

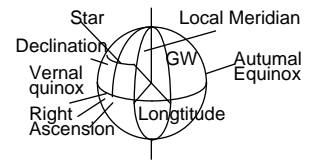
# Astro Data

	SIDERAL REVOLUTION	SIDEREAL YEAR	EQUATOR TO ORBIT DEGREES	ORBIT TO ECLIPTIC DEG	SEMIMAJOR AX OF REV Km	ECCENT	APHELION	PERHELION	LONITITUDE PERHELION DEG (a-x)
SUN	7.60234E6	87.9693	0	7.0028	5.795E7	.0068	6.986E7	4.604E7	76.583
MERC	1.94141E7	224.7009	R179.0	3.40	1.0811E8	.0549	1.5207E8	1.4707E8	130.783
VEN	3.1558150E7	365.2564	23.45	0	1.4957E8	.0934	4.05506E5	3.63299E5	101.983
EARTH	2.36055E9	686.9796	6.683	5.12	3.84403E5	.0484	7.35E9	8.82E6	335.033
MOON	5.93553E7	4332.1248	25.20	1.85	2.2784E8	.0543			13.417
MARS	3.74320E8	10825.863	3.117	1.309	7.7814E8	.0460			91.950
JUP	9.29604E8	30676.15	26.75	2.493	1.4270E9	.008			169.75
SAT	2.65114E9	90824.2	R97.983	.0773	2.8703E9	.2481			44.117
URAN	5.20027E9	76.1YEARS	29.0	1.779	4.4999E9				270.059
NEP	7.83735E9		29?	17.146	5.909E9				306?
PLUTO									
HALLEY				162					

	LONGITUDE ASCENDING NODE DEG	RADIUS Km	MASS Kgm
SUN	47.667	695950.0	1.991E30
MERC	76.183	2433.0	3.181E23
VEN	49.133	6053.0	4.883E24
EARTH	99.883	6371.315 AV	5.979E24
MOON	113.167	1738.3	7.354E22
MARS	73.717	3380.0	6.418E23
JUP	131.167	69758	1.901E27
SAT	131.278	58219	5.684E26
URAN	58	23470	8.682E25
NEP		22716	1.027E26
PLUTO		5700	1.08E24
HALLEY			

**EQUATION OF TIME**  
 due to elliptic orbit  
 diff between noon and  
 expected noon  
 Jan 1, 2m, 21s slow  
 Feb 1, 13m, 28s slow  
 March 1, 12m, 3s slow  
 April 1, 4m, 8s slow  
 May 1, 2m, 53s fast  
 July 1, 3.31s slow  
 Aug 1, 6m, 14s slow  
 Sept 1, 0m, 11s slow  
 Oct 1, 10m, 5s fast  
 Nov 16m, 19s fast  
 Dec 1, 11m, 9s fast

**CALENDER**  
 Julian Day= Days Since Jan 1, 4713 BC  
 Day Begins a noon Greenwich time  
 Jan 1, 64, 6:00PM PST=  
 J.D. 2,438,396.5825  
 4:00PM PST = GW midnight  
 put into effect Jan 1, 45BC  
 the year before Caesar assassination  
 by adding 90 days to 46BC  
 Roman Cal was modeled after Egyptian  
 46 BC known as year of confusion  
 JAN Janus, two faced god  
 FEB Februarius, feast of purification, sacrifices  
 MAR Mars  
 APRIL Unknown  
 MAY Maius, Jupiter great god  
 JUNE a Roman clan  
 JULY Julius Caesar  
 AUG Augustus Caesar  
 SEPT 7th  
 OCT 8th  
 NOV 9th  
 DEC 10th  
 OCT 4, 1582 WAS CALLED OCT 15  
 By Pope Gregory XIII  
 NO LEAP YEARS 1700, 1800, 1900  
 1600, 2000 LEAP YEARS  
 LEAP DAY = FEB 29

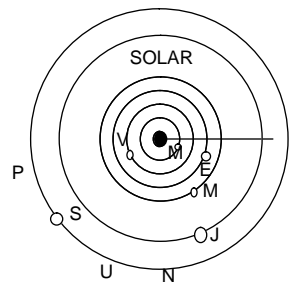


UT=24 HOUR GMT  
 PST=UT-8 Pacific Standard  
 EST=UT-5 Eastern Mountain  
 MST=UT-7 Mountain  
 CST=UT-6 Central  
 PDT=UT-7 Pacific Daylight  
 (April 24 to Oct 29)

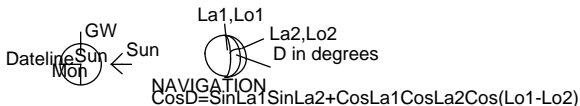
**SOLAR DAY**  
 JAN 24H 0M 29S  
 APRIL 23H 59M 42S  
 JULY 24H 0M 12S  
 OCT 23H 59M 41S

**EARTH**  
 1 TROPICAL YEAR 1900  
 31 556 926.9747 SEC  
 Decreases .53 secs per year  
 Days increase 1 millisecc per century  
 due to tidal friction  
 E5 millisecc 5 to 10 year cycle  
 due to internal of earth  
 Earth late 30msec in June  
 Earth ahead 30 msec in Oct  
 North Pole remains in a 40ft radius  
 around position of pole  
 Magnetic Pole 1970  
 north 76.2N 101W  
 south 66S 139.1E  
 Precession of 23.5i due to moon  
 cause Vernal Equinox to move 50"  
 of an arc per year, 25735 year  
 cycle move northpole in cclockwise  
 direction

$F=ma=Gmm/R^2$   
 $G=6.670E-11 Nm^2/Kgm^2$   
 acceleration in circle= $v^2/R$   
 $Energy=1/2mv^2$   
 impulse= $ft$   
 momentum= $mv$   
**ECLIPSE**  
 $x^2/a^2+y^2/b^2=1$   
 $Foci=ae$   
 $e=((a^2-b^2)/a)^{1/2}$



SEPT/1/1984	Helio Longitude
Mercury	349 51.6"
Venus	209 50.6"
Mars	302 07.9"
Juptite	284 29.0"
Saturn	227 17.8"
Uranus	252 49.6"
Neptune	270 33.6"
Pluto	211 47.7"



**POLARIS MUST BE OBSERVE 12 HOURS APART TO SET POLE**  
**DECLINATION OF POLARIS**

1900	88 46"	1940	88 59"	1980	89 08"
1910	88 50"	1950	89 02"	1990	89 11"
1920	88 53"	1970	89 05"	2000	89 14"
1930	88 56"			2010	89 20"

Full Moon Oct 9, 1984 @ 23:58  
 Perigee Sept 25, 1984 @ 2:51

**MOON**  
 SIDEREAL PERIOD 27days 7hours 43.2minutes  
 New Moon 29days 12hours 44.05minutes  
**INCLINE OF ORBIT** 5i8'  
 518' to 4159' due to external  
 Regression of Nodes, 18.6 years  
 Advance of perogee 8.85 years  
**TIDES**  
 NEW OR FULL MOON = SUN + MOON = SPRING TIDES  
 QUARTER MOON TIDES CANCEL OUT = HEAP TIDES  
**ECLIPSES**  
 Eclipse year = 346.6 days  
 recurrent eclipse = saros  
 223 synodic months = 18 years 11 + 1/3 days  
 Feb 26 1975 Eclipse  
 Begin 16h 9.2m GMT  
 End 17h 39.0  
 Max duration 2m 49s  
 Portland Oregon Lat(45|31'06") Lo(122|40'35")  
 San Jose Lat(37|20'16") Lo(121|53'24")

