54' 12"	0.48987
24	348° 20' 22"	-5° 03' 23"	351° 16' 42"	-9° 15' 41"	0° 56' 47"	15' 28.47"	246° 49' 33"	0.49422

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	259° 09' 35"	-0.90"	258° 12' 01"	-22° 59' 40"	0.9847350	16' 14.51"	23° 26' 15"	6 m 52 s
1	259° 12' 07"	-0.90"	258° 14' 46"	-22° 59' 53"	0.9847298	16' 14.51"	23° 26' 15"	6 m 51 s
2	259° 14' 40"	-0.90"	258° 17' 31"	-23° 00' 05"	0.9847247	16' 14.52"	23° 26' 15"	6 m 50 s
3	259° 17' 12"	-0.90"	258° 20' 16"	-23° 00' 17"	0.9847195	16' 14.52"	23° 26' 15"	6 m 49 s
4	259° 19' 44"	-0.89"	258° 23' 01"	-23° 00' 29"	0.9847143	16' 14.53"	23° 26' 15"	6 m 48 s
5	259° 22' 17"	-0.89"	258° 25' 46"	-23° 00' 42"	0.9847092	16' 14.53"	23° 26' 15"	6 m 47 s
6	259° 24' 49"	-0.89"	258° 28' 31"	-23° 00' 54"	0.9847041	16' 14.54"	23° 26' 15"	6 m 45 s
7	259° 27' 22"	-0.89"	258° 31' 16"	-23° 01' 06"	0.9846989	16' 14.54"	23° 26' 15"	6 m 44 s
8	259° 29' 54"	-0.89"	258° 34' 02"	-23° 01' 18"	0.9846938	16' 14.55"	23° 26' 15"	6 m 43 s
9	259° 32' 27"	-0.89"	258° 36' 47"	-23° 01' 30"	0.9846887	16' 14.55"	23° 26' 15"	6 m 42 s
10	259° 34' 59"	-0.89"	258° 39' 32"	-23° 01' 42"	0.9846836	16' 14.56"	23° 26' 15"	6 m 41 s
11	259° 37' 32"	-0.88"	258° 42' 17"	-23° 01' 54"	0.9846785	16' 14.56"	23° 26' 15"	6 m 40 s
12	259° 40' 04"	-0.88"	258° 45' 02"	-23° 02' 06"	0.9846734	16' 14.57"	23° 26' 15"	6 m 38 s
13	259° 42' 37"	-0.88"	258° 47' 47"	-23° 02' 17"	0.9846683	16' 14.57"	23° 26' 15"	6 m 37 s
14	259° 45' 09"	-0.88"	258° 50' 33"	-23° 02' 29"	0.9846633	16' 14.58"	23° 26' 15"	6 m 36 s
15	259° 47' 41"	-0.88"	258° 53' 18"	-23° 02' 41"	0.9846582	16' 14.58"	23° 26' 15"	6 m 35 s
16	259° 50' 14"	-0.88"	258° 56' 03"	-23° 02' 52"	0.9846531	16' 14.59"	23° 26' 15"	6 m 34 s
17	259° 52' 46"	-0.87"	258° 58' 48"	-23° 03' 04"	0.9846481	16' 14.59"	23° 26' 15"	6 m 33 s
18	259° 55' 19"	-0.87"	259° 01' 33"	-23° 03' 16"	0.9846430	16' 14.60"	23° 26' 15"	6 m 32 s
19	259° 57' 51"	-0.87"	259° 04' 19"	-23° 03' 27"	0.9846380	16' 14.60"	23° 26' 15"	6 m 30 s
20	260° 00' 24"	-0.87"	259° 07' 04"	-23° 03' 39"	0.9846330	16' 14.61"	23° 26' 15"	6 m 29 s
21	260° 02' 56"	-0.87"	259° 09' 49"	-23° 03' 50"	0.9846280	16' 14.61"	23° 26' 15"	6 m 28 s
22	260° 05' 29"	-0.86"	259° 12' 34"	-23° 04' 01"	0.9846230	16' 14.62"	23° 26' 15"	6 m 27 s
23	260° 08' 01"	-0.86"	259° 15' 20"	-23° 04' 13"	0.9846180	16' 14.62"	23° 26' 15"	6 m 26 s
24	260° 10' 34"	-0.86"	259° 18' 05"	-23° 04' 24"	0.9846130	16' 14.63"	23° 26' 15"	6 m 25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	348° 20' 22"	-5° 03' 23"	351° 16' 42"	-9° 15' 41"	0° 56' 47"	15' 28.47"	246° 49' 33"	0.49422
1	348° 52' 53"	-5° 02' 30"	351° 46' 29"	-9° 02' 06"	0° 56' 45"	15' 27.90"	246° 45' 01"	0.49856
2	349° 25' 21"	-5° 01' 36"	352° 16' 12"	-8° 48' 29"	0° 56' 43"	15' 27.33"	246° 40' 38"	0.50290
3	349° 57' 47"	-5° 00' 41"	352° 45' 50"	-8° 34' 50"	0° 56' 41"	15' 26.76"	246° 36' 23"	0.50723
4	350° 30' 10"	-4° 59' 44"	353° 15' 24"	-8° 21' 11"	0° 56' 39"	15' 26.20"	246° 32' 16"	0.51155
5	351° 02' 31"	-4° 58' 45"	353° 44' 54"	-8° 07' 30"	0° 56' 37"	15' 25.64"	246° 28' 17"	0.51587
6	351° 34' 49"	-4° 57' 45"	354° 14' 20"	-7° 53' 48"	0° 56' 35"	15' 25.08"	246° 24' 26"	0.52018
7	352° 07' 05"	-4° 56' 44"	354° 43' 41"	-7° 40' 05"	0° 56' 33"	15' 24.53"	246° 20' 43"	0.52448
8	352° 39' 19"	-4° 55' 41"	355° 12' 59"	-7° 26' 21"	0° 56' 31"	15' 23.98"	246° 17' 08"	0.52878
9	353° 11' 30"	-4° 54' 36"	355° 42' 13"	-7° 12' 36"	0° 56' 29"	15' 23.43"	246° 13' 41"	0.53307
10	353° 43' 39"	-4° 53' 30"	356° 11' 23"	-6° 58' 51"	0° 56' 27"	15' 22.89"	246° 10' 21"	0.53735
11	354° 15' 46"	-4° 52' 23"	356° 40' 29"	-6° 45' 04"	0° 56' 25"	15' 22.35"	246° 7' 10"	0.54162
12	354° 47' 50"	-4° 51' 14"	357° 09' 32"	-6° 31' 17"	0° 56' 23"	15' 21.81"	246° 4' 06"	0.54588
13	355° 19' 52"	-4° 50' 04"	357° 38' 31"	-6° 17' 29"	0° 56' 21"	15' 21.28"	246° 1' 10"	0.55014
14	355° 51' 51"	-4° 48' 52"	358° 07' 26"	-6° 03' 40"	0° 56' 19"	15' 20.75"	245° 58' 22"	0.55438
15	356° 23' 49"	-4° 47' 39"	358° 36' 18"	-5° 49' 50"	0° 56' 17"	15' 20.22"	245° 55' 42"	0.55862
16	356° 55' 44"	-4° 46' 24"	359° 05' 07"	-5° 36' 01"	0° 56' 15"	15' 19.70"	245° 53' 09"	0.56285
17	357° 27' 36"	-4° 45' 08"	359° 33' 52"	-5° 22' 10"	0° 56' 13"	15' 19.18"	245° 50' 44"	0.56706
18	357° 59' 27"	-4° 43' 51"	0° 02' 35"	-5° 08' 19"	0° 56' 11"	15' 18.66"	245° 48' 27"	0.57127
19	358° 31' 15"	-4° 42' 32"	0° 31' 14"	-4° 54' 28"	0° 56' 09"	15' 18.15"	245° 46' 17"	0.57547
20	359° 03' 01"	-4° 41' 12"	0° 59' 50"	-4° 40' 37"	0° 56' 08"	15' 17.64"	245° 44' 15"	0.57965
21	359° 34' 45"	-4° 39' 51"	1° 28' 23"	-4° 26' 45"	0° 56' 06"	15' 17.14"	245° 42' 21"	0.58383
22	0° 06' 27"	-4° 38' 28"	1° 56' 53"	-4° 12' 53"	0° 56' 04"	15' 16.64"	245° 40' 34"	0.58799
23	0° 38' 07"	-4° 37' 04"	2° 25' 20"	-3° 59' 01"	0° 56' 02"	15' 16.14"	245° 38' 55"	0.59214
24	1° 09' 44"	-4° 35' 39"	2° 53' 45"	-3° 45' 09"	0° 56' 00"	15' 15.64"	245° 37' 23"	0.59629

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	260° 10' 34"	-0.86"	259° 18' 05"	-23° 04' 24"	0.9846130	16' 14.63"	23° 26' 15"	6 m 25 s
1	260° 13' 06"	-0.86"	259° 20' 50"	-23° 04' 35"	0.9846080	16' 14.63"	23° 26' 15"	6 m 23 s
2	260° 15' 39"	-0.86"	259° 23' 35"	-23° 04' 46"	0.9846030	16' 14.64"	23° 26' 15"	6 m 22 s
3	260° 18' 11"	-0.85"	259° 26' 21"	-23° 04' 58"	0.9845981	16' 14.64"	23° 26' 15"	6 m 21 s
4	260° 20' 44"	-0.85"	259° 29' 06"	-23° 05' 09"	0.9845931	16' 14.65"	23° 26' 15"	6 m 20 s
5	260° 23' 16"	-0.85"	259° 31' 51"	-23° 05' 20"	0.9845882	16' 14.65"	23° 26' 15"	6 m 19 s
6	260° 25' 49"	-0.85"	259° 34' 37"	-23° 05' 31"	0.9845832	16' 14.66"	23° 26' 15"	6 m 18 s
7	260° 28' 21"	-0.84"	259° 37' 22"	-23° 05' 42"	0.9845783	16' 14.66"	23° 26' 15"	6 m 16 s
8	260° 30' 54"	-0.84"	259° 40' 07"	-23° 05' 53"	0.9845734	16' 14.67"	23° 26' 15"	6 m 15 s
9	260° 33' 26"	-0.84"	259° 42' 53"	-23° 06' 03"	0.9845685	16' 14.67"	23° 26' 15"	6 m 14 s
10	260° 35' 59"	-0.84"	259° 45' 38"	-23° 06' 14"	0.9845636	16' 14.68"	23° 26' 15"	6 m 13 s
11	260° 38' 31"	-0.83"	259° 48' 23"	-23° 06' 25"	0.9845587	16' 14.68"	23° 26' 15"	6 m 12 s
12	260° 41' 03"	-0.83"	259° 51' 09"	-23° 06' 36"	0.9845538	16' 14.69"	23° 26' 15"	6 m 11 s
13	260° 43' 36"	-0.83"	259° 53' 54"	-23° 06' 46"	0.9845489	16' 14.69"	23° 26' 15"	6 m 09 s
14	260° 46' 08"	-0.83"	259° 56' 40"	-23° 06' 57"	0.9845441	16' 14.69"	23° 26' 15"	6 m 08 s
15	260° 48' 41"	-0.82"	259° 59' 25"	-23° 07' 08"	0.9845392	16' 14.70"	23° 26' 15"	6 m 07 s
16	260° 51' 13"	-0.82"	260° 02' 10"	-23° 07' 18"	0.9845344	16' 14.70"	23° 26' 15"	6 m 06 s
17	260° 53' 46"	-0.82"	260° 04' 56"	-23° 07' 29"	0.9845295	16' 14.71"	23° 26' 15"	6 m 05 s
18	260° 56' 18"	-0.81"	260° 07' 41"	-23° 07' 39"	0.9845247	16' 14.71"	23° 26' 15"	6 m 04 s
19	260° 58' 51"	-0.81"	260° 10' 27"	-23° 07' 49"	0.9845199	16' 14.72"	23° 26' 15"	6 m 02 s
20	261° 01' 23"	-0.81"	260° 13' 12"	-23° 07' 60"	0.9845150	16' 14.72"	23° 26' 15"	6 m 01 s
21	261° 03' 56"	-0.80"	260° 15' 58"	-23° 08' 10"	0.9845102	16' 14.73"	23° 26' 15"	6 m 00 s
22	261° 06' 28"	-0.80"	260° 18' 43"	-23° 08' 20"	0.9845054	16' 14.73"	23° 26' 15"	5 m 59 s
23	261° 09' 01"	-0.80"	260° 21' 28"	-23° 08' 30"	0.9845007	16' 14.74"	23° 26' 15"	5 m 58 s
24	261° 11' 33"	-0.79"	260° 24' 14"	-23° 08' 40"	0.9844959	16' 14.74"	23° 26' 15"	5 m 56 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	1° 09' 44"	-4° 35' 39"	2° 53' 45"	-3° 45' 09"	0° 56' 00"	15' 15.64"	245° 37' 23"	0.59629
1	1° 41' 20"	-4° 34' 12"	3° 22' 07"	-3° 31' 17"	0° 55' 58"	15' 15.15"	245° 35' 59"	0.60042
2	2° 12' 53"	-4° 32' 45"	3° 50' 26"	-3° 17' 25"	0° 55' 57"	15' 14.67"	245° 34' 43"	0.60453
3	2° 44' 25"	-4° 31' 15"	4° 18' 43"	-3° 03' 32"	0° 55' 55"	15' 14.18"	245° 33' 34"	0.60864
4	3° 15' 54"	-4° 29' 45"	4° 46' 57"	-2° 49' 40"	0° 55' 53"	15' 13.70"	245° 32' 32"	0.61273
5	3° 47' 21"	-4° 28' 13"	5° 15' 09"	-2° 35' 48"	0° 55' 51"	15' 13.23"	245° 31' 38"	0.61681
6	4° 18' 46"	-4° 26' 40"	5° 43' 18"	-2° 21' 57"	0° 55' 50"	15' 12.75"	245° 30' 51"	0.62088
7	4° 50' 09"	-4° 25' 06"	6° 11' 26"	-2° 08' 05"	0° 55' 48"	15' 12.29"	245° 30' 12"	0.62494
8	5° 21' 31"	-4° 23' 31"	6° 39' 31"	-1° 54' 14"	0° 55' 46"	15' 11.82"	245° 29' 40"	0.62898
9	5° 52' 50"	-4° 21' 54"	7° 07' 34"	-1° 40' 23"	0° 55' 44"	15' 11.36"	245° 29' 16"	0.63301
10	6° 24' 07"	-4° 20' 16"	7° 35' 35"	-1° 26' 33"	0° 55' 43"	15' 10.90"	245° 28' 59"	0.63703
11	6° 55' 23"	-4° 18' 37"	8° 03' 34"	-1° 12' 43"	0° 55' 41"	15' 10.45"	245° 28' 49"	0.64103
12	7° 26' 36"	-4° 16' 57"	8° 31' 32"	0° -58' 53"	0° 55' 39"	15' 10.00"	245° 28' 47"	0.64501
13	7° 57' 48"	-4° 15' 16"	8° 59' 27"	0° -45' 05"	0° 55' 38"	15' 09.55"	245° 28' 52"	0.64899
14	8° 28' 58"	-4° 13' 33"	9° 27' 21"	0° -31' 16"	0° 55' 36"	15' 09.11"	245° 29' 04"	0.65295
15	9° 00' 05"	-4° 11' 49"	9° 55' 13"	0° -17' 29"	0° 55' 35"	15' 08.67"	245° 29' 24"	0.65689
16	9° 31' 11"	-4° 10' 05"	10° 23' 04"	0° -3' 42"	0° 55' 33"	15' 08.24"	245° 29' 51"	0.66082
17	10° 02' 16"	-4° 08' 19"	10° 50' 53"	0° 10' 05"	0° 55' 31"	15' 07.81"	245° 30' 25"	0.66473
18	10° 33' 18"	-4° 06' 32"	11° 18' 40"	0° 23' 50"	0° 55' 30"	15' 07.38"	245° 31' 07"	0.66863
19	11° 04' 19"	-4° 04' 43"	11° 46' 27"	0° 37' 35"	0° 55' 28"	15' 06.96"	245° 31' 55"	0.67252
20	11° 35' 18"	-4° 02' 54"	12° 14' 12"	0° 51' 19"	0° 55' 27"	15' 06.54"	245° 32' 52"	0.67639
21	12° 06' 15"	-4° 01' 04"	12° 41' 55"	1° 05' 02"	0° 55' 25"	15' 06.13"	245° 33' 55"	0.68024
22	12° 37' 10"	-3° 59' 13"	13° 09' 38"	1° 18' 43"	0° 55' 24"	15' 05.71"	245° 35' 06"	0.68408
23	13° 08' 04"	-3° 57' 20"	13° 37' 19"	1° 32' 24"	0° 55' 22"	15' 05.31"	245° 36' 24"	0.68790
24	13° 38' 56"	-3° 55' 27"	14° 04' 60"	1° 46' 04"	0° 55' 21"	15' 04.90"	245° 37' 49"	0.69170

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	261° 11' 33"	-0.79"	260° 24' 14"	-23° 08' 40"	0.9844959	16' 14.74"	23° 26' 15"	5 m 56 s
1	261° 14' 06"	-0.79"	260° 26' 59"	-23° 08' 51"	0.9844911	16' 14.75"	23° 26' 15"	5 m 55 s
2	261° 16' 38"	-0.79"	260° 29' 45"	-23° 09' 01"	0.9844864	16' 14.75"	23° 26' 15"	5 m 54 s
3	261° 19' 11"	-0.78"	260° 32' 30"	-23° 09' 11"	0.9844816	16' 14.76"	23° 26' 15"	5 m 53 s
4	261° 21' 43"	-0.78"	260° 35' 16"	-23° 09' 21"	0.9844769	16' 14.76"	23° 26' 15"	5 m 52 s
5	261° 24' 16"	-0.78"	260° 38' 01"	-23° 09' 30"	0.9844721	16' 14.77"	23° 26' 15"	5 m 51 s
6	261° 26' 48"	-0.77"	260° 40' 47"	-23° 09' 40"	0.9844674	16' 14.77"	23° 26' 15"	5 m 49 s
7	261° 29' 21"	-0.77"	260° 43' 32"	-23° 09' 50"	0.9844627	16' 14.78"	23° 26' 15"	5 m 48 s
8	261° 31' 53"	-0.77"	260° 46' 18"	-23° 09' 60"	0.9844580	16' 14.78"	23° 26' 15"	5 m 47 s
9	261° 34' 26"	-0.76"	260° 49' 04"	-23° 10' 09"	0.9844533	16' 14.78"	23° 26' 15"	5 m 46 s
10	261° 36' 58"	-0.76"	260° 51' 49"	-23° 10' 19"	0.9844486	16' 14.79"	23° 26' 15"	5 m 45 s
11	261° 39' 31"	-0.76"	260° 54' 35"	-23° 10' 29"	0.9844439	16' 14.79"	23° 26' 15"	5 m 44 s
12	261° 42' 03"	-0.75"	260° 57' 20"	-23° 10' 38"	0.9844393	16' 14.80"	23° 26' 15"	5 m 42 s
13	261° 44' 36"	-0.75"	261° 00' 06"	-23° 10' 48"	0.9844346	16' 14.80"	23° 26' 15"	5 m 41 s
14	261° 47' 08"	-0.74"	261° 02' 51"	-23° 10' 57"	0.9844300	16' 14.81"	23° 26' 15"	5 m 40 s
15	261° 49' 41"	-0.74"	261° 05' 37"	-23° 11' 07"	0.9844253	16' 14.81"	23° 26' 15"	5 m 39 s
16	261° 52' 13"	-0.74"	261° 08' 23"	-23° 11' 16"	0.9844207	16' 14.82"	23° 26' 15"	5 m 38 s
17	261° 54' 46"	-0.73"	261° 11' 08"	-23° 11' 25"	0.9844161	16' 14.82"	23° 26' 15"	5 m 36 s
18	261° 57' 18"	-0.73"	261° 13' 54"	-23° 11' 35"	0.9844115	16' 14.83"	23° 26' 15"	5 m 35 s
19	261° 59' 51"	-0.72"	261° 16' 39"	-23° 11' 44"	0.9844069	16' 14.83"	23° 26' 15"	5 m 34 s
20	262° 02' 23"	-0.72"	261° 19' 25"	-23° 11' 53"	0.9844023	16' 14.84"	23° 26' 15"	5 m 33 s
21	262° 04' 56"	-0.72"	261° 22' 11"	-23° 12' 02"	0.9843977	16' 14.84"	23° 26' 15"	5 m 32 s
22	262° 07' 29"	-0.71"	261° 24' 56"	-23° 12' 11"	0.9843931	16' 14.84"	23° 26' 15"	5 m 30 s
23	262° 10' 01"	-0.71"	261° 27' 42"	-23° 12' 20"	0.9843886	16' 14.85"	23° 26' 15"	5 m 29 s
24	262° 12' 34"	-0.70"	261° 30' 28"	-23° 12' 29"	0.9843840	16' 14.85"	23° 26' 15"	5 m 28 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	13° 38' 56"	-3° 55' 27"	14° 04' 60"	1° 46' 04"	0° 55' 21"	15' 04.90"	245° 37' 49"	0.69170
1	14° 09' 47"	-3° 53' 32"	14° 32' 39"	1° 59' 43"	0° 55' 19"	15' 04.50"	245° 39' 22"	0.69549
2	14° 40' 35"	-3° 51' 37"	15° 00' 18"	2° 13' 21"	0° 55' 18"	15' 04.11"	245° 41' 01"	0.69926
3	15° 11' 22"	-3° 49' 40"	15° 27' 55"	2° 26' 57"	0° 55' 16"	15' 03.72"	245° 42' 48"	0.70301
4	15° 42' 08"	-3° 47' 42"	15° 55' 32"	2° 40' 32"	0° 55' 15"	15' 03.33"	245° 44' 43"	0.70675
5	16° 12' 52"	-3° 45' 44"	16° 23' 09"	2° 54' 06"	0° 55' 14"	15' 02.95"	245° 46' 44"	0.71047
6	16° 43' 34"	-3° 43' 44"	16° 50' 44"	3° 07' 39"	0° 55' 12"	15' 02.57"	245° 48' 53"	0.71417
7	17° 14' 15"	-3° 41' 44"	17° 18' 19"	3° 21' 10"	0° 55' 11"	15' 02.19"	245° 51' 09"	0.71786
8	17° 44' 54"	-3° 39' 42"	17° 45' 54"	3° 34' 40"	0° 55' 09"	15' 01.82"	245° 53' 32"	0.72153
9	18° 15' 32"	-3° 37' 40"	18° 13' 28"	3° 48' 09"	0° 55' 08"	15' 01.45"	245° 56' 03"	0.72518
10	18° 46' 08"	-3° 35' 36"	18° 41' 02"	4° 01' 36"	0° 55' 07"	15' 01.09"	245° 58' 40"	0.72881
11	19° 16' 43"	-3° 33' 32"	19° 08' 36"	4° 15' 01"	0° 55' 05"	15' 00.72"	246° 1' 25"	0.73242
12	19° 47' 16"	-3° 31' 27"	19° 36' 09"	4° 28' 25"	0° 55' 04"	15' 00.37"	246° 4' 18"	0.73602
13	20° 17' 48"	-3° 29' 21"	20° 03' 42"	4° 41' 48"	0° 55' 03"	15' 00.02"	246° 7' 17"	0.73959
14	20° 48' 19"	-3° 27' 14"	20° 31' 15"	4° 55' 08"	0° 55' 02"	14' 59.67"	246° 10' 24"	0.74315
15	21° 18' 48"	-3° 25' 06"	20° 58' 48"	5° 08' 27"	0° 55' 00"	14' 59.32"	246° 13' 38"	0.74669
16	21° 49' 16"	-3° 22' 57"	21° 26' 21"	5° 21' 45"	0° 54' 59"	14' 58.98"	246° 16' 60"	0.75021
17	22° 19' 42"	-3° 20' 48"	21° 53' 54"	5° 35' 00"	0° 54' 58"	14' 58.64"	246° 20' 28"	0.75371
18	22° 50' 07"	-3° 18' 37"	22° 21' 27"	5° 48' 14"	0° 54' 57"	14' 58.31"	246° 24' 04"	0.75719
19	23° 20' 30"	-3° 16' 26"	22° 49' 01"	6° 01' 25"	0° 54' 55"	14' 57.98"	246° 27' 48"	0.76065
20	23° 50' 53"	-3° 14' 14"	23° 16' 35"	6° 14' 35"	0° 54' 54"	14' 57.65"	246° 31' 38"	0.76410
21	24° 21' 14"	-3° 12' 01"	23° 44' 09"	6° 27' 43"	0° 54' 53"	14' 57.33"	246° 35' 36"	0.76752
22	24° 51' 33"	-3° 09' 47"	24° 11' 43"	6° 40' 49"	0° 54' 52"	14' 57.01"	246° 39' 42"	0.77092
23	25° 21' 52"	-3° 07' 32"	24° 39' 18"	6° 53' 53"	0° 54' 51"	14' 56.70"	246° 43' 54"	0.77430
24	25° 52' 09"	-3° 05' 17"	25° 06' 53"	7° 06' 55"	0° 54' 50"	14' 56.39"	246° 48' 15"	0.77767

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	262° 12' 34"	-0.70"	261° 30' 28"	-23° 12' 29"	0.9843840	16' 14.85"	23° 26' 15"	5 m 28 s
1	262° 15' 06"	-0.70"	261° 33' 13"	-23° 12' 38"	0.9843795	16' 14.86"	23° 26' 15"	5 m 27 s
2	262° 17' 39"	-0.69"	261° 35' 59"	-23° 12' 47"	0.9843749	16' 14.86"	23° 26' 15"	5 m 26 s
3	262° 20' 11"	-0.69"	261° 38' 45"	-23° 12' 56"	0.9843704	16' 14.87"	23° 26' 15"	5 m 25 s
4	262° 22' 44"	-0.69"	261° 41' 30"	-23° 13' 05"	0.9843659	16' 14.87"	23° 26' 15"	5 m 23 s
5	262° 25' 16"	-0.68"	261° 44' 16"	-23° 13' 13"	0.9843614	16' 14.88"	23° 26' 15"	5 m 22 s
6	262° 27' 49"	-0.68"	261° 47' 02"	-23° 13' 22"	0.9843569	16' 14.88"	23° 26' 15"	5 m 21 s
7	262° 30' 21"	-0.67"	261° 49' 47"	-23° 13' 31"	0.9843524	16' 14.88"	23° 26' 15"	5 m 20 s
8	262° 32' 54"	-0.67"	261° 52' 33"	-23° 13' 39"	0.9843479	16' 14.89"	23° 26' 15"	5 m 19 s
9	262° 35' 26"	-0.66"	261° 55' 19"	-23° 13' 48"	0.9843434	16' 14.89"	23° 26' 15"	5 m 17 s
10	262° 37' 59"	-0.66"	261° 58' 05"	-23° 13' 56"	0.9843390	16' 14.90"	23° 26' 15"	5 m 16 s
11	262° 40' 31"	-0.65"	262° 00' 50"	-23° 14' 05"	0.9843345	16' 14.90"	23° 26' 15"	5 m 15 s
12	262° 43' 04"	-0.65"	262° 03' 36"	-23° 14' 13"	0.9843301	16' 14.91"	23° 26' 15"	5 m 14 s
13	262° 45' 36"	-0.65"	262° 06' 22"	-23° 14' 22"	0.9843257	16' 14.91"	23° 26' 15"	5 m 13 s
14	262° 48' 09"	-0.64"	262° 09' 08"	-23° 14' 30"	0.9843212	16' 14.92"	23° 26' 15"	5 m 11 s
15	262° 50' 41"	-0.64"	262° 11' 53"	-23° 14' 38"	0.9843168	16' 14.92"	23° 26' 15"	5 m 10 s
16	262° 53' 14"	-0.63"	262° 14' 39"	-23° 14' 46"	0.9843124	16' 14.92"	23° 26' 15"	5 m 09 s
17	262° 55' 47"	-0.63"	262° 17' 25"	-23° 14' 54"	0.9843080	16' 14.93"	23° 26' 15"	5 m 08 s
18	262° 58' 19"	-0.62"	262° 20' 11"	-23° 15' 03"	0.9843037	16' 14.93"	23° 26' 15"	5 m 07 s
19	262° 00' 52"	-0.62"	262° 22' 56"	-23° 15' 11"	0.9842993	16' 14.94"	23° 26' 15"	5 m 05 s
20	263° 03' 24"	-0.61"	262° 25' 42"	-23° 15' 19"	0.9842949	16' 14.94"	23° 26' 15"	5 m 04 s
21	263° 05' 57"	-0.61"	262° 28' 28"	-23° 15' 27"	0.9842906	16' 14.95"	23° 26' 15"	5 m 03 s
22	263° 08' 29"	-0.60"	262° 31' 14"	-23° 15' 34"	0.9842862	16' 14.95"	23° 26' 15"	5 m 02 s
23	263° 11' 02"	-0.60"	262° 33' 60"	-23° 15' 42"	0.9842819	16' 14.95"	23° 26' 15"	5 m 01 s
24	263° 13' 34"	-0.59"	262° 36' 45"	-23° 15' 50"	0.9842776	16' 14.96"	23° 26' 15"	4 m 59 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	25° 52' 09"	-3° 05' 17"	25° 06' 53"	7° 06' 55"	0° 54' 50"	14' 56.39"	246° 48' 15"	0.77767
1	26° 22' 25"	-3° 03' 01"	25° 34' 29"	7° 19' 55"	0° 54' 48"	14' 56.08"	246° 52' 42"	0.78101
2	26° 52' 40"	-3° 00' 44"	26° 02' 06"	7° 32' 52"	0° 54' 47"	14' 55.78"	246° 57' 17"	0.78433
3	27° 22' 53"	-2° 58' 27"	26° 29' 43"	7° 45' 48"	0° 54' 46"	14' 55.48"	247° 1' 60"	0.78763
4	27° 53' 06"	-2° 56' 08"	26° 57' 21"	7° 58' 41"	0° 54' 45"	14' 55.19"	247° 6' 49"	0.79091
5	28° 23' 17"	-2° 53' 49"	27° 24' 60"	8° 11' 32"	0° 54' 44"	14' 54.89"	247° 11' 47"	0.79417
6	28° 53' 27"	-2° 51' 29"	27° 52' 39"	8° 24' 21"	0° 54' 43"	14' 54.61"	247° 16' 52"	0.79741
7	29° 23' 36"	-2° 49' 09"	28° 20' 20"	8° 37' 07"	0° 54' 42"	14' 54.32"	247° 22' 04"	0.80062
8	29° 53' 44"	-2° 46' 48"	28° 48' 02"	8° 49' 51"	0° 54' 41"	14' 54.04"	247° 27' 24"	0.80382
9	30° 23' 51"	-2° 44' 26"	29° 15' 44"	9° 02' 32"	0° 54' 40"	14' 53.77"	247° 32' 52"	0.80699
10	30° 53' 56"	-2° 42' 03"	29° 43' 28"	9° 15' 11"	0° 54' 39"	14' 53.49"	247° 38' 27"	0.81015
11	31° 24' 01"	-2° 39' 40"	30° 11' 12"	9° 27' 47"	0° 54' 38"	14' 53.22"	247° 44' 09"	0.81328
12	31° 54' 05"	-2° 37' 16"	30° 38' 58"	9° 40' 21"	0° 54' 37"	14' 52.96"	247° 49' 60"	0.81638
13	32° 24' 07"	-2° 34' 51"	31° 06' 46"	9° 52' 52"	0° 54' 36"	14' 52.70"	247° 55' 58"	0.81947
14	32° 54' 09"	-2° 32' 26"	31° 34' 34"	10° 05' 21"	0° 54' 35"	14' 52.44"	248° 2' 04"	0.82254
15	33° 24' 10"	-2° 30' 00"	32° 02' 24"	10° 17' 46"	0° 54' 34"	14' 52.18"	248° 8' 18"	0.82558
16	33° 54' 09"	-2° 27' 34"	32° 30' 15"	10° 30' 10"	0° 54' 33"	14' 51.93"	248° 14' 39"	0.82860
17	34° 24' 08"	-2° 25' 07"	32° 58' 08"	10° 42' 30"	0° 54' 32"	14' 51.69"	248° 21' 08"	0.83159
18	34° 54' 06"	-2° 22' 40"	33° 26' 02"	10° 54' 47"	0° 54' 31"	14' 51.44"	248° 27' 45"	0.83457
19	35° 24' 03"	-2° 20' 11"	33° 53' 58"	11° 07' 02"	0° 54' 30"	14' 51.20"	248° 34' 30"	0.83752
20	35° 53' 59"	-2° 17' 43"	34° 21' 55"	11° 19' 14"	0° 54' 30"	14' 50.97"	248° 41' 23"	0.84045
21	36° 23' 54"	-2° 15' 13"	34° 49' 54"	11° 31' 22"	0° 54' 29"	14' 50.73"	248° 48' 24"	0.84335
22	36° 53' 48"	-2° 12' 44"	35° 17' 55"	11° 43' 28"	0° 54' 28"	14' 50.50"	248° 55' 33"	0.84623
23	37° 23' 41"	-2° 10' 13"	35° 45' 57"	11° 55' 31"	0° 54' 27"	14' 50.28"	249° 2' 50"	0.84909
24	37° 53' 34"	-2° 07' 42"	36° 14' 02"	12° 07' 30"	0° 54' 26"	14' 50.06"	249° 10' 16"	0.85193

