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# CALENDAR CONVERSION AND NEW MOON CONJUNCTION MANUAL

## Introduction

This booklet is designed to introduce you to the calendar conversion program, to the subject and problems of chronology, and to show you how to use the program to resolve difficult problems. You will have an advantage heretofore unknown as you research the historical documents of the ancient past. The methodology is not new. It works on the principle that the ancients dated events by observing the movements of the heavenly bodies. Astronomical cycles are reliable, in fact so much so that we still use them for our calendars and clocks today. Many years were spent evaluating ancient calendars and documents so that we could understand them. Then we superimposed these calendars on astronomical software so that an amateur could input data from one calendar and instantly see a transfer of that data to all other calendar systems used in the ancient Near East. The ephemeral tables commonly used today neither extend into the remote past, nor do they include any system of calendar conversions on them. That is why this program will be very valuable for your research.

The ephemeral generator for our software was developed from J. Meehus, *Astronomical Formulae for Calculators*. It is the standard formula used by astronomers today and includes the slowing of the rotation of the earth from the gravitational pull of the moon. Absolute precision is necessary for any device designed to calculate the location of heavenly bodies in the remote past. Solar eclipses, for instance, demand a very narrow margin of error to reconstruct the exact hour several thousand years ago when the moon cast its narrow shadow on a specific location of the earth. Ancients recorded almost every unexpected change in the heavens. These make benchmarks which can be used to precisely date important events in the past.

## CALENDARS AND CYCLES

There were primarily two calendars used by ancient people. The most popular was a lunar-solar calendar which used lunar cycles to determine months and solar cycles to determine years. This calendar was used by most of the ancient world. A second calendar was based on the rising of the star Sirius and was used by Egypt from earliest times to the second century C.E. At times they also recorded certain phases of the moon within their stellar calendar. In some cases, documents were dated by two different calendar systems, both lunar and stellar. Lunar cycles vary in length, but average 29.530587 days. Solar years average 365.242199 days. Stellar years average 365.25 days.

In addition to observation, people had independent counting systems. The Egyptians had a 365 day calendar, which had its origin much earlier than the first dynasties of Egypt. Ancient Israel had cycles of seven days and years, Jubilee years every forty-nine years, and twenty-four priestly sections which changed every Saturday. Events were dated in various ways. At times, from the accession of a king or ruler. At other times from a cycle of games, and still others from an era which began with a certain event, like the Seleucid era. It is not difficult to see why the state of the art could only reach certain limits without computers.

**Acknowledgment** The author would like to acknowledge the contributions of several persons whose works, design, and or comments have been utilized in the development and testing of this project. These include Dr. D. K. Yeoman and Dr. Myles Standish of the Jet Propulsion Laboratory, Dr. Own Gingerich of Harvard's Center for Astrophysics, Dr. Jefferys from the University of Austin, and Dr. Dennis Georg of the University of Colorado. Without programmers Charles Kluepfel, Mark Ness, and James Haines, the project would not have been finished.

## CALENDARS, BIBLICAL VS. OTHERS

**1). Biblical Days vs. Years** The Biblical day starts at sunset. The Biblical calendar was an observed calendar with months alternately containing twenty-nine and thirty days, or 29 - 29 & 30 - 30 days. The sun was created to set the days and years, and the moon was given to set the festivals and the months (Genesis 1:14; Psalm 104:19). Men knew when the next new moon would appear; for experience told them that it would be the second or third day after they saw the last old moon. David and Jonathan, at the time of the dark moon, knew that the next day would be a new moon (I Samuel 20:4-5).

The beginning of the year took place when the crops reached a certain degree of maturity in the spring, and so their first month was named "Abib" which implied "green ears." The appearance of the new moon after the full ear would be the start of the year. On the fourteenth day of that month they killed the Passover victim and then began the harvest. Since our study concerns itself with the Biblical period, this is the calendar we use extensively. The months of the Biblical calendar are listed below with their equivalent in the Gregorian calendar:

- |     |              |             |
|-----|--------------|-------------|
| 1). | Nisan (Abib) | March-April |
| 2). | Ziv (Iyyar)  | April-May   |
| 3). | Sivan        | May-June    |

4).	Tammuz	June-July
5).	Ab	July-August
6).	Elul	August-September
7).	Ethanim (Tishri)	September-October
8).	Bul (Marchesvan)	October-November
9).	Kislev	November-December
10).	Tebet	December-January
11).	Shebat	January-February
12).	Adar	February-March
13).	Veadar	March-April

**2). Present day Jewish Calendars vs. Biblical Jewish Calendars** The present Jewish day, like the Biblical day, starts at sunset. The present day Jewish calendar is no longer an observed calendar, for deviations are made from observation. The calendar was initiated by Hillel in the fourth century C.E. This calendar makes the following exceptions from the observed calendar: 1) The new year begins on Tishri 1, not on the Biblical Nisan 1, and 2) The day of Atonement cannot fall next to a Saturday, nor Tishri 21 on a Saturday. To prevent these occurrences, the first of Tishri is made to fall on days other than Sunday, Wednesday or Friday. This is accomplished by delaying the starting of the year by one or two days.