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	263° 13' 34"	-0.59"	262° 36' 45"	-23° 15' 50"	0.9842776	16' 14.96"	23° 26' 15"	4 m 59 s
1	263° 16' 07"	-0.59"	262° 39' 31"	-23° 15' 58"	0.9842733	16' 14.96"	23° 26' 15"	4 m 58 s
2	263° 18' 39"	-0.58"	262° 42' 17"	-23° 16' 06"	0.9842690	16' 14.97"	23° 26' 15"	4 m 57 s
3	263° 21' 12"	-0.58"	262° 45' 03"	-23° 16' 13"	0.9842647	16' 14.97"	23° 26' 15"	4 m 56 s
4	263° 23' 44"	-0.57"	262° 47' 49"	-23° 16' 21"	0.9842604	16' 14.98"	23° 26' 15"	4 m 55 s
5	263° 26' 17"	-0.57"	262° 50' 35"	-23° 16' 29"	0.9842561	16' 14.98"	23° 26' 15"	4 m 53 s
6	263° 28' 50"	-0.56"	262° 53' 21"	-23° 16' 36"	0.9842518	16' 14.98"	23° 26' 15"	4 m 52 s
7	263° 31' 22"	-0.56"	262° 56' 06"	-23° 16' 44"	0.9842476	16' 14.99"	23° 26' 15"	4 m 51 s
8	263° 33' 55"	-0.55"	262° 58' 52"	-23° 16' 51"	0.9842434	16' 14.99"	23° 26' 15"	4 m 50 s
9	263° 36' 27"	-0.55"	263° 01' 38"	-23° 16' 58"	0.9842391	16' 15.00"	23° 26' 15"	4 m 49 s
10	263° 38' 60"	-0.54"	263° 04' 24"	-23° 17' 06"	0.9842349	16' 15.00"	23° 26' 15"	4 m 47 s
11	263° 41' 32"	-0.54"	263° 07' 10"	-23° 17' 13"	0.9842307	16' 15.01"	23° 26' 15"	4 m 46 s
12	263° 44' 05"	-0.53"	263° 09' 56"	-23° 17' 20"	0.9842265	16' 15.01"	23° 26' 15"	4 m 45 s
13	263° 46' 37"	-0.53"	263° 12' 42"	-23° 17' 27"	0.9842223	16' 15.01"	23° 26' 15"	4 m 44 s
14	263° 49' 10"	-0.52"	263° 15' 28"	-23° 17' 35"	0.9842181	16' 15.02"	23° 26' 15"	4 m 43 s
15	263° 51' 43"	-0.52"	263° 18' 14"	-23° 17' 42"	0.9842139	16' 15.02"	23° 26' 15"	4 m 41 s
16	263° 54' 15"	-0.51"	263° 20' 60"	-23° 17' 49"	0.9842098	16' 15.03"	23° 26' 15"	4 m 40 s
17	263° 56' 48"	-0.51"	263° 23' 45"	-23° 17' 56"	0.9842056	16' 15.03"	23° 26' 15"	4 m 39 s
18	263° 59' 20"	-0.50"	263° 26' 31"	-23° 18' 03"	0.9842015	16' 15.03"	23° 26' 15"	4 m 38 s
19	264° 01' 53"	-0.49"	263° 29' 17"	-23° 18' 10"	0.9841973	16' 15.04"	23° 26' 15"	4 m 37 s
20	264° 04' 25"	-0.49"	263° 32' 03"	-23° 18' 16"	0.9841932	16' 15.04"	23° 26' 15"	4 m 35 s
21	264° 06' 58"	-0.48"	263° 34' 49"	-23° 18' 23"	0.9841891	16' 15.05"	23° 26' 15"	4 m 34 s
22	264° 09' 30"	-0.48"	263° 37' 35"	-23° 18' 30"	0.9841850	16' 15.05"	23° 26' 15"	4 m 33 s
23	264° 12' 03"	-0.47"	263° 40' 21"	-23° 18' 37"	0.9841809	16' 15.05"	23° 26' 15"	4 m 32 s
24	264° 14' 36"	-0.47"	263° 43' 07"	-23° 18' 43"	0.9841768	16' 15.06"	23° 26' 15"	4 m 31 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	37° 53' 34"	-2° 07' 42"	36° 14' 02"	12° 07' 30"	0° 54' 26"	14' 50.06"	249° 10' 16"	0.85193
1	38° 23' 26"	-2° 05' 11"	36° 42' 08"	12° 19' 27"	0° 54' 25"	14' 49.84"	249° 17' 49"	0.85474
2	38° 53' 16"	-2° 02' 39"	37° 10' 16"	12° 31' 20"	0° 54' 25"	14' 49.62"	249° 25' 31"	0.85753
3	39° 23' 07"	-2° 00' 07"	37° 38' 26"	12° 43' 10"	0° 54' 24"	14' 49.41"	249° 33' 21"	0.86029
4	39° 52' 56"	-1° 57' 34"	38° 06' 37"	12° 54' 57"	0° 54' 23"	14' 49.20"	249° 41' 19"	0.86303
5	40° 22' 45"	-1° 55' 01"	38° 34' 51"	13° 06' 41"	0° 54' 22"	14' 49.00"	249° 49' 26"	0.86575
6	40° 52' 32"	-1° 52' 27"	39° 03' 07"	13° 18' 21"	0° 54' 22"	14' 48.80"	249° 57' 42"	0.86844
7	41° 22' 20"	-1° 49' 53"	39° 31' 26"	13° 29' 58"	0° 54' 21"	14' 48.60"	250° 6' 05"	0.87111
8	41° 52' 06"	-1° 47' 18"	39° 59' 46"	13° 41' 31"	0° 54' 20"	14' 48.41"	250° 14' 38"	0.87375
9	42° 21' 52"	-1° 44' 43"	40° 28' 08"	13° 53' 01"	0° 54' 19"	14' 48.21"	250° 23' 19"	0.87637
10	42° 51' 37"	-1° 42' 08"	40° 56' 33"	14° 04' 28"	0° 54' 19"	14' 48.03"	250° 32' 09"	0.87896
11	43° 21' 21"	-1° 39' 32"	41° 25' 00"	14° 15' 51"	0° 54' 18"	14' 47.84"	250° 41' 08"	0.88153
12	43° 51' 05"	-1° 36' 56"	41° 53' 29"	14° 27' 10"	0° 54' 17"	14' 47.66"	250° 50' 16"	0.88408
13	44° 20' 48"	-1° 34' 19"	42° 22' 01"	14° 38' 26"	0° 54' 17"	14' 47.48"	250° 59' 33"	0.88659
14	44° 50' 31"	-1° 31' 42"	42° 50' 35"	14° 49' 38"	0° 54' 16"	14' 47.31"	251° 8' 59"	0.88909
15	45° 20' 13"	-1° 29' 05"	43° 19' 12"	15° 00' 46"	0° 54' 16"	14' 47.14"	251° 18' 35"	0.89156
16	45° 49' 54"	-1° 26' 27"	43° 47' 51"	15° 11' 50"	0° 54' 15"	14' 46.97"	251° 28' 19"	0.89400
17	46° 19' 35"	-1° 23' 49"	44° 16' 32"	15° 22' 51"	0° 54' 14"	14' 46.81"	251° 38' 14"	0.89642
18	46° 49' 15"	-1° 21' 11"	44° 45' 17"	15° 33' 48"	0° 54' 14"	14' 46.65"	251° 48' 17"	0.89881
19	47° 18' 54"	-1° 18' 32"	45° 14' 03"	15° 44' 40"	0° 54' 13"	14' 46.49"	251° 58' 31"	0.90118
20	47° 48' 33"	-1° 15' 53"	45° 42' 53"	15° 55' 29"	0° 54' 13"	14' 46.33"	252° 8' 54"	0.90352
21	48° 18' 12"	-1° 13' 14"	46° 11' 45"	16° 06' 14"	0° 54' 12"	14' 46.18"	252° 19' 27"	0.90583
22	48° 47' 50"	-1° 10' 34"	46° 40' 39"	16° 16' 55"	0° 54' 11"	14' 46.03"	252° 30' 11"	0.90812
23	49° 17' 28"	-1° 07' 54"	47° 09' 37"	16° 27' 32"	0° 54' 11"	14' 45.89"	252° 41' 04"	0.91038
24	49° 47' 05"	-1° 05' 14"	47° 38' 37"	16° 38' 04"	0° 54' 10"	14' 45.75"	252° 52' 08"	0.91262

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	264° 14' 36"	-0.47"	263° 43' 07"	-23° 18' 43"	0.9841768	16' 15.06"	23° 26' 15"	4 m 31 s
1	264° 17' 08"	-0.46"	263° 45' 53"	-23° 18' 50"	0.9841728	16' 15.06"	23° 26' 15"	4 m 29 s
2	264° 19' 41"	-0.46"	263° 48' 39"	-23° 18' 56"	0.9841687	16' 15.07"	23° 26' 15"	4 m 28 s
3	264° 22' 13"	-0.45"	263° 51' 25"	-23° 19' 03"	0.9841646	16' 15.07"	23° 26' 15"	4 m 27 s
4	264° 24' 46"	-0.45"	263° 54' 11"	-23° 19' 09"	0.9841606	16' 15.07"	23° 26' 15"	4 m 26 s
5	264° 27' 18"	-0.44"	263° 56' 57"	-23° 19' 16"	0.9841566	16' 15.08"	23° 26' 15"	4 m 24 s
6	264° 29' 51"	-0.44"	263° 59' 43"	-23° 19' 22"	0.9841525	16' 15.08"	23° 26' 15"	4 m 23 s
7	264° 32' 24"	-0.43"	264° 02' 29"	-23° 19' 29"	0.9841485	16' 15.09"	23° 26' 15"	4 m 22 s
8	264° 34' 56"	-0.42"	264° 05' 15"	-23° 19' 35"	0.9841445	16' 15.09"	23° 26' 15"	4 m 21 s
9	264° 37' 29"	-0.42"	264° 08' 01"	-23° 19' 41"	0.9841405	16' 15.09"	23° 26' 15"	4 m 20 s
10	264° 40' 01"	-0.41"	264° 10' 47"	-23° 19' 47"	0.9841366	16' 15.10"	23° 26' 15"	4 m 18 s
11	264° 42' 34"	-0.41"	264° 13' 33"	-23° 19' 53"	0.9841326	16' 15.10"	23° 26' 15"	4 m 17 s
12	264° 45' 06"	-0.40"	264° 16' 19"	-23° 19' 59"	0.9841286	16' 15.11"	23° 26' 15"	4 m 16 s
13	264° 47' 39"	-0.40"	264° 19' 05"	-23° 20' 05"	0.9841247	16' 15.11"	23° 26' 15"	4 m 15 s
14	264° 50' 12"	-0.39"	264° 21' 51"	-23° 20' 11"	0.9841207	16' 15.11"	23° 26' 15"	4 m 14 s
15	264° 52' 44"	-0.39"	264° 24' 37"	-23° 20' 17"	0.9841168	16' 15.12"	23° 26' 15"	4 m 12 s
16	264° 55' 17"	-0.38"	264° 27' 23"	-23° 20' 23"	0.9841129	16' 15.12"	23° 26' 15"	4 m 11 s
17	264° 57' 49"	-0.37"	264° 30' 09"	-23° 20' 29"	0.9841090	16' 15.13"	23° 26' 15"	4 m 10 s
18	265° 00' 22"	-0.37"	264° 32' 55"	-23° 20' 35"	0.9841051	16' 15.13"	23° 26' 15"	4 m 09 s
19	265° 02' 54"	-0.36"	264° 35' 42"	-23° 20' 41"	0.9841012	16' 15.13"	23° 26' 15"	4 m 07 s
20	265° 05' 27"	-0.36"	264° 38' 28"	-23° 20' 46"	0.9840973	16' 15.14"	23° 26' 15"	4 m 06 s
21	265° 07' 60"	-0.35"	264° 41' 14"	-23° 20' 52"	0.9840935	16' 15.14"	23° 26' 15"	4 m 05 s
22	265° 10' 32"	-0.35"	264° 43' 60"	-23° 20' 57"	0.9840896	16' 15.14"	23° 26' 15"	4 m 04 s
23	265° 13' 05"	-0.34"	264° 46' 46"	-23° 21' 03"	0.9840858	16' 15.15"	23° 26' 15"	4 m 03 s
24	265° 15' 37"	-0.34"	264° 49' 32"	-23° 21' 09"	0.9840819	16' 15.15"	23° 26' 15"	4 m 01 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	49° 47' 05"	-1° 05' 14"	47° 38' 37"	16° 38' 04"	0° 54' 10"	14' 45.75"	252° 52' 08"	0.91262
1	50° 16' 42"	-1° 02' 34"	48° 07' 40"	16° 48' 32"	0° 54' 10"	14' 45.61"	253° 3' 23"	0.91483
2	50° 46' 18"	0°-59' 54"	48° 36' 45"	16° 58' 57"	0° 54' 09"	14' 45.47"	253° 14' 48"	0.91702
3	51° 15' 54"	0°-57' 13"	49° 05' 54"	17° 09' 16"	0° 54' 09"	14' 45.34"	253° 26' 24"	0.91917
4	51° 45' 29"	0°-54' 32"	49° 35' 05"	17° 19' 32"	0° 54' 08"	14' 45.21"	253° 38' 11"	0.92130
5	52° 15' 04"	0°-51' 51"	50° 04' 20"	17° 29' 43"	0° 54' 08"	14' 45.09"	253° 50' 10"	0.92341
6	52° 44' 39"	0°-49' 10"	50° 33' 37"	17° 39' 50"	0° 54' 08"	14' 44.96"	254° 2' 20"	0.92549
7	53° 14' 13"	0°-46' 28"	51° 02' 57"	17° 49' 52"	0° 54' 07"	14' 44.84"	254° 14' 42"	0.92754
8	53° 43' 47"	0°-43' 46"	51° 32' 20"	17° 59' 50"	0° 54' 07"	14' 44.73"	254° 27' 16"	0.92956
9	54° 13' 20"	0°-41' 05"	52° 01' 47"	18° 09' 43"	0° 54' 06"	14' 44.61"	254° 40' 02"	0.93156
10	54° 42' 53"	0°-38' 23"	52° 31' 16"	18° 19' 32"	0° 54' 06"	14' 44.50"	254° 53' 01"	0.93353
11	55° 12' 26"	0°-35' 40"	53° 00' 48"	18° 29' 16"	0° 54' 05"	14' 44.39"	255° 6' 13"	0.93547
12	55° 41' 59"	0°-32' 58"	53° 30' 24"	18° 38' 55"	0° 54' 05"	14' 44.29"	255° 19' 37"	0.93738
13	56° 11' 31"	0°-30' 16"	54° 00' 02"	18° 48' 30"	0° 54' 05"	14' 44.18"	255° 33' 15"	0.93927
14	56° 41' 03"	0°-27' 33"	54° 29' 43"	18° 57' 59"	0° 54' 04"	14' 44.09"	255° 47' 07"	0.94113
15	57° 10' 34"	0°-24' 51"	54° 59' 28"	19° 07' 24"	0° 54' 04"	14' 43.99"	256° 1' 14"	0.94296
16	57° 40' 06"	0°-22' 08"	55° 29' 16"	19° 16' 45"	0° 54' 04"	14' 43.90"	256° 15' 34"	0.94476
17	58° 09' 37"	0°-19' 26"	55° 59' 07"	19° 25' 60"	0° 54' 03"	14' 43.81"	256° 30' 10"	0.94654
18	58° 39' 08"	0°-16' 43"	56° 29' 01"	19° 35' 10"	0° 54' 03"	14' 43.72"	256° 45' 01"	0.94829
19	59° 08' 38"	0°-14' 00"	56° 58' 58"	19° 44' 15"	0° 54' 03"	14' 43.63"	257° 0' 09"	0.95001
20	59° 38' 09"	0°-11' 17"	57° 28' 59"	19° 53' 15"	0° 54' 02"	14' 43.55"	257° 15' 32"	0.95170
21	60° 07' 39"	0° -8' 34"	57° 59' 02"	20° 02' 10"	0° 54' 02"	14' 43.47"	257° 31' 13"	0.95337
22	60° 37' 09"	0° -5' 52"	58° 29' 09"	20° 11' 00"	0° 54' 02"	14' 43.40"	257° 47' 11"	0.95500
23	61° 06' 39"	0° -3' 09"	58° 59' 19"	20° 19' 45"	0° 54' 02"	14' 43.32"	258° 3' 28"	0.95661
24	61° 36' 09"	0° 00'-26"	59° 29' 33"	20° 28' 24"	0° 54' 01"	14' 43.25"	258° 20' 04"	0.95819

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	265° 15' 37"	-0.34"	264° 49' 32"	-23° 21' 09"	0.9840819	16' 15.15"	23° 26' 15"	4 m 01 s
1	265° 18' 10"	-0.33"	264° 52' 18"	-23° 21' 14"	0.9840781	16' 15.16"	23° 26' 15"	4 m 00 s
2	265° 20' 43"	-0.32"	264° 55' 04"	-23° 21' 19"	0.9840743	16' 15.16"	23° 26' 15"	3 m 59 s
3	265° 23' 15"	-0.32"	264° 57' 50"	-23° 21' 25"	0.9840705	16' 15.16"	23° 26' 15"	3 m 58 s
4	265° 25' 48"	-0.31"	265° 00' 36"	-23° 21' 30"	0.9840667	16' 15.17"	23° 26' 15"	3 m 56 s
5	265° 28' 20"	-0.31"	265° 03' 23"	-23° 21' 35"	0.9840629	16' 15.17"	23° 26' 15"	3 m 55 s
6	265° 30' 53"	-0.30"	265° 06' 09"	-23° 21' 40"	0.9840591	16' 15.18"	23° 26' 15"	3 m 54 s
7	265° 33' 26"	-0.30"	265° 08' 55"	-23° 21' 46"	0.9840554	16' 15.18"	23° 26' 15"	3 m 53 s
8	265° 35' 58"	-0.29"	265° 11' 41"	-23° 21' 51"	0.9840516	16' 15.18"	23° 26' 15"	3 m 52 s
9	265° 38' 31"	-0.29"	265° 14' 27"	-23° 21' 56"	0.9840479	16' 15.19"	23° 26' 15"	3 m 50 s
10	265° 41' 03"	-0.28"	265° 17' 13"	-23° 22' 01"	0.9840441	16' 15.19"	23° 26' 15"	3 m 49 s
11	265° 43' 36"	-0.27"	265° 19' 59"	-23° 22' 06"	0.9840404	16' 15.19"	23° 26' 15"	3 m 48 s
12	265° 46' 09"	-0.27"	265° 22' 46"	-23° 22' 11"	0.9840367	16' 15.20"	23° 26' 15"	3 m 47 s
13	265° 48' 41"	-0.26"	265° 25' 32"	-23° 22' 15"	0.9840330	16' 15.20"	23° 26' 15"	3 m 46 s
14	265° 51' 14"	-0.26"	265° 28' 18"	-23° 22' 20"	0.9840293	16' 15.20"	23° 26' 15"	3 m 44 s
15	265° 53' 46"	-0.25"	265° 31' 04"	-23° 22' 25"	0.9840256	16' 15.21"	23° 26' 15"	3 m 43 s
16	265° 56' 19"	-0.25"	265° 33' 50"	-23° 22' 30"	0.9840219	16' 15.21"	23° 26' 15"	3 m 42 s
17	265° 58' 52"	-0.24"	265° 36' 36"	-23° 22' 34"	0.9840183	16' 15.22"	23° 26' 15"	3 m 41 s
18	266° 01' 24"	-0.24"	265° 39' 23"	-23° 22' 39"	0.9840146	16' 15.22"	23° 26' 15"	3 m 39 s
19	266° 03' 57"	-0.23"	265° 42' 09"	-23° 22' 44"	0.9840110	16' 15.22"	23° 26' 15"	3 m 38 s
20	266° 06' 29"	-0.23"	265° 44' 55"	-23° 22' 48"	0.9840074	16' 15.23"	23° 26' 15"	3 m 37 s
21	266° 09' 02"	-0.22"	265° 47' 41"	-23° 22' 53"	0.9840038	16' 15.23"	23° 26' 15"	3 m 36 s
22	266° 11' 35"	-0.21"	265° 50' 27"	-23° 22' 57"	0.9840001	16' 15.23"	23° 26' 15"	3 m 35 s
23	266° 14' 07"	-0.21"	265° 53' 13"	-23° 23' 01"	0.9839966	16' 15.24"	23° 26' 15"	3 m 33 s
24	266° 16' 40"	-0.20"	265° 55' 60"	-23° 23' 06"	0.9839930	16' 15.24"	23° 26' 15"	3 m 32 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	61° 36' 09"	0° 00' 26"	59° 29' 33"	20° 28' 24"	0° 54' 01"	14' 43.25"	258° 20' 04"	0.95819
1	62° 05' 38"	0° 02' 17"	59° 59' 49"	20° 36' 58"	0° 54' 01"	14' 43.19"	258° 36' 59"	0.95974
2	62° 35' 08"	0° 04' 57"	60° 30' 10"	20° 45' 25"	0° 54' 01"	14' 43.12"	258° 54' 10"	0.96126
3	63° 04' 37"	0° 07' 40"	61° 00' 33"	20° 53' 48"	0° 54' 01"	14' 43.06"	259° 11' 47"	0.96276
4	63° 34' 06"	0° 10' 23"	61° 30' 59"	21° 02' 06"	0° 54' 00"	14' 43.00"	259° 29' 47"	0.96422
5	64° 03' 35"	0° 13' 05"	62° 01' 29"	21° 10' 19"	0° 54' 00"	14' 42.94"	259° 48' 10"	0.96566
6	64° 33' 04"	0° 15' 48"	62° 32' 01"	21° 18' 26"	0° 53' 60"	14' 42.89"	260° 6' 58"	0.96707
7	65° 02' 33"	0° 18' 30"	63° 02' 38"	21° 26' 27"	0° 53' 60"	14' 42.84"	260° 26' 11"	0.96845
8	65° 32' 02"	0° 21' 12"	63° 33' 17"	21° 34' 23"	0° 53' 60"	14' 42.79"	260° 45' 52"	0.96980
9	66° 01' 31"	0° 23' 55"	64° 03' 60"	21° 42' 13"	0° 53' 59"	14' 42.74"	261° 6' 01"	0.97112
10	66° 30' 59"	0° 26' 37"	64° 34' 45"	21° 49' 57"	0° 53' 59"	14' 42.70"	261° 26' 41"	0.97241
11	67° 00' 28"	0° 29' 19"	65° 05' 35"	21° 57' 36"	0° 53' 59"	14' 42.66"	261° 47' 52"	0.97367
12	67° 29' 57"	0° 32' 00"	65° 36' 27"	22° 05' 09"	0° 53' 59"	14' 42.62"	262° 9' 38"	0.97490
13	67° 59' 25"	0° 34' 42"	66° 07' 22"	22° 12' 36"	0° 53' 59"	14' 42.59"	262° 31' 59"	0.97611
14	68° 28' 54"	0° 37' 24"	66° 38' 21"	22° 19' 58"	0° 53' 59"	14' 42.55"	262° 54' 59"	0.97728
15	68° 58' 23"	0° 40' 05"	67° 09' 23"	22° 27' 13"	0° 53' 59"	14' 42.52"	263° 18' 40"	0.97843
16	69° 27' 51"	0° 42' 46"	67° 40' 29"	22° 34' 22"	0° 53' 59"	14' 42.50"	263° 43' 04"	0.97954
17	69° 57' 20"	0° 45' 27"	68° 11' 37"	22° 41' 26"	0° 53' 58"	14' 42.47"	264° 8' 16"	0.98063
18	70° 26' 48"	0° 48' 07"	68° 42' 49"	22° 48' 23"	0° 53' 58"	14' 42.45"	264° 34' 18"	0.98168
19	70° 56' 17"	0° 50' 48"	69° 14' 03"	22° 55' 14"	0° 53' 58"	14' 42.43"	265° 1' 15"	0.98271
20	71° 25' 46"	0° 53' 28"	69° 45' 21"	23° 01' 59"	0° 53' 58"	14' 42.41"	265° 29' 11"	0.98371
21	71° 55' 15"	0° 56' 08"	70° 16' 42"	23° 08' 38"	0° 53' 58"	14' 42.40"	265° 58' 11"	0.98467
22	72° 24' 43"	0° 58' 48"	70° 48' 07"	23° 15' 11"	0° 53' 58"	14' 42.39"	266° 28' 20"	0.98561
23	72° 54' 12"	1° 01' 27"	71° 19' 34"	23° 21' 37"	0° 53' 58"	14' 42.38"	266° 59' 46"	0.98652
24	73° 23' 41"	1° 04' 07"	71° 51' 04"	23° 27' 57"	0° 53' 58"	14' 42.37"	267° 32' 35"	0.98739

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	266° 16' 40"	-0.20"	265° 55' 60"	-23° 23' 06"	0.9839930	16' 15.24"	23° 26' 15"	3 m 32 s
1	266° 19' 12"	-0.20"	265° 58' 46"	-23° 23' 10"	0.9839894	16' 15.24"	23° 26' 15"	3 m 31 s
2	266° 21' 45"	-0.19"	266° 01' 32"	-23° 23' 14"	0.9839858	16' 15.25"	23° 26' 15"	3 m 30 s
3	266° 24' 18"	-0.19"	266° 04' 18"	-23° 23' 18"	0.9839823	16' 15.25"	23° 26' 15"	3 m 28 s
4	266° 26' 50"	-0.18"	266° 07' 05"	-23° 23' 23"	0.9839787	16' 15.25"	23° 26' 15"	3 m 27 s
5	266° 29' 23"	-0.18"	266° 09' 51"	-23° 23' 27"	0.9839752	16' 15.26"	23° 26' 15"	3 m 26 s
6	266° 31' 55"	-0.17"	266° 12' 37"	-23° 23' 31"	0.9839717	16' 15.26"	23° 26' 15"	3 m 25 s
7	266° 34' 28"	-0.17"	266° 15' 23"	-23° 23' 35"	0.9839682	16' 15.27"	23° 26' 15"	3 m 23 s
8	266° 37' 01"	-0.16"	266° 18' 09"	-23° 23' 39"	0.9839647	16' 15.27"	23° 26' 15"	3 m 22 s
9	266° 39' 33"	-0.15"	266° 20' 56"	-23° 23' 42"	0.9839612	16' 15.27"	23° 26' 15"	3 m 21 s
10	266° 42' 06"	-0.15"	266° 23' 42"	-23° 23' 46"	0.9839577	16' 15.28"	23° 26' 15"	3 m 20 s
11	266° 44' 39"	-0.14"	266° 26' 28"	-23° 23' 50"	0.9839542	16' 15.28"	23° 26' 15"	3 m 19 s
12	266° 47' 11"	-0.14"	266° 29' 14"	-23° 23' 54"	0.9839508	16' 15.28"	23° 26' 15"	3 m 17 s
13	266° 49' 44"	-0.13"	266° 32' 01"	-23° 23' 57"	0.9839473	16' 15.29"	23° 26' 15"	3 m 16 s
14	266° 52' 16"	-0.13"	266° 34' 47"	-23° 24' 01"	0.9839439	16' 15.29"	23° 26' 15"	3 m 15 s
15	266° 54' 49"	-0.12"	266° 37' 33"	-23° 24' 05"	0.9839404	16' 15.29"	23° 26' 15"	3 m 14 s
16	266° 57' 22"	-0.12"	266° 40' 20"	-23° 24' 08"	0.9839370	16' 15.30"	23° 26' 15"	3 m 12 s
17	266° 59' 54"	-0.11"	266° 43' 06"	-23° 24' 12"	0.9839336	16' 15.30"	23° 26' 15"	3 m 11 s
18	267° 02' 27"	-0.11"	266° 45' 52"	-23° 24' 15"	0.9839302	16' 15.30"	23° 26' 15"	3 m 10 s
19	267° 04' 60"	-0.10"	266° 48' 38"	-23° 24' 19"	0.9839268	16' 15.31"	23° 26' 15"	3 m 09 s
20	267° 07' 32"	-0.10"	266° 51' 25"	-23° 24' 22"	0.9839235	16' 15.31"	23° 26' 15"	3 m 07 s
21	267° 10' 05"	-0.09"	266° 54' 11"	-23° 24' 25"	0.9839201	16' 15.31"	23° 26' 15"	3 m 06 s
22	267° 12' 37"	-0.09"	266° 56' 57"	-23° 24' 28"	0.9839167	16' 15.32"	23° 26' 15"	3 m 05 s
23	267° 15' 10"	-0.08"	266° 59' 43"	-23° 24' 32"	0.9839134	16' 15.32"	23° 26' 15"	3 m 04 s
24	267° 17' 43"	-0.08"	267° 02' 30"	-23° 24' 35"	0.9839101	16' 15.32"	23° 26' 15"	3 m 03 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	73° 23' 41"	1° 04' 07"	71° 51' 04"	23° 27' 57"	0° 53' 58"	14' 42.37"	267° 32' 35"	0.98739
1	73° 53' 11"	1° 06' 45"	72° 22' 38"	23° 34' 11"	0° 53' 58"	14' 42.37"	268° 6' 55"	0.98824
2	74° 22' 40"	1° 09' 24"	72° 54' 14"	23° 40' 19"	0° 53' 58"	14' 42.36"	268° 42' 57"	0.98906
3	74° 52' 09"	1° 12' 02"	73° 25' 54"	23° 46' 20"	0° 53' 58"	14' 42.36"	269° 20' 51"	0.98984
4	75° 21' 39"	1° 14' 40"	73° 57' 36"	23° 52' 14"	0° 53' 58"	14' 42.37"	270° 0' 50"	0.99060
5	75° 51' 08"	1° 17' 18"	74° 29' 22"	23° 58' 02"	0° 53' 58"	14' 42.37"	270° 43' 07"	0.99133
6	76° 20' 38"	1° 19' 55"	75° 01' 10"	24° 03' 44"	0° 53' 58"	14' 42.38"	271° 28' 01"	0.99202
7	76° 50' 08"	1° 22' 32"	75° 33' 01"	24° 09' 19"	0° 53' 58"	14' 42.39"	272° 15' 52"	0.99269
8	77° 19' 38"	1° 25' 09"	76° 04' 55"	24° 14' 47"	0° 53' 58"	14' 42.40"	273° 7' 03"	0.99333
9	77° 49' 08"	1° 27' 45"	76° 36' 52"	24° 20' 09"	0° 53' 58"	14' 42.42"	274° 2' 02"	0.99393
10	78° 18' 39"	1° 30' 20"	77° 08' 52"	24° 25' 24"	0° 53' 58"	14' 42.44"	275° 1' 23"	0.99450
11	78° 48' 10"	1° 32' 56"	77° 40' 54"	24° 30' 32"	0° 53' 58"	14' 42.46"	276° 5' 46"	0.99505
12	79° 17' 40"	1° 35' 31"	78° 12' 60"	24° 35' 33"	0° 53' 58"	14' 42.48"	277° 16' 01"	0.99556
13	79° 47' 11"	1° 38' 05"	78° 45' 08"	24° 40' 28"	0° 53' 59"	14' 42.50"	278° 33' 08"	0.99605
14	80° 16' 43"	1° 40' 39"	79° 17' 18"	24° 45' 16"	0° 53' 59"	14' 42.53"	279° 58' 21"	0.99650
15	80° 46' 14"	1° 43' 13"	79° 49' 32"	24° 49' 57"	0° 53' 59"	14' 42.56"	281° 33' 14"	0.99692
16	81° 15' 46"	1° 45' 46"	80° 21' 47"	24° 54' 31"	0° 53' 59"	14' 42.59"	283° 19' 43"	0.99731
17	81° 45' 18"	1° 48' 19"	80° 54' 06"	24° 58' 58"	0° 53' 59"	14' 42.63"	285° 20' 15"	0.99767
18	82° 14' 50"	1° 50' 51"	81° 26' 27"	25° 03' 18"	0° 53' 59"	14' 42.66"	287° 38' 01"	0.99800
19	82° 44' 23"	1° 53' 23"	81° 58' 50"	25° 07' 31"	0° 53' 59"	14' 42.70"	290° 17' 04"	0.99830
20	83° 13' 56"	1° 55' 54"	82° 31' 16"	25° 11' 38"	0° 53' 59"	14' 42.75"	293° 22' 40"	0.99857
21	83° 43' 29"	1° 58' 25"	83° 03' 44"	25° 15' 37"	0° 53' 60"	14' 42.79"	297° 1' 40"	0.99881
22	84° 13' 02"	2° 00' 55"	83° 36' 14"	25° 19' 29"	0° 53' 60"	14' 42.84"	301° 22' 47"	0.99901
23	84° 42' 36"	2° 03' 25"	84° 08' 47"	25° 23' 13"	0° 53' 60"	14' 42.88"	306° 36' 55"	0.99919
24	85° 12' 10"	2° 05' 54"	84° 41' 22"	25° 26' 51"	0° 54' 00"	14' 42.93"	312° 56' 43"	0.99933