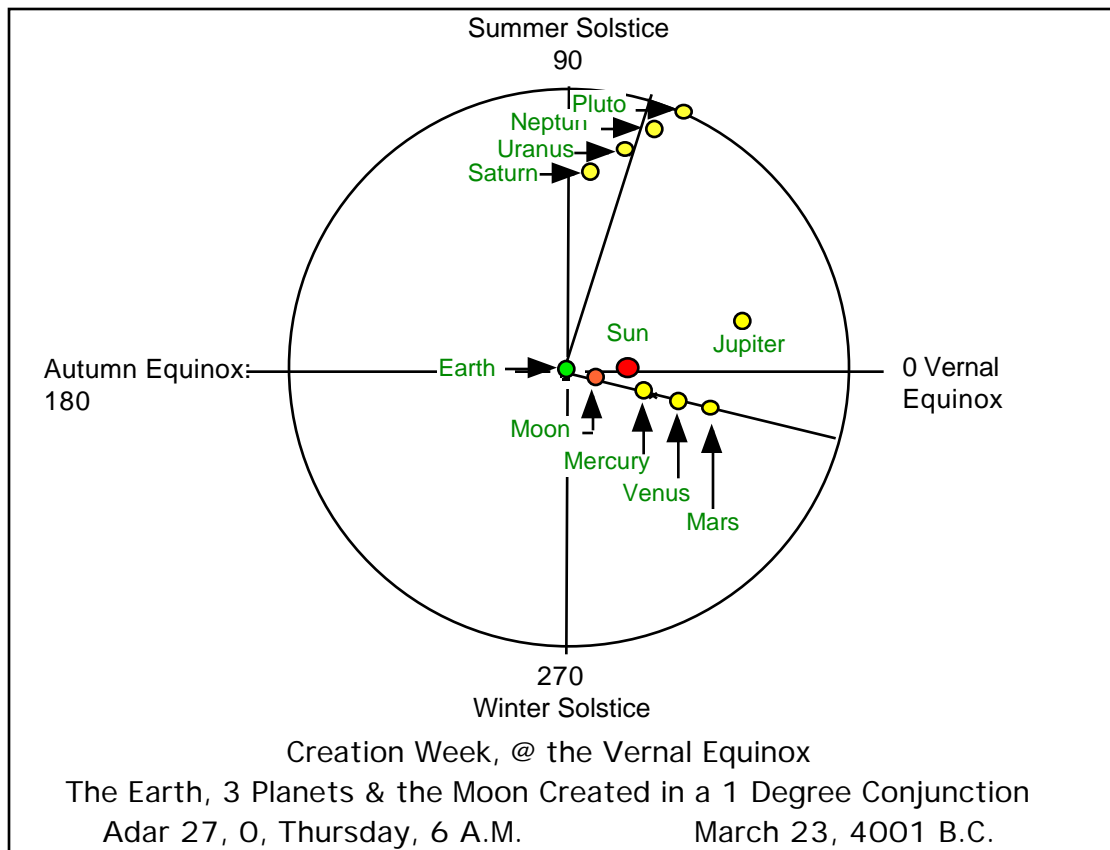
This explanation may be an over simplification of the differences between the Biblical calendar and the Hillel calendar. The calendars will occasionally be at variance by one or two days, and in some cases, even one month. This results in a leap year different from the Biblical leap year which is only influenced by the position of the sun. Since Biblical chronology took place before the first century C.E., we have no use for the Hillel calendar in Biblical studies, and do not include it in our present research. Today's Jewish numbering of months are six months different from the Biblical months, and would appear as follows:

1).	Ethanim (Tishri)	September-October
2).	Bul (Marchesvan)	October-November
3).	Kislev	November-December
4).	Tebet	December-January
5).	Shebat	January-February
6).	Adar	February-March
7).	Veadar	March-April
8).	Nisan (Abib)	March-April
9).	Ziv (Iyyar)	April-May
10).	Sivan	May-June
11).	Tammuz	June-July
12).	Ab	July-August
13).	Elul	August-September

**3). Gregorian Calendar** The Gregorian day starts at midnight. The Gregorian calendar used today was founded by Julius Caesar in 46 B.C. Its final modification came in 1582 by Pope Gregory XIII, hence the name. It does not use the moon for the determination of any of the months. Years are dated from the assumed year of the birth of Christ, or the "Christian era." This date is in error by six years, and so causes some confusion. January 1 is called 1 C.E., and December 31 of the previous year is called 1 B.C.E. There is no "zero" year between. The early calendar was called the "Julian calendar" which is not to be confused with an astronomical period used by astronomers.

The Gregorian calendar is very important to our study. We do not use it in any way except as a solar reference calendar. We are familiar with it, so it helps to know, for example, that an event recorded on Kislev 25, year 145 of the Seleucid era was on December 13, 167 B.C.E. In some cases, a date is given by an ancient system of lunar dating, and at the same time it is said that the summer solstice occurred. One such example is an ancient Babylonian document which tells us that the summer solstice occurred on Sivan 9, year thirty-seven of Nebuchadnezzar. We can empirically examine the potential years, and find that June 22, fell on the ninth day of a lunar month in 568 B.C.E.

It is interesting that creation ties together with the solar year, or the Gregorian calendar which is roughly based on it. The vernal equinox began exactly at 8:40 p.m., Jerusalem time, on the start of the Biblical Wednesday when God created the sun and moon. The planets, Mercury, Venus, and Mars were in conjunction with the moon at 343 degrees, at 7 a.m. Jerusalem time, on Thursday. At the same time, the outer planets formed a similar geocentric conjunction on the opposite side of the sun, a rare spectacular. The moon and sun were in conjunction on Friday at 1:40 p.m. Jerusalem time. This resulted in a visible new moon by sunset of the start of the Biblical Sunday, also Abib 1, the Biblical New Year's Day.



**4). Julian Period** The Julian day began at noon. The Julian period was named after Julius Scaliger, the father of Joseph Justus Scaliger (1540-1609). He decided that a consecutive numbering system would be of inestimable help if arranged as a cyclic period of great length. The period is a cycle of 7980 years, based on the Metonic Cycle of nineteen years, a solar cycle of twenty-eight years, and the Indiction cycle of fifteen years. The solar cycle was a period after which the days of the seven-day week repeated on the same dates ( $19 \times 28 \times 15 = 7980$ ). He started his calendar on January 1, 4713 B.C.E. There is a zero B.C.E. in this system, hence any year given in Julian years will be one less than Gregorian years in events which fell before 1 B.C.E. January 1, 4713 B.C.E. was called day one, and each day afterward was numbered successively. The system follows a 365.25 day year, and is sliding within the 365.242199 day apparent year. The difference between the two is caused by the shifting of the equinoxes, or the moving of the polar star in the sky. As an example, January 1, 4713 B.C.E., day #1 (Julian) was November 24, 4714 B.C.E. (Gregorian), and on September 23, 1987 C.E., Gregorian, the Julian equivalent was September 10, 1987, day #2447061. It is important to know that most ancient dates given by astronomers are given in this calendar. When using astronomical dating, one must always adjust the B.C.E. date one year, and at the same time realize that June 21 does not mean the first day of summer.

We use the Julian calendar for astronomical programs and dating. We have also applied its principle to Bible calendars, that is we assign a number to every day of the past. The only difference is that we start our system of numbering on the first day after Creation week, at which time the Julian period has numbered 260174 days.