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	267° 17' 43"	-0.08"	267° 02' 30"	-23° 24' 35"	0.9839101	16' 15.32"	23° 26' 15"	3 m 03 s
1	267° 20' 15"	-0.07"	267° 05' 16"	-23° 24' 38"	0.9839067	16' 15.33"	23° 26' 15"	3 m 01 s
2	267° 22' 48"	-0.07"	267° 08' 02"	-23° 24' 41"	0.9839034	16' 15.33"	23° 26' 15"	3 m 00 s
3	267° 25' 21"	-0.06"	267° 10' 49"	-23° 24' 44"	0.9839001	16' 15.33"	23° 26' 15"	2 m 59 s
4	267° 27' 53"	-0.06"	267° 13' 35"	-23° 24' 47"	0.9838968	16' 15.34"	23° 26' 15"	2 m 58 s
5	267° 30' 26"	-0.05"	267° 16' 21"	-23° 24' 50"	0.9838936	16' 15.34"	23° 26' 15"	2 m 56 s
6	267° 32' 59"	-0.05"	267° 19' 08"	-23° 24' 53"	0.9838903	16' 15.34"	23° 26' 15"	2 m 55 s
7	267° 35' 31"	-0.04"	267° 21' 54"	-23° 24' 56"	0.9838870	16' 15.35"	23° 26' 15"	2 m 54 s
8	267° 38' 04"	-0.04"	267° 24' 40"	-23° 24' 58"	0.9838838	16' 15.35"	23° 26' 15"	2 m 53 s
9	267° 40' 37"	-0.03"	267° 27' 27"	-23° 25' 01"	0.9838806	16' 15.35"	23° 26' 15"	2 m 51 s
10	267° 43' 09"	-0.03"	267° 30' 13"	-23° 25' 04"	0.9838773	16' 15.36"	23° 26' 15"	2 m 50 s
11	267° 45' 42"	-0.02"	267° 32' 59"	-23° 25' 06"	0.9838741	16' 15.36"	23° 26' 15"	2 m 49 s
12	267° 48' 14"	-0.02"	267° 35' 46"	-23° 25' 09"	0.9838709	16' 15.36"	23° 26' 15"	2 m 48 s
13	267° 50' 47"	-0.01"	267° 38' 32"	-23° 25' 11"	0.9838677	16' 15.36"	23° 26' 15"	2 m 47 s
14	267° 53' 20"	-0.01"	267° 41' 18"	-23° 25' 14"	0.9838645	16' 15.37"	23° 26' 15"	2 m 45 s
15	267° 55' 52"	-0.00"	267° 44' 05"	-23° 25' 16"	0.9838614	16' 15.37"	23° 26' 15"	2 m 44 s
16	267° 58' 25"	-0.00"	267° 46' 51"	-23° 25' 19"	0.9838582	16' 15.37"	23° 26' 15"	2 m 43 s
17	268° 00' 58"	0.00"	267° 49' 37"	-23° 25' 21"	0.9838550	16' 15.38"	23° 26' 15"	2 m 42 s
18	268° 03' 30"	0.01"	267° 52' 24"	-23° 25' 23"	0.9838519	16' 15.38"	23° 26' 15"	2 m 40 s
19	268° 06' 03"	0.01"	267° 55' 10"	-23° 25' 25"	0.9838488	16' 15.38"	23° 26' 15"	2 m 39 s
20	268° 08' 36"	0.02"	267° 57' 56"	-23° 25' 28"	0.9838456	16' 15.39"	23° 26' 15"	2 m 38 s
21	268° 11' 08"	0.02"	268° 00' 43"	-23° 25' 30"	0.9838425	16' 15.39"	23° 26' 15"	2 m 37 s
22	268° 13' 41"	0.03"	268° 03' 29"	-23° 25' 32"	0.9838394	16' 15.39"	23° 26' 15"	2 m 35 s
23	268° 16' 14"	0.03"	268° 06' 15"	-23° 25' 34"	0.9838364	16' 15.40"	23° 26' 15"	2 m 34 s
24	268° 18' 46"	0.04"	268° 09' 02"	-23° 25' 36"	0.9838333	16' 15.40"	23° 26' 15"	2 m 33 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	85° 12' 10"	2° 05' 54"	84° 41' 22"	25° 26' 51"	0° 54' 00"	14' 42.93"	312° 56' 43"	0.99933
1	85° 41' 44"	2° 08' 23"	85° 13' 59"	25° 30' 22"	0° 54' 00"	14' 42.99"	320° 34' 50"	0.99945
2	86° 11' 19"	2° 10' 51"	85° 46' 38"	25° 33' 45"	0° 54' 01"	14' 43.04"	329° 39' 11"	0.99953
3	86° 40' 53"	2° 13' 18"	86° 19' 19"	25° 37' 01"	0° 54' 01"	14' 43.10"	340° 4' 53"	0.99958
4	87° 10' 29"	2° 15' 45"	86° 52' 03"	25° 40' 10"	0° 54' 01"	14' 43.16"	351° 26' 04"	0.99961
5	87° 40' 04"	2° 18' 11"	87° 24' 48"	25° 43' 11"	0° 54' 01"	14' 43.22"	2° 57' 10"	0.99960
6	88° 09' 40"	2° 20' 37"	87° 57' 35"	25° 46' 05"	0° 54' 01"	14' 43.29"	13° 48' 32"	0.99956
7	88° 39' 17"	2° 23' 02"	88° 30' 24"	25° 48' 52"	0° 54' 02"	14' 43.36"	23° 25' 49"	0.99948
8	89° 08' 53"	2° 25' 27"	89° 03' 15"	25° 51' 32"	0° 54' 02"	14' 43.43"	31° 36' 48"	0.99938
9	89° 38' 31"	2° 27' 50"	89° 36' 08"	25° 54' 04"	0° 54' 02"	14' 43.50"	38° 25' 35"	0.99925
10	90° 08' 08"	2° 30' 14"	90° 09' 02"	25° 56' 28"	0° 54' 02"	14' 43.57"	44° 3' 44"	0.99908
11	90° 37' 46"	2° 32' 36"	90° 41' 58"	25° 58' 46"	0° 54' 03"	14' 43.65"	48° 44' 16"	0.99889
12	91° 07' 24"	2° 34' 58"	91° 14' 56"	26° 00' 55"	0° 54' 03"	14' 43.73"	52° 38' 50"	0.99866
13	91° 37' 03"	2° 37' 19"	91° 47' 55"	26° 02' 58"	0° 54' 03"	14' 43.81"	55° 56' 60"	0.99840
14	92° 06' 42"	2° 39' 40"	92° 20' 55"	26° 04' 53"	0° 54' 04"	14' 43.89"	58° 46' 16"	0.99812
15	92° 36' 22"	2° 41' 59"	92° 53' 57"	26° 06' 40"	0° 54' 04"	14' 43.98"	61° 12' 28"	0.99780
16	93° 06' 01"	2° 44' 18"	93° 27' 00"	26° 08' 20"	0° 54' 04"	14' 44.07"	63° 20' 05"	0.99744
17	93° 35' 42"	2° 46' 37"	94° 00' 05"	26° 09' 52"	0° 54' 05"	14' 44.16"	65° 12' 36"	0.99706
18	94° 05' 23"	2° 48' 54"	94° 33' 10"	26° 11' 17"	0° 54' 05"	14' 44.25"	66° 52' 43"	0.99665
19	94° 35' 04"	2° 51' 11"	95° 06' 17"	26° 12' 34"	0° 54' 05"	14' 44.34"	68° 22' 34"	0.99621
20	95° 04' 46"	2° 53' 27"	95° 39' 25"	26° 13' 43"	0° 54' 06"	14' 44.44"	69° 43' 50"	0.99573
21	95° 34' 28"	2° 55' 43"	96° 12' 34"	26° 14' 45"	0° 54' 06"	14' 44.54"	70° 57' 52"	0.99523
22	96° 04' 11"	2° 57' 57"	96° 45' 44"	26° 15' 40"	0° 54' 06"	14' 44.64"	72° 5' 45"	0.99469
23	96° 33' 54"	3° 00' 11"	97° 18' 55"	26° 16' 26"	0° 54' 07"	14' 44.75"	73° 8' 23"	0.99412
24	97° 03' 38"	3° 02' 24"	97° 52' 07"	26° 17' 05"	0° 54' 07"	14' 44.85"	74° 6' 28"	0.99352

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	268° 18' 46"	0.04"	268° 09' 02"	-23° 25' 36"	0.9838333	16' 15.40"	23° 26' 15"	2 m 33 s
1	268° 21' 19"	0.04"	268° 11' 48"	-23° 25' 38"	0.9838302	16' 15.40"	23° 26' 15"	2 m 32 s
2	268° 23' 52"	0.04"	268° 14' 35"	-23° 25' 40"	0.9838272	16' 15.41"	23° 26' 15"	2 m 31 s
3	268° 26' 24"	0.05"	268° 17' 21"	-23° 25' 41"	0.9838241	16' 15.41"	23° 26' 15"	2 m 29 s
4	268° 28' 57"	0.05"	268° 20' 07"	-23° 25' 43"	0.9838211	16' 15.41"	23° 26' 15"	2 m 28 s
5	268° 31' 30"	0.06"	268° 22' 54"	-23° 25' 45"	0.9838180	16' 15.41"	23° 26' 15"	2 m 27 s
6	268° 34' 02"	0.06"	268° 25' 40"	-23° 25' 47"	0.9838150	16' 15.42"	23° 26' 15"	2 m 26 s
7	268° 36' 35"	0.06"	268° 28' 26"	-23° 25' 48"	0.9838120	16' 15.42"	23° 26' 15"	2 m 24 s
8	268° 39' 08"	0.07"	268° 31' 13"	-23° 25' 50"	0.9838090	16' 15.42"	23° 26' 15"	2 m 23 s
9	268° 41' 40"	0.07"	268° 33' 59"	-23° 25' 51"	0.9838061	16' 15.43"	23° 26' 15"	2 m 22 s
10	268° 44' 13"	0.08"	268° 36' 46"	-23° 25' 53"	0.9838031	16' 15.43"	23° 26' 15"	2 m 21 s
11	268° 46' 46"	0.08"	268° 39' 32"	-23° 25' 54"	0.9838001	16' 15.43"	23° 26' 15"	2 m 19 s
12	268° 49' 18"	0.08"	268° 42' 18"	-23° 25' 56"	0.9837972	16' 15.43"	23° 26' 15"	2 m 18 s
13	268° 51' 51"	0.09"	268° 45' 05"	-23° 25' 57"	0.9837942	16' 15.44"	23° 26' 15"	2 m 17 s
14	268° 54' 24"	0.09"	268° 47' 51"	-23° 25' 58"	0.9837913	16' 15.44"	23° 26' 15"	2 m 16 s
15	268° 56' 56"	0.10"	268° 50' 38"	-23° 25' 60"	0.9837884	16' 15.44"	23° 26' 15"	2 m 14 s
16	268° 59' 29"	0.10"	268° 53' 24"	-23° 26' 01"	0.9837855	16' 15.45"	23° 26' 15"	2 m 13 s
17	269° 02' 02"	0.10"	268° 56' 10"	-23° 26' 02"	0.9837826	16' 15.45"	23° 26' 15"	2 m 12 s
18	269° 04' 34"	0.11"	268° 58' 57"	-23° 26' 03"	0.9837797	16' 15.45"	23° 26' 15"	2 m 11 s
19	269° 07' 07"	0.11"	269° 01' 43"	-23° 26' 04"	0.9837768	16' 15.45"	23° 26' 15"	2 m 09 s
20	269° 09' 40"	0.11"	269° 04' 30"	-23° 26' 05"	0.9837740	16' 15.46"	23° 26' 15"	2 m 08 s
21	269° 12' 12"	0.12"	269° 07' 16"	-23° 26' 06"	0.9837711	16' 15.46"	23° 26' 15"	2 m 07 s
22	269° 14' 45"	0.12"	269° 10' 02"	-23° 26' 07"	0.9837683	16' 15.46"	23° 26' 15"	2 m 06 s
23	269° 17' 18"	0.13"	269° 12' 49"	-23° 26' 08"	0.9837654	16' 15.47"	23° 26' 15"	2 m 05 s
24	269° 19' 50"	0.13"	269° 15' 35"	-23° 26' 09"	0.9837626	16' 15.47"	23° 26' 15"	2 m 03 s

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DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	97° 03' 38"	3° 02' 24"	97° 52' 07"	26° 17' 05"	0° 54' 07"	14' 44.85"	74° 6' 28"	0.99352
1	97° 33' 22"	3° 04' 36"	98° 25' 19"	26° 17' 37"	0° 54' 08"	14' 44.96"	75° 0' 38"	0.99289
2	98° 03' 07"	3° 06' 47"	98° 58' 32"	26° 18' 01"	0° 54' 08"	14' 45.07"	75° 51' 21"	0.99223
3	98° 32' 52"	3° 08' 58"	99° 31' 46"	26° 18' 17"	0° 54' 08"	14' 45.18"	76° 39' 04"	0.99154
4	99° 02' 38"	3° 11' 08"	100° 05' 00"	26° 18' 25"	0° 54' 09"	14' 45.30"	77° 24' 08"	0.99082
5	99° 32' 24"	3° 13' 17"	100° 38' 15"	26° 18' 26"	0° 54' 09"	14' 45.42"	78° 6' 50"	0.99006
6	100° 02' 11"	3° 15' 25"	101° 11' 30"	26° 18' 19"	0° 54' 10"	14' 45.54"	78° 47' 27"	0.98928
7	100° 31' 59"	3° 17' 32"	101° 44' 46"	26° 18' 05"	0° 54' 10"	14' 45.66"	79° 26' 12"	0.98847
8	101° 01' 47"	3° 19' 38"	102° 18' 02"	26° 17' 42"	0° 54' 11"	14' 45.79"	80° 3' 15"	0.98762
9	101° 31' 35"	3° 21' 44"	102° 51' 18"	26° 17' 12"	0° 54' 11"	14' 45.91"	80° 38' 48"	0.98674
10	102° 01' 24"	3° 23' 48"	103° 24' 34"	26° 16' 35"	0° 54' 12"	14' 46.04"	81° 12' 58"	0.98584
11	102° 31' 14"	3° 25' 52"	103° 57' 51"	26° 15' 49"	0° 54' 12"	14' 46.17"	81° 45' 54"	0.98490
12	103° 01' 04"	3° 27' 54"	104° 31' 07"	26° 14' 56"	0° 54' 13"	14' 46.31"	82° 17' 41"	0.98393
13	103° 30' 55"	3° 29' 56"	105° 04' 23"	26° 13' 55"	0° 54' 13"	14' 46.45"	82° 48' 27"	0.98293
14	104° 00' 47"	3° 31' 57"	105° 37' 40"	26° 12' 47"	0° 54' 14"	14' 46.58"	83° 18' 15"	0.98190
15	104° 30' 39"	3° 33' 57"	106° 10' 56"	26° 11' 31"	0° 54' 14"	14' 46.73"	83° 47' 11"	0.98084
16	105° 00' 32"	3° 35' 56"	106° 44' 12"	26° 10' 07"	0° 54' 15"	14' 46.87"	84° 15' 20"	0.97975
17	105° 30' 25"	3° 37' 54"	107° 17' 28"	26° 08' 36"	0° 54' 15"	14' 47.02"	84° 42' 43"	0.97862
18	106° 00' 19"	3° 39' 51"	107° 50' 43"	26° 06' 56"	0° 54' 16"	14' 47.16"	85° 9' 25"	0.97747
19	106° 30' 14"	3° 41' 47"	108° 23' 58"	26° 05' 10"	0° 54' 16"	14' 47.31"	85° 35' 29"	0.97629
20	107° 00' 09"	3° 43' 42"	108° 57' 13"	26° 03' 15"	0° 54' 17"	14' 47.47"	86° 0' 58"	0.97507
21	107° 30' 05"	3° 45' 36"	109° 30' 27"	26° 01' 13"	0° 54' 17"	14' 47.62"	86° 25' 53"	0.97383
22	108° 00' 01"	3° 47' 29"	110° 03' 40"	25° 59' 03"	0° 54' 18"	14' 47.78"	86° 50' 17"	0.97255
23	108° 29' 59"	3° 49' 22"	110° 36' 53"	25° 56' 46"	0° 54' 18"	14' 47.94"	87° 14' 11"	0.97125
24	108° 59' 57"	3° 51' 13"	111° 10' 05"	25° 54' 21"	0° 54' 19"	14' 48.10"	87° 37' 39"	0.96992

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	269° 19' 50"	0.13"	269° 15' 35"	-23° 26' 09"	0.9837626	16' 15.47"	23° 26' 15"	2 m 03 s
1	269° 22' 23"	0.13"	269° 18' 22"	-23° 26' 09"	0.9837598	16' 15.47"	23° 26' 15"	2 m 02 s
2	269° 24' 56"	0.14"	269° 21' 08"	-23° 26' 10"	0.9837570	16' 15.47"	23° 26' 15"	2 m 01 s
3	269° 27' 28"	0.14"	269° 23' 54"	-23° 26' 11"	0.9837542	16' 15.48"	23° 26' 15"	1 m 60 s
4	269° 30' 01"	0.14"	269° 26' 41"	-23° 26' 11"	0.9837514	16' 15.48"	23° 26' 15"	1 m 58 s
5	269° 32' 34"	0.15"	269° 29' 27"	-23° 26' 12"	0.9837487	16' 15.48"	23° 26' 15"	1 m 57 s
6	269° 35' 07"	0.15"	269° 32' 14"	-23° 26' 13"	0.9837459	16' 15.49"	23° 26' 15"	1 m 56 s
7	269° 37' 39"	0.15"	269° 35' 00"	-23° 26' 13"	0.9837432	16' 15.49"	23° 26' 15"	1 m 55 s
8	269° 40' 12"	0.15"	269° 37' 47"	-23° 26' 13"	0.9837404	16' 15.49"	23° 26' 15"	1 m 53 s
9	269° 42' 45"	0.16"	269° 40' 33"	-23° 26' 14"	0.9837377	16' 15.49"	23° 26' 15"	1 m 52 s
10	269° 45' 17"	0.16"	269° 43' 19"	-23° 26' 14"	0.9837350	16' 15.50"	23° 26' 15"	1 m 51 s
11	269° 47' 50"	0.16"	269° 46' 06"	-23° 26' 14"	0.9837323	16' 15.50"	23° 26' 15"	1 m 50 s
12	269° 50' 23"	0.17"	269° 48' 52"	-23° 26' 15"	0.9837296	16' 15.50"	23° 26' 15"	1 m 48 s
13	269° 52' 55"	0.17"	269° 51' 39"	-23° 26' 15"	0.9837269	16' 15.50"	23° 26' 15"	1 m 47 s
14	269° 55' 28"	0.17"	269° 54' 25"	-23° 26' 15"	0.9837242	16' 15.51"	23° 26' 15"	1 m 46 s
15	269° 58' 01"	0.18"	269° 57' 12"	-23° 26' 15"	0.9837216	16' 15.51"	23° 26' 15"	1 m 45 s
16	270° 00' 34"	0.18"	269° 59' 58"	-23° 26' 15"	0.9837189	16' 15.51"	23° 26' 15"	1 m 43 s
17	270° 03' 06"	0.18"	270° 02' 45"	-23° 26' 15"	0.9837163	16' 15.52"	23° 26' 15"	1 m 42 s
18	270° 05' 39"	0.18"	270° 05' 31"	-23° 26' 15"	0.9837136	16' 15.52"	23° 26' 15"	1 m 41 s
19	270° 08' 12"	0.19"	270° 08' 17"	-23° 26' 15"	0.9837110	16' 15.52"	23° 26' 15"	1 m 40 s
20	270° 10' 44"	0.19"	270° 11' 04"	-23° 26' 15"	0.9837084	16' 15.52"	23° 26' 15"	1 m 39 s
21	270° 13' 17"	0.19"	270° 13' 50"	-23° 26' 14"	0.9837058	16' 15.53"	23° 26' 15"	1 m 37 s
22	270° 15' 50"	0.19"	270° 16' 37"	-23° 26' 14"	0.9837032	16' 15.53"	23° 26' 15"	1 m 36 s
23	270° 18' 22"	0.20"	270° 19' 23"	-23° 26' 14"	0.9837006	16' 15.53"	23° 26' 15"	1 m 35 s
24	270° 20' 55"	0.20"	270° 22' 10"	-23° 26' 13"	0.9836981	16' 15.53"	23° 26' 15"	1 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	108° 59' 57"	3° 51' 13"	111° 10' 05"	25° 54' 21"	0° 54' 19"	14' 48.10"	87° 37' 39"	0.96992
1	109° 29' 55"	3° 53' 03"	111° 43' 16"	25° 51' 48"	0° 54' 20"	14' 48.27"	88° 0' 40"	0.96855
2	109° 59' 55"	3° 54' 52"	112° 16' 26"	25° 49' 08"	0° 54' 20"	14' 48.44"	88° 23' 17"	0.96715
3	110° 29' 55"	3° 56' 40"	112° 49' 36"	25° 46' 20"	0° 54' 21"	14' 48.61"	88° 45' 32"	0.96573
4	110° 59' 56"	3° 58' 26"	113° 22' 44"	25° 43' 24"	0° 54' 22"	14' 48.78"	89° 7' 24"	0.96427
5	111° 29' 57"	4° 00' 12"	113° 55' 52"	25° 40' 21"	0° 54' 22"	14' 48.95"	89° 28' 56"	0.96279
6	111° 59' 59"	4° 01' 57"	114° 28' 58"	25° 37' 11"	0° 54' 23"	14' 49.13"	89° 50' 08"	0.96127
7	112° 30' 02"	4° 03' 41"	115° 02' 03"	25° 33' 53"	0° 54' 24"	14' 49.31"	90° 11' 01"	0.95973
8	113° 00' 06"	4° 05' 23"	115° 35' 07"	25° 30' 27"	0° 54' 24"	14' 49.49"	90° 31' 36"	0.95815
9	113° 30' 10"	4° 07' 05"	116° 08' 10"	25° 26' 54"	0° 54' 25"	14' 49.68"	90° 51' 55"	0.95655
10	114° 00' 16"	4° 08' 45"	116° 41' 12"	25° 23' 13"	0° 54' 26"	14' 49.86"	91° 11' 56"	0.95491
11	114° 30' 22"	4° 10' 24"	117° 14' 12"	25° 19' 25"	0° 54' 26"	14' 50.05"	91° 31' 43"	0.95325
12	115° 00' 28"	4° 12' 03"	117° 47' 11"	25° 15' 30"	0° 54' 27"	14' 50.25"	91° 51' 14"	0.95155
13	115° 30' 36"	4° 13' 40"	118° 20' 08"	25° 11' 27"	0° 54' 28"	14' 50.44"	92° 10' 30"	0.94983
14	116° 00' 44"	4° 15' 15"	118° 53' 04"	25° 07' 16"	0° 54' 28"	14' 50.64"	92° 29' 33"	0.94808
15	116° 30' 53"	4° 16' 50"	119° 25' 59"	25° 02' 59"	0° 54' 29"	14' 50.84"	92° 48' 22"	0.94629
16	117° 01' 03"	4° 18' 24"	119° 58' 51"	24° 58' 34"	0° 54' 30"	14' 51.04"	93° 6' 58"	0.94448
17	117° 31' 14"	4° 19' 56"	120° 31' 42"	24° 54' 01"	0° 54' 31"	14' 51.24"	93° 25' 21"	0.94264
18	118° 01' 25"	4° 21' 27"	121° 04' 32"	24° 49' 22"	0° 54' 31"	14' 51.45"	93° 43' 32"	0.94077
19	118° 31' 38"	4° 22' 57"	121° 37' 19"	24° 44' 35"	0° 54' 32"	14' 51.66"	94° 1' 31"	0.93887
20	119° 01' 51"	4° 24' 26"	122° 10' 05"	24° 39' 40"	0° 54' 33"	14' 51.87"	94° 19' 18"	0.93694
21	119° 32' 05"	4° 25' 54"	122° 42' 49"	24° 34' 39"	0° 54' 34"	14' 52.09"	94° 36' 54"	0.93499
22	120° 02' 20"	4° 27' 20"	123° 15' 32"	24° 29' 30"	0° 54' 35"	14' 52.31"	94° 54' 19"	0.93300
23	120° 32' 36"	4° 28' 45"	123° 48' 12"	24° 24' 14"	0° 54' 35"	14' 52.53"	95° 11' 33"	0.93098
24	121° 02' 53"	4° 30' 09"	124° 20' 50"	24° 18' 51"	0° 54' 36"	14' 52.75"	95° 28' 37"	0.92894

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	270° 20' 55"	0.20"	270° 22' 10"	-23° 26' 13"	0.9836981	16' 15.53"	23° 26' 15"	1 m 34 s
1	270° 23' 28"	0.20"	270° 24' 56"	-23° 26' 13"	0.9836955	16' 15.54"	23° 26' 15"	1 m 32 s
2	270° 26' 01"	0.20"	270° 27' 42"	-23° 26' 13"	0.9836930	16' 15.54"	23° 26' 15"	1 m 31 s
3	270° 28' 33"	0.21"	270° 30' 29"	-23° 26' 12"	0.9836904	16' 15.54"	23° 26' 15"	1 m 30 s
4	270° 31' 06"	0.21"	270° 33' 15"	-23° 26' 11"	0.9836879	16' 15.54"	23° 26' 15"	1 m 29 s
5	270° 33' 39"	0.21"	270° 36' 02"	-23° 26' 11"	0.9836854	16' 15.55"	23° 26' 15"	1 m 27 s
6	270° 36' 11"	0.21"	270° 38' 48"	-23° 26' 10"	0.9836829	16' 15.55"	23° 26' 15"	1 m 26 s
7	270° 38' 44"	0.21"	270° 41' 35"	-23° 26' 09"	0.9836804	16' 15.55"	23° 26' 15"	1 m 25 s
8	270° 41' 17"	0.22"	270° 44' 21"	-23° 26' 09"	0.9836779	16' 15.55"	23° 26' 15"	1 m 24 s
9	270° 43' 50"	0.22"	270° 47' 08"	-23° 26' 08"	0.9836754	16' 15.56"	23° 26' 15"	1 m 22 s
10	270° 46' 22"	0.22"	270° 49' 54"	-23° 26' 07"	0.9836730	16' 15.56"	23° 26' 15"	1 m 21 s
11	270° 48' 55"	0.22"	270° 52' 41"	-23° 26' 06"	0.9836705	16' 15.56"	23° 26' 15"	1 m 20 s
12	270° 51' 28"	0.22"	270° 55' 27"	-23° 26' 05"	0.9836681	16' 15.56"	23° 26' 15"	1 m 19 s
13	270° 54' 00"	0.22"	270° 58' 13"	-23° 26' 04"	0.9836657	16' 15.57"	23° 26' 15"	1 m 17 s
14	270° 56' 33"	0.23"	271° 00' 60"	-23° 26' 03"	0.9836632	16' 15.57"	23° 26' 15"	1 m 16 s
15	270° 59' 06"	0.23"	271° 03' 46"	-23° 26' 02"	0.9836608	16' 15.57"	23° 26' 15"	1 m 15 s
16	271° 01' 39"	0.23"	271° 06' 33"	-23° 26' 01"	0.9836584	16' 15.57"	23° 26' 15"	1 m 14 s
17	271° 04' 11"	0.23"	271° 09' 19"	-23° 25' 60"	0.9836560	16' 15.57"	23° 26' 15"	1 m 12 s
18	271° 06' 44"	0.23"	271° 12' 06"	-23° 25' 58"	0.9836537	16' 15.58"	23° 26' 15"	1 m 11 s
19	271° 09' 17"	0.23"	271° 14' 52"	-23° 25' 57"	0.9836513	16' 15.58"	23° 26' 15"	1 m 10 s
20	271° 11' 50"	0.24"	271° 17' 39"	-23° 25' 56"	0.9836489	16' 15.58"	23° 26' 15"	1 m 09 s
21	271° 14' 22"	0.24"	271° 20' 25"	-23° 25' 54"	0.9836466	16' 15.58"	23° 26' 15"	1 m 08 s
22	271° 16' 55"	0.24"	271° 23' 12"	-23° 25' 53"	0.9836442	16' 15.59"	23° 26' 15"	1 m 06 s
23	271° 19' 28"	0.24"	271° 25' 58"	-23° 25' 51"	0.9836419	16' 15.59"	23° 26' 15"	1 m 05 s
24	271° 22' 01"	0.24"	271° 28' 44"	-23° 25' 50"	0.9836396	16' 15.59"	23° 26' 15"	1 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	121° 02' 53"	4° 30' 09"	124° 20' 50"	24° 18' 51"	0° 54' 36"	14' 52.75"	95° 28' 37"	0.92894
1	121° 33' 10"	4° 31' 32"	124° 53' 27"	24° 13' 21"	0° 54' 37"	14' 52.97"	95° 45' 30"	0.92687
2	122° 03' 29"	4° 32' 54"	125° 26' 01"	24° 07' 44"	0° 54' 38"	14' 53.20"	96° 2' 13"	0.92477
3	122° 33' 48"	4° 34' 14"	125° 58' 34"	24° 01' 60"	0° 54' 39"	14' 53.43"	96° 18' 47"	0.92264
4	123° 04' 08"	4° 35' 33"	126° 31' 04"	23° 56' 08"	0° 54' 40"	14' 53.66"	96° 35' 10"	0.92048
5	123° 34' 29"	4° 36' 51"	127° 03' 32"	23° 50' 10"	0° 54' 40"	14' 53.90"	96° 51' 24"	0.91829
6	124° 04' 52"	4° 38' 07"	127° 35' 58"	23° 44' 05"	0° 54' 41"	14' 54.14"	97° 7' 29"	0.91608
7	124° 35' 15"	4° 39' 22"	128° 08' 22"	23° 37' 53"	0° 54' 42"	14' 54.38"	97° 23' 24"	0.91383
8	125° 05' 39"	4° 40' 36"	128° 40' 43"	23° 31' 34"	0° 54' 43"	14' 54.62"	97° 39' 10"	0.91156
9	125° 36' 04"	4° 41' 49"	129° 13' 03"	23° 25' 08"	0° 54' 44"	14' 54.87"	97° 54' 47"	0.90927
10	126° 06' 29"	4° 43' 00"	129° 45' 20"	23° 18' 35"	0° 54' 45"	14' 55.12"	98° 10' 15"	0.90694
11	126° 36' 56"	4° 44' 10"	130° 17' 35"	23° 11' 55"	0° 54' 46"	14' 55.37"	98° 25' 35"	0.90458
12	127° 07' 24"	4° 45' 19"	130° 49' 47"	23° 05' 09"	0° 54' 47"	14' 55.63"	98° 40' 46"	0.90220
13	127° 37' 53"	4° 46' 26"	131° 21' 57"	22° 58' 16"	0° 54' 48"	14' 55.88"	98° 55' 48"	0.89979
14	128° 08' 23"	4° 47' 32"	131° 54' 05"	22° 51' 16"	0° 54' 49"	14' 56.14"	99° 10' 41"	0.89736
15	128° 38' 54"	4° 48' 37"	132° 26' 11"	22° 44' 09"	0° 54' 50"	14' 56.41"	99° 25' 26"	0.89489
16	129° 09' 25"	4° 49' 41"	132° 58' 14"	22° 36' 56"	0° 54' 51"	14' 56.67"	99° 40' 03"	0.89240
17	129° 39' 58"	4° 50' 43"	133° 30' 14"	22° 29' 37"	0° 54' 52"	14' 56.94"	99° 54' 32"	0.88988
18	130° 10' 32"	4° 51' 43"	134° 02' 12"	22° 22' 10"	0° 54' 53"	14' 57.21"	100° 8' 52"	0.88733
19	130° 41' 07"	4° 52' 43"	134° 34' 08"	22° 14' 38"	0° 54' 54"	14' 57.49"	100° 23' 04"	0.88476
20	131° 11' 43"	4° 53' 41"	135° 06' 01"	22° 06' 58"	0° 54' 55"	14' 57.76"	100° 37' 08"	0.88216
21	131° 42' 20"	4° 54' 37"	135° 37' 52"	21° 59' 13"	0° 54' 56"	14' 58.04"	100° 51' 04"	0.87953
22	132° 12' 58"	4° 55' 33"	136° 09' 40"	21° 51' 21"	0° 54' 57"	14' 58.32"	101° 4' 52"	0.87688
23	132° 43' 37"	4° 56' 27"	136° 41' 26"	21° 43' 22"	0° 54' 58"	14' 58.61"	101° 18' 32"	0.87420
24	133° 14' 18"	4° 57' 19"	137° 13' 10"	21° 35' 18"	0° 54' 59"	14' 58.90"	101° 32' 04"	0.87150