**5). The Seleucid Era** This "era" is not a calendar system as such. It is an era which started when the Seleucids (Greeks) began their rule over the Jews in 312 B.C.E. Many documents which survive from the period between the Old and New Testaments are dated this way. Greek lunar months have an exact counterpart with Biblical months as follows:

1).	Nisan (Abib)	Xanthikos	March-April
2).	Ziv (Iyyar)	Artemisios	April-May
3).	Sivan	Daisios	May-June
4).	Tammuz	Panemos	June-July
5).	Ab	Loos	July-August
6).	Elul	Gorpiaios	August-September
7).	Ethanim (Tishri)	Hyperberetaios	September-October
8).	Bul (Marchesvan)	Dios	October-November
9).	Kislev	Apellaios	November-December

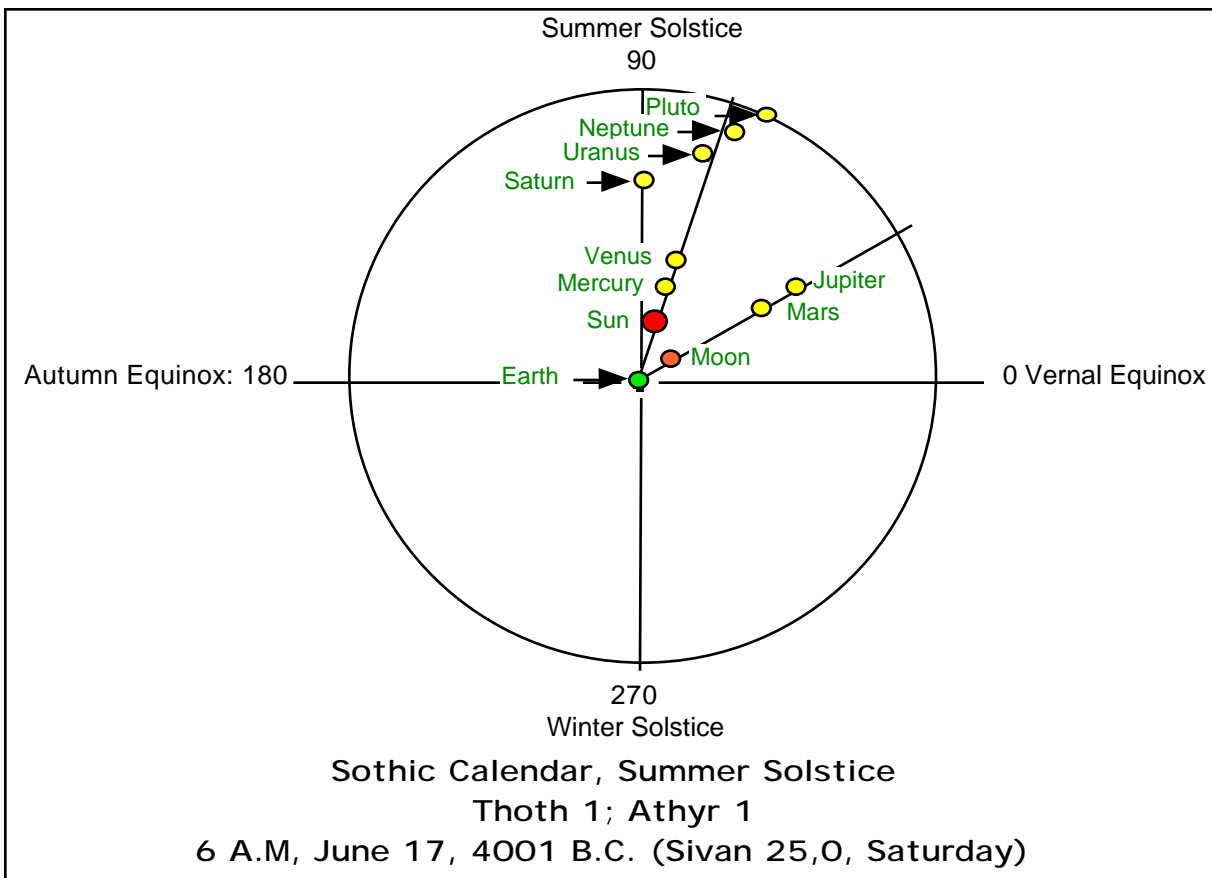
10).	Tebet	Audynaius	December-January
11).	Shebat	Peritios	January-February
12).	Adar	Dystos	February-March
13).	Veadar	Xanthikos II	March-April

**6). Origin and Explanation of Egyptian Calendars** Egyptian calendars have not been completely understood. There are basically two calendars. Both of them have twelve months of thirty days plus and additional five days for religious purposes. The first of these calendars attached to the star Sirius, and as such is a true stellar calendar. Man would observe its 365.25 days in contrast to the solar calendar which he observes to have 365.242199 days. It is rather interesting, that for all practical purposes, this stellar year has a precise .25 decimal which is used to an advantage as we shall see later. The year was divided into three seasons which were named Akhet (inundation of the Nile), Peroyet (coming forth of plants) and Shomu (deficiency). When a date was given in this calendar, for example, it would be read: second season, first month, day eight. This would compute, and is often times written, V,8, since it was the eighth day of the fifth month of the year.

The reason this calendar has a longer year than the solar year is because of the slow shift of the equinoxes. The stars are moving in the same relative direction as the earth which gives the impression of a delayed period. We call this a "fixed" calendar since it is fixed to an astronomical object. The night of Sirius would last 70 days, and the day of Sirius would last 295 days. The rising of Sirius always took place on I,1, New Years day. The setting could be expected on IX,25, season three, month one, day 25.

The summer solstice took place on June 17, 4001 B.C.E., and the rising of Sirius took place at the same time. A special planet alignment also occurred at this time. As we stated earlier, New Years day in this calendar is moving slowly in relation to the solar year. In 4001 B.C.E., New Year's day took place on June 18 (Gregorian), near the summer solstice, whereas today it rises on August 1 (Gregorian). This movement over 5986 years has amounted to 44 days, or about eleven and a quarter seconds per year; one day in approximately 137 years.

Herodotus tells us that the rising of the Nile took place at the summer solstice, and continued for 100 days afterward (*Herodotus* II,19). No doubt the rising of the Nile and the first day of the year were the same when the calendar was first used. By the start of the Persian period, New Years day had moved from the summer solstice to July 18. This caused confusion in dating events by seasons, for the season of inundation was thirty days too late. The calendar was no longer useful as a means of dating seasonal events so they abandoned it in favor of a second calendar they were using which dated events by numbered or named months.



The second Egyptian calendar contained 365 days, and wandered, or slid within the stellar year and the solar year, since it differed by .25 days from the stellar calendar, and by .242199 days from the solar calendar. This second calendar might appropriately be called a "sliding" calendar since it was not attached to any astronomical body, and depended entirely on man's system of counting twelve months of thirty days plus five days. Dates were not given in seasons, but only in months by name. One of the primary uses of this sliding calendar was to date events over great periods of time. It had exactly 365 days, and the stellar had (for all practical purposes) 365.25 days. The result was that the schematic, or calculated calendar moved one day ahead of the rising of Sirius every four years, taking 1461 years ( $4 \times 365.25$ ) to complete a "period of eternity," when it would again be in synchronism. If Sirius arose on IX,9 in this calendar, one could easily determine that 996 years had elapsed since the two were in synchronization ( $8 \times 30 + 9 = 249 \times 4 = 996$ ). It started on April 18th, 60 days (two months) exactly before the star Sirius arose.

The Egyptian day started in the morning. The two calendars were in synchronism on July 18, 143 C.E. (Gregorian), and again on July 7, 1318 B.C.E. (Gregorian). We can establish this from several sources, the most significant being a series of letters from a Jewish colony in Egypt which dated events by two calendar systems, the Jewish and the Egyptian. Claudius Ptolemy, an Egyptian astronomer, also dated many events from 747 B.C.E. for almost 1000 years, connecting astronomical locations and Egyptian dates. Examples of both Egyptian fixed and sliding calendar systems for the twelve months of 312 B.C.E. (Seleucid era) follow:

	<b>Fixed</b>	<b>Sliding</b>	<b>Gregorian</b>	<b>Seleucid</b>
1)	Thoth 1	(9)Pachom 13	July 14, 312 B.C.E.	Phanemos 10
2)	Phaophi 1	(10)Payni 13	August 13	Loos 10
3)	Athyr 1	(11)Epiphi 13	September 12	Goriaios 11
4)	Choiak 1	(12)Mesore 13	October 12	Hyperberetaios 11
5)	Tybi 1	(1)Thoth 8	November 11	Dios 12
6)	Mechir 1	(2)Phaophi 8	December 11	Appelaos 12
7)	Phanemoth 1	(3)Athyr 8	Jan. 11, 311 B.C.E.	Audynais 14
8)	Pharmouthi 1	(4)Choiak 8	February 10	Peritios 14
9)	Pachom 1	(5)Tybi 8	March 12	Dystos 15
10)	Payni 1	(6)Mechir 8	April 11	Xanthikos 15
11)	Epiphi 1	(7)Phanemoth 8	May 11	Artemisios 16
12)	Mesore 1	(8)Pharmouthi 8	June 10	Daisios 16
13)	Intercalary 1	(9)Pachom 8	July 10	Phanemos 16
14)	Thoth 1	(9)Pachom 13	July 15	Phanemos 21

It can easily be seen that the two calendars are out of synchronization by 252 days (Thoth 1 - Pachom 13 = 8 months + 12 days)  $\times 4 = 1008$  years + 312 B.C.E. = 1320 B.C.E., the last time the calendars were in synchronization (1319-1321 B.C.E.).

**7). Olympiads** The Greeks celebrated their Olympic races on the first full moon after the summer solstice. This would date their first race on June 28, 777 B.C.E. Events were dated from this date. The races were held every four years, hence an event would be dated by the "Olympiad" and the year of the Olympiad. Ancient Greece also used the lunar-solar calendar. We find the use of Olympiads an absolute necessity for the eight centuries B.C.E. An example of a double dated event using Olympiads and Biblical dating: "The city was taken on the third month, on the day of the fast [Sivan 23] upon the hundred and seventy ninth Olympiad" (*Antiquities* XIV.iv.3). In another place, speaking of the same date, Josephus says, "from the days of our forefathers, to rest on the Sabbath day ..." (*ibid*). The date, Sivan 23, during the 179th Olympiad should be a Sabbath day. The computer shows this to be June 18, 64 B.C.E. when Pompey captured Jerusalem.

**8). Sabbath Cycles** Adam was created on day six. God rested on day seven, and day eight began Nisan 1 of the completed world. This cycle was kept by man from that time forward. Ancient Summer mentioned the seven day cycle, and Jacob, long before Moses' Law, celebrated his marriage week (Genesis 29:26). Moses re-established that principle, since it probably was not a practice during their stay in Egypt. The first Sunday of the completed universe is day #1, and would be Nisan 1, year 0, March 26, 4001 B.C.E. (Gregorian). Was there ever a chance that the Sabbath day was lost? The only time when it might have been lost would be at a time when there were no humans observing it. This only was possible during the stay in Egypt. If three people in the world are practicing this cycle, you have a two to one chance against losing it. If we have several hundred, we have no chance at all of losing it. God restored the Sabbath cycle at the time of Moses, and there is not a chance of having lost it since then. We use this cycle extensively to evaluate dates given in the Bible. As an example, did Nisan 1, of year 0 occur on a Sunday? Did Moses read the Law on Shebat 1, 2579 on a Saturday? Did Jesus die on Nisan 15, 4030 on a Friday?, etc.

Every seventh year was a special year. This was a new principle introduced by Moses, and so it began with the reading of the Law on Sinai before the entrance into Canaan. It was to be kept every seven years, and there

was to be a series of things done on that year. The Law was to be read at the end of the year, when the planting would normally take place for the next year's crop. People were to remit their debts on that year. In short, man, animal, and land were to take a rest one year out of seven, and dedicate himself to the principles of God (Deut. 31:9-13). The counting began in 2579 A.M., 1421 B.C.E., when Moses read the book of Deuteronomy. We find a number of times when a Sabbath year is mentioned or implied by the things being done. As an example, "In the third year of his reign he sent his officers: ... together with the priests Elishama and Jehoram. They gave instruction in Judah, having with them the book of the Law of Yahweh" (II Chronicles 17:7). The Sabbath year could easily have been lost since it was not practiced during the period of Jewish exile. They did not have to put their crops aside on the Sabbath year since the Law only applied to the land of Palestine. Over the years since C.E. 70 the Jews finally lost it. Several mentions of this year are accurate on tombstones after the loss of their Temple in C.E. 70. As we will demonstrate later, Rabbinical chronologists do not have a correct count of years since then. I am certain this helped to confuse them and caused them to place the Sabbath year in the wrong place in this era. As an example, they consider the Sabbath year to start in the fall of C.E. 1986, and end in the fall of C.E. 1987. We know that this period ends 1917 years after C.E. 70, which according to their own records, was a Sabbath year. If C.E. 70 was a Sabbath year, then C.E. 1988 will be one ( $1988 - 70 = 1918 = 274 \times 7$ ).