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	271° 22' 01"	0.24"	271° 28' 44"	-23° 25' 50"	0.9836396	16' 15.59"	23° 26' 15"	1 m 04 s
1	271° 24' 33"	0.24"	271° 31' 31"	-23° 25' 48"	0.9836373	16' 15.59"	23° 26' 15"	1 m 03 s
2	271° 27' 06"	0.24"	271° 34' 17"	-23° 25' 47"	0.9836350	16' 15.60"	23° 26' 15"	1 m 01 s
3	271° 29' 39"	0.24"	271° 37' 04"	-23° 25' 45"	0.9836327	16' 15.60"	23° 26' 15"	1 m 00 s
4	271° 32' 11"	0.24"	271° 39' 50"	-23° 25' 43"	0.9836304	16' 15.60"	23° 26' 15"	0 m 59 s
5	271° 34' 44"	0.24"	271° 42' 37"	-23° 25' 41"	0.9836282	16' 15.60"	23° 26' 15"	0 m 58 s
6	271° 37' 17"	0.25"	271° 45' 23"	-23° 25' 40"	0.9836259	16' 15.60"	23° 26' 15"	0 m 56 s
7	271° 39' 50"	0.25"	271° 48' 10"	-23° 25' 38"	0.9836237	16' 15.61"	23° 26' 15"	0 m 55 s
8	271° 42' 22"	0.25"	271° 50' 56"	-23° 25' 36"	0.9836214	16' 15.61"	23° 26' 15"	0 m 54 s
9	271° 44' 55"	0.25"	271° 53' 43"	-23° 25' 34"	0.9836192	16' 15.61"	23° 26' 15"	0 m 53 s
10	271° 47' 28"	0.25"	271° 56' 29"	-23° 25' 32"	0.9836170	16' 15.61"	23° 26' 15"	0 m 51 s
11	271° 50' 01"	0.25"	271° 59' 15"	-23° 25' 30"	0.9836148	16' 15.62"	23° 26' 15"	0 m 50 s
12	271° 52' 33"	0.25"	272° 02' 02"	-23° 25' 28"	0.9836126	16' 15.62"	23° 26' 15"	0 m 49 s
13	271° 55' 06"	0.25"	272° 04' 48"	-23° 25' 25"	0.9836104	16' 15.62"	23° 26' 15"	0 m 48 s
14	271° 57' 39"	0.25"	272° 07' 35"	-23° 25' 23"	0.9836083	16' 15.62"	23° 26' 15"	0 m 46 s
15	272° 00' 12"	0.25"	272° 10' 21"	-23° 25' 21"	0.9836061	16' 15.62"	23° 26' 15"	0 m 45 s
16	272° 02' 44"	0.25"	272° 13' 08"	-23° 25' 19"	0.9836039	16' 15.63"	23° 26' 15"	0 m 44 s
17	272° 05' 17"	0.25"	272° 15' 54"	-23° 25' 16"	0.9836018	16' 15.63"	23° 26' 15"	0 m 43 s
18	272° 07' 50"	0.25"	272° 18' 41"	-23° 25' 14"	0.9835997	16' 15.63"	23° 26' 15"	0 m 41 s
19	272° 10' 23"	0.25"	272° 21' 27"	-23° 25' 11"	0.9835976	16' 15.63"	23° 26' 15"	0 m 40 s
20	272° 12' 55"	0.25"	272° 24' 14"	-23° 25' 09"	0.9835954	16' 15.63"	23° 26' 15"	0 m 39 s
21	272° 15' 28"	0.25"	272° 27' 00"	-23° 25' 06"	0.9835933	16' 15.64"	23° 26' 15"	0 m 38 s
22	272° 18' 01"	0.25"	272° 29' 46"	-23° 25' 04"	0.9835912	16' 15.64"	23° 26' 15"	0 m 37 s
23	272° 20' 34"	0.25"	272° 32' 33"	-23° 25' 01"	0.9835892	16' 15.64"	23° 26' 15"	0 m 35 s
24	272° 23' 07"	0.25"	272° 35' 19"	-23° 24' 58"	0.9835871	16' 15.64"	23° 26' 15"	0 m 34 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	133° 14' 18"	4° 57' 19"	137° 13' 10"	21° 35' 18"	0° 54' 59"	14' 58.90"	101° 32' 04"	0.87150
1	133° 44' 59"	4° 58' 10"	137° 44' 50"	21° 27' 07"	0° 54' 60"	14' 59.19"	101° 45' 28"	0.86876
2	134° 15' 42"	4° 58' 60"	138° 16' 29"	21° 18' 49"	0° 55' 01"	14' 59.48"	101° 58' 45"	0.86601
3	134° 46' 25"	4° 59' 48"	138° 48' 04"	21° 10' 26"	0° 55' 02"	14' 59.78"	102° 11' 53"	0.86322
4	135° 17' 10"	5° 00' 35"	139° 19' 38"	21° 01' 56"	0° 55' 03"	15' 00.08"	102° 24' 54"	0.86041
5	135° 47' 56"	5° 01' 20"	139° 51' 08"	20° 53' 20"	0° 55' 04"	15' 00.38"	102° 37' 47"	0.85757
6	136° 18' 43"	5° 02' 04"	140° 22' 36"	20° 44' 39"	0° 55' 05"	15' 00.68"	102° 50' 32"	0.85471
7	136° 49' 31"	5° 02' 47"	140° 54' 02"	20° 35' 51"	0° 55' 06"	15' 00.99"	103° 3' 10"	0.85182
8	137° 20' 20"	5° 03' 28"	141° 25' 25"	20° 26' 57"	0° 55' 08"	15' 01.30"	103° 15' 39"	0.84891
9	137° 51' 11"	5° 04' 08"	141° 56' 46"	20° 17' 57"	0° 55' 09"	15' 01.62"	103° 28' 01"	0.84597
10	138° 22' 03"	5° 04' 46"	142° 28' 04"	20° 08' 51"	0° 55' 10"	15' 01.93"	103° 40' 16"	0.84301
11	138° 52' 56"	5° 05' 23"	142° 59' 20"	19° 59' 40"	0° 55' 11"	15' 02.25"	103° 52' 23"	0.84002
12	139° 23' 50"	5° 05' 58"	143° 30' 33"	19° 50' 22"	0° 55' 12"	15' 02.58"	104° 4' 22"	0.83701
13	139° 54' 45"	5° 06' 32"	144° 01' 43"	19° 40' 59"	0° 55' 13"	15' 02.90"	104° 16' 13"	0.83397
14	140° 25' 42"	5° 07' 04"	144° 32' 51"	19° 31' 30"	0° 55' 15"	15' 03.23"	104° 27' 57"	0.83091
15	140° 56' 40"	5° 07' 35"	145° 03' 57"	19° 21' 55"	0° 55' 16"	15' 03.56"	104° 39' 34"	0.82782
16	141° 27' 39"	5° 08' 05"	145° 35' 00"	19° 12' 15"	0° 55' 17"	15' 03.90"	104° 51' 03"	0.82471
17	141° 58' 39"	5° 08' 33"	146° 06' 01"	19° 02' 29"	0° 55' 18"	15' 04.23"	105° 2' 24"	0.82157
18	142° 29' 41"	5° 08' 59"	146° 36' 59"	18° 52' 38"	0° 55' 20"	15' 04.57"	105° 13' 37"	0.81841
19	143° 00' 44"	5° 09' 24"	147° 07' 55"	18° 42' 41"	0° 55' 21"	15' 04.92"	105° 24' 44"	0.81523
20	143° 31' 48"	5° 09' 47"	147° 38' 48"	18° 32' 38"	0° 55' 22"	15' 05.26"	105° 35' 42"	0.81202
21	144° 02' 53"	5° 10' 09"	148° 09' 39"	18° 22' 30"	0° 55' 23"	15' 05.61"	105° 46' 33"	0.80879
22	144° 34' 00"	5° 10' 30"	148° 40' 28"	18° 12' 17"	0° 55' 25"	15' 05.96"	105° 57' 17"	0.80553
23	145° 05' 08"	5° 10' 49"	149° 11' 14"	18° 01' 58"	0° 55' 26"	15' 06.32"	106° 7' 53"	0.80225
24	145° 36' 18"	5° 11' 06"	149° 41' 58"	17° 51' 34"	0° 55' 27"	15' 06.68"	106° 18' 21"	0.79895

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	272° 23' 07"	0.25"	272° 35' 19"	-23° 24' 58"	0.9835871	16' 15.64"	23° 26' 15"	0 m 34 s
1	272° 25' 39"	0.25"	272° 38' 06"	-23° 24' 55"	0.9835850	16' 15.65"	23° 26' 15"	0 m 33 s
2	272° 28' 12"	0.25"	272° 40' 52"	-23° 24' 53"	0.9835830	16' 15.65"	23° 26' 15"	0 m 32 s
3	272° 30' 45"	0.25"	272° 43' 39"	-23° 24' 50"	0.9835809	16' 15.65"	23° 26' 15"	0 m 30 s
4	272° 33' 18"	0.25"	272° 46' 25"	-23° 24' 47"	0.9835789	16' 15.65"	23° 26' 15"	0 m 29 s
5	272° 35' 50"	0.25"	272° 49' 12"	-23° 24' 44"	0.9835769	16' 15.65"	23° 26' 15"	0 m 28 s
6	272° 38' 23"	0.25"	272° 51' 58"	-23° 24' 41"	0.9835749	16' 15.66"	23° 26' 15"	0 m 27 s
7	272° 40' 56"	0.25"	272° 54' 44"	-23° 24' 38"	0.9835729	16' 15.66"	23° 26' 15"	0 m 25 s
8	272° 43' 29"	0.25"	272° 57' 31"	-23° 24' 35"	0.9835709	16' 15.66"	23° 26' 15"	0 m 24 s
9	272° 46' 01"	0.25"	273° 00' 17"	-23° 24' 32"	0.9835689	16' 15.66"	23° 26' 15"	0 m 23 s
10	272° 48' 34"	0.25"	273° 03' 04"	-23° 24' 28"	0.9835669	16' 15.66"	23° 26' 15"	0 m 22 s
11	272° 51' 07"	0.25"	273° 05' 50"	-23° 24' 25"	0.9835650	16' 15.67"	23° 26' 15"	0 m 20 s
12	272° 53' 40"	0.25"	273° 08' 37"	-23° 24' 22"	0.9835630	16' 15.67"	23° 26' 15"	0 m 19 s
13	272° 56' 13"	0.25"	273° 11' 23"	-23° 24' 18"	0.9835611	16' 15.67"	23° 26' 15"	0 m 18 s
14	272° 58' 45"	0.24"	273° 14' 10"	-23° 24' 15"	0.9835592	16' 15.67"	23° 26' 15"	0 m 17 s
15	273° 01' 18"	0.24"	273° 16' 56"	-23° 24' 12"	0.9835572	16' 15.67"	23° 26' 15"	0 m 15 s
16	273° 03' 51"	0.24"	273° 19' 42"	-23° 24' 08"	0.9835553	16' 15.67"	23° 26' 15"	0 m 14 s
17	273° 06' 24"	0.24"	273° 22' 29"	-23° 24' 04"	0.9835534	16' 15.68"	23° 26' 15"	0 m 13 s
18	273° 08' 56"	0.24"	273° 25' 15"	-23° 24' 01"	0.9835515	16' 15.68"	23° 26' 15"	0 m 12 s
19	273° 11' 29"	0.24"	273° 28' 02"	-23° 23' 57"	0.9835497	16' 15.68"	23° 26' 15"	0 m 11 s
20	273° 14' 02"	0.24"	273° 30' 48"	-23° 23' 54"	0.9835478	16' 15.68"	23° 26' 15"	0 m 09 s
21	273° 16' 35"	0.24"	273° 33' 35"	-23° 23' 50"	0.9835459	16' 15.68"	23° 26' 15"	0 m 08 s
22	273° 19' 08"	0.24"	273° 36' 21"	-23° 23' 46"	0.9835441	16' 15.69"	23° 26' 15"	0 m 07 s
23	273° 21' 40"	0.23"	273° 39' 07"	-23° 23' 42"	0.9835422	16' 15.69"	23° 26' 15"	0 m 06 s
24	273° 24' 13"	0.23"	273° 41' 54"	-23° 23' 38"	0.9835404	16' 15.69"	23° 26' 15"	0 m 04 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	145° 36' 18"	5° 11' 06"	149° 41' 58"	17° 51' 34"	0° 55' 27"	15' 06.68"	106° 18' 21"	0.79895
1	146° 07' 29"	5° 11' 22"	150° 12' 40"	17° 41' 05"	0° 55' 29"	15' 07.04"	106° 28' 42"	0.79563
2	146° 38' 41"	5° 11' 36"	150° 43' 19"	17° 30' 31"	0° 55' 30"	15' 07.40"	106° 38' 55"	0.79228
3	147° 09' 54"	5° 11' 49"	151° 13' 56"	17° 19' 51"	0° 55' 31"	15' 07.77"	106° 49' 01"	0.78891
4	147° 41' 09"	5° 12' 01"	151° 44' 31"	17° 09' 06"	0° 55' 33"	15' 08.14"	106° 58' 59"	0.78552
5	148° 12' 26"	5° 12' 10"	152° 15' 04"	16° 58' 16"	0° 55' 34"	15' 08.51"	107° 8' 50"	0.78210
6	148° 43' 43"	5° 12' 19"	152° 45' 35"	16° 47' 22"	0° 55' 35"	15' 08.89"	107° 18' 34"	0.77866
7	149° 15' 03"	5° 12' 25"	153° 16' 03"	16° 36' 22"	0° 55' 37"	15' 09.27"	107° 28' 09"	0.77520
8	149° 46' 23"	5° 12' 30"	153° 46' 29"	16° 25' 17"	0° 55' 38"	15' 09.65"	107° 37' 38"	0.77172
9	150° 17' 45"	5° 12' 34"	154° 16' 53"	16° 14' 07"	0° 55' 40"	15' 10.04"	107° 46' 58"	0.76822
10	150° 49' 09"	5° 12' 36"	154° 47' 15"	16° 02' 53"	0° 55' 41"	15' 10.43"	107° 56' 12"	0.76469
11	151° 20' 34"	5° 12' 36"	155° 17' 35"	15° 51' 33"	0° 55' 42"	15' 10.82"	108° 5' 17"	0.76114
12	151° 52' 00"	5° 12' 35"	155° 47' 54"	15° 40' 09"	0° 55' 44"	15' 11.21"	108° 14' 15"	0.75758
13	152° 23' 28"	5° 12' 32"	156° 18' 10"	15° 28' 41"	0° 55' 45"	15' 11.61"	108° 23' 06"	0.75399
14	152° 54' 58"	5° 12' 28"	156° 48' 24"	15° 17' 07"	0° 55' 47"	15' 12.01"	108° 31' 49"	0.75038
15	153° 26' 29"	5° 12' 22"	157° 18' 36"	15° 05' 29"	0° 55' 48"	15' 12.41"	108° 40' 25"	0.74674
16	153° 58' 01"	5° 12' 15"	157° 48' 47"	14° 53' 46"	0° 55' 50"	15' 12.82"	108° 48' 53"	0.74309
17	154° 29' 35"	5° 12' 06"	158° 18' 55"	14° 41' 59"	0° 55' 51"	15' 13.23"	108° 57' 13"	0.73942
18	155° 01' 11"	5° 11' 55"	158° 49' 02"	14° 30' 07"	0° 55' 53"	15' 13.64"	109° 5' 26"	0.73573
19	155° 32' 48"	5° 11' 43"	159° 19' 07"	14° 18' 11"	0° 55' 54"	15' 14.06"	109° 13' 32"	0.73202
20	156° 04' 27"	5° 11' 29"	159° 49' 11"	14° 06' 11"	0° 55' 56"	15' 14.48"	109° 21' 29"	0.72828
21	156° 36' 07"	5° 11' 14"	160° 19' 12"	13° 54' 06"	0° 55' 57"	15' 14.90"	109° 29' 20"	0.72453
22	157° 07' 49"	5° 10' 57"	160° 49' 13"	13° 41' 57"	0° 55' 59"	15' 15.32"	109° 37' 02"	0.72076
23	157° 39' 32"	5° 10' 38"	161° 19' 11"	13° 29' 43"	0° 56' 01"	15' 15.75"	109° 44' 37"	0.71697
24	158° 11' 17"	5° 10' 18"	161° 49' 08"	13° 17' 26"	0° 56' 02"	15' 16.18"	109° 52' 05"	0.71316

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DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	273° 24' 13"	0.23"	273° 41' 54"	-23° 23' 38"	0.9835404	16' 15.69"	23° 26' 15"	0 m 04 s
1	273° 26' 46"	0.23"	273° 44' 40"	-23° 23' 34"	0.9835386	16' 15.69"	23° 26' 15"	0 m 03 s
2	273° 29' 19"	0.23"	273° 47' 27"	-23° 23' 30"	0.9835368	16' 15.69"	23° 26' 15"	0 m 02 s
3	273° 31' 52"	0.23"	273° 50' 13"	-23° 23' 26"	0.9835350	16' 15.69"	23° 26' 15"	0 m 01 s
4	273° 34' 24"	0.23"	273° 52' 59"	-23° 23' 22"	0.9835332	16' 15.70"	23° 26' 15"	0 m -1 s
5	273° 36' 57"	0.23"	273° 55' 46"	-23° 23' 18"	0.9835314	16' 15.70"	23° 26' 15"	0 m -2 s
6	273° 39' 30"	0.22"	273° 58' 32"	-23° 23' 14"	0.9835296	16' 15.70"	23° 26' 15"	0 m -3 s
7	273° 42' 03"	0.22"	274° 01' 19"	-23° 23' 10"	0.9835278	16' 15.70"	23° 26' 15"	0 m -4 s
8	273° 44' 36"	0.22"	274° 04' 05"	-23° 23' 05"	0.9835261	16' 15.70"	23° 26' 15"	0 m -6 s
9	273° 47' 08"	0.22"	274° 06' 52"	-23° 23' 01"	0.9835243	16' 15.71"	23° 26' 15"	0 m -7 s
10	273° 49' 41"	0.22"	274° 09' 38"	-23° 22' 57"	0.9835226	16' 15.71"	23° 26' 15"	0 m -8 s
11	273° 52' 14"	0.21"	274° 12' 24"	-23° 22' 52"	0.9835209	16' 15.71"	23° 26' 15"	0 m -9 s
12	273° 54' 47"	0.21"	274° 15' 11"	-23° 22' 48"	0.9835192	16' 15.71"	23° 26' 15"	0 m -10 s
13	273° 57' 20"	0.21"	274° 17' 57"	-23° 22' 43"	0.9835175	16' 15.71"	23° 26' 15"	0 m -12 s
14	273° 59' 52"	0.21"	274° 20' 44"	-23° 22' 39"	0.9835158	16' 15.71"	23° 26' 15"	0 m -13 s
15	274° 02' 25"	0.21"	274° 23' 30"	-23° 22' 34"	0.9835141	16' 15.72"	23° 26' 15"	0 m -14 s
16	274° 04' 58"	0.20"	274° 26' 16"	-23° 22' 29"	0.9835124	16' 15.72"	23° 26' 15"	0 m -15 s
17	274° 07' 31"	0.20"	274° 29' 03"	-23° 22' 25"	0.9835107	16' 15.72"	23° 26' 15"	0 m -17 s
18	274° 10' 04"	0.20"	274° 31' 49"	-23° 22' 20"	0.9835091	16' 15.72"	23° 26' 15"	0 m -18 s
19	274° 12' 36"	0.20"	274° 34' 35"	-23° 22' 15"	0.9835074	16' 15.72"	23° 26' 15"	0 m -19 s
20	274° 15' 09"	0.19"	274° 37' 22"	-23° 22' 10"	0.9835058	16' 15.72"	23° 26' 15"	0 m -20 s
21	274° 17' 42"	0.19"	274° 40' 08"	-23° 22' 05"	0.9835041	16' 15.73"	23° 26' 15"	0 m -22 s
22	274° 20' 15"	0.19"	274° 42' 55"	-23° 22' 00"	0.9835025	16' 15.73"	23° 26' 15"	0 m -23 s
23	274° 22' 48"	0.19"	274° 45' 41"	-23° 21' 55"	0.9835009	16' 15.73"	23° 26' 15"	0 m -24 s
24	274° 25' 20"	0.18"	274° 48' 27"	-23° 21' 50"	0.9834993	16' 15.73"	23° 26' 15"	0 m -25 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	158° 11' 17"	5° 10' 18"	161° 49' 08"	13° 17' 26"	0° 56' 02"	15' 16.18"	109° 52' 05"	0.71316
1	158° 43' 04"	5° 09' 56"	162° 19' 04"	13° 05' 04"	0° 56' 04"	15' 16.62"	109° 59' 25"	0.70933
2	159° 14' 53"	5° 09' 33"	162° 48' 58"	12° 52' 38"	0° 56' 05"	15' 17.05"	110° 6' 37"	0.70548
3	159° 46' 43"	5° 09' 08"	163° 18' 51"	12° 40' 08"	0° 56' 07"	15' 17.49"	110° 13' 42"	0.70162
4	160° 18' 34"	5° 08' 41"	163° 48' 43"	12° 27' 34"	0° 56' 09"	15' 17.94"	110° 20' 39"	0.69773
5	160° 50' 28"	5° 08' 13"	164° 18' 33"	12° 14' 56"	0° 56' 10"	15' 18.38"	110° 27' 29"	0.69383
6	161° 22' 23"	5° 07' 43"	164° 48' 22"	12° 02' 15"	0° 56' 12"	15' 18.83"	110° 34' 10"	0.68991
7	161° 54' 20"	5° 07' 11"	165° 18' 10"	11° 49' 29"	0° 56' 14"	15' 19.28"	110° 40' 45"	0.68597
8	162° 26' 18"	5° 06' 38"	165° 47' 56"	11° 36' 39"	0° 56' 15"	15' 19.74"	110° 47' 11"	0.68202
9	162° 58' 18"	5° 06' 03"	166° 17' 42"	11° 23' 46"	0° 56' 17"	15' 20.19"	110° 53' 30"	0.67804
10	163° 30' 21"	5° 05' 27"	166° 47' 26"	11° 10' 49"	0° 56' 19"	15' 20.65"	110° 59' 41"	0.67405
11	164° 02' 24"	5° 04' 49"	167° 17' 10"	10° 57' 49"	0° 56' 20"	15' 21.12"	111° 5' 45"	0.67005
12	164° 34' 30"	5° 04' 09"	167° 46' 53"	10° 44' 44"	0° 56' 22"	15' 21.58"	111° 11' 41"	0.66602
13	165° 06' 37"	5° 03' 28"	168° 16' 34"	10° 31' 36"	0° 56' 24"	15' 22.05"	111° 17' 29"	0.66198
14	165° 38' 46"	5° 02' 45"	168° 46' 15"	10° 18' 25"	0° 56' 25"	15' 22.52"	111° 23' 10"	0.65793
15	166° 10' 57"	5° 02' 01"	169° 15' 56"	10° 05' 10"	0° 56' 27"	15' 23.00"	111° 28' 42"	0.65386
16	166° 43' 10"	5° 01' 15"	169° 45' 35"	9° 51' 52"	0° 56' 29"	15' 23.47"	111° 34' 07"	0.64977
17	167° 15' 25"	5° 00' 27"	170° 15' 14"	9° 38' 30"	0° 56' 31"	15' 23.95"	111° 39' 25"	0.64566
18	167° 47' 41"	4° 59' 38"	170° 44' 52"	9° 25' 05"	0° 56' 32"	15' 24.44"	111° 44' 34"	0.64155
19	168° 19' 59"	4° 58' 46"	171° 14' 30"	9° 11' 37"	0° 56' 34"	15' 24.92"	111° 49' 36"	0.63741
20	168° 52' 19"	4° 57' 54"	171° 44' 07"	8° 58' 05"	0° 56' 36"	15' 25.41"	111° 54' 30"	0.63326
21	169° 24' 41"	4° 56' 60"	172° 13' 44"	8° 44' 30"	0° 56' 38"	15' 25.90"	111° 59' 16"	0.62910
22	169° 57' 05"	4° 56' 04"	172° 43' 21"	8° 30' 52"	0° 56' 40"	15' 26.40"	112° 3' 54"	0.62492
23	170° 29' 31"	4° 55' 06"	173° 12' 57"	8° 17' 11"	0° 56' 41"	15' 26.89"	112° 8' 25"	0.62073
24	171° 01' 59"	4° 54' 07"	173° 42' 33"	8° 03' 27"	0° 56' 43"	15' 27.39"	112° 12' 48"	0.61653

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	274° 25' 20"	0.18"	274° 48' 27"	-23° 21' 50"	0.9834993	16' 15.73"	23° 26' 15"	0 m-25 s
1	274° 27' 53"	0.18"	274° 51' 14"	-23° 21' 45"	0.9834977	16' 15.73"	23° 26' 15"	0 m-27 s
2	274° 30' 26"	0.18"	274° 54' 00"	-23° 21' 40"	0.9834961	16' 15.73"	23° 26' 15"	0 m-28 s
3	274° 32' 59"	0.18"	274° 56' 46"	-23° 21' 35"	0.9834946	16' 15.73"	23° 26' 15"	0 m-29 s
4	274° 35' 32"	0.17"	274° 59' 33"	-23° 21' 29"	0.9834930	16' 15.74"	23° 26' 15"	0 m-30 s
5	274° 38' 05"	0.17"	275° 02' 19"	-23° 21' 24"	0.9834914	16' 15.74"	23° 26' 15"	0 m-31 s
6	274° 40' 37"	0.17"	275° 05' 06"	-23° 21' 19"	0.9834899	16' 15.74"	23° 26' 15"	0 m-33 s
7	274° 43' 10"	0.17"	275° 07' 52"	-23° 21' 13"	0.9834883	16' 15.74"	23° 26' 15"	0 m-34 s
8	274° 45' 43"	0.16"	275° 10' 38"	-23° 21' 08"	0.9834868	16' 15.74"	23° 26' 15"	0 m-35 s
9	274° 48' 16"	0.16"	275° 13' 25"	-23° 21' 02"	0.9834853	16' 15.74"	23° 26' 15"	0 m-36 s
10	274° 50' 49"	0.16"	275° 16' 11"	-23° 20' 57"	0.9834838	16' 15.75"	23° 26' 15"	0 m-38 s
11	274° 53' 21"	0.15"	275° 18' 57"	-23° 20' 51"	0.9834823	16' 15.75"	23° 26' 15"	0 m-39 s
12	274° 55' 54"	0.15"	275° 21' 44"	-23° 20' 46"	0.9834808	16' 15.75"	23° 26' 15"	0 m-40 s
13	274° 58' 27"	0.15"	275° 24' 30"	-23° 20' 40"	0.9834793	16' 15.75"	23° 26' 15"	0 m-41 s
14	275° 00' 60"	0.14"	275° 27' 16"	-23° 20' 34"	0.9834778	16' 15.75"	23° 26' 15"	0 m-43 s
15	275° 03' 33"	0.14"	275° 30' 03"	-23° 20' 28"	0.9834764	16' 15.75"	23° 26' 15"	0 m-44 s
16	275° 06' 06"	0.14"	275° 32' 49"	-23° 20' 22"	0.9834749	16' 15.75"	23° 26' 15"	0 m-45 s
17	275° 08' 38"	0.13"	275° 35' 35"	-23° 20' 17"	0.9834735	16' 15.76"	23° 26' 15"	0 m-46 s
18	275° 11' 11"	0.13"	275° 38' 22"	-23° 20' 11"	0.9834720	16' 15.76"	23° 26' 15"	0 m-47 s
19	275° 13' 44"	0.13"	275° 41' 08"	-23° 20' 05"	0.9834706	16' 15.76"	23° 26' 15"	0 m-49 s
20	275° 16' 17"	0.12"	275° 43' 54"	-23° 19' 59"	0.9834692	16' 15.76"	23° 26' 15"	0 m-50 s
21	275° 18' 50"	0.12"	275° 46' 41"	-23° 19' 52"	0.9834677	16' 15.76"	23° 26' 15"	0 m-51 s
22	275° 21' 23"	0.12"	275° 49' 27"	-23° 19' 46"	0.9834663	16' 15.76"	23° 26' 15"	0 m-52 s
23	275° 23' 55"	0.11"	275° 52' 13"	-23° 19' 40"	0.9834649	16' 15.76"	23° 26' 15"	0 m-54 s
24	275° 26' 28"	0.11"	275° 54' 59"	-23° 19' 34"	0.9834636	16' 15.77"	23° 26' 15"	0 m-55 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	171° 01' 59"	4° 54' 07"	173° 42' 33"	8° 03' 27"	0° 56' 43"	15' 27.39"	112° 12' 48"	0.61653
1	171° 34' 29"	4° 53' 06"	174° 12' 09"	7° 49' 40"	0° 56' 45"	15' 27.89"	112° 17' 02"	0.61231
2	172° 07' 00"	4° 52' 04"	174° 41' 44"	7° 35' 50"	0° 56' 47"	15' 28.40"	112° 21' 09"	0.60808
3	172° 39' 34"	4° 50' 59"	175° 11' 20"	7° 21' 57"	0° 56' 49"	15' 28.91"	112° 25' 08"	0.60383
4	173° 12' 09"	4° 49' 54"	175° 40' 56"	7° 08' 02"	0° 56' 51"	15' 29.42"	112° 28' 59"	0.59957
5	173° 44' 47"	4° 48' 46"	176° 10' 32"	6° 54' 03"	0° 56' 53"	15' 29.93"	112° 32' 43"	0.59530
6	174° 17' 26"	4° 47' 37"	176° 40' 08"	6° 40' 02"	0° 56' 54"	15' 30.44"	112° 36' 18"	0.59102
7	174° 50' 08"	4° 46' 27"	177° 09' 44"	6° 25' 58"	0° 56' 56"	15' 30.96"	112° 39' 45"	0.58673
8	175° 22' 52"	4° 45' 14"	177° 39' 20"	6° 11' 52"	0° 56' 58"	15' 31.48"	112° 43' 04"	0.58242
9	175° 55' 37"	4° 44' 01"	178° 08' 57"	5° 57' 43"	0° 57' 00"	15' 32.00"	112° 46' 15"	0.57810
10	176° 28' 25"	4° 42' 45"	178° 38' 34"	5° 43' 31"	0° 57' 02"	15' 32.53"	112° 49' 19"	0.57377
11	177° 01' 14"	4° 41' 28"	179° 08' 12"	5° 29' 17"	0° 57' 04"	15' 33.05"	112° 52' 14"	0.56943
12	177° 34' 06"	4° 40' 09"	179° 37' 50"	5° 15' 01"	0° 57' 06"	15' 33.58"	112° 55' 01"	0.56508
13	178° 06' 60"	4° 38' 49"	180° 07' 29"	5° 00' 42"	0° 57' 08"	15' 34.11"	112° 57' 40"	0.56072
14	178° 39' 56"	4° 37' 27"	180° 37' 09"	4° 46' 21"	0° 57' 10"	15' 34.65"	113° 0' 11"	0.55635
15	179° 12' 54"	4° 36' 03"	181° 06' 49"	4° 31' 58"	0° 57' 12"	15' 35.18"	113° 2' 33"	0.55197
16	179° 45' 54"	4° 34' 38"	181° 36' 30"	4° 17' 32"	0° 57' 14"	15' 35.72"	113° 4' 48"	0.54758
17	180° 18' 56"	4° 33' 11"	182° 06' 12"	4° 03' 05"	0° 57' 16"	15' 36.26"	113° 6' 54"	0.54318
18	180° 52' 01"	4° 31' 43"	182° 35' 55"	3° 48' 35"	0° 57' 18"	15' 36.80"	113° 8' 52"	0.53877
19	181° 25' 07"	4° 30' 13"	183° 05' 40"	3° 34' 03"	0° 57' 20"	15' 37.35"	113° 10' 42"	0.53435
20	181° 58' 16"	4° 28' 41"	183° 35' 25"	3° 19' 29"	0° 57' 22"	15' 37.90"	113° 12' 24"	0.52993
21	182° 31' 26"	4° 27' 08"	184° 05' 11"	3° 04' 54"	0° 57' 24"	15' 38.45"	113° 13' 57"	0.52549
22	183° 04' 39"	4° 25' 33"	184° 34' 59"	2° 50' 16"	0° 57' 26"	15' 39.00"	113° 15' 22"	0.52105
23	183° 37' 55"	4° 23' 56"	185° 04' 48"	2° 35' 37"	0° 57' 28"	15' 39.55"	113° 16' 39"	0.51660
24	184° 11' 12"	4° 22' 18"	185° 34' 38"	2° 20' 56"	0° 57' 30"	15' 40.10"	113° 17' 47"	0.51215

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	275° 26' 28"	0.11"	275° 54' 59"	-23° 19' 34"	0.9834636	16' 15.77"	23° 26' 15"	0 m-55 s
1	275° 29' 01"	0.11"	275° 57' 46"	-23° 19' 28"	0.9834622	16' 15.77"	23° 26' 15"	0 m-56 s
2	275° 31' 34"	0.10"	276° 00' 32"	-23° 19' 21"	0.9834608	16' 15.77"	23° 26' 15"	0 m-57 s
3	275° 34' 07"	0.10"	276° 03' 18"	-23° 19' 15"	0.9834595	16' 15.77"	23° 26' 15"	0 m-58 s
4	275° 36' 40"	0.09"	276° 06' 05"	-23° 19' 08"	0.9834581	16' 15.77"	23° 26' 15"	0 m-60 s
5	275° 39' 13"	0.09"	276° 08' 51"	-23° 19' 02"	0.9834568	16' 15.77"	23° 26' 15"	-1 m 01 s
6	275° 41' 45"	0.09"	276° 11' 37"	-23° 18' 55"	0.9834554	16' 15.77"	23° 26' 15"	-1 m 02 s
7	275° 44' 18"	0.08"	276° 14' 24"	-23° 18' 49"	0.9834541	16' 15.78"	23° 26' 15"	-1 m 03 s
8	275° 46' 51"	0.08"	276° 17' 10"	-23° 18' 42"	0.9834528	16' 15.78"	23° 26' 15"	-1 m 05 s
9	275° 49' 24"	0.08"	276° 19' 56"	-23° 18' 36"	0.9834515	16' 15.78"	23° 26' 15"	-1 m 06 s
10	275° 51' 57"	0.07"	276° 22' 42"	-23° 18' 29"	0.9834502	16' 15.78"	23° 26' 15"	-1 m 07 s
11	275° 54' 30"	0.07"	276° 25' 29"	-23° 18' 22"	0.9834489	16' 15.78"	23° 26' 15"	-1 m 08 s
12	275° 57' 03"	0.06"	276° 28' 15"	-23° 18' 15"	0.9834476	16' 15.78"	23° 26' 15"	-1 m 09 s
13	275° 59' 35"	0.06"	276° 31' 01"	-23° 18' 08"	0.9834463	16' 15.78"	23° 26' 15"	-1 m 11 s
14	276° 02' 08"	0.05"	276° 33' 47"	-23° 18' 01"	0.9834451	16' 15.78"	23° 26' 15"	-1 m 12 s
15	276° 04' 41"	0.05"	276° 36' 34"	-23° 17' 55"	0.9834438	16' 15.79"	23° 26' 15"	-1 m 13 s
16	276° 07' 14"	0.05"	276° 39' 20"	-23° 17' 47"	0.9834425	16' 15.79"	23° 26' 15"	-1 m 14 s
17	276° 09' 47"	0.04"	276° 42' 06"	-23° 17' 40"	0.9834413	16' 15.79"	23° 26' 15"	-1 m 16 s
18	276° 12' 20"	0.04"	276° 44' 52"	-23° 17' 33"	0.9834401	16' 15.79"	23° 26' 15"	-1 m 17 s
19	276° 14' 53"	0.03"	276° 47' 39"	-23° 17' 26"	0.9834389	16' 15.79"	23° 26' 15"	-1 m 18 s
20	276° 17' 25"	0.03"	276° 50' 25"	-23° 17' 19"	0.9834376	16' 15.79"	23° 26' 15"	-1 m 19 s
21	276° 19' 58"	0.02"	276° 53' 11"	-23° 17' 12"	0.9834364	16' 15.79"	23° 26' 15"	-1 m 20 s
22	276° 22' 31"	0.02"	276° 55' 57"	-23° 17' 04"	0.9834352	16' 15.79"	23° 26' 15"	-1 m 22 s
23	276° 25' 04"	0.02"	276° 58' 44"	-23° 16' 57"	0.9834340	16' 15.79"	23° 26' 15"	-1 m 23 s
24	276° 27' 37"	0.01"	277° 01' 30"	-23° 16' 50"	0.9834329	16' 15.80"	23° 26' 15"	-1 m 24 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	184° 11' 12"	4° 22' 18"	185° 34' 38"	2° 20' 56"	0° 57' 30"	15' 40.10"	113° 17' 47"	0.51215
1	184° 44' 32"	4° 20' 39"	186° 04' 30"	2° 06' 13"	0° 57' 32"	15' 40.66"	113° 18' 47"	0.50769
2	185° 17' 53"	4° 18' 57"	186° 34' 24"	1° 51' 29"	0° 57' 34"	15' 41.22"	113° 19' 38"	0.50322
3	185° 51' 17"	4° 17' 14"	187° 04' 19"	1° 36' 43"	0° 57' 36"	15' 41.78"	113° 20' 21"	0.49874
4	186° 24' 44"	4° 15' 30"	187° 34' 16"	1° 21' 56"	0° 57' 38"	15' 42.34"	113° 20' 55"	0.49426
5	186° 58' 12"	4° 13' 44"	188° 04' 14"	1° 07' 07"	0° 57' 40"	15' 42.90"	113° 21' 21"	0.48978
6	187° 31' 43"	4° 11' 57"	188° 34' 15"	0° 52' 17"	0° 57' 42"	15' 43.47"	113° 21' 38"	0.48529
7	188° 05' 16"	4° 10' 07"	189° 04' 17"	0° 37' 25"	0° 57' 44"	15' 44.03"	113° 21' 47"	0.48079
8	188° 38' 51"	4° 08' 17"	189° 34' 21"	0° 22' 32"	0° 57' 46"	15' 44.60"	113° 21' 46"	0.47629
9	189° 12' 29"	4° 06' 25"	190° 04' 28"	0° 07' 39"	0° 57' 49"	15' 45.17"	113° 21' 38"	0.47179
10	189° 46' 09"	4° 04' 31"	190° 34' 36"	0° -7' 16"	0° 57' 51"	15' 45.74"	113° 21' 20"	0.46728
11	190° 19' 51"	4° 02' 36"	191° 04' 47"	0° -22' 13"	0° 57' 53"	15' 46.31"	113° 20' 54"	0.46277
12	190° 53' 36"	4° 00' 39"	191° 35' 00"	0° -37' 10"	0° 57' 55"	15' 46.89"	113° 20' 19"	0.45825
13	191° 27' 22"	3° 58' 40"	192° 05' 16"	0° -52' 08"	0° 57' 57"	15' 47.46"	113° 19' 35"	0.45374
14	192° 01' 12"	3° 56' 41"	192° 35' 34"	-1° 07' 07"	0° 57' 59"	15' 48.04"	113° 18' 42"	0.44922
15	192° 35' 03"	3° 54' 39"	193° 05' 55"	-1° 22' 06"	0° 58' 01"	15' 48.62"	113° 17' 41"	0.44470
16	193° 08' 57"	3° 52' 36"	193° 36' 18"	-1° 37' 07"	0° 58' 03"	15' 49.19"	113° 16' 30"	0.44017
17	193° 42' 53"	3° 50' 32"	194° 06' 44"	-1° 52' 08"	0° 58' 05"	15' 49.77"	113° 15' 10"	0.43565
18	194° 16' 52"	3° 48' 26"	194° 37' 13"	-2° 07' 09"	0° 58' 08"	15' 50.35"	113° 13' 42"	0.43113
19	194° 50' 53"	3° 46' 18"	195° 07' 44"	-2° 22' 11"	0° 58' 10"	15' 50.93"	113° 12' 04"	0.42660
20	195° 24' 56"	3° 44' 10"	195° 38' 19"	-2° 37' 14"	0° 58' 12"	15' 51.51"	113° 10' 17"	0.42208
21	195° 59' 02"	3° 41' 59"	196° 08' 56"	-2° 52' 17"	0° 58' 14"	15' 52.10"	113° 8' 21"	0.41755
22	196° 33' 10"	3° 39' 47"	196° 39' 37"	-3° 07' 20"	0° 58' 16"	15' 52.68"	113° 6' 15"	0.41303
23	197° 07' 21"	3° 37' 34"	197° 10' 21"	-3° 22' 24"	0° 58' 18"	15' 53.26"	113° 4' 01"	0.40851
24	197° 41' 33"	3° 35' 19"	197° 41' 08"	-3° 37' 28"	0° 58' 20"	15' 53.85"	113° 1' 37"	0.40399

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	276° 27' 37"	0.01"	277° 01' 30"	-23° 16' 50"	0.9834329	16' 15.80"	23° 26' 15"	-1 m 24 s
1	276° 30' 10"	0.01"	277° 04' 16"	-23° 16' 42"	0.9834317	16' 15.80"	23° 26' 15"	-1 m 25 s
2	276° 32' 43"	0.00"	277° 07' 02"	-23° 16' 35"	0.9834305	16' 15.80"	23° 26' 15"	-1 m 27 s
3	276° 35' 15"	-0.00"	277° 09' 48"	-23° 16' 27"	0.9834294	16' 15.80"	23° 26' 15"	-1 m 28 s
4	276° 37' 48"	-0.01"	277° 12' 35"	-23° 16' 19"	0.9834282	16' 15.80"	23° 26' 15"	-1 m 29 s
5	276° 40' 21"	-0.01"	277° 15' 21"	-23° 16' 12"	0.9834271	16' 15.80"	23° 26' 15"	-1 m 30 s
6	276° 42' 54"	-0.02"	277° 18' 07"	-23° 16' 04"	0.9834259	16' 15.80"	23° 26' 15"	-1 m 31 s
7	276° 45' 27"	-0.02"	277° 20' 53"	-23° 15' 56"	0.9834248	16' 15.80"	23° 26' 15"	-1 m 33 s
8	276° 47' 60"	-0.03"	277° 23' 39"	-23° 15' 49"	0.9834237	16' 15.81"	23° 26' 15"	-1 m 34 s
9	276° 50' 33"	-0.03"	277° 26' 26"	-23° 15' 41"	0.9834226	16' 15.81"	23° 26' 15"	-1 m 35 s
10	276° 53' 06"	-0.03"	277° 29' 12"	-23° 15' 33"	0.9834215	16' 15.81"	23° 26' 15"	-1 m 36 s
11	276° 55' 38"	-0.04"	277° 31' 58"	-23° 15' 25"	0.9834204	16' 15.81"	23° 26' 15"	-1 m 38 s
12	276° 58' 11"	-0.04"	277° 34' 44"	-23° 15' 17"	0.9834193	16' 15.81"	23° 26' 15"	-1 m 39 s
13	277° 00' 44"	-0.05"	277° 37' 30"	-23° 15' 09"	0.9834182	16' 15.81"	23° 26' 15"	-1 m 40 s
14	277° 03' 17"	-0.05"	277° 40' 16"	-23° 15' 01"	0.9834171	16' 15.81"	23° 26' 15"	-1 m 41 s
15	277° 05' 50"	-0.06"	277° 43' 03"	-23° 14' 53"	0.9834161	16' 15.81"	23° 26' 15"	-1 m 42 s
16	277° 08' 23"	-0.06"	277° 45' 49"	-23° 14' 44"	0.9834150	16' 15.81"	23° 26' 15"	-1 m 44 s
17	277° 10' 56"	-0.07"	277° 48' 35"	-23° 14' 36"	0.9834140	16' 15.81"	23° 26' 15"	-1 m 45 s
18	277° 13' 29"	-0.07"	277° 51' 21"	-23° 14' 28"	0.9834129	16' 15.82"	23° 26' 15"	-1 m 46 s
19	277° 16' 01"	-0.08"	277° 54' 07"	-23° 14' 20"	0.9834119	16' 15.82"	23° 26' 15"	-1 m 47 s
20	277° 18' 34"	-0.08"	277° 56' 53"	-23° 14' 11"	0.9834109	16' 15.82"	23° 26' 15"	-1 m 48 s
21	277° 21' 07"	-0.09"	277° 59' 39"	-23° 14' 03"	0.9834099	16' 15.82"	23° 26' 15"	-1 m 50 s
22	277° 23' 40"	-0.09"	278° 02' 26"	-23° 13' 54"	0.9834089	16' 15.82"	23° 26' 15"	-1 m 51 s
23	277° 26' 13"	-0.10"	278° 05' 12"	-23° 13' 46"	0.9834079	16' 15.82"	23° 26' 15"	-1 m 52 s
24	277° 28' 46"	-0.10"	278° 07' 58"	-23° 13' 37"	0.9834069	16' 15.82"	23° 26' 15"	-1 m 53 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	197° 41' 33"	3° 35' 19"	197° 41' 08"	-3° 37' 28"	0° 58' 20"	15' 53.85"	113° 1' 37"	0.40399
1	198° 15' 49"	3° 33' 03"	198° 11' 59"	-3° 52' 31"	0° 58' 23"	15' 54.43"	112° 59' 03"	0.39947
2	198° 50' 06"	3° 30' 45"	198° 42' 53"	-4° 07' 35"	0° 58' 25"	15' 55.02"	112° 56' 21"	0.39495
3	199° 24' 27"	3° 28' 26"	199° 13' 50"	-4° 22' 39"	0° 58' 27"	15' 55.60"	112° 53' 29"	0.39044
4	199° 58' 49"	3° 26' 06"	199° 44' 51"	-4° 37' 42"	0° 58' 29"	15' 56.19"	112° 50' 27"	0.38593
5	200° 33' 14"	3° 23' 44"	200° 15' 56"	-4° 52' 46"	0° 58' 31"	15' 56.78"	112° 47' 16"	0.38142
6	201° 07' 42"	3° 21' 21"	200° 47' 04"	-5° 07' 49"	0° 58' 33"	15' 57.36"	112° 43' 55"	0.37692
7	201° 42' 12"	3° 18' 56"	201° 18' 16"	-5° 22' 52"	0° 58' 35"	15' 57.95"	112° 40' 24"	0.37242
8	202° 16' 44"	3° 16' 30"	201° 49' 33"	-5° 37' 54"	0° 58' 38"	15' 58.53"	112° 36' 44"	0.36793
9	202° 51' 19"	3° 14' 03"	202° 20' 53"	-5° 52' 56"	0° 58' 40"	15' 59.12"	112° 32' 54"	0.36344
10	203° 25' 56"	3° 11' 34"	202° 52' 17"	-6° 07' 57"	0° 58' 42"	15' 59.70"	112° 28' 54"	0.35896
11	204° 00' 36"	3° 09' 04"	203° 23' 46"	-6° 22' 57"	0° 58' 44"	16' 00.29"	112° 24' 44"	0.35448
12	204° 35' 18"	3° 06' 32"	203° 55' 18"	-6° 37' 57"	0° 58' 46"	16' 00.88"	112° 20' 24"	0.35001
13	205° 10' 03"	3° 03' 59"	204° 26' 55"	-6° 52' 55"	0° 58' 48"	16' 01.46"	112° 15' 54"	0.34555
14	205° 44' 50"	3° 01' 25"	204° 58' 37"	-7° 07' 53"	0° 58' 50"	16' 02.04"	112° 11' 14"	0.34109
15	206° 19' 39"	2° 58' 50"	205° 30' 23"	-7° 22' 50"	0° 58' 53"	16' 02.63"	112° 6' 24"	0.33665
16	206° 54' 31"	2° 56' 13"	206° 02' 13"	-7° 37' 46"	0° 58' 55"	16' 03.21"	112° 1' 24"	0.33221
17	207° 29' 26"	2° 53' 35"	206° 34' 08"	-7° 52' 40"	0° 58' 57"	16' 03.79"	111° 56' 13"	0.32778
18	208° 04' 23"	2° 50' 56"	207° 06' 08"	-8° 07' 33"	0° 58' 59"	16' 04.37"	111° 50' 52"	0.32336
19	208° 39' 22"	2° 48' 15"	207° 38' 12"	-8° 22' 25"	0° 59' 01"	16' 04.95"	111° 45' 21"	0.31895
20	209° 14' 24"	2° 45' 34"	208° 10' 22"	-8° 37' 15"	0° 59' 03"	16' 05.53"	111° 39' 39"	0.31455
21	209° 49' 29"	2° 42' 51"	208° 42' 36"	-8° 52' 04"	0° 59' 05"	16' 06.11"	111° 33' 47"	0.31016
22	210° 24' 36"	2° 40' 06"	209° 14' 56"	-9° 06' 51"	0° 59' 08"	16' 06.69"	111° 27' 44"	0.30578
23	210° 59' 45"	2° 37' 21"	209° 47' 20"	-9° 21' 36"	0° 59' 10"	16' 07.26"	111° 21' 30"	0.30141
24	211° 34' 57"	2° 34' 34"	210° 19' 50"	-9° 36' 19"	0° 59' 12"	16' 07.84"	111° 15' 06"	0.29705

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	277° 28' 46"	-0.10"	278° 07' 58"	-23° 13' 37"	0.9834069	16' 15.82"	23° 26' 15"	-1 m 53 s
1	277° 31' 19"	-0.11"	278° 10' 44"	-23° 13' 29"	0.9834059	16' 15.82"	23° 26' 15"	-1 m 55 s
2	277° 33' 52"	-0.11"	278° 13' 30"	-23° 13' 20"	0.9834049	16' 15.82"	23° 26' 15"	-1 m 56 s
3	277° 36' 25"	-0.12"	278° 16' 16"	-23° 13' 11"	0.9834039	16' 15.82"	23° 26' 15"	-1 m 57 s
4	277° 38' 57"	-0.12"	278° 19' 02"	-23° 13' 02"	0.9834030	16' 15.83"	23° 26' 15"	-1 m 58 s
5	277° 41' 30"	-0.13"	278° 21' 48"	-23° 12' 54"	0.9834020	16' 15.83"	23° 26' 15"	-1 m 59 s
6	277° 44' 03"	-0.14"	278° 24' 34"	-23° 12' 45"	0.9834011	16' 15.83"	23° 26' 15"	-2 m 01 s
7	277° 46' 36"	-0.14"	278° 27' 20"	-23° 12' 36"	0.9834001	16' 15.83"	23° 26' 15"	-2 m 02 s
8	277° 49' 09"	-0.15"	278° 30' 06"	-23° 12' 27"	0.9833992	16' 15.83"	23° 26' 15"	-2 m 03 s
9	277° 51' 42"	-0.15"	278° 32' 53"	-23° 12' 18"	0.9833983	16' 15.83"	23° 26' 15"	-2 m 04 s
10	277° 54' 15"	-0.16"	278° 35' 39"	-23° 12' 09"	0.9833974	16' 15.83"	23° 26' 15"	-2 m 05 s
11	277° 56' 48"	-0.16"	278° 38' 25"	-23° 11' 60"	0.9833965	16' 15.83"	23° 26' 15"	-2 m 07 s
12	277° 59' 21"	-0.17"	278° 41' 11"	-23° 11' 51"	0.9833956	16' 15.83"	23° 26' 15"	-2 m 08 s
13	278° 01' 54"	-0.17"	278° 43' 57"	-23° 11' 41"	0.9833947	16' 15.83"	23° 26' 15"	-2 m 09 s
14	278° 04' 26"	-0.18"	278° 46' 43"	-23° 11' 32"	0.9833938	16' 15.83"	23° 26' 15"	-2 m 10 s
15	278° 06' 59"	-0.18"	278° 49' 29"	-23° 11' 23"	0.9833929	16' 15.84"	23° 26' 15"	-2 m 11 s
16	278° 09' 32"	-0.19"	278° 52' 15"	-23° 11' 13"	0.9833920	16' 15.84"	23° 26' 15"	-2 m 13 s
17	278° 12' 05"	-0.19"	278° 55' 01"	-23° 11' 04"	0.9833912	16' 15.84"	23° 26' 15"	-2 m 14 s
18	278° 14' 38"	-0.20"	278° 57' 47"	-23° 10' 55"	0.9833903	16' 15.84"	23° 26' 15"	-2 m 15 s
19	278° 17' 11"	-0.20"	279° 00' 33"	-23° 10' 45"	0.9833894	16' 15.84"	23° 26' 15"	-2 m 16 s
20	278° 19' 44"	-0.21"	279° 03' 19"	-23° 10' 36"	0.9833886	16' 15.84"	23° 26' 15"	-2 m 18 s
21	278° 22' 17"	-0.21"	279° 06' 05"	-23° 10' 26"	0.9833878	16' 15.84"	23° 26' 15"	-2 m 19 s
22	278° 24' 50"	-0.22"	279° 08' 51"	-23° 10' 16"	0.9833869	16' 15.84"	23° 26' 15"	-2 m 20 s
23	278° 27' 23"	-0.23"	279° 11' 37"	-23° 10' 07"	0.9833861	16' 15.84"	23° 26' 15"	-2 m 21 s
24	278° 29' 56"	-0.23"	279° 14' 23"	-23° 09' 57"	0.9833853	16' 15.84"	23° 26' 15"	-2 m 22 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	211° 34' 57"	2° 34' 34"	210° 19' 50"	-9° 36' 19"	0° 59' 12"	16' 07.84"	111° 15' 06"	0.29705
1	212° 10' 11"	2° 31' 47"	210° 52' 25"	-9° 51' 01"	0° 59' 14"	16' 08.41"	111° 8' 31"	0.29271
2	212° 45' 28"	2° 28' 58"	211° 25' 05"	-10° 05' 40"	0° 59' 16"	16' 08.98"	111° 1' 45"	0.28838
3	213° 20' 47"	2° 26' 08"	211° 57' 51"	-10° 20' 17"	0° 59' 18"	16' 09.55"	110° 54' 48"	0.28407
4	213° 56' 09"	2° 23' 17"	212° 30' 42"	-10° 34' 52"	0° 59' 20"	16' 10.12"	110° 47' 40"	0.27976
5	214° 31' 33"	2° 20' 24"	213° 03' 39"	-10° 49' 25"	0° 59' 22"	16' 10.68"	110° 40' 21"	0.27548
6	215° 06' 60"	2° 17' 31"	213° 36' 41"	-11° 03' 55"	0° 59' 24"	16' 11.25"	110° 32' 50"	0.27120
7	215° 42' 29"	2° 14' 36"	214° 09' 49"	-11° 18' 23"	0° 59' 26"	16' 11.81"	110° 25' 09"	0.26695
8	216° 18' 01"	2° 11' 41"	214° 43' 03"	-11° 32' 48"	0° 59' 28"	16' 12.37"	110° 17' 16"	0.26271
9	216° 53' 35"	2° 08' 44"	215° 16' 23"	-11° 47' 10"	0° 59' 30"	16' 12.93"	110° 9' 11"	0.25848
10	217° 29' 11"	2° 05' 47"	215° 49' 48"	-12° 01' 30"	0° 59' 32"	16' 13.48"	110° 0' 55"	0.25427
11	218° 04' 50"	2° 02' 48"	216° 23' 20"	-12° 15' 46"	0° 59' 34"	16' 14.03"	109° 52' 28"	0.25008
12	218° 40' 31"	1° 59' 48"	216° 56' 57"	-12° 29' 60"	0° 59' 36"	16' 14.58"	109° 43' 49"	0.24591
13	219° 16' 15"	1° 56' 48"	217° 30' 41"	-12° 44' 10"	0° 59' 38"	16' 15.13"	109° 34' 58"	0.24176
14	219° 52' 01"	1° 53' 46"	218° 04' 31"	-12° 58' 17"	0° 59' 40"	16' 15.67"	109° 25' 55"	0.23762
15	220° 27' 50"	1° 50' 44"	218° 38' 27"	-13° 12' 20"	0° 59' 42"	16' 16.22"	109° 16' 40"	0.23351
16	221° 03' 41"	1° 47' 40"	219° 12' 30"	-13° 26' 20"	0° 59' 44"	16' 16.75"	109° 7' 13"	0.22941
17	221° 39' 34"	1° 44' 36"	219° 46' 38"	-13° 40' 17"	0° 59' 46"	16' 17.29"	108° 57' 34"	0.22534
18	222° 15' 30"	1° 41' 31"	220° 20' 54"	-13° 54' 09"	0° 59' 48"	16' 17.82"	108° 47' 43"	0.22128
19	222° 51' 28"	1° 38' 24"	220° 55' 15"	-14° 07' 58"	0° 59' 50"	16' 18.35"	108° 37' 39"	0.21725
20	223° 27' 29"	1° 35' 17"	221° 29' 44"	-14° 21' 43"	0° 59' 52"	16' 18.88"	108° 27' 23"	0.21324
21	224° 03' 32"	1° 32' 10"	222° 04' 19"	-14° 35' 24"	0° 59' 54"	16' 19.40"	108° 16' 55"	0.20925
22	224° 39' 37"	1° 29' 01"	222° 39' 00"	-14° 49' 01"	0° 59' 56"	16' 19.92"	108° 6' 13"	0.20529
23	225° 15' 45"	1° 25' 52"	223° 13' 48"	-15° 02' 33"	0° 59' 58"	16' 20.43"	107° 55' 19"	0.20134
24	225° 51' 55"	1° 22' 41"	223° 48' 44"	-15° 16' 01"	0° 59' 60"	16' 20.94"	107° 44' 13"	0.19743

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Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	278° 29' 56"	-0.23"	279° 14' 23"	-23° 09' 57"	0.9833853	16' 15.84"	23° 26' 15"	-2 m 22 s
1	278° 32' 28"	-0.24"	279° 17' 09"	-23° 09' 47"	0.9833845	16' 15.84"	23° 26' 15"	-2 m 24 s
2	278° 35' 01"	-0.24"	279° 19' 55"	-23° 09' 37"	0.9833837	16' 15.84"	23° 26' 15"	-2 m 25 s
3	278° 37' 34"	-0.25"	279° 22' 41"	-23° 09' 27"	0.9833829	16' 15.85"	23° 26' 15"	-2 m 26 s
4	278° 40' 07"	-0.25"	279° 25' 27"	-23° 09' 17"	0.9833821	16' 15.85"	23° 26' 15"	-2 m 27 s
5	278° 42' 40"	-0.26"	279° 28' 13"	-23° 09' 07"	0.9833813	16' 15.85"	23° 26' 15"	-2 m 28 s
6	278° 45' 13"	-0.26"	279° 30' 59"	-23° 08' 57"	0.9833806	16' 15.85"	23° 26' 15"	-2 m 30 s
7	278° 47' 46"	-0.27"	279° 33' 45"	-23° 08' 47"	0.9833798	16' 15.85"	23° 26' 15"	-2 m 31 s
8	278° 50' 19"	-0.27"	279° 36' 31"	-23° 08' 37"	0.9833790	16' 15.85"	23° 26' 15"	-2 m 32 s
9	278° 52' 52"	-0.28"	279° 39' 17"	-23° 08' 27"	0.9833783	16' 15.85"	23° 26' 15"	-2 m 33 s
10	278° 55' 25"	-0.29"	279° 42' 02"	-23° 08' 17"	0.9833775	16' 15.85"	23° 26' 15"	-2 m 34 s
11	278° 57' 58"	-0.29"	279° 44' 48"	-23° 08' 07"	0.9833768	16' 15.85"	23° 26' 15"	-2 m 36 s
12	279° 00' 30"	-0.30"	279° 47' 34"	-23° 07' 56"	0.9833761	16' 15.85"	23° 26' 15"	-2 m 37 s
13	279° 03' 03"	-0.30"	279° 50' 20"	-23° 07' 46"	0.9833753	16' 15.85"	23° 26' 15"	-2 m 38 s
14	279° 05' 36"	-0.31"	279° 53' 06"	-23° 07' 35"	0.9833746	16' 15.85"	23° 26' 15"	-2 m 39 s
15	279° 08' 09"	-0.31"	279° 55' 52"	-23° 07' 25"	0.9833739	16' 15.85"	23° 26' 15"	-2 m 40 s
16	279° 10' 42"	-0.32"	279° 58' 38"	-23° 07' 14"	0.9833732	16' 15.86"	23° 26' 15"	-2 m 42 s
17	279° 13' 15"	-0.32"	280° 01' 24"	-23° 07' 04"	0.9833725	16' 15.86"	23° 26' 15"	-2 m 43 s
18	279° 15' 48"	-0.33"	280° 04' 10"	-23° 06' 53"	0.9833718	16' 15.86"	23° 26' 15"	-2 m 44 s
19	279° 18' 21"	-0.34"	280° 06' 56"	-23° 06' 43"	0.9833711	16' 15.86"	23° 26' 15"	-2 m 45 s
20	279° 20' 54"	-0.34"	280° 09' 41"	-23° 06' 32"	0.9833705	16' 15.86"	23° 26' 15"	-2 m 46 s
21	279° 23' 27"	-0.35"	280° 12' 27"	-23° 06' 21"	0.9833698	16' 15.86"	23° 26' 15"	-2 m 47 s
22	279° 25' 60"	-0.35"	280° 15' 13"	-23° 06' 10"	0.9833691	16' 15.86"	23° 26' 15"	-2 m 49 s
23	279° 28' 33"	-0.36"	280° 17' 59"	-23° 05' 60"	0.9833685	16' 15.86"	23° 26' 15"	-2 m 50 s
24	279° 31' 06"	-0.36"	280° 20' 45"	-23° 05' 49"	0.9833678	16' 15.86"	23° 26' 15"	-2 m 51 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	225° 51' 55"	1° 22' 41"	223° 48' 44"	-15° 16' 01"	0° 59' 60"	16' 20.94"	107° 44' 13"	0.19743
1	226° 28' 07"	1° 19' 30"	224° 23' 45"	-15° 29' 24"	1° 00' 02"	16' 21.45"	107° 32' 53"	0.19353
2	227° 04' 21"	1° 16' 19"	224° 58' 54"	-15° 42' 43"	1° 00' 04"	16' 21.95"	107° 21' 20"	0.18967
3	227° 40' 38"	1° 13' 06"	225° 34' 10"	-15° 55' 57"	1° 00' 05"	16' 22.45"	107° 9' 33"	0.18582
4	228° 16' 57"	1° 09' 53"	226° 09' 32"	-16° 09' 06"	1° 00' 07"	16' 22.95"	106° 57' 34"	0.18201
5	228° 53' 19"	1° 06' 40"	226° 45' 02"	-16° 22' 10"	1° 00' 09"	16' 23.44"	106° 45' 21"	0.17822
6	229° 29' 42"	1° 03' 25"	227° 20' 38"	-16° 35' 09"	1° 00' 11"	16' 23.92"	106° 32' 54"	0.17446
7	230° 06' 08"	1° 00' 10"	227° 56' 22"	-16° 48' 03"	1° 00' 13"	16' 24.40"	106° 20' 14"	0.17072
8	230° 42' 36"	0° 56' 55"	228° 32' 13"	-17° 00' 51"	1° 00' 14"	16' 24.88"	106° 7' 19"	0.16701
9	231° 19' 07"	0° 53' 39"	229° 08' 11"	-17° 13' 34"	1° 00' 16"	16' 25.35"	105° 54' 11"	0.16334
10	231° 55' 39"	0° 50' 22"	229° 44' 16"	-17° 26' 11"	1° 00' 18"	16' 25.82"	105° 40' 48"	0.15969
11	232° 32' 14"	0° 47' 05"	230° 20' 28"	-17° 38' 42"	1° 00' 19"	16' 26.28"	105° 27' 11"	0.15607
12	233° 08' 51"	0° 43' 47"	230° 56' 47"	-17° 51' 08"	1° 00' 21"	16' 26.74"	105° 13' 20"	0.15248
13	233° 45' 30"	0° 40' 29"	231° 33' 14"	-18° 03' 27"	1° 00' 23"	16' 27.19"	104° 59' 14"	0.14892
14	234° 22' 11"	0° 37' 10"	232° 09' 48"	-18° 15' 40"	1° 00' 24"	16' 27.64"	104° 44' 53"	0.14539
15	234° 58' 54"	0° 33' 51"	232° 46' 29"	-18° 27' 47"	1° 00' 26"	16' 28.08"	104° 30' 17"	0.14190
16	235° 35' 39"	0° 30' 31"	233° 23' 18"	-18° 39' 48"	1° 00' 28"	16' 28.51"	104° 15' 26"	0.13844
17	236° 12' 27"	0° 27' 11"	234° 00' 14"	-18° 51' 42"	1° 00' 29"	16' 28.94"	104° 0' 19"	0.13500
18	236° 49' 16"	0° 23' 51"	234° 37' 17"	-19° 03' 30"	1° 00' 31"	16' 29.37"	103° 44' 56"	0.13161
19	237° 26' 07"	0° 20' 30"	235° 14' 27"	-19° 15' 10"	1° 00' 32"	16' 29.79"	103° 29' 18"	0.12824
20	238° 03' 01"	0° 17' 10"	235° 51' 45"	-19° 26' 44"	1° 00' 34"	16' 30.20"	103° 13' 24"	0.12491
21	238° 39' 56"	0° 13' 48"	236° 29' 10"	-19° 38' 11"	1° 00' 35"	16' 30.61"	102° 57' 13"	0.12162
22	239° 16' 54"	0° 10' 27"	237° 06' 43"	-19° 49' 30"	1° 00' 37"	16' 31.01"	102° 40' 46"	0.11836
23	239° 53' 53"	0° 07' 05"	237° 44' 23"	-20° 00' 43"	1° 00' 38"	16' 31.40"	102° 24' 01"	0.11514
24	240° 30' 54"	0° 03' 43"	238° 22' 10"	-20° 11' 48"	1° 00' 40"	16' 31.79"	102° 6' 60"	0.11195