The Jubilee cycle was different from the Sabbath cycle only in that land was to be reclaimed in addition to remitting debts and reading the Law. It was always the seventh Sabbath year. The first of these cycles did not begin until Joshua died. Just before his death he called a great assembly and made the final distribution of the land (Joshua 24). This took place 20 years after the entrance into the land in 2600 A.M., 1401 B.C.E. There are examples of its use as well: "At the end of twenty years it took Solomon to erect the two buildings, the Temple of Yahweh and the Royal palace (Hiram king of Tyre had provided Solomon with as much cedar wood, juniper wood and gold as he wanted), King Solomon gave Hiram twenty towns in the land of Galilee" (I Kings 9:10). The land was distributed by Joshua in 2600 (1401 B.C.E.), and in 4070 (C.E. 70), thirty Jubilees later, it was lost to Titus ( $4070 - 2600 = 1470 = 30 \times 49$  years). If the Jubilee took place in 4070, and the Sabbath also took place then, certainly 1988 is the Sabbath year, and the chronology of the Rabbis is in error.

**9). The Priests** David established twenty-four orders of priests to perform their duties in the Temple. Like earlier priests, they were to serve one week, changing on Saturday. This cycle was a perpetual cycle which consisted of 168 days ( $24 \times 7$ ), and as a result, moved forward in the solar year by about 29 days per year ( $168 \times 2 = 336 - 365 = 29$ ). The first time these priests were installed was at the first coronation of Solomon by David, on Passover of 986 B.C.E. (I Kings 1:28-40, I Chronicles 28:1, 21, 29:1-25). The Julian day number for that day was 1361385, and the age of the earth at that time was 1101212 days. Priestly cycles are not often mentioned, but there are some examples. The Talmud tells us that the Temple fell to Nebuchadnezzar one year after the Sabbath year, on the end of the Sabbath day, when the Jehoiarib section was serving. As we examine the disputed years involved, we find that only 588 B.C.E. fits out of the years 588, 587, and 586 B.C.E. This makes 3412, 589 B.C.E. a Sabbath year, in agreement with our previous conclusion ( $4070 - 3412 = 658 = 94 \times 7$ ).

**10). The Islamic Calendar** The Islamic calendar is computed from the Hejira, the flight of Mohammed from Mecca to Medina. The epoch is Mohammed's arrival in Medina, considered to be sunset July 16, 622 C.E. by the majority of Muslims. (Some who reckon the day from midnight to midnight uses July 15 as the epoch.)

The calendar is a purely lunar one, that is, the year contains only 354 days. It does not take into consideration the solar revolution, so the calendar consistently moves back 11 days for each solar year. Periodically one day is added for a leap year. In the case of those using July 16 as the epoch, the leap day is added to the second, fifth, seventh, 10th, 13th, 16th, 18th, 21st, 24th, 26th and 29th years of a 30 year cycle. When July 15 is used as the epoch, the 15th, rather than the 16th year has a leap day added. Otherwise the intercalations are the same.

The months of the Islamic calendar contain, alternately, 29 or 30 days. The last month which may have either number. The extra day is intercalated at regular intervals because the moon's orbit is just over 29 1/2 days long. The months, standard to the Islamic world are:

1.	Muharram	30 days
2.	Safar	29 days
3.	Rabi I	30 days
4.	Rabi II	29 days
5.	Jumada I	30 days
6.	Jumada II	29 days
7.	Rajab	30 days
8.	Sha'ban	29 days
9.	Ramadan	30 days
10.	Shawwal	29 days
11.	Dhu al-Qada	30 days
12.	Dhu al-Hijjah	29 or 30 days

The Islamic month begins when two responsible witnesses claim they can see the first crescent of the new moon. They then go before the qadi (judge), who, if he decides they are correct, informs a mufti (interpreter of the law). He, in turn, announces that the new month has begun. Prior to the coming of the telephone and telegraph, complications could arise if the weather was cloudy. Each local group decided independently just when the month actually started, and the day could, on occasion, be later than the calendar indication. It has become customary among Middle Eastern Muslims to accept the verdict of Cairo on when the month begins.

The Islamic calendar uses a week of seven days, the names of which vary from place to place. They are invariably connected to solar, lunar and planetary motion. The only day with a standard name is el Jumah, or the "day of gathering," the equivalent of the Hebrew Sabbath and the Christian Sunday. This day is Friday and is considered the first of the week. Because Mohammed entered Medina at sunset, the Muslim day runs sundown to sundown. Therefore the week begins at sundown on Friday and runs through sundown of the following Friday.

The Islamic calendar contains one major fast period and two major feasts. During the month of Ramadan no food or drink may be taken from sunrise until it is dark enough to see the stars. Immediately following Ramadan is a feast period known as Eed es Sagheer. It lasts for three days, or from the first through the third of Shawwal. The other major feast, Eed el Keeber or Kurban, is celebrated from the 10th through the 13th or 14th of the last month of the Islamic year, Dhu al Hijjah. Whether it continues for three or four days is determined by whether or not there is an intercalary day added to that year. The feast celebrates Abraham's attempt to sacrifice Ishmael.

There are several other feast and fast days that are celebrated through the Islamic world. The fast of Yom Ashoorah may be celebrated for the first ten days of Moharram, the key day being either the 9th or 10th day, depending on the moon's position. Feast days occur on the 12th day of the third month (Rabi I), Mohammed's birthday, in the fourth month (Rabi II) celebrating el Hoseyn's birthday (el Hoseyn was Mohammed's son), and in the seventh month (Rejab), celebrating Mohammed's ascension to Heaven.

The era of the Hejira is used by many different peoples, often in conjunction with another calendar. The era is the official one in Saudi Arabia, Yeman and the smaller nations in the Persian Gulf. It is used with the Christian calendar in Egypt, Syria, Jordan and Morocco. Muslims throughout the world use it for religious purposes. There have been some attempts to modify the calendar and make it conform with the more prevalent Christian one. During the 17th century Turkey adopted the Julian year while retaining the Muslim era. In the late 19th century, Turkey dropped the Islamic calendar and for official purposes adopted the Gregorian. Iran, during the mid 20th century adopted a solar calendar with Persian names for months and the Muslim era. (**The Book of Calendars**, Frank Praise, Editor, **Facts On File, Inc.**, N. Y., 1982, pp. 71-72.)

## CONCLUSION

I hope you have a better understanding of ancient calendars and the way the computer works. The computer has been prompted to select the nearest new moon to the vernal equinox. Of course, we may not be absolutely certain that it picked the correct moon in case the maturity of the crops was early or late. The maturity of the crops, however, is a function of the moon and the sun, therefore, there is seldom any reason to suspect any radical deviation from the norm. If it is important to establish a date with absolute certainty, examine the first of Nisan for the year in question, and try to determine if the month occurred at a marginal point in the solar year. If so, take that into account when you study all the data. I have never found an important Biblical date to be located at one of these months where Nisan occurs on the day we have told the computer to jump or add a month. It has been told to pick the new moon within two weeks + or - the vernal equinox, and so far as we can determine, it has elected the correct month every time, based on the fact that we got the results demanded by the text.

## DESIGN IN HISTORY

I hope you have been stimulated to join me in the fun of researching Bible chronology. I hope you will find that the study of Bible chronology is one of the most satisfying and faith finding ways there is to study the Bible. You will find that the mind of God is far far above the mind the man, and that He has placed so many "riddles" in His Word that one could spend the rest of his life in this research. Most important, chronology makes the difference as one tries to elect the true religion, and the true doctrines which go along with it. Have fun!

## OPERATING YOUR PROGRAM

### IBM COMPATIBLE

**FIRST, MAKE SURE THAT THE “CAPS LOCK” IS DOWN!!!**

Several icons appear in the folder !PCCAL4.

Click on the icon shown below.



This will prompt the following MAIN MENU. From this we have three options.

CALENDAR CONVERSION ALL RIGHTS RESERVED. COPYRIGHT 1986 CHRONOLOGY-HISTORY RESEARCH INSTITUTE	
03-12-1993	09:26:57
1 - CALENDAR CONVERSIONS  2 - MOON PHASES  3 - LEAVE SYSTEM  ENTER CHOICE ?	

1 - CALENDAR CONVERSIONS: This program allows the user to input a date from any one ancient calendar, and the computer in turn will calculate and display all of the dates from other ancient and recent calendars which are equal to it.

2- MOON PHASES: As we input a year, the computer will give the precise rising date and tome of the new moon for that year as it is found in England (Greenwich Mean Time).

3 - LEAVE SYSTEM: We must always exit the calendar/new moon program by coming back through this, the MAIN MENU. To get back to this menu, strike “M” until you come to it. Then, when you strike “3” and enter, you will leave this program.

### CALENDAR CONVERSIONS

Strike "1" then ENTER. A screen will appear (see below) which will ask you for the calendar you wish to input.

### SCREEN DATA AND PROMPTS

**To convert a Gregorian year to a Biblical year, one must use the following equations:**

4001 - B.C. year (Gregorian) = A.M. year

4000 + A.D. year (Gregorian) = A.M. year

**Example:**

4001 - 653 B.C. = 3348 A.M.  
4000 + 1987 A.D. = 5987 A.M.

**To convert Biblical years to Gregorian we use the following equations:**

4001 - A.M. year = B.C. year (Gregorian)  
4000 + A.M. year = A.D. year (Gregorian)

**Example:**

5987 A.M. - 4000 = 1987 A.D.  
3238 A.M. - 4001 = 763 B.C.

CALENDAR CONVERSION ALL RIGHTS RESERVED. COPYRIGHT 1986 CHRONOLOGY-HISTORY RESEARCH INSTITUTE	
H - HEBREW/BABYLON	J - JULIAN DAY
S - SELEUCID/GREEK	G - GREGORIAN DAY
A - A.M.	E - EGYPTIAN DAY
O - OLYMPIAD	I - ISLAMIC DAY
M - MAIN MENU	Q - QUIT PROGRAM
ENTER CHOICE	

**HEBREW/BABYLON**

If we chose to input a Hebrew date, we strike "H" from the menu (If the screen returns to the MAIN MENU, you do not have the caps lock down). The screen will then show:

**ENTER HEBREW DATE (MM,DD,YYYY)**

Enter a trial date: 12, 21, 5992 (Adar is the 12th Hebrew lunar month).

**The computer shows that this is March 15, 1993 (in the Gregorian calendar)**

**PROMPT MENU**

Notice the prompts alongside the calendar information. Most of them are self explanatory. Three prompts make it possible for us to add or subtract days, weeks, or years. If we subtract years, the calculations will always be in relation to the AM date, the first line on the screen, yet the years that are subtracted are solar years. To subtract days, weeks, or years, use a minus sign before the number you wish to subtract.

The day of the week is shown immediately above the prompt menu. This day matches the calendar dates on the screen.

A.M. : ADAR 21 , 5992 AM 2188888

JULIAN: MARCH 2 , 1993 2449061.75

GREGORIAN: MARCH 15 , 1993 AD

EGYPTIAN SLIDING: (11) EPEPHI 25

EGYPTIAN FIXED: (8) PHARMOUTH 17 EPOCH #5

ISLAMIC: (9) RAMADAN 21 , YEAR 1413 OF HEGIRA

OLYMPIAD: #692 , YEAR 3

JUBILEE YR: #79 + 11 YEARS (AFTER JACOB)

JUBILEE YR: #70 + 25 YEARS (AFTER MOSES)

SABBATH YEAR: #487 + 4 YEARS (AFTER DEUTERONOMY)

PRIESTLY CYCLE: 7 -HAKKOZ

MONDAY

MENU

A - ADD/SUB DAYS  
D - ELAPSED DAYS  
E - EGYPTIAN DATE  
G - GREGORIAN DATE  
H - HEBREW DATE  
I - ISLAMIC DATE  
M - RETURN TO MENU  
N - NEXT DAY  
O - OLYMPIADS  
P - PREVIOUS DAY  
S - SELEUCID DATE  
W - ADD/SUB WEEKS  
Y - ADD/SUB YEAR

ENTER CHOICE?

Line 1: Adam's Calendar	month	day	yr	age in days after Creation, AM (*Anno Mundi)
Line 2: Astronomer's	month	day	yr	Julian day# after Jan. 1, - 4713
Line 3: Gregorian	month	day	yr	day of the week
Line 4: Egypt Sliding	month	day		
Line 5: Egypt Fixed	month	day		1461 year epoch cycle
Line 6: Greek Olympics	game #	+ yrs		month day
Line 7: Jubilee Counting	jubilee#	+ yrs		After Jacob's birth
Line 8: Jubilee Counting	jubilee#	+ yrs		After Moses' Call
Line 9: Sabbath Counting	Sabbath#	+yrs		After Deuteronomy
Line 10: Orders of David	section	going off duty/section coming on duty		

(See Appendix C for details)

Screen Prompts \* "Anno Mundi" is Latin for "in the year of the world."