31 Desember 2021

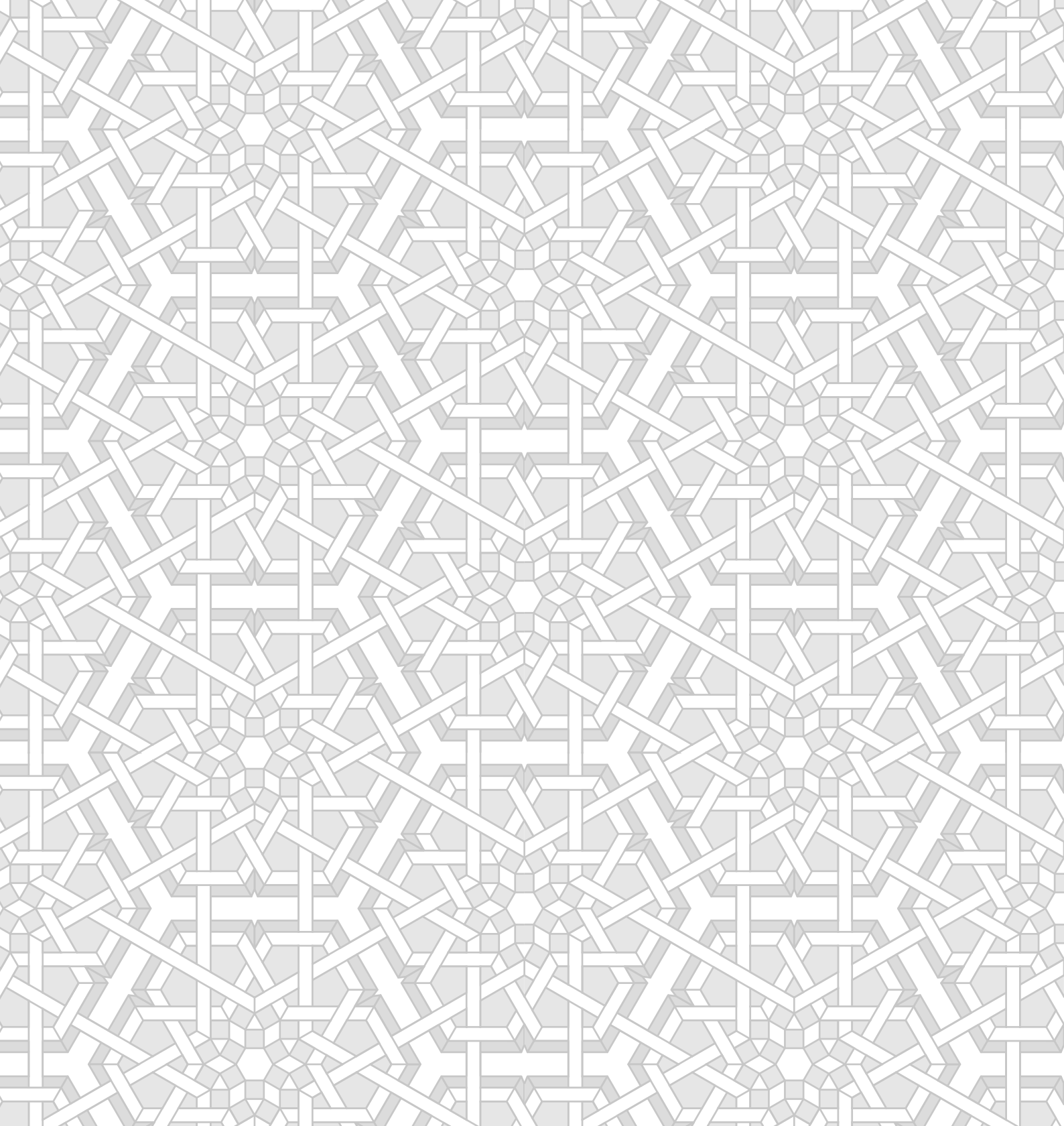
DATA MATAHARI

Jam	Ecliptic Longitude *)	Ecliptic Latitude *)	Apparent Right Ascension	Apparent Declination	True Geocentric Distance	Semi Diameter	True Obliquity	Equation Of Time
0	279° 31' 06"	-0.36"	280° 20' 45"	-23° 05' 49"	0.9833678	16' 15.86"	23° 26' 15"	-2 m 51 s
1	279° 33' 38"	-0.37"	280° 23' 31"	-23° 05' 38"	0.9833672	16' 15.86"	23° 26' 15"	-2 m 52 s
2	279° 36' 11"	-0.37"	280° 26' 16"	-23° 05' 27"	0.9833665	16' 15.86"	23° 26' 15"	-2 m 53 s
3	279° 38' 44"	-0.38"	280° 29' 02"	-23° 05' 16"	0.9833659	16' 15.86"	23° 26' 15"	-2 m 55 s
4	279° 41' 17"	-0.38"	280° 31' 48"	-23° 05' 05"	0.9833653	16' 15.86"	23° 26' 15"	-2 m 56 s
5	279° 43' 50"	-0.39"	280° 34' 34"	-23° 04' 53"	0.9833647	16' 15.86"	23° 26' 15"	-2 m 57 s
6	279° 46' 23"	-0.40"	280° 37' 20"	-23° 04' 42"	0.9833641	16' 15.86"	23° 26' 15"	-2 m 58 s
7	279° 48' 56"	-0.40"	280° 40' 05"	-23° 04' 31"	0.9833635	16' 15.87"	23° 26' 15"	-2 m 59 s
8	279° 51' 29"	-0.41"	280° 42' 51"	-23° 04' 20"	0.9833629	16' 15.87"	23° 26' 15"	-3 m 01 s
9	279° 54' 02"	-0.41"	280° 45' 37"	-23° 04' 08"	0.9833623	16' 15.87"	23° 26' 15"	-3 m 02 s
10	279° 56' 35"	-0.42"	280° 48' 23"	-23° 03' 57"	0.9833617	16' 15.87"	23° 26' 15"	-3 m 03 s
11	279° 59' 08"	-0.42"	280° 51' 09"	-23° 03' 46"	0.9833611	16' 15.87"	23° 26' 15"	-3 m 04 s
12	280° 01' 41"	-0.43"	280° 53' 54"	-23° 03' 34"	0.9833605	16' 15.87"	23° 26' 15"	-3 m 05 s
13	280° 04' 14"	-0.43"	280° 56' 40"	-23° 03' 23"	0.9833600	16' 15.87"	23° 26' 15"	-3 m 07 s
14	280° 06' 47"	-0.44"	280° 59' 26"	-23° 03' 11"	0.9833594	16' 15.87"	23° 26' 15"	-3 m 08 s
15	280° 09' 19"	-0.44"	281° 02' 11"	-23° 02' 59"	0.9833589	16' 15.87"	23° 26' 15"	-3 m 09 s
16	280° 11' 52"	-0.45"	281° 04' 57"	-23° 02' 48"	0.9833583	16' 15.87"	23° 26' 15"	-3 m 10 s
17	280° 14' 25"	-0.46"	281° 07' 43"	-23° 02' 36"	0.9833578	16' 15.87"	23° 26' 15"	-3 m 11 s
18	280° 16' 58"	-0.46"	281° 10' 29"	-23° 02' 24"	0.9833573	16' 15.87"	23° 26' 15"	-3 m 12 s
19	280° 19' 31"	-0.47"	281° 13' 14"	-23° 02' 13"	0.9833567	16' 15.87"	23° 26' 15"	-3 m 14 s
20	280° 22' 04"	-0.47"	281° 16' 00"	-23° 02' 01"	0.9833562	16' 15.87"	23° 26' 15"	-3 m 15 s
21	280° 24' 37"	-0.48"	281° 18' 46"	-23° 01' 49"	0.9833557	16' 15.87"	23° 26' 15"	-3 m 16 s
22	280° 27' 10"	-0.48"	281° 21' 31"	-23° 01' 37"	0.9833552	16' 15.87"	23° 26' 15"	-3 m 17 s
23	280° 29' 43"	-0.49"	281° 24' 17"	-23° 01' 25"	0.9833547	16' 15.87"	23° 26' 15"	-3 m 18 s
24	280° 32' 16"	-0.49"	281° 27' 03"	-23° 01' 13"	0.9833542	16' 15.87"	23° 26' 15"	-3 m 20 s

*) for mean equinox of date

DATA BULAN

Jam	Apparent Longitude	Apparent Latitude	Apparent Right Ascension	Apparent Declination	Horizontal Parallax	Semi Diameter	Angle Bright Limb	Fraction Illumination
0	240° 30' 54"	0° 03' 43"	238° 22' 10"	-20° 11' 48"	1° 00' 40"	16' 31.79"	102° 6' 60"	0.11195
1	241° 07' 57"	0° 00' 21"	239° 00' 04"	-20° 22' 45"	1° 00' 41"	16' 32.17"	101° 49' 41"	0.10880
2	241° 45' 02"	0° -3' 01"	239° 38' 06"	-20° 33' 35"	1° 00' 42"	16' 32.54"	101° 32' 04"	0.10568
3	242° 22' 09"	0° -6' 24"	240° 16' 15"	-20° 44' 16"	1° 00' 44"	16' 32.91"	101° 14' 09"	0.10261
4	242° 59' 17"	0° -9' 46"	240° 54' 31"	-20° 54' 50"	1° 00' 45"	16' 33.27"	100° 55' 56"	0.09957
5	243° 36' 28"	0° -13' 09"	241° 32' 54"	-21° 05' 16"	1° 00' 46"	16' 33.63"	100° 37' 24"	0.09657
6	244° 13' 40"	0° -16' 31"	242° 11' 25"	-21° 15' 34"	1° 00' 48"	16' 33.98"	100° 18' 32"	0.09361
7	244° 50' 54"	0° -19' 54"	242° 50' 02"	-21° 25' 43"	1° 00' 49"	16' 34.32"	99° 59' 21"	0.09069
8	245° 28' 09"	0° -23' 17"	243° 28' 47"	-21° 35' 44"	1° 00' 50"	16' 34.65"	99° 39' 49"	0.08781
9	246° 05' 26"	0° -26' 39"	244° 07' 39"	-21° 45' 36"	1° 00' 51"	16' 34.98"	99° 19' 56"	0.08496
10	246° 42' 45"	0° -30' 02"	244° 46' 37"	-21° 55' 20"	1° 00' 53"	16' 35.30"	98° 59' 43"	0.08216
11	247° 20' 06"	0° -33' 24"	245° 25' 43"	-22° 04' 54"	1° 00' 54"	16' 35.61"	98° 39' 07"	0.07941
12	247° 57' 28"	0° -36' 47"	246° 04' 56"	-22° 14' 20"	1° 00' 55"	16' 35.92"	98° 18' 09"	0.07669
13	248° 34' 51"	0° -40' 09"	246° 44' 15"	-22° 23' 37"	1° 00' 56"	16' 36.21"	97° 56' 47"	0.07401
14	249° 12' 17"	0° -43' 31"	247° 23' 41"	-22° 32' 43"	1° 00' 57"	16' 36.50"	97° 35' 02"	0.07138
15	249° 49' 43"	0° -46' 53"	248° 03' 14"	-22° 41' 43"	1° 00' 58"	16' 36.78"	97° 12' 52"	0.06879
16	250° 27' 11"	0° -50' 14"	248° 42' 53"	-22° 50' 32"	1° 00' 59"	16' 37.06"	96° 50' 16"	0.06624
17	251° 04' 41"	0° -53' 36"	249° 22' 39"	-22° 59' 11"	1° 00' 60"	16' 37.33"	96° 27' 14"	0.06374
18	251° 42' 12"	0° -56' 57"	250° 02' 32"	-23° 07' 41"	1° 01' 01"	16' 37.58"	96° 3' 44"	0.06128
19	252° 19' 44"	-1° 00' 17"	250° 42' 31"	-23° 16' 00"	1° 01' 02"	16' 37.83"	95° 39' 46"	0.05886
20	252° 57' 18"	-1° 03' 38"	251° 22' 36"	-23° 24' 10"	1° 01' 03"	16' 38.08"	95° 15' 18"	0.05649
21	253° 34' 53"	-1° 06' 58"	252° 02' 47"	-23° 32' 10"	1° 01' 04"	16' 38.31"	94° 50' 18"	0.05417
22	254° 12' 29"	-1° 10' 18"	252° 43' 05"	-23° 40' 00"	1° 01' 04"	16' 38.54"	94° 24' 46"	0.05189
23	254° 50' 06"	-1° 13' 37"	253° 23' 28"	-23° 47' 40"	1° 01' 05"	16' 38.76"	93° 58' 40"	0.04966
24	255° 27' 45"	-1° 16' 56"	254° 03' 58"	-23° 55' 09"	1° 01' 06"	16' 38.97"	93° 31' 58"	0.04747



LAMPIRAN - LAMPIRAN





PRESIDEN
REPUBLIK INDONESIA

KEPUTUSAN PRESIDEN REPUBLIK INDONESIA
NOMOR 41 TAHUN 1987

TENTANG

PEMBAGIAN WILAYAH REPUBLIK INDONESIA
MENJADI 3 (TIGA) WILAYAH WAKTU
PRESIDEN REPUBLIK INDONESIA

- Menimbang :
- a. bahwa pembagian waktu mempunyai peranan penting dalam menunjang kelancaran penyelenggaraan pemerintahan dalam arti yang seluas-luasnya dan dalam usaha peningkatan efisiensi kerja di segala bidang;
 - b. bahwa pembagian waktu sekarang ini dinilai tidak sesuai lagi dengan kenyataan waktu dan geografis, khususnya di beberapa daerah Propinsi Daerah Tingkat I Kalimantan Barat, Kalimantan Tengah, dan Propinsi Daerah Tingkat I Bali;
 - c. bahwa sehubungan dengan hal di atas, dipandang perlu untuk menata kembali pembagian wilayah waktu di Indonesia sebagaimana yang telah ditetapkan dalam Keputusan Presiden nomor 243 tahun 1963.

Mengingat : Pasal 4 ayat (1) Undang-undang Dasar 1945

MEMUTUSKAN :

Menetapkan : KEPUTUSAN PRESIDEN REPUBLIK INDONESIA
TENTANG PEMBAGIAN WILAYAH REPUBLIK
INDONESIA MENJADI 3 (TIGA) WILAYAH WAKTU

Pasal 1

- (1) Wilayah Republik Indonesia dibagi menjadi (tiga) wilayah waktu dengan 3 (tiga) waktu tolok.
- (2) 3 (tiga) wilayah waktu sebagaimana dimaksud dalam ayat (1) adalah :
 1. Waktu Indonesia Barat, meliputi :
 - a. Seluruh Propinsi Daerah Tingkat I Sumatera
 - b. Seluruh Propinsi Daerah Tingkat I Jawa dan Madura



PRESIDEN
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- 2 -

- c. Propinsi Daerah Tingkat I Kalimantan Barat
 - d. Propinsi Daerah Tingkat I Kalimantan Tengah
2. Waktu Indonesia Tengah, meliputi
- a. Propinsi Daerah Tingkat I Kalimantan Timur;
 - b. Propinsi Daerah Tingkat I Kalimantan Selatan;
 - c. Propinsi Daerah Tingkat I Bali;
 - d. Propinsi Daerah Tingkat I Nusa Tenggara Barat;
 - e. Propinsi Daerah Tingkat I Nusa Tenggara Timur;
 - f. Propinsi Daerah Tingkat I Timor Timur;
 - g. Propinsi Daerah Tingkat I Sulawesi
3. Waktu Indonesia Timur meliputi
- a. Propinsi Daerah Tingkat I Maluku
 - b. Propinsi Daerah Tingkat I Irian Jaya
- (3) 3 (tiga) wilayah waktu sebagaimana dimaksud dalam ayat (2) tersebut, masing-masing ditetapkan dengan waktu tolok sebagai berikut :
- a. Waktu Indonesia Barat dengan waktu tolok (GMT + 7 jam) dan derajat tolok 105° Bujur Timur;
 - b. Waktu Indonesia Tengah dengan waktu tolok (GMT + 8 jam) dan derajat tolok 120° Bujur Timur
 - c. Waktu Indonesia Timur dengan waktu tolok (GMT + 9 jam) dan derajat tolok 135° Bujur Timur.

Pasal 2

Pada saat mulai berlakunya Keputusan Presiden Ini, Keputusan Presiden Normor 243 Tahun 1963 tentang Pembagian Wilayah Republik Indonesia menjadi 3 (tiga) Wilayah Waktu Dengan 3 (tiga) Waktu Tolok dinyatakan tidak berlaku.



PRESIDEN
REPUBLIK INDONESIA

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Pasal 3

Keputusan Presiden ini mulai berlaku pada tanggal 1 Januari 1988

Ditetapkan di Jakarta
Pada tanggal 26 Nopember 1987
PRESIDEN REPUBLIK INDONESIA

ttd

S O E H A R T O

Salinan sesuai dengan aslinya
SEKRETARIAT KABINET RI
Kepala Biro Hukum
dan Perundang-undangan

Bambang Koesowo, SH, LLM

**KEBIJAKAN PEMERINTAH RI
DALAM MENETAPKAN AWAL BULAN QAMARIYAH
DI INDONESIA**

MUKADIMAH

1. Undang-undang Nomor 3 Tahun 2006 tentang Perubahan Undang-undang Nomor 7 Tahun 1989 tentang Peradilan Agama pasal 52A Pengadilan Agama memberikan Itsbat Kesaksian Rukyat Hilal dalam penentuan awal bulan pada tahun Hijriyah. Sedangkan penetapan awal bulan qomariyah masih menjadi kewenangan Menteri Agama. Berdasarkan Peraturan Menteri Agama nomor 42 tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama, Direktorat Urusan Agama Islam dan Pembinaan Syariah mempunyai tugas melaksanakan perumusan dan pelaksanaan kebijakan, standardisasi, bimbingan teknis, dan evaluasi, serta pengawasan di bidang urusan agama islam dan pembinaan syariah sesuai dengan ketentuan peraturan perundang-undangan yang termasuk di dalamnya masalah hisab rukyat, sedangkan pelaksanaan di daerah di tangani oleh Bidang Urusan Agama Islam dan Pembinaan Syariah / Bimas Islam.
2. Menyatukan penentuan awal Ramadan, Syawal dan Zulhijah merupakan salahsatu upaya mewujudkan persatuan umat dalam beribadah sehingga terciptapersatuan umat, baik lahir maupun batin serta adanya kehidupan yang penuhrasa toleransi, selaras, seimbang dan berkesinambungan.
3. Namun dalam kenyataannya penentuan tersebut terdapat perbedaan (Khilaf) di kalangan para ulama dan pemuka agama Islam. Di satu pihak bersikukuh dengan rukyat sedangkan di lain pihak boleh saja dengan hisab.
4. Masalah puasa dan hari raya, disamping merupakan masalah fiqh termasuk juga masalah sosial, masalah yang dikerjakan secara umum bersama-sama, maka perbedaan tersebut dapat berdampak yang kurang baik di kalangan kaum muslimin sendiri maupun masyarakat pada umumnya. Islam adalah Agamarahmatal lil ‘aalamiin dengan membawa konsep ukhuwah telah banyak tercatat dalam sejarah, namun dalam soal puasa dan hari raya, yang seharusnya sama ternyata belum mampu bersatu.

DASAR HUKUM

1. Undang-Undang Nomor 25 Tahun 2004 tentang Sistem Perencanaan Pembangunan Nasional;

2. Undang-Undang Nomor 3 Tahun 2006 tentang Perubahan Atas Undang-Undang Nomor 7 Tahun 1989 tentang Peradilan Agama;
3. Undang-undang Nomor 17 Tahun 2007 tentang Rencana Pembangunan Jangka Panjang Nasional Tahun 2005-2025;
4. Peraturan Presiden Nomor 7 tahun 2015 tentang Organisaasi Kementerian Negara;
5. Peraturan Presiden Nomor 83 tahun 2015 tentang Kementerian Agama;
6. Peraturan Menteri Agama Nomor 42 Tahun 2016 tentang Organisasi dan Tata Kerja Kementerian Agama;
7. Peraturan Menteri Agama Nomor 13 Tahun 2012 tentang Organisasi dan Tata Kerja Instansi Vertikal Kementerian Agama.

SASARAN

1. Meningkatnya kualitas pelayanan kehidupan beragama bagi seluruh lapisan masyarakat;
2. Menyamakan persepsi penentuan awal bulan qomariyah;
3. Meningkatnya kerukunan intern dan antar umat beragama dalam rangka terwujudnya kehidupan yang harmonis, toleransi dan saling menghormati.

KEBIJAKAN

1. Umum :
 - a. Menghimpun seluruh pendapat ulama, para ahli dan instansi terkait dalam masalah hisab rukyat
 - b. Mengembangkan ilmu hisab dan rukyat
 - c. Melaksanakan musyawarah / pertemuan
 - d. Melakukan rukyat bersama
 - e. Menyelenggarakan pelatihan bersama
 - f. Menyusun dan menyebarkan buku, almanak dan sebagainya
 - g. Melakukan kerjasama dalam maupun luar negeri.
2. Kebijakan Penetapan Awal Bulan Qomariyah
 - a. Selain Ramadan, Syawal, dan Zulhijah dapat berdasar hisab (tinggi hilal + 2°, elongasi 3° atau umur bulan 8 jam antara saat 'ijtima' dengan ghurub)

- b. Untuk Ramadan, Syawal, dan Zulhijah berdasar hisab dan rukyat, yaitu:
 - 1) Data hisab dan hasil rukyat sebagai masukan
 - 2) Ditetapkan dalam sidang itsbat
 - 3) Rukyat dilaksanakan oleh Pegawai Kementerian Agama, Kanwil Kementerian Agama, Kantor Kementerian Agama Kabupaten/Kota, instansi terkait, Ormas Islam dan masyarakat luas (Koordinator : Kanwil Kementerian Agama/Kantor Kementerian Agama Kab/Kota)
 - 4) Itsbat rukyat hilal oleh hakim Pengadilan Tinggi Agama / Pengadilan Agama
3. Tim Hisab Rukyat Pusat dikoordinasikan oleh Direktorat Urusan Agama Islam dan Pembinaan Syariah, BHR Daerah dikoordinasikan oleh Kanwil Kementerian Agama Provinsi, sedangkan BHR Kabupaten/Kota dikoordinasikan oleh Kantor Kementerian Agama Kabupaten/Kota. Badan Hisab Rukyat Kementerian Agama dapat terdiri dari unsur :
 - a. Kementerian Agama
 - b. Pengadilan Agama
 - c. Ulama / Majelis Ulama Indonesia
 - d. Ormas Islam
 - e. Perguruan Tinggi
 - f. Badan Meteorologi dan Geofisika/Planetarium
 - g. Pemerintah Daerah/Instansi terkait
 - h. Tokoh/Ahli hisab rukyat.

PROSEDUR PENETAPAN

1. Rukyatul Hilal
 - a. Dirjen Bimbingan Masyarakat Islam Kementerian Agama memeritahkan rukyatul hilal menjelang awal Ramadan, Syawal, dan Zulhijah kepada Kanwil Kementerian Agama dan Kantor Kementerian Agama seluruh Indonesia.
 - b. Kanwil Kementerian Agama dan Kantor Kementerian Agama sebagai koordinator penyelenggaraan pelaksanaan rukyat di daerah masing-masing.
 - c. Rukyat dilakukan bersama-sama dengan instansi terkait, perwakilan ormas Islam, tokoh agama, ahli hisab rukyat, dan masyarakat luas.

Untuk mendukung kelancaran kegiatan di atas, Ditjen Badan Peradilan Agama Mahkamah Agung menugaskan Hakim Agama pada Pengadilan Tinggi

Agama/Mahkamah Syariah Provinsi dan Pengadilan Agama/Mahkamah Syariah seluruh Indonesia sebagai tenaga ahli dan petugas menyumpah saksi rukyatul hilal.

Oleh karena itu, Kanwil Kementerian Agama dan Kantor Kementerian Agama sebagai penanggung jawab dan koordinator pelaksanaan rukyat di daerah masing-masing diharapkan melakukan rukyatul hilal di tempat-tempat strategis dan di tempat-tempat lain yang dimungkinkan hilal dapat terlihat dan selalu mengikut sertakan Hakim Pengadilan Agama/Mahkamah Syariah. Sedangkan masyarakat luas yang ingin melakukan rukyat agar bergabung atau berkoordinasi dengan Panitia Rukyat Kanwil Kementerian Agama dan Kantor Kementerian Agama di daerah masing-masing. Masyarakat diharapkan tidak membuat tempat rukyat sendiri-sendiri tanpa sepengetahuan Kanwil Kementerian Agama dan Kantor Kementerian Agama.

Laporan rukyat dari Panitia Rukyat Daerah dan masyarakat luas sesegera mungkin dilaporkan kepada Panitia Rukyat dan Itsbat Awal Ramadan, Syawal dan Zulhijah di Kementerian Agama RI.

2. Penetapan Pemerintah

Dalam madzhab Syafi'i mensyaratkan bahwa penetapan (itsbat) awal bulan qamariyah khususnya awal Ramadan, Syawal, dan Zulhijah harus dilakukan oleh pemerintah/qadli. Apabila pemerintah telah menetapkannya maka seluruh umat Islam wajib mengikuti dan melaksanakannya. Sedang madzhab Hanafi, Maliki, dan Hanbali tidak mensyaratkan harus ditetapkan oleh pemerintah/qadli. Tetapi jika pemerintah telah menetapkannya maka umat Islam wajib mengikuti dan mentaatinya.

Itsbat (penetapan) Pemerintah diperlukan karena ada beberapa keuntungan, antara lain :

1. Itsbat diperlukan untuk mendapatkan keabsahan
2. Itsbat diperlukan untuk mencegah kerancuan dan keraguan sistem pelaporan.
3. Itsbat diperlukan untuk penyatuan umat dan menghilangkan perbedaan pendapat.

Semuanya wajib mengikuti dan mentaati, serta tidak boleh lagi terjadi adanya silang pendapat demi tegaknya ukhuwah Islamiyah. Sesuai dengan kaidah fiqih :

- a. *Hukm al hakim ilzam wa yarfa'u al khilaf.*
- b. *Tasharruf al imam 'ala raiyatih manuthun bi al mashlahah.*
- c. *Inna ijthada ulil amr huwa al ashlu al tsalits minas-syari'ah al islamiyah wa innahum idza ajma'u ra'yahum wajaba 'ala al amah wa 'ala hukkamiha al 'amalu bih.*
- d. Fatwa MUI Nomor 2 Tahun 2004 tentang Penentuan Awal Ramadan, Syawal, dan Zulhijah. Menyatakan bahwa "seluruh umat Islam di Indonesia wajib

mentaati ketetapan Pemerintah RI tentang Penetapan Awal Ramadan, Syawal dan Zulhijah”.

Pelaksanaan sidang itsbat selalu menjunjung tinggi musyawarah, menghormati sikap perbedaan pendapat, kebersamaan, dan demokratis, serta menerima saran dan pendapat dari peserta sidang. Setelah saran dan pendapat dibahas dan diterima, dengan suasana bersama-sama berupaya mencari keputusan yang terbaik, lalu mengambil musyawarah mufakat, bulat dan masalah, maka sidang memutuskan “Penetapan tanggal 1 Ramadan, Syawal dan Zulhijah”.

**KEPUTUSAN FATWA
MAJELIS ULAMA INDONESIA**

Nomor 2 tahun 2004

Tentang

PENETAPAN AWAL RAMADHAN, SYAWAL, DAN DZULHIJAH

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Majelis Ulama Indonesia,

MENIMBANG

- : a. bahwa umat Islam Indonesia dalam melaksanakan puasa Ramadhan, salat Idul Fitri dan Idul Adha, serta ibadah-ibadah lain yang terkait dengan ketiga bulan tersebut terkadang tidak dapat melakukannya pada hari dan tanggal yang sama disebabkan perbedaan dalam penetapan awal bulan-bulan tersebut;
- b. bahwa keadaan sebagaimana tersebut pada huruf a dapat menimbulkan citra dan dampak negative terhadap syi'ar dan dakwah Islam;
- c. bahwa Ijtima' Ulama Komisi Fatwa se-Indonesia pada tanggal 22 Syawwal 1424 H / 16 Desember 2003 telah menfatwakan tentang penetapan awal bulan Ramadhan, Syawwal, dan Dzulhijjah sebagai upaya mengatasi hal diatas;
- d. bahwa oleh karena itu, Majelis Ulama Indonesia memandang perlu menetapkan fatwa tentang penetapan awal bulan Ramadhan, Syawwal dan Dzulhijjah dimaksud untuk dijadikan pedoman.

MENGINGAT

- : 1. Firman Allah SWT, antara lain

هُوَ الَّذِي جَعَلَ الشَّمْسَ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَرَهُ مَنَازِلَ

لِتَعْلَمُوا عَدَدَ السِّنِينَ وَالْحِسَابَ (يونس [١٠]: ٥)

Dia-lah yang menjadikan matahari bersinar dan bulan bercahaya dan ditetapkan-Nya manzilah-manzilah (tempat-tempat) bagi perjalanan bulan itu, supaya kamu mengetahui bilangan tahun dan perhitungan (waktu). (QS Yunus [10]: 5)

يَا أَيُّهَا الَّذِينَ آمَنُوا أَطِيعُوا اللَّهَ وَأَطِيعُوا الرَّسُولَ وَأُولَى الْأَمْرِ
مِنْكُمْ (النساء [4]: ٥٩)

Hai orang-orang yang beriman, taatlah kepada Allah, taatlah kepada Rasul dan ulil-amri diantara kamu (QS. an-Nisa'[4]:59)

2. Hadits – hadits Nabi s.a.w, antara lain

(١) لَا تَصُومُوا حَتَّى تَرَوْا الْهَيْلَالَ وَلَا تُفْطِرُوا حَتَّى تَرَوْهُ فَإِنْ
غَمَّ عَلَيْكُمْ فَأَقْدِرُوا لَهُ (رواه البخاري ومسلم عن ابن عمر)

“janganlah kamu berpuasa (Ramadhan) sehingga melihat tanggal (satu Ramadhan) dan janganlah berbuka (mengakhiri puasa Ramadhan) sehingga tanggal (satu Syawwal). Jika dihalangi oleh awan/mendung maka kira-kiralah”. (H.R. Bukhari Muslim dari Ibnu Umar).

(٢) صُومُوا لِرُؤُوسِهِ وَأَفْطِرُوا لِرُؤُوسِهِ فَإِنْ غُيِبَ عَلَيْكُمْ فَأَكْمِلُوا
عِدَّةَ شَعْبَانَ ثَلَاثِينَ

“Berpuasalah (Ramadhan) karena melihat tanggal (satu Ramadhan). Dan berbukalah (mengakhiri puasa Ramadhan) karena melihat tanggal (satu Syawwal). Apabila kamu terhalangi, sehingga tidak dapat melihatnya maka sempurnakanlah bilangan Sya’ban tiga puluh hari”. (Bukhari Muslim dari Abu Hurairah).

(٣) عَلَيْكُمْ بِالسَّمْعِ وَالطَّاعَةِ وَإِنْ وُلِّيَ عَلَيْكُمْ عَبْدٌ حَبَشِيٌّ

“Wajib bagi kalian untuk taat (kepada pemimpin), meskipun yang memimpin kalian itu seorang hamba sahaya Habsyi”. (H.R. Bukhari dari Irbadh bin Sariyah).

3. Qa’idah fiqh:

(٤) حُكْمُ الْحَاكِمِ الزَّامٌ وَيَرْفَعُ الْخِلَافَ

“Keputusan pemerintah itu mengikat (wajib dipatuhi) dan menghilangkan silang pendapat”.

MEMPERHATIKAN : 1. Pendapat para ulama ahli fiqh; antara lain pendapat Imam al Syarwani dalam Hasyiyah al-Syarwani:

وَمَحَلُّ الْخِلَافِ إِذَا لَمْ يَحْكَمْ بِهِ حَاكِمٌ، فَإِنْ حَكَمَ بِهِ حَاكِمٌ
يَرَاهُ وَجِبَ الصَّوْمُ عَلَى الْكَافَةِ وَلَمْ يُنْقِضِ الْحُكْمُ إِجْمَاعًا.
قَالَهُ النَّوَوِيُّ فِي مَجْمُوعِهِ، وَهُوَ صَرِيحٌ فِي أَنَّ لِلْقَاضِي أَنْ
يَحْكُمَ بِكُونَ اللَّيْلَةِ مِنْ رَمَضَانَ. (حَاشِيَةِ الشَّرَوَانِيِّ، جِزء ٣ ص
٣٧٦)

2. Keputusan Ijtima Ulama Komisi Fatwa se-Indonesia tentang Fatwa Bunga (interest/fa'idah), tanggal 22 Syawal 1424/16 Desember 2003.
3. Keputusan Rapat Komisi Fatwa MUI, tanggal 05 Dzulhijjah 1424/24 Januari 2004.