## GREGORIAN CALENDAR

If you want to input a Gregorian date, strike "G". At this, the screen will appear:

ENTER GREGORIAN DATE (MM,DD,YYYY)?

Insert the date **March 15, 1993**, and see if you get the same screen shown above. All four digits need to be given for a date like 1987, or 2002. A B.C. date would be given in negative years, i.e., 546 B.C. would be given as -546. If you make a mistake, **REDO FROM THE START** will appear. At that, try the entry again. Once you are in a screen position, you will see all the other calendar systems which exist at that time. If the Seleucid calendar is no longer in use, the screen has been told to drop it.

**Remember:** The Gregorian year starts with January 1, whereas the Hebrew year starts with the new moon nearest March 21. There is a period of about three months when the year may shift on the screen. This will change the above equation so that the first three months of the Gregorian calendar will move into a later year while the Hebrew calendar will remain in the

old year.

**Notice:** Each of the calendars on the screen has its own day, and each of them start at a different hour, so it might be a bit confusing. Once a date of any calendar appears on the screen, regardless of the calendar input used; look at the Gregorian date and input that date again. The second date is the one you will use. If the Hebrew date is desired, and the second input gives a different Hebrew date by one day than you want, simply change the Gregorian date by one day so that the Hebrew date you want is achieved. It is always important to input the final date on the Gregorian calendar. Most of the time you will get the same results, but some of the time the calculations will fall between the six hour overlap and the computer does not know which day of the week to pick.

## EGYPTIAN

Striking the "E" will prompt:

**ENTER SLIDING CALENDAR MONTH #:?**

At this enter the Egyptian sliding calendar month and strike return.

**ENTER SLIDING CALENDAR DAY #:?**

At this time you would enter the day for that month and return.

**ENTER FIXED CALENDAR MONTH #:?**

Enter month number and return.

**ENTER FIXED CALENDAR DAY #:?**

Enter day number and return.

**ENTER EPOCH NUMBER #:?**

The Epoch numbers begin in the following years:

Epoch 1 starts June 16, 4241 B.C.

Epoch 2 starts June 27, 2781 B.C.

Epoch 3 starts July 8, 1321 B.C.

Epoch 4 starts July 18, 140 A.D.

## ISLAMIC

Any desired date can be found in the Islamic calendar using the same methodology. Islamic years are always twelve lunar months, and the first day of their year moves about eleven days in relation to the solar year, since there are 354 days in twelve lunar months.

## SELEUCID/GREEK

The Seleucid entry is made by striking the "S". Once on the screen, the format is the same. Seleucid dates are given in Greek lunar months and days, and they are given in years in relation to the Seleucid era.

## OLYMPIAD

The Olympiad entry asks for two numbers, the Olympiad, and the year within it.

## A.M. OPTION

Striking "A" from the menu will ask the question:

**ENTER ELAPSED DAYS SINCE CREATION?**

At that point, any number you enter will give the date in each of the calendar systems since day eight of the Creation week.

## JULIAN DAY OPTION

Striking "J" will prompt:

## ENTER JULI? DAY:

At that time, you may enter the astronomer's date for a specific day in the past. This portion of the program is helpful for precisely dating events as astronomers would date them. The readout on the screen is the second from the top, and shows months which look like Gregorian months, but they are not the same. Make certain you do not read the Julian months when looking for Gregorian months. Most ancient dating methods are given in these months. It is desirable to have the solar year, whereas the Julian months are not. Notice also, that the Julian years will be the same as Gregorian after A.D. 1, but before that, they will be one year different. This is a result of the zero B.C. which exists in astronomical dating, but does not exist in historical dating.

## NEW MOON 80 PROGRAM

One can get to the MOON PHASES program by returning to the MAIN MENU. This program is designed to calculate the actual conjunction dates and times of the day for each new moon within a certain year in history. The calculations will be read in the Gregorian calendar. Then the computer will add 24 hours to the actual conjunction time, and give you a screen and typewritten copy of the dates in the Hebrew calendar, showing when each sabbath day occurs within any month. When you are in the program, the prompt will appear:

ENTER YEAR?

THE YEAR TO BE ENTERED WILL BE  
THE ELAPSED YEAR SINCE CREATION  
  
IF AD, USE GREGORIAN YEAR + 4000  
IF BC, USE 4001 - GREGORIAN YEAR

YEAR - 5993						
DAY FOR FIRST OF MONTH		HEBREW SABBATHS	A.M. DAYS CREATION	GREGORIAN DATE	HOUR OF OCCURANCE	JULIAN DATE
NISAN	01, THU	03 10 17 24	2188896	TUE MAR 23, 1993	@ 07:18	2449070
IYAR	01, FRI	02 09 16 23 30	2188925	WED APR 21, 1993	@ 23:28	2449099
SIVAN	01, SUN	07 14 21 28	2188955	FRI MAY 21, 1993	@ 13:54	2449129
TAMMUZ	01, TUE	05 12 19 26	2188983	SUN JUN 20, 1993	@ 02:16	2449158
AB	01, WED	04 11 18 25	2189014	MON JUL 19, 1993	@ 12:25	2449188
ELUL	01, THU	03 10 17 24	2189043	TUE AUG 17, 1993	@ 20:37	2449217
TISHRI	01, SAT	01 08 15 22 29	2189073	THU SEP 16, 1993	@ 03:52	2449247
HESHVAN	01, SUN	07 14 21 28	2189102	FRI OCT 15, 1993	@ 11:35	2449276
KISLEV	01, MON	06 13 20 27	2189131	SAT NOV 13, 1993	@ 21:10	2449305
TEBETH	01, WED	04 11 18 25	2189161	MON DEC 13, 1993	@ 09:11	2449335
SHEBAT	01, THU	03 10 17 24	2189190	TUE JAN 11, 1994	@ 23:31	2449364
ADAR	01, SAT	01 08 15 22 29	2189220	THU FEB 10, 1994	@ 15:27	2449394

After we have examined the data above, we can select one of the options listed below. One of these options is to make a calendar for any one specific month we choose. If we strike "M," the second a question will be asked.

ENTER HEBREW MONTH # ? \_\_\_\_\_

ENTER ONE OF THE FOLLOWING COMMANDS

(E)XIT TO MAIN PROGRAM  
 (I)NPUT NEW YEAR  
 (P)REVIOUS YEAR-NEW MOONS  
 (N)EXT YEAR-NEW MOONS  
 (M)ONTH CALENDAR?