Dengan memohon ridha Allah SWT

MEMUTUSKAN

MENETAPKAN : FATWA TENTANG PENETAPAN AWAL RAMADHAN, SYAWAL DAN DZULHIJAH

Pertama : **Fatwa**

1. Penetapan awal Ramadhan, Syawal dan Dzulhijjah dilakukan berdasarkan metode ru'yah dan hisab oleh Pemerintah RI cq Menteri Agama dan berlaku secara nasional.
2. Seluruh umat Islam di Indonesia wajib menaati ketetapan pemerintah RI tentang penetapan awal Ramadhan, Syawal dan Dzulhijjah.
3. Dalam menetapkan awal Ramadhan, Syawal dan Dzulhijjah, Menteri Agama wajib berkonsultasi dengan Majelis Ulama Indonesia, ormas-ormas Islam dan Instansi terkait.
4. Hasil rukyat dari daerah yang memungkinkan hilal dirukyat walaupun di luar wilayah Indonesia yang

mathla'nya sama dengan Indonesia dapat dijadikan pedoman oleh Menteri Agama RI.

Kedua : **Rekomendasi**

Agar Majelis Ulama Indonesia mengusahakan adanya kriteria penentuan awal Ramadhan, Syawal dan Dzulhijjah untuk dijadikan pedoman oleh Menteri Agama dengan membahasnya bersama ormas-ormas Islam dan para ahli terkait.

Jakarta, 05 Dzulhijjah 1424 H
24 Januari 2004 M

**MAJELIS ULAMA INDONESIA
KOMISI FATWA,**

Ketua,

ttd

KH. MA'RUF AMIN

Sekretaris,

ttd

HASANUDIN

FATWA
MAJELIS ULAMA INDONESIA
Nomor : 05 Tahun 2010
Tentang
ARAH KIBLAT

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Komisi Fatwa Majelis Ulama Indonesia

- Menimbang : a. bahwa dalam rangka memberikan pedoman kepada masyarakat tentang arah Kiblat, Majelis Ulama Indonesia menetapkan Fatwa Nomor 3 Tahun 2010 tentang Kiblat, yang pada bagian ketentuan Hukum Nomor 3 disebutkan: "Letak geografis Indonesia yang berada di bagian timur Ka'bah/Mekkah Maka kiblat umat Islam Indonesia adalah menghadap ke arah barat".
- b. bahwa terhadap diktum fatwa tersebut muncul pertanyaan di masyarakat, yang bisa menimbulkan kesimpangsiuran penafsiran serta pertanyaan mengenai keabsahan shalat yang arah kiblatnya menghadap ke barat laut;
- c. bahwa oleh karena itu, Komisi Fatwa Majelis Ulama Indonesia memandang perlu menetapkan fatwa tentang arah kiblat untuk dijadikan pedoman bagi masyarakat.
- Mengingat : 1. Firman Allah SWT:

قَدْ نَرَى تَقَلُّبَ وَجْهِكَ فِي السَّمَاءِ ط فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضَاهَا ءِ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ ءِ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ ءِ وَإِنَّ الَّذِينَ أُوتُوا الْكِتَابَ لَيَعْلَمُونَ أَنَّهُ الْحَقُّ مِنْ رَبِّهِمْ ءِ وَمَا

اللَّهُ بِغَفْلٍ عَمَّا يَعْمَلُونَ ﴿١٤٤﴾

Sungguh Kami (sering) melihat mukamu menengadah ke langit, maka sungguh Kami akan memalingkan kamu ke kiblat yang kamu sukai. Palingkanlah mukamu ke arah Masjidil Haram, dan di mana saja kamu berada, palingkanlah mukamu ke arahmu. dan sesunoouhnua orano-orano (Yahudi dan Nasrani)

yang diberi Al-Kitab (Taurat dan Injil) memang mengetahui bahwa berpaling ke Masjidil Haram itu adalah benar dari Tuhannya; dan Allah sekali-kali tidak lengah dari apa yang mereka kerjakan. (QS. Al-Baqarah [2]:144)

2. Firman Allah SWT:

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَإِنَّهُ لَلْحَقُّ مِنْ رَبِّكَ ۗ وَمَا اللَّهُ بِغَفِيلٍ عَمَّا تَعْمَلُونَ ﴿١٤٩﴾

Dan dari mana saja kamu keluar (datang), maka palingkanlah wajahmu ke arah Masjidil Haram; Sesungguhnya ketentuan itu benar-benar sesuatu yang haq dari Tuhanmu. Dan Allah sekali-kali tidak lengah dari apa yang kamu kerjakan. (QS. Al-Baqarah [2]:149)

3. Firman Allah SWT:

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ ۗ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ ۗ لِئَلَّا يَكُونَ لِلنَّاسِ عَلَيْكُمْ حُجَّةٌ إِلَّا الَّذِينَ ظَلَمُوا مِنْهُمْ فَلَا تَخْشَوْهُمْ وَاخْشَوْنِي ۗ وَلَا تَمَّ نِعْمَتِي عَلَيْكُمْ وَلَعَلَّكُمْ تَهْتَدُونَ ﴿١٥٠﴾

Dan dari mana saja kamu (keluar), maka palingkanlah wajahmu ke arah Masjidil Haram. Dan di mana saja kamu (sekalian) berada, maka palingkanlah wajahmu ke arahnya, agar tidak ada hujjah bagi manusia atas kamu, kecuali orang-orang yang zalim di antara mereka. Maka janganlah kamu takut kepada mereka dan takutlah kepada-Ku (saja). Dan agar Ku sempurnakan nikmat-Ku atasmu, dan supaya kamu mendapat petunjuk. (QS. Al-Baqarah [2] : 150)

4. Firman Allah SWT:

وَلِلَّهِ الْمَشْرِقُ وَالْمَغْرِبُ ۚ فَأَيْنَمَا تُوَلُّوا فَثَمَّ وَجْهُ اللَّهِ ۗ إِنَّ اللَّهَ وَاسِعٌ عَلِيمٌ ﴿١٥١﴾

Dan kepunyaan Allah-lah Timur dan Barat, maka ke manapun kamu menghadap di situlah wajah Allah. Sesungguhnya Allah

Maha Luas (rahmat-Nya) lagi Maha Mengetahui.
(QS. Al-Baqarah [2] : 115)

5. Firman Allah SWT:

وَجَاهِدُوا فِي اللَّهِ حَقَّ جِهَادِهِ ۗ هُوَ اجْتَبَاكُمْ وَمَا جَعَلَ عَلَيْكُمْ فِي
الدِّينِ مِنْ حَرَجٍ ۗ مِلَّةَ أَبِيكُمْ إِبْرَاهِيمَ ۗ هُوَ سَمَّاكُمُ الْمُسْلِمِينَ مِنْ قَبْلُ
وَفِي هَذَا لِيُكُونَ الرَّسُولُ شَهِيدًا عَلَيْكُمْ وَتَكُونُوا شُهَدَاءَ عَلَى النَّاسِ ۗ
فَأَقِمْوَا الصَّلَاةَ وَآتُوا الزَّكَاةَ وَاعْتَصِمُوا بِاللَّهِ هُوَ مَوْلَاكُمْ فَنِعْمَ
الْمَوْلَىٰ وَنِعْمَ النَّصِيرُ ﴿٧٨﴾

Dan berjihadlah kamu di jalan Allah dengan jihad yang sebenar-benarnya. Dia telah memilih kamu dan Dia sekali-kali tidak menjadikan untuk kamu dalam agama suatu kesempitan. (Ikutilah) agama orang tuamu Ibrahim. Dia (Allah) telah menamai kamu sekalian orang-orang muslim dari dahulu, dan (begitu pula) dalam (al-Qur'an) ini, supaya Rasul itu menjadi saksi atas dirimu dan supaya kamu semua menjadi saksi atas segenap manusia, maka dirikanlah shalat, tunaikanlah zakat dan berpeganglah kamu pada tali Allah. Dia adalah Pelindungmu, maka Dialah sebaik-baik Pelindung dan sebaik-baik Penolong. (QS. Al-Hajj [22]:78)

6. Hadits Nabi SAW:

عَنْ عَطَاءٍ قَالَ : سَمِعْتُ ابْنَ عَبَّاسٍ قَالَ لَمَّا دَخَلَ النَّبِيُّ صَلَّى اللَّهُ عَلَيْهِ
وَسَلَّمَ الْبَيْتَ دَعَا فِي نَوَاحِيهِ كُلِّهَا وَلَمْ يُصَلِّ حَتَّىٰ خَرَجَ مِنْهُ فَلَمَّا خَرَجَ
رَكَعَ رَكَعَتَيْنِ فِي قِبَلِ الْكَعْبَةِ وَقَالَ (هَذِهِ الْقِبْلَةُ)

Dari `Atha, ia berkata: aku mendengar Ibnu `Abbas berkata: setelah Rasulullah SAW masuk ke Ka`bah beliau berdo`a pada setiap sudutnya dan beliau tidak shalat (di dalamnya) sampai beliau keluar Ka`bah. Setelah beliau keluar Ka`bah, beliau lalu shalat dua raka`at di hadapan Ka`bah. Rasulullah SAW lalu bersabda : "Inilah kiblat". (HR. Imam Bukhari dan Imam Muslim)

7. Hadits Nabi SAW:

قَالَ أَبُو هُرَيْرَةَ قَالَ النَّبِيُّ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - اسْتَقْبَلِ الْقِبْلَةَ وَكَبِّرْ
(رواه البخارى)

Abu Hurairah berkata, Rasulullah SAW bersabda: "Menghadaplah kiblat, kemudian bertakbirlah (takbiratul ihram)" (HR. Imam Bukhari)

8. Hadits Nabi SAW:

عَنْ مَالِكٍ عَنْ عَبْدِ اللَّهِ بْنِ دِينَارٍ عَنْ ابْنِ عُمَرَ قَالَ بَيْنَمَا النَّاسُ فِي صَلَاةِ الصُّبْحِ بَقْبَاءَ إِذْ جَاءَهُمْ آتٌ فَقَالَ إِنَّ رَسُولَ اللَّهِ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - قَدْ أَنْزَلَ عَلَيْهِ اللَّيْلَةَ ، وَقَدْ أُمِرَ أَنْ يَسْتَقْبِلَ الْكَعْبَةَ ، فَاسْتَقْبَلُوهَا . وَكَانَتْ وُجُوهُهُمْ إِلَى الشَّامِ فَاسْتَدَارُوا إِلَى الْقِبْلَةِ . أَطْرَافَهُ
(رواه البخارى)

Dari Malik dari Abdullah bin Dinar dari Ibnu Umar berkata: ketika orang-orang sedang shalat Shubuh di Masjid Quba`, tiba-tiba datang seseorang berkata bahwa Rasulullah SAW tadi malam menerima wahyu dan diperintahkan untuk menghadap Ka`bah. Mereka lalu mengubah arah (shalat), yang ketika itu menghadap ke arah Syam (Baitul Maqdis), ke arah kiblat (Masjidil Haram). (HR. Imam Bukhari)

9. Hadits Nabi SAW:

عَنْ سَعِيدِ بْنِ أَبِي سَعِيدٍ الْمَقْبُرِيِّ عَنْ أَبِي هُرَيْرَةَ - رَضِيَ اللَّهُ عَنْهُ أَنَّ رَجُلًا دَخَلَ الْمَسْجِدَ وَرَسُولُ اللَّهِ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - جَالِسٌ فِي نَاحِيَةِ الْمَسْجِدِ فَصَلَّى ، ثُمَّ جَاءَ فَسَلَّمَ عَلَيْهِ فَقَالَ لَهُ رَسُولُ اللَّهِ - صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - « وَعَلَيْكَ السَّلَامُ ارْجِعْ فَصَلِّ فَإِنَّكَ لَمْ تُصَلِّ » . فَارْجِعْ فَصَلَّى ، ثُمَّ جَاءَ فَسَلَّمَ . فَقَالَ « وَعَلَيْكَ السَّلَامُ فَارْجِعْ فَصَلِّ ، فَإِنَّكَ لَمْ تُصَلِّ » . فَقَالَ فِي الثَّانِيَةِ أَوْ فِي الَّتِي بَعْدَهَا عَلَّمَنِي يَا رَسُولَ اللَّهِ . فَقَالَ « إِذَا قُمْتَ إِلَى الصَّلَاةِ فَاسْبِغِ الوُضُوءَ ، ثُمَّ اسْتَقْبِلِ الْقِبْلَةَ فَكَبِّرْ ، ثُمَّ اقْرَأْ بِمَا تيسَّرَ مَعَكَ مِنَ الْقُرْآنِ ، ثُمَّ ارْكَعْ حَتَّى تَطْمَئِنَّ رَاكِعًا ، ثُمَّ ارْفَعْ حَتَّى تَسْتَوِيَ قَائِمًا ، ثُمَّ اسْجُدْ حَتَّى تَطْمَئِنَّ سَاجِدًا ،

ثُمَّ ارْفَعْ حَتَّى تَطْمَئِنَّ جَالِسًا ، ثُمَّ اسْجُدْ حَتَّى تَطْمَئِنَّ سَاجِدًا ، ثُمَّ ارْفَعْ
حَتَّى تَطْمَئِنَّ جَالِسًا ، ثُمَّ افْعَلْ ذَلِكَ فِي صَلَاتِكَ كُلِّهَا «

Dari Sa`id ibn Sa`id al-Maqburi dari Abu Hurairah r.a. bahwa ada seorang laki-laki masuk ke masjid kemudian ia shalat dan saat itu ada Rasulullah sedang duduk di salah satu sudut masjid. Setelah shalat orang itu mendatangi Rasul dan memberi salam kepada beliau. Rasul lalu menjawab: "Wa`alaikum al-salam, kembalilah/ulangilah shalatmu karena sesungguhnya kamu belum shalat". Laki-laki itu kemudian mengulangi shalatnya dan kembali mendatangi Rasul serta memberi salam kepada beliau. Rasul menjawab salam dan berkata: "ulangi kembali shalatmu karena kamu belum shalat". Kemudian laki-laki itu berkata di pengulangan shalat yang kedua atau sesudahnya; "Ajarilah aku wahai Rasulullah" Rasulullah menjawab : "Apabila engkau akan menunaikan shalat maka sempurnakanlah wudlu, menghadaplah kiblat lalu bertakbirlah (takbiratul ihram), kemudian bacalah apa yang mudah bagimu dari ayat-ayat al-Qur`an, lalu ruku`lah dengan thuma`ninah, lalu berdiri dengan sempurna, lalu sujud dengan thuma`ninah, lalu duduk dengan thuma`ninah, lalu sujud dengan thuma`ninah, kemudian bangun dan duduk dengan thuma`ninah. Maka lakukanlah seperti itu pada setiap shalat kamu" (HR. Imam Bukhari)

10. Hadits Nabi SAW:

أبي هريرة رضي الله عنه أَنَّ النَّبِيَّ - صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ - قَالَ : " مَا بَيْنَ الْمَشْرِقِ وَالْمَغْرِبِ قِبْلَةٌ " (رواه الترمذي)

Dari Abu Hurairah r.a. bahwa Nabi SAW bersabda: "Arah antara Timur dan Barat adalah Kiblat". (HR. Imam al-Turmudzi)

11. Hadits Nabi SAW:

عَنْ ابْنِ عَبَّاسٍ أَنَّ رَسُولَ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ : الْبَيْتُ قِبْلَةٌ لِأَهْلِ الْمَسْجِدِ ، وَالْمَسْجِدُ قِبْلَةٌ لِأَهْلِ الْحَرَمِ ، وَالْحَرَمُ قِبْلَةٌ لِأَهْلِ الْأَرْضِ فِي مَشَارِقِهَا وَمَغَارِبِهَا مِنْ أُمَّتِي .

Dari Ibnu `Abbas bahwa Nabi SAW bersabda: Ka'bah adalah kiblat bagi orang yang shalat di masjidil haram, dan masjidil haram adalah kiblat bagi penduduk yang tinggal di tanah haram (Mekkah), dan tanah haram (Mekkah) adalah kiblat bagi penduduk bumi di timurnya dan di baratnya dari umatku".

Memperhatikan : 1. Pendapat Imam 'Ala al-Din al-Kasani al-Hanafi dalam kitab *Badai' Shanai' fi Tartib al-Syarai'*:

أَنَّ الْمُصَلِّيَّ لَا يَخْلُو إِذَا كَانَ قَادِرًا عَلَى الْاِسْتِقْبَالِ أَوْ كَانَ عَاجِزًا عَنْهُ فَإِنْ كَانَ قَادِرًا يَجِبُ عَلَيْهِ التَّوَجُّهُ إِلَى الْقِبْلَةِ إِنْ كَانَ فِي حَالِ مُشَاهَدَةِ الْكَعْبَةِ فَإِلَى عَيْنِهَا ، أَيْ : أَيِّ جِهَةٍ كَانَتْ مِنْ جِهَاتِ الْكَعْبَةِ ، حَتَّىٰ لَوْ كَانَ مُنْحَرِفًا عَنْهَا غَيْرَ مُتَوَجِّهٍ إِلَى شَيْءٍ مِنْهَا لَمْ يَجِزْ ، لِقَوْلِهِ تَعَالَى :

{ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ } ، وَفِي وَسْعِهِ تَوَلِيَةُ الْوَجْهِ إِلَى عَيْنِهَا فَيَجِبُ ذَلِكَ ، وَإِنْ كَانَ غَائِبًا عَنِ الْكَعْبَةِ يَجِبُ عَلَيْهِ التَّوَجُّهُ إِلَى جِهَتِهَا ، وَهِيَ الْمَحَارِيبُ الْمَنْصُوبَةُ بِالْإِمَارَاتِ الدَّالَّةِ عَلَيْهَا لَا إِلَى عَيْنِهَا ، وَتُعْتَبَرُ الْجِهَةُ دُونَ الْعَيْنِ . كَذَا ذَكَرَ الْكُرْخِيُّ وَالرَّازِيُّ ، وَهُوَ قَوْلُ عَامَّةِ مُشَائِكِنَا بِمَا وَرَاءَ النَّهْرِ

"Sesungguhnya bagi orang yang shalat tidak boleh kosong/lepas, apakah ia mampu atau tidak, untuk

menghadap kiblat. Apabila ia mampu maka wajib baginya menghadap kiblat, jika ia dapat menyaksikannya (Ka'bah) maka ia harus menghadap kepada 'ainul Ka'bah atau kepada arah dari arah kiblat. Jika ia tidak menghadap salah satunya maka itu tidak diperbolehkan, sebagaimana firman Allah "...dan dimana saja kamu berada, palingkanlah mukamu ke arahnya...". Dan dalam keadaan yang memungkinkan menghadap tepat

ke 'ainul ka'bah maka wajib dilakukan. Namun jika ghaib (tidak dapat melihat ka'bah) maka wajib menghadap ke arah Ka'bah (*jihatul Ka'bah*)..."

2. Pendapat Imam al-Qurtubi dalam Kitab *Jami` al-Ahkam Al-Qur'an* :

واختلفوا هل فرض الغائب استقبال العين أو الجهة؟ فمهم من قال بالأول قال ابن العربي (ت ٥٤٣ هـ) وهو ضعيف لأنه تكليف لما لا يصل إليه . ومنهم من قال بالجهة ، وهو الصحيح لثلاثة أمور:

الأول : أنه الممكن الذي يرتبط به التكليف

الثاني : أنه المأمور به في القرآن لقوله تعالى : {فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ} يعني من الأرض من شرق أو غرب {فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ}

الثالث : أن العلماء احتجوا بالصف الطويل الذي يعلم قطعاً أنه أضعاف عرض البيت

"Mereka berbeda pendapat apakah wajib bagi si ghaib (orang yang shalat dan tidak dapat melihat Ka'bah) untuk menghadap tepat ke bangunan Ka'bah (*'ainul Ka'bah*) atau ke arah Ka'bah (*jihatul Ka'bah*)? sebagian berpendapat pertama (yaitu, menghadap *'ainul Ka'bah*) berkata Ibnu `Arabi (W.534 H) : pendapat ini adalah lemah karena membebani orang yang tidak dapat shalat dengan menghadap tepat *'ainul Ka'bah*. Sebagian lain berpendapat cukup menghadap arah Ka'bah (*Jihatul Ka'bah*). Pendapat terakhir inilah yang benar, dengan tiga alasan: (1) Bahwa hal inilah yang memungkinkan bagi ketentuan sebuah taklif (pembebanan hukum). (2) Bahwa hal inilah yang

diperintahkan oleh al-Qur'an dalam ayat *فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ* (maka palingkanlah wajahmu ke arah Masjidil Haram) yakni belahan bumi di timur dan barat *فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ* (palingkanlah mukamu ke arahnya). (3) Bahwa para ulama berhujjah dengan (kebolehan) shalat dengan shaf yang panjang, yang sangat lemah (kecil kemungkinan) dapat menghadap tepat ke bangunan Ka'bah (*'ainul Ka'bah*)."

3. Pendapat Imam Al-Syirazi dalam kitab al-Muhadzdzab:

وإن لم يكن شيء من ذلك نظرت فإن كان ممن يعرف الدلائل فإن كان غائبا عن مكة اجتهد في طلب القبلة لأن له طريقا إلى معرفتها بالشمس والقمر والجبال والرياح ولهذا قال الله تعالى : { وَعَلَامَاتٍ وَبِالنَّجْمِ هُمْ يَهْتَدُونَ } [النحل : ١٦] فكان له أن يجتهد كالعالم في الحادثة وفي فرضه قولان : قال في الأم : فرضها إصابة العين لأن من لزمه فرض القبلة لزمه إصابة العين المكّي وظاهر ما نقله المزني أن الفرض هو الجهة لأنه لو كان الفرض هو العين لما صحت صلاة الصف الطويل لأن فيهم من يخرج عن العين

"Jika sama sekali ia tidak memiliki petunjuk apapun, maka dilihat maslahatnya. Jika ia termasuk orang yang mengetahui tanda-tanda atau petunjuk kiblat, maka meskipun ia tidak dapat melihat Ka'bah, ia harus tetap berijtihad mengetahui kiblat. Karena ia memiliki cara untuk mengetahuinya melalui keberadaan matahari, bulan, gunung, dan angin karena Allah SWT berfirman:

وَعَلَامَاتٍ وَبِالنَّجْمِ هُمْ يَهْتَدُونَ

"Dan (Dia ciptakan) tanda-tanda (penunjuk jalan). Dan dengan bintang-bintang itulah mereka mendapat petunjuk". (Qs An-Nahl:16).

Dengan begitu ia berhak berijtihad (dalam menentukan letak Ka'bah) seperti orang yang paham tentang fenomena alam mengenai kewajibannya ada dua pendapat. Dalam kitab al-Umm, Imam al-Syafi'i berkata : "Yang wajib dalam berkiblat adalah menghadap secara tepat ke bangunan Ka'bah. Karena orang yang diwajibkan

untuk menghadap kiblat, ia wajib menghadap ke bangunan Ka'bah, seperti halnya orang Mekkah. "Sedangkan teks yang jelas yang dikutip oleh imam al-Muzanni (murid Imam al-Syafi'i) dari Imam al-Syafi'i mengatakan bahwa yang wajib adalah menghadap ke arah Ka'bah (Jihatul Ka'bah) karena seandainya yang wajib itu adalah menghadap ke bangunan Ka'bah secara fisik, maka shalat jama'ah yang shafnya memanjang adalah tidak sah, sebab diantara mereka terdapat orang yang menghadap ke arah di luar dari bangunan Ka'bah."

4. Pendapat Ibnu Qudamah al-Hanbali:

ولنا، قول النبي صلى الله عليه السلام: " ما بين المشرق والمغرب قبلة " رواه الترمذي وقال: حديث حسن صحيح وظاهره أن جميع ما بينهما قبلة . ولأنه لو كان الفرض إصابة العين ، لما صحت صلاة أهل الصف الطويل على خط مستو، ولا صلاة اثنين متباعدين يستقبلان قبلة واحدة . فإنه لا يجوز أن يتوجه إلى الكعبة مع طول الصف إلا بقدرها . فإن قيل : مع البعيد يتسع المحاذي . قلنا : إنما يتسع مع تقوس الصف ، أما مع استوائه فلا . وشطر البيت : نحوه و قبله.

"Dan bagi kita adalah sabda Nabi SAW:" Arah antara timur dan barat adalah kiblat"(HR.Imam At-Tirmidzi), menurut sebuah pendapat hadist ini adalah hasan shahih.yang jelas bahwa arah antara keduanya adalah kiblat karena jika yang diwajibkan adalah menghadap tepat ke bangunan Ka'bah ('ainul Ka'bah) maka tidaklah sah shalat orang dengan shaf yang panjang..."

5. Makalah Drs.KH.A.Ghazaly Masroeri tentang" arah kiblat dari Indonesia" Dan "Posisi Arah Barat Indonesia" dalam rapat komisi Fatwa MUI tanggal 1 Juli 2010;
6. Pandangan dan pendapat rapat Komisi Fatwa MUI pada hari senin tanggal 1 Februari 2010 dan 1 Juli 2010.

MEMUTUSKAN

Menetapkan : FATWA TENTANG ARAH KIBLAT

Pertama : Ketentuan Hukum

1. Kiblat bagi orang yang shalat dan dapat melihat Ka`bah adalah menghadap ke bangunan Ka`bah (*ainul Ka`bah*)
2. Kiblat bagi orang yang shalat dan tidak dapat melihat Ka`bah adalah arah Ka`bah (*Jihat al-Ka`bah*)
3. Kiblat umat Islam Indonesia adalah menghadap ke barat laut dengan posisi bervariasi sesuai dengan letak kawasan masing-masing.

Kedua : **Rekomendasi**

Bangunan masjid/musholla yang tidak tepat arah kiblatnya, perlu ditata ulang shafnya tanpa membongkar bangunannya

Ditetapkan di : Jakarta

Tanggal : 18 Rajab 1431 H
01 Juli 2010 M

KOMISI FATWA
MAJELIS ULAMA INDONESIA

Ketua,

ttd

DR. H. M. ANWAR IBRAHIM

Sekretaris,

ttd

DR. H. HASANUDIN, M.Ag.

CONTOH PERHITUNGAN AWAL WAKTU SHALAT UNTUK JAKARTA

Pada tanggal 3 Januari 2021

Data :

1. Lintang Tempat (ϕ) = $-06^{\circ} 10'$ (LS)
2. Bujur Tempat (λ) = $106^{\circ} 49'$ (BT)
3. Deklinasi Matahari (δ_0) jam 5 GMT = $-22^{\circ} 47' 56''$
4. Equation of Time (e) jam 5 GMT = $-00^j 04^m 27^d$
5. $\cotan h_{\text{asar}}$ = $\tan [\phi - \delta] + 1$
 $= \tan [-06^{\circ} 10' - -22^{\circ} 47' 56''] + 1$
 $= \tan 16^{\circ} 37' 56'' + 1$
 $= 0.298725414 + 1$
 $= 1.298725414^{-1}$
 $= 0.769985702$
 $h_{\text{asar}} = \tan^{-1} 0.769441182 = 37^{\circ} 35' 44.72''$
 - a. h_{asar} = $37^{\circ} 35' 44.72''$
 - b. h_{magrib} = -01°
 - c. $h_{\text{isya'}}$ = -18°
 - d. h_{subuh} = -20°
 - e. h_{imsak} = 10 menit sebelum subuh
 - f. h_{terbit} = -01°
 - g. h_{dhuha} = $04^{\circ} 30'$
6. Mer. Pass = $12^j 00^m 00^d - (-00^j 04^m 27^d)$
 $= 12^j 04^m 27.00^d$
7. Interpolasi = $(106^{\circ} 49' - 105^{\circ}) : 15$
 $= 00^j 07^m 16.00^d$

1. Awal Waktu Zuhur :

- Mer. Pass = $12^j 04^m 27.00^d$ (LMT)
 Interpolasi = $00^j 07^m 16.00^d -$
 $11^j 57^m 11.00^d$
 $11^j 58^m$
 Ikhtiyat = $00^j 03^m +$
 $12^j 01^m$ (WIB)

2. Awal Waktu Ashar :

$$\boxed{\cos t = -\tan \phi \tan \delta_0 + \sin h_{\text{as}} : \cos \phi : \cos \delta_0}$$

$$\begin{aligned} \cos t &= -\tan -06^{\circ} 10' \times \tan -22^{\circ} 47' 56'' + \sin 37^{\circ} 35' 44.72'' : \\ &\quad \cos -06^{\circ} 10' : \cos -22^{\circ} 47' 56'' \end{aligned}$$

$$\begin{aligned}
 &= 0.108046159 \times -0.420338474 + 0.610086469 : \\
 &0.994213627 : 0.921870666 \\
 &= 0.620227527 \\
 t &= 51^\circ 40' 2.09'' \\
 \text{Mer. Pass} &= 12^j 04^m 27.00^d \\
 t : 15 &= \underline{03^j 26^m 40.14^d} + \\
 &15^j 31^m 07.14^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &15^j 23^m 51.14^d \\
 &15^j 24^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Ashar} &= 15^j 26^m \text{ (WIB)}
 \end{aligned}$$

3. Awal Waktu Maghrib :

$$\text{Cos } t = -\tan \phi \tan \delta_o + \sin h_{mg} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \text{Cos } t &= -\tan -06^\circ 10' \times \tan -22^\circ 47' 56'' + \sin -01^\circ : \\
 &\cos -06^\circ 10' : \cos -22^\circ 47' 56'' \\
 &= 0.108046159 \times -0.420338474 + -0.017452406 : \\
 &0.994213627 : 0.921870666 \\
 &= -0.064457652 \\
 t &= 93^\circ 41' 44.57'' \\
 \text{Mer. Pass} &= 12^j 04^m 27.00^d \\
 t : 15 &= \underline{06^j 14^m 46.97^d} + \\
 &18^j 19^m 13.97^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &18^j 11^m 57.97^d \\
 &18^j 12^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Maghrib} &= 18^j 14^m \text{ (WIB)}
 \end{aligned}$$

4. Awal Waktu Isya' :

$$\text{Cos } t = -\tan \phi \tan \delta_o + \sin h_{is} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \text{Cos } t &= -\tan -06^\circ 10' \times \tan -22^\circ 47' 56'' + \sin -18^\circ : \\
 &\cos -06^\circ 10' : \cos -22^\circ 47' 56'' \\
 &= 0.108046159 \times -0.420338474 + -0.309016994 : \\
 &0.994213627 : 0.921870666 \\
 &= -0.382573327 \\
 t &= 112^\circ 29' 35.4'' \\
 \text{Mer. Pass} &= 12^j 04^m 27.00^d
 \end{aligned}$$

$$\begin{aligned}
 t : 15 &= \underline{07^j 29^m 58.36^d} + \\
 &19^j 34^m 25.36^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &19^j 27^m 09.36^d \\
 &19^j 28^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Isya}' &= 19^j 30^m \text{ (WIB)}
 \end{aligned}$$

5. Awal Waktu Subuh :

$$\text{Cos } t = -\tan \phi \tan \delta_o + \sin h_{sb} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \text{Cos } t &= -\tan -06^\circ 10' \times \tan -22^\circ 47' 56'' + \sin -20^\circ : \\
 &\cos -06^\circ 10' : \cos -22^\circ 47' 56'' \\
 &= 0.108046159 \times -0.420338474 + -0.342020143 : \\
 &0.994213627 : 0.921870666 \\
 &= -0.41858188 \\
 t &= 114^\circ 44' 42.3'' \\
 \text{Mer. Pass} &= 12^j 04^m 27.00^d \\
 t : 15 &= \underline{07^j 38^m 58.82^d} - \\
 &04^j 25^m 28.18^d \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^j 07^m 16.00^d} - \\
 &04^j 18^m 12.18^d \\
 &04^j 19^m \\
 \text{Ikhtiyat} &= \underline{00^j 02^m} + \\
 \text{Subuh} &= 04^j 21^m \text{ (WIB)}
 \end{aligned}$$

6. Waktu Imsak :

$$\text{Imsak} = \text{Waktu Subuh} - 10^m$$

$$\begin{aligned}
 \text{Subuh} &= 04^j 21^m \text{ (WIB)} \\
 &= \underline{00^j 10^m} - \\
 \text{Imsak} &= 04^j 11^m \text{ (WIB)}
 \end{aligned}$$

7. Waktu Terbit :

$$\text{Cos } t = -\tan \phi \tan \delta_o + \sin h_{tb} : \cos \phi : \cos \delta_o$$

$$\begin{aligned}
 \text{Cos } t &= -\tan -06^\circ 10' \times \tan -22^\circ 47' 56'' + \sin -01^\circ : \\
 &\cos -06^\circ 10' : \cos -22^\circ 47' 56'' \\
 &= 0.108046159 \times -0.420338474 + -0.017452406 : \\
 &0.994213627 : 0.921870666 \\
 &= -0.064457652
 \end{aligned}$$

$$\begin{aligned}
 t &= 93^{\circ} 41' 44.57'' \\
 \text{Mer. Pass} &= 12^{\text{j}} 04^{\text{m}} 27.00^{\text{d}} \\
 t : 15 &= \underline{06^{\text{j}} 14^{\text{m}} 46.97^{\text{d}}} - \\
 &\quad 05^{\text{j}} 49^{\text{m}} 40.03^{\text{d}} \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^{\text{j}} 07^{\text{m}} 16.00^{\text{d}}} - \\
 &\quad 05^{\text{j}} 42^{\text{m}} 24.03^{\text{d}} \\
 &\quad 05^{\text{j}} 42^{\text{m}} \\
 \text{Ikhtiyat} &= \underline{00^{\text{j}} 02^{\text{m}}} - \\
 \text{Terbit} &= 05^{\text{j}} 40^{\text{m}} \text{ (WIB)}
 \end{aligned}$$

8. Awal Waktu Duha :

$$\text{Cos } t = -\tan \phi \tan \delta_0 + \sin h_{\text{dl}} : \cos \phi : \cos \delta_0$$

$$\begin{aligned}
 \text{Cos } t &= -\tan -06^{\circ} 10' \times \tan -22^{\circ} 47' 56'' + \sin 04^{\circ} 30' : \\
 &\quad \cos -06^{\circ} 10' : \cos -22^{\circ} 47' 56'' \\
 &= 0.108046159 \times -0.420338474 + 0.078459095 : \\
 &\quad 0.994213627 : 0.921870666 \\
 &= 0.04018795 \\
 t &= 87^{\circ} 41' 48.41'' \\
 \text{Mer. Pass} &= 12^{\text{j}} 04^{\text{m}} 27.00^{\text{d}} \\
 t : 15 &= \underline{05^{\text{j}} 50^{\text{m}} 47.23^{\text{d}}} - \\
 &\quad 06^{\text{j}} 13^{\text{m}} 39.77^{\text{d}} \text{ (LMT)} \\
 \text{Interpolasi} &= \underline{00^{\text{j}} 07^{\text{m}} 16.00^{\text{d}}} - \\
 &\quad 06^{\text{j}} 06^{\text{m}} 23.77^{\text{d}} \\
 &\quad 06^{\text{j}} 07^{\text{m}} \\
 \text{Ikhtiyat} &= \underline{00^{\text{j}} 02^{\text{m}}} + \\
 \text{Dluha} &= 06^{\text{j}} 09^{\text{m}} \text{ (WIB)}
 \end{aligned}$$

Hasil Perhitungan

Awal waktu-waktu shalat untuk Jakarta pada tanggal 3 Januari 2020

Imsak	Subuh	Terbit	Duha	Zuhur	Asar	Maghrib	Isya
04:11	04:21	05:40	06:09	12:01	15:26	18:14	19:30

CONTOH PERHITUNGAN AWAL BULAN RAMADAN 1442 H

1. Menentukan bulan dan tahun

Sebagai contoh, dihitung waktu ijtima' dan posisi hilal menjelang bulan Ramadan 1442 H.

2. Menentukan Lokasi

Perhitungan untuk lokasi pantai Pelabuhan Ratu, Sukabumi dengan posisi

Lintang Tempat (ϕ) = $-07^{\circ} 01' 44.60''$

Bujur Tempat (λ) = $106^{\circ} 33' 27.80''$

Tinggi tempat = 52.685 meter di atas air laut

3. Konversi Tanggal

29 Sya'ban 1442 H atau tanggal 29-08-1442 H

Waktu yang telah dilalui sebanyak 1441 th, lebih 07 bl, lebih 29 hr.

1441 tahun : 30 tahun = 48 daur lebih 1 tahun

48 daur = 48 x 10631 hari = 510288 hari

1 tahun = 1 x 354 = 354 hari

07 bulan = (30 x 4) + (29 x 3) = 207 hari

29 hari = 29 hari +

Jumlah = 510878 hari

Selisih kalender Masehi – Hijriyah = 227016 hari

Anggaran baru Gregorius = 13 hari +

JUMLAH = 737907 hari

510878 : 7 = 72982 lebih 4 = Senin (dihitung mulai Jum'at)

510878 : 5 = 102175 lebih 3 = Pon (dihitung mulai Legi)

737907 : 1461 = 505 siklus lebih 102 hari

505 siklus = 504 x 4 = 2020 tahun

102 hari = 0 tahun lebih 102 hari

Waktu yang dilewati = 2020 tahun + 3 bulan + 11 hari

atau 2020 tahun lebih 3 bulan lebih 12 hari

Jadi 29 Sya'ban 1442 H bertepatan 12 April 2021 M (Senin Pon).

4. Menyiapkan data astronomi pada tanggal 12 April 2021 M
5. FIB (*Fraction Illumination Bulan*) terkecil pada tanggal 12 April 2021 M yaitu 0.00115, pada jam 03 (GMT)
6. ELM jam 03 = 22° 26' 27.00"
 ELM jam 04 = 22° 28' 55.00" -
 Selisih (**B₁**) = **00° 02' 28.00"**
7. ALB jam 03 = 22° 38' 24.00"
 ALB jam 04 = 23° 08' 24.00" -
 Selisih (**B₂**) = **00° 30' 00.00"**
8. ELM jam 03 = 22° 26' 27.00"
 ALB jam 03 = 22° 38' 24.00" -
MB = **-00° 11' 57.00"**
9. B₂ = 00° 30' 00.00"
 B₁ = 00° 02' 28.00" -
SB = **00° 27' 32.00"**
10. Titik Ijtima' = MB : SB
 = -00° 11' 57.00" : 00° 27' 32.00"
 = **-00° 26' 02.47"**
11. Waktu FIB terkecil = 03^j 00^m 00^d
 Titik Ijtima' = -00° 26' 02.47" +
Ijtima' = **02^j 33^m 57.53^d**
 Koreksi ΔT = 00^j 02^m 09.67^d -
 Ijtima' dalam GMT = 02^j 31^m 47.86^d
 Koreksi WIB = 07^j 00^m 00.00^d +
Ijtima' = **09^j 31^m 47.86^d**
12. Perkiraan matahari terbenam untuk Pelabuhan Ratu, Sukabumi pada tanggal 12 April 2021

φ	= -07° 01' 44.60"
λ	= 106° 33' 27.80"
Tt	= 52.685 m
δ	= 08° 51' 03.00"
e	= -00 ^j 01 ^m 43.00 ^d

$$\begin{aligned}
 \text{Dip} &= \sqrt{52.685 \times 0.0293} = 00^\circ 12' 45.62'' \\
 h &= -(00^\circ 16' + 00^\circ 34' 30'' + \text{Dip}) = -01^\circ 03' 15.62'' \\
 \cos t &= -\tan \phi \tan \delta + \sin h : \cos \phi : \cos \delta \\
 &= -\tan -07^\circ 01' 44.6'' \times \tan 08^\circ 51' 03.00'' + \sin -01^\circ 03' 15.62'' \\
 &\quad : \cos -07^\circ 01' 44.6'' : \cos 08^\circ 51' 03.00'' \\
 &= 0.000436359 \\
 t &= 89^\circ 58' 29.99'' \\
 12 - e &= 12^j 58^m 44.00^d \\
 t : 15 &= \underline{05^j 59^m 54.45^d} + \\
 12 - e + t : 15 &= 18^j 00^m 38.45^d \\
 \lambda : 15 &= \underline{07^j 06^m 13.85^d} - \\
 \text{Matahari terbenam} &= \mathbf{10^j 54^m 23.15^d}
 \end{aligned}$$

13. Data dari Ephemeris pada jam 10:54:23.15 (GMT)

a) Deklinasi matahari (δ_\odot)

$$\begin{aligned}
 \delta_\odot \text{ jam 10} &= 08^\circ 50' 08.00'' && 08^\circ 50' 08.00'' \\
 \delta_\odot \text{ jam 11} &= \underline{08^\circ 51' 03.00''} - \\
 &\quad -00^\circ 00' 55.00'' \\
 &\quad \underline{00^\circ 54' 23.15''} \times \\
 &\quad -00^\circ 00' 49.85'' && \underline{-00^\circ 00' 49.85''} - \\
 \delta_\odot \text{ jam 10:54:23.15} &= && \mathbf{08^\circ 50' 57.85''}
 \end{aligned}$$

b) Semi diameter matahari (SD_\odot)

$$\begin{aligned}
 SD_\odot \text{ jam 10} &= 00^\circ 15' 57.23'' && 00^\circ 15' 57.23'' \\
 SD_\odot \text{ jam 11} &= \underline{00^\circ 15' 57.22''} - \\
 &\quad 00^\circ 00' 00.01'' \\
 &\quad \underline{00^\circ 54' 23.15''} \times \\
 &\quad 00^\circ 00' 00.01'' && \underline{00^\circ 00' 00.01''} - \\
 SD_\odot \text{ jam 10:54:23.15} &= && \mathbf{00^\circ 15' 57.22''}
 \end{aligned}$$

c) Equation of Time (e)

$$\begin{aligned}
 e \text{ jam 10} &= 00^j 01^m 44.00^d && -00^j 00^m 44.00^d \\
 e \text{ jam 11} &= \underline{00^j 00^m 43.00^d} - \\
 &\quad -00^\circ 00' 01.00'' \\
 &\quad \underline{00^\circ 54' 23.15''} \times
 \end{aligned}$$

$$\begin{aligned}
 & -00^{\circ} 00' 00.91'' & -00^{\circ} 00' 00.91'' - \\
 \mathbf{e \text{ jam } 10:54:23.15} & = & \mathbf{-00^j 00^m 43.09^d} \\
 \\
 14. h_o & = -(SD_o + 00^{\circ} 34' 30'' + \text{Dip}) \\
 & = -(00^{\circ} 15' 57.22'' + 00^{\circ} 34' 30'' + 00^{\circ} 12' 45.62'') \\
 & = -01^{\circ} 03' 12.84'' \\
 \\
 15. \cos t_o & = -\tan \phi \tan \delta + \sin h : \cos \phi : \cos \delta \\
 & = -\tan -07^{\circ} 01' 44.6'' \times \tan 08^{\circ} 50' 57.85'' + \sin -01^{\circ} 03' 12.84'' \\
 & \quad : \cos -07^{\circ} 01' 44.6'' : \cos 08^{\circ} 50' 57.85'' \\
 & = 0.00044702 \\
 t_o & = \mathbf{89^{\circ} 58' 27.80''} \\
 \\
 16. \text{Ghurub} & = 12 - e + (t_o : 15) - (\lambda : 15) \\
 12 - e & = 12^j 00^m 44.00^d \\
 t : 15 & = \underline{05^j 59^m 54.45^d} + \\
 12 - e + t : 15 & = 18^j 00^m 38.45^d \\
 \lambda : 15 & = \underline{07^j 06^m 13.85^d} - \\
 \text{Ghurub} & = 10^j 54^m 24.60^d \\
 \text{Koreksi WIB} & = \underline{07^j 00^m 00.00^d} + \\
 & \quad \mathbf{17^j 54^m 23.09^d} \\
 \\
 17. AR_o \text{ jam } 10 & = 21^{\circ} 00' 44.00'' & 21^{\circ} 00' 44.00'' \\
 AR_o \text{ jam } 11 & = \underline{21^{\circ} 03' 02.00''} - \\
 & -00^{\circ} 02' 18.00'' \\
 & \underline{00^{\circ} 54' 23.09''} \times \\
 & -00^{\circ} 02' 05.09'' & \underline{-00^{\circ} 02' 05.09''} - \\
 \mathbf{AR_o \text{ jam } 10:54:23.09} & = & \mathbf{21^{\circ} 02' 49.09''} \\
 \\
 18. AR_c \text{ jam } 10 & = 25^{\circ} 34' 18.00'' & 25^{\circ} 34' 18.00'' \\
 AR_c \text{ jam } 11 & = \underline{26^{\circ} 01' 41.00''} - \\
 & -00^{\circ} 27' 23.00'' \\
 & \underline{00^{\circ} 54' 23.09''} \times \\
 & -00^{\circ} 24' 49.24'' & \underline{-00^{\circ} 24' 49.24''} - \\
 \mathbf{AR_c \text{ jam } 10:54:23.09} & = & \mathbf{25^{\circ} 59' 07.24''} \\
 \\
 19. \delta_c \text{ jam } 10 & = 06^{\circ} 40' 50.00'' & 06^{\circ} 40' 50.00'' \\
 \delta_c \text{ jam } 11 & = \underline{06^{\circ} 53' 18.00''} -
 \end{aligned}$$

$$\begin{aligned}
 & -00^{\circ} 12' 28.00'' \\
 & \quad \underline{00^{\circ} 54' 23.09''} \times \\
 & -00^{\circ} 11' 18.00'' \qquad \underline{-00^{\circ} 11' 18.00''} - \\
 \delta_{\text{jam } 10:54:23.09} & = \qquad \qquad \qquad \mathbf{06^{\circ} 52' 08.00''} \\
 \\
 20. \text{SD}_{\text{jam } 10} & = 00^{\circ} 14' 47.07'' \qquad 00^{\circ} 14' 47.07'' \\
 \text{SD}_{\text{jam } 11} & = \underline{00^{\circ} 14' 46.93''} - \\
 & -00^{\circ} 00' 00.14'' \\
 & \quad \underline{00^{\circ} 54' 23.09''} \times \\
 & -00^{\circ} 00' 00.13'' \qquad \underline{-00^{\circ} 00' 00.13''} - \\
 \text{SD}_{\text{jam } 10:54:23.09} & = \qquad \qquad \qquad \mathbf{00^{\circ} 14' 46.94''} \\
 \\
 21. \text{HP}_{\text{jam } 10} & = 00^{\circ} 54' 15.00'' \qquad 00^{\circ} 54' 15.00'' \\
 \text{HP}_{\text{jam } 11} & = \underline{00^{\circ} 54' 15.00''} - \\
 & -00^{\circ} 00' 00.00'' \\
 & \quad \underline{00^{\circ} 54' 23.09''} \times \\
 & -00^{\circ} 00' 00.00'' \qquad \underline{-00^{\circ} 00' 00.00''} - \\
 \text{HP}_{\text{jam } 10:54:23.09} & = \qquad \qquad \qquad \mathbf{00^{\circ} 54' 15.00''} \\
 \\
 22. t_{\zeta} & = \text{AR}_o - \text{AR}_{\zeta} + t_o \\
 & = 21^{\circ} 02' 49.09'' - 25^{\circ} 59' 07.24'' + 89^{\circ} 58' 27.80'' \\
 & = \mathbf{85^{\circ} 02' 09.64''} \\
 \\
 23. \sin h_{\zeta} & = \sin \phi \sin \delta + \cos \phi \cos \delta \cos t \\
 & = \sin -07^{\circ} 01' 44.60'' \times \sin 06^{\circ} 52' 08.00'' + \cos -07^{\circ} 01' 44.60'' \\
 & \quad \times \cos 06^{\circ} 53' 18.00'' \times \cos 85^{\circ} 02' 09.64'' \\
 & = 0.070627366 \\
 h_{\zeta} & = \mathbf{04^{\circ} 03' 00.08''} \\
 \\
 24. P & = \cos h_{\zeta} \times \text{HP}_{\zeta} \\
 & = \cos 04^{\circ} 03' 00.08'' \times 00^{\circ} 54' 15.00'' \\
 P & = \mathbf{00^{\circ} 54' 06.87''} \\
 \\
 25. h_{\zeta}^{\circ} & = h - P + \text{SD} \\
 h_{\zeta} & = 04^{\circ} 03' 00.08'' \\
 P & = \underline{00^{\circ} 54' 06.87''} - \\
 & \quad 03^{\circ} 08' 53.21'' \\
 \text{SD} & = \underline{00^{\circ} 14' 46.94''} +
 \end{aligned}$$

$$\begin{aligned}
 h_c^\circ &= \mathbf{03^\circ 23' 40.15''} \\
 26. \text{ Refr} &= 00^\circ 12' 38.02'' \\
 &= (12.7' - (12.7' - 12.5') \times (03^\circ 23' 40.15'' - 03^\circ 22')) : (03^\circ 27' - 03^\circ 22') / 60 \\
 &= 0.210553871 \\
 &= \mathbf{00^\circ 12' 37.99''} \\
 27. h_c' &= h_c^\circ + \text{Refr} + \text{Dip} \\
 h_c^\circ &= 03^\circ 23' 40.15'' \\
 \text{Refr} &= 00^\circ 12' 37.99'' \\
 \text{Dip} &= \underline{00^\circ 12' 45.62''} + \\
 h_c' \text{ Upper} &= \mathbf{03^\circ 49' 03.75''} \\
 \text{SD} &= 00^\circ 14' 46.94'' \\
 h_c' \text{ Center} &= \mathbf{03^\circ 34' 16.82''} \\
 28. \sin \text{NF} &= (\sin \phi \sin \delta) : (\cos \phi \cos \delta) \\
 &= (\sin -07^\circ 01' 44.60'' \times \sin 06^\circ 52' 08.00'') : (\cos -07^\circ 01' 44.60'' \times \cos 06^\circ 52' 08.00'') \\
 &= -0.014852934 \\
 \text{NF} &= \mathbf{-00^\circ 51' 03.75''} \\
 29. \text{PNF} &= \cos \text{NF} \times \text{HP} \\
 &= \cos -00^\circ 51' 03.75'' \times 00^\circ 54' 15.00'' \\
 \text{PNF} &= \mathbf{00^\circ 54' 14.64''} \\
 30. \text{SBSH} &= 90 + \text{NF} \\
 &= 90 + -00^\circ 51' 03.75'' \\
 \text{SBSH} &= \mathbf{89^\circ 08' 56.25''} \\
 31. \text{SBS}_c &= 90 + \text{NF} + \text{PNF} - (\text{SD} + 0.575 + \text{Dip}) \\
 &= 90 + -00^\circ 51' 03.75'' + 00^\circ 54' 14.64'' - (00^\circ 14' 46.94'' + 0.575 + 00^\circ 12' 45.62'') \\
 \text{SBS}_c &= \mathbf{89^\circ 01' 08.33''} \\
 32. \text{Lm}_c &= (\text{SBS} - t) : 15 \\
 &= (89^\circ 01' 08.33'' - 85^\circ 02' 09.64'') : 15 \\
 \text{Lm}_c &= \mathbf{00^j 15^m 55.91^d}
 \end{aligned}$$

$$= 04^{\circ} 02' 50.85'' : 15$$

NH = **0.269830555 Jari**

40. $\tan \text{MRG}$ = $[\text{PH} : h_c']$
 = $[-01^{\circ} 20' 39.33'' : 03^{\circ} 49' 03.75'']$
 = -0.352111323

MRG = **$-19^{\circ} 23' 51.88''$**

41. $\cos \text{JB}$ = $\cos h_c' \times \cos \text{PH}$
 = $\cos 03^{\circ} 49' 03.75'' \times \cos -01^{\circ} 20' 39.33''$
 = 0.997506334

JB = **$04^{\circ} 02' 49.66''$**

Dari perhitungan di atas dapat diketahui bahwa ijtima' menjelang bulan Ramadan 1442 H terjadi pada hari Senin Pon tanggal 12 April 2021 M jam 09:31:47.86 WIB.

Untuk lokasi Pelabuhanratu, Sukabumi (Jawa Barat):

Matahari Terbenam	= 17:54:23.15 WIB
Arah Matahari	= $08^{\circ} 47' 13.18''$ (Utara Titik Barat)
Tinggi Hilal	= $03^{\circ} 34' 16.82''$ (di atas ufuk Mar'i)
Arah Hilal	= $07^{\circ} 26' 33.85''$ (Utara Titik Barat)
Posisi Hilal	= $-01^{\circ} 20' 39.33''$ (Selatan Matahari)
Jarak Busur	= $04^{\circ} 02' 49.66''$
Keadaan Hilal	= Miring ke Selatan
Lama Hilal	= $00^j 15^m 55.91^d$
Hilal Terbenam	= 18:10:19.43 WIB
Arah Terb. Hilal	= $06^{\circ} 56' 13.49''$ (Utara Titik Barat)
Illuminasi Hilal	= 0.00212753 (0.21%)
Nurul Hilal	= 0.269277474 (jari)

DAFTAR REFRAKSI

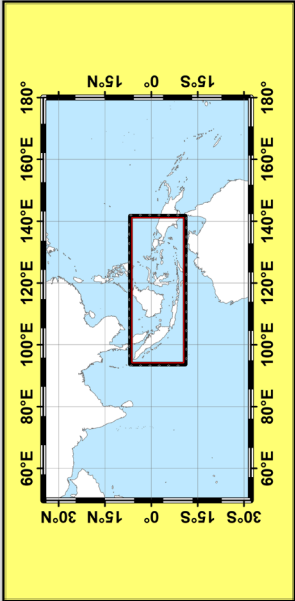
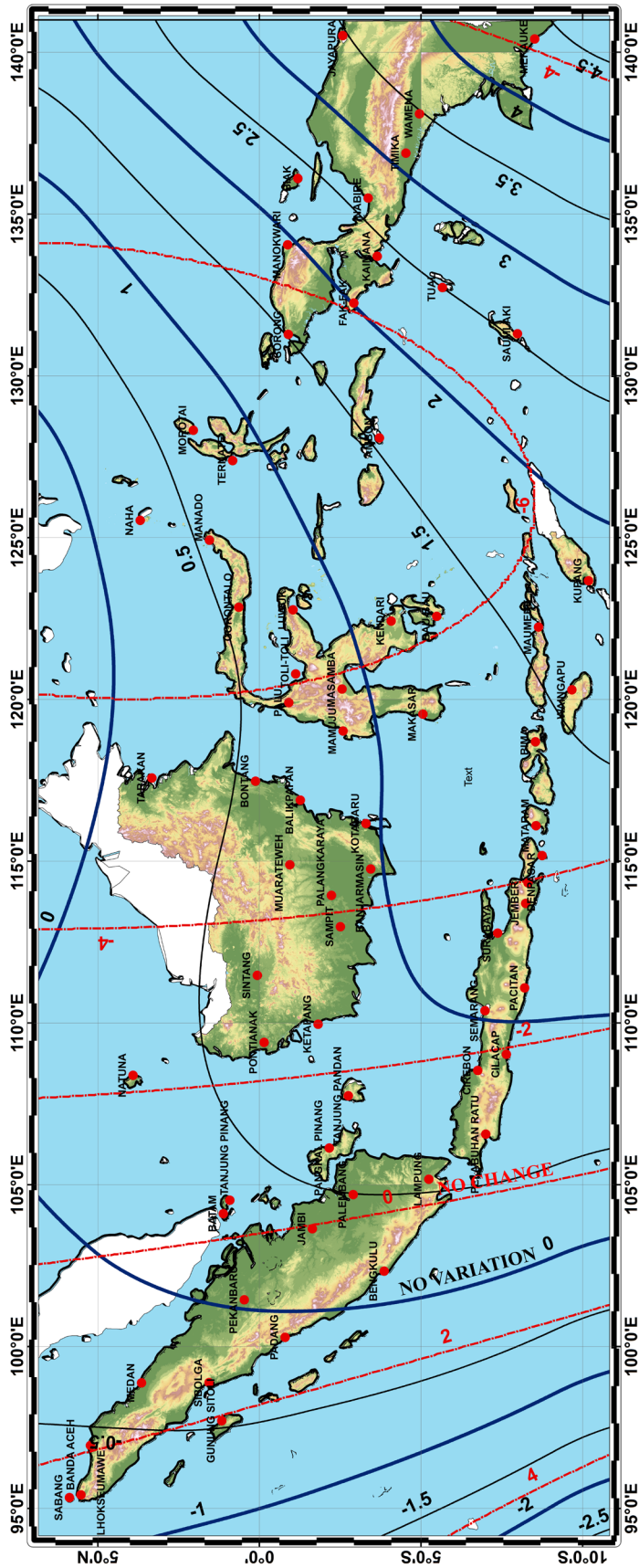
h	Refr	h'	h	Refr	h'	h	Refr	h'	h	Refr	h'
-0° 35'	34.5'	0° 00'	2° 14'	16.1'	2° 30'	5° 51'	08.5'	6° 00'	15° 00'	03.5'	15° 04'
-0° 31'	33.8'	0° 03'	2° 19'	15.8'	2° 35'	6° 02'	08.3'	6° 10'	15° 27'	03.4'	15° 30'
-0° 27'	33.2'	0° 06'	2° 24'	15.5'	2° 40'	6° 12'	08.1'	6° 20'	15° 54'	03.3'	15° 57'
-0° 24'	32.6'	0° 09'	2° 30'	15.2'	2° 45'	6° 22'	07.9'	6° 30'	16° 23'	03.2'	16° 26'
-0° 20'	32.0'	0° 12'	2° 35'	14.9'	2° 50'	6° 32'	07.7'	6° 40'	16° 53'	03.1'	16° 56'
-0° 16'	31.4'	0° 15'	2° 40'	14.7'	2° 55'	6° 42'	07.6'	6° 50'	17° 25'	03.0'	17° 28'
-0° 13'	30.8'	0° 18'	2° 46'	14.4'	3° 00'	6° 53'	07.4'	7° 00'	17° 59'	02.9'	18° 02'
-0° 09'	30.3'	0° 21'	2° 51'	14.1'	3° 05'	7° 03'	07.2'	7° 10'	18° 35'	02.8'	18° 38'
-0° 06'	29.8'	0° 24'	2° 56'	13.9'	3° 10'	7° 13'	07.1'	7° 20'	19° 14'	02.7'	19° 17'
-0° 02'	29.2'	0° 27'	3° 01'	13.7'	3° 15'	7° 23'	07.0'	7° 30'	19° 55'	02.6'	19° 58'
+0 01'	28.7'	0° 30'	3° 07'	13.4'	3° 20'	7° 33'	06.8'	7° 40'	20° 39'	02.5'	20° 42'
+0 05'	28.2'	0° 33'	3° 12'	13.2'	3° 25'	7° 43'	06.7'	7° 50'	21° 26'	02.4'	21° 28'
0° 08'	27.8'	0° 36'	3° 17'	13.0'	3° 30'	7° 53'	06.6'	8° 00'	22° 17'	02.3'	22° 19'
0° 12'	27.3'	0° 39'	3° 22'	12.7'	3° 35'	8° 04'	06.4'	8° 10'	23° 11'	02.2'	23° 13'
0° 15'	26.8'	0° 42'	3° 27'	12.5'	3° 40'	8° 14'	06.3'	8° 20'	24° 09'	02.1'	24° 11'
0° 19'	26.4'	0° 45'	3° 33'	12.3'	3° 45'	8° 24'	06.2'	8° 30'	25° 12'	02.0'	25° 14'
0° 22'	25.9'	0° 48'	3° 38'	12.1'	3° 50'	8° 34'	06.1'	8° 40'	26° 20'	01.9'	26° 22'
0° 26'	25.5'	0° 51'	3° 43'	11.9'	3° 55'	8° 44'	06.0'	8° 50'	27° 34'	01.8'	27° 36'
0° 29'	25.1'	0° 54'	3° 48'	11.8'	4° 00'	8° 54'	05.9'	9° 00'	28° 54'	01.7'	28° 56'
0° 32'	24.7'	0° 57'	3° 53'	11.6'	4° 05'	9° 04'	05.8'	9° 10'	30° 22'	01.6'	30° 24'
0° 36'	24.3'	1° 00'	3° 59'	11.4'	4° 10'	9° 14'	05.7'	9° 20'	31° 58'	01.5'	32° 00'
0° 39'	24.0'	1° 03'	4° 04'	11.2'	4° 15'	9° 24'	05.6'	9° 30'	33° 44'	01.4'	33° 45'
0° 42'	23.6'	1° 06'	4° 09'	11.1'	4° 20'	9° 34'	05.5'	9° 40'	35° 39'	01.3'	35° 40'
0° 46'	23.2'	1° 09'	4° 14'	10.9'	4° 25'	9° 45'	05.4'	9° 50'	37° 47'	01.2'	37° 48'
0° 49'	22.9'	1° 12'	4° 19'	10.7'	4° 30'	9° 51'	05.3'	9° 56'	40° 07'	01.1'	40° 08'
0° 52'	22.5'	1° 15'	4° 24'	10.6'	4° 35'	10° 03'	05.2'	10° 08'	42° 43'	01.0'	42° 44'
0° 56'	22.2'	1° 18'	4° 30'	10.4'	4° 40'	10° 15'	05.1'	10° 20'	45° 35'	00.9'	45° 36'
0° 59'	21.9'	1° 21'	4° 35'	10.3'	4° 45'	10° 28'	05.0'	10° 33'	48° 46'	00.8'	48° 47'
1° 02'	21.6'	1° 24'	4° 40'	10.1'	4° 50'	10° 41'	04.9'	10° 46'	52° 17'	00.7'	52° 18'
1° 06'	21.2'	1° 27'	4° 45'	10.0'	4° 55'	10° 55'	04.8'	11° 00'	56° 10'	00.6'	56° 11'
1° 09'	20.9'	1° 30'	4° 50'	09.9'	5° 00'	11° 09'	04.7'	11° 14'	60° 27'	00.5'	60° 28'
1° 14'	20.5'	1° 35'	4° 55'	09.7'	5° 05'	11° 24'	04.6'	11° 29'	65° 08'	00.4'	65° 08'
1° 20'	20.0'	1° 40'	5° 00'	09.6'	5° 10'	11° 40'	04.5'	11° 45'	70° 11'	00.3'	70° 11'
1° 25'	19.5'	1° 45'	5° 05'	09.5'	5° 15'	11° 57'	04.4'	12° 01'	75° 34'	00.2'	75° 34'
1° 31'	19.1'	1° 50'	5° 11'	09.4'	5° 20'	12° 14'	04.3'	12° 18'	81° 13'	00.1'	81° 13'
1° 36'	18.7'	1° 55'	5° 16'	09.2'	5° 25'	12° 31'	04.2'	12° 35'	87° 03'	00.0'	87° 03'
1° 42'	18.3'	2° 00'	5° 21'	09.1'	5° 30'	12° 50'	04.1'	12° 54'	Keterangan: h = Tinggi Nyata Refr = Refraksi h' = Tinggi Lihat h' = h + Refr		
1° 47'	17.9'	2° 05'	5° 26'	09.0'	5° 35'	13° 09'	04.0'	13° 13'			
1° 52'	17.5'	2° 10'	5° 31'	08.9'	5° 40'	13° 29'	03.9'	13° 33'			
1° 58'	17.2'	2° 15'	5° 36'	08.8'	5° 45'	13° 50'	03.8'	13° 54'			
2° 03'	16.8'	2° 20'	5° 41'	08.7'	5° 50'	14° 12'	03.7'	14° 16'			
2° 08'	16.5'	2° 25'	5° 46'	08.6'	5° 55'	14° 36'	03.6'	14° 40'			

DAFTAR KERENDAHAN UFUK

(Berdasarkan rumus $D = 1,76 \sqrt{m}$)

Tinggi	Rendah Ufuk	Tinggi	Rendah Ufuk	Tinggi	Rendah Ufuk	Tinggi	Rendah Ufuk
Meter	`	Meter	`	Meter	`	Meter	`
1	1.8	34	10.3	160	22.3	475	38.4
2	2.5	36	10.6	170	23.0	500	39.4
3	3.0	38	10.8	180	23.6	525	40.3
4	3.5	40	11.1	190	24.3	550	41.3
5	3.9	45	11.8	200	24.9	575	42.2
6	4.3	50	12.4	210	25.5	600	43.1
7	4.7	55	13.1	220	26.1	625	44.0
8	5.0	60	13.6	230	26.7	650	44.9
9	5.3	65	14.2	240	27.3	675	45.7
10	5.6	70	14.7	250	27.8	700	46.6
12	6.1	75	15.2	260	28.4	725	47.4
14	6.6	80	15.7	270	28.9	750	48.2
16	7.0	85	16.2	280	29.4	775	49.0
18	7.5	90	16.7	290	30.0	800	49.8
20	7.9	95	17.2	300	30.5	825	50.5
22	8.3	100	17.6	325	31.7	850	51.3
24	8.6	110	18.5	350	32.9	875	52.1
26	9.0	120	19.3	375	34.1	900	52.8
28	9.3	130	20.1	400	35.2	925	53.5
30	9.6	140	20.8	425	36.3	950	54.2
32	10.0	150	21.6	450	37.3	975	55.0

1. GEOMAGNETIC DECLINATION COMPONENT EPOCH 2015.0



LEGEND :

- Location of Repeat Stations
- Contour Declination with Interval 1 Degrees
- Contour Declination with Interval 0.5 Degrees
- - - Contour Annual Change in Minute of Arc

METEOROLOGICAL CLIMATOLOGICAL
AND GEOPHYSICAL AGENCY

BMKG

Scale 1:10,400,000

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