ENTER ONE OF THE FOLLOWING COMMANDS

(E)XIT TO MAIN PROGRAM  
 (I)NPUT NEW YEAR  
 (P)REVIOUS YEAR-NEW MOONS  
 (N)EXT YEAR-NEW MOONS  
 (M)ONTH CALENDAR? M  
 ENTER HEBREW MONTH #?\_\_\_\_

As an experiment, we strike 12.

SUN	MON	TUE	WED	THU	FRI	SAT
						01
02	03	04	05	06	07	08
09	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

## OPERATING YOUR **MACINTOSH** CALENDAR CONVERSION

Note: Some programs interfere with the operation of this calendar program, causing it to hang up. For best results, restart your computer and at the same time, hold down the "shift" key. This will disable the extensions.

Copy to your desktop. Click on the CAL4 icon. The following appears.

```
*** OPTIONS ***
G - GREGORIAN
H - HEBREW
S - SELEUCID
A - A.M.
J - JULIAN DAY
I - ISLAMIC
M - MAIN MENU
N - NEW MOONS
ENTER SELECTION
```

Strike "G" and the following prompt appears:

```
ENTER GREGORIAN DATE LIKE THIS: MM,DD,YYYY  3,24,1993
```

The following screen appears

```

CAL4-NewMoon(1990)Apl
A.M.: Nisan 1 , 5993 AM                                2,188,897.
JULIAN: March 11 , 1993                                2,449,071.
GREGORIAN: March 24 , 1993 AD                          Wednesday
EGYPT SLIDING: ( 12 ) Mesore 4
EGYPT FIXED: ( 8 ) Pharmouthi 26      EPOCH # 4
ISLAMIC: ( 10 ) Shawwal 1 , YEAR 1413 OF HEGIRA

OLYMPIAD: # 692 , YEAR 4      ( 11 )Munychion 1
JUBILEE YR: # 79 + 12 YEARS (AFTER JACOB)
JUBILEE YR: # 70 + 26 YEARS (AFTER MOSES)
SABBATH YR: # 487 + 5 YEARS (AFTER DEUTERONOMY)
PRIEST: 8 -Abijah

A = ADD DAYS      N = NEXT DAY      P = PREVIOUS DAY      G = GREGORIAN
H = HEBREW        D = AM DAY #      E = EGYPTIAN DATE      O = OLYMPIAD
S = SELEUCID      W = ADD WEEKS     Y = ADD YEARS          I = ISLAM
M = MAIN MENU     T = PRINT PAGE
```

Strike "M" (return) to return to MENU

```
*** OPTIONS ***
G - GREGORIAN
H - HEBREW
S - SELEUCID
A - A.M.
J - JULIAN DAY
I - ISLAMIC
M - MAIN MENU
N - NEW MOONS

ENTER SELECTION
```

Strike "N" (return) to find New Moon Conjunctions  
Type "5993" (Return) for the year

```
THE YEAR TO BE ENTERED WILL BE
THE ELAPSED YEAR SINCE CREATION
```

```
I.E. IF AD, GREGORIAN + 4000
IF BC, 4001 - GREGORIAN (BC)
```

```
ENTER YEAR? 5993
```

**Note:** The computer calendar shows Nisan 1 on a Wednesday, whereas the new moon program shows it on a Thursday. This date was chosen to show that marginal proximities at times influence a computer's ability to select the right age of the moon. In this case, you can see that the moon's age was only about 12 hours old, but according to an astronomy program, it could have been seen.

JERUSALEM MOON CONJUNCTION					HEBREW CALENDAR		
DAY	GREGORIAN	TIME	JD#	DAY MONTH	AM#		
01-Tue	Mar 23 , 1993	07:18	2449070	Thu Nisan 1	2188896		
02-Wed	Apr 21 , 1993	23:28	2449099	Fri Iyar 1	2188926		
03-Fri	May 21 , 1993	13:54	2449129	Sun Sivan 1	2188956		
04-Sun	Jun 20 , 1993	02:16	2449158	Tue Tammuz 1	2188984		
05-Mon	Jul 19 , 1993	12:25	2449188	Wed Ab 1	2189015		
06-Tue	Aug 17 , 1993	20:37	2449217	Thu Elul 1	2189044		
07-Thu	Sep 16 , 1993	03:52	2449247	Sat Tishri 1	2189073		
08-Fri	Oct 15 , 1993	11:36	2449276	Sun Heshvan 1	2189102		
09-Sat	Nov 13 , 1993	21:10	2449305	Mon Kislev 1	2189132		
10-Mon	Dec 13 , 1993	09:11	2449335	Wed Tebeth 1	2189161		
11-Tue	Jan 11 , 1994	23:31	2449364	Thu Shebat 1	2189191		
12-Thu	Feb 10 , 1994	15:27	2449394	Sat Adar 1	2189221		

ENTER (T) TO PRINT? |

## Making a Bible Calendar For One Month of This Year

Strike "Return"

ENTER ONE OF THE FOLLOWING COMMANDS

(Q)UIT TO STOP  
(I)NPUT NEW YEAR  
(P)REVIOUS YEAR-NEW MOONS  
(N)EXT YEAR-NEW MOONS  
(M)ONTH CALENDAR? |

Strike "M" then Return

ENTER ONE OF THE FOLLOWING COMMANDS

(Q)UIT TO STOP  
(I)NPUT NEW YEAR  
(P)REVIOUS YEAR-NEW MOONS  
(N)EXT YEAR-NEW MOONS  
(M)ONTH CALENDAR? m

ENTER HEBREW MONTH #? |

Enter "1" Return

What Day Of The Week Does  
Nisan 1 Fall On?

1 = SUNDAY  
2 = MONDAY  
3 = TUESDAY  
4 = WEDNESDAY  
5 = THURSDAY  
6 = FRIDAY  
7 = SATURDAY? |

Enter "4" Return

This will provide a calendar for the first month (Nisan) of the year 5993, which took place in 1993 A.D.

CAL4-NewMoon(1990)Apl						
Nisan 1 1993 / 1994 A.D.						
SUN	MON	TUE	WED	THU	FRI	SAT
			01	02	03	04
05	06	07	08	09	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29			
PRESS < T > FOR COPY OR < N > IF NOT?						

### Conclusion:

The Macintosh instructions are quite simple and abbreviated. If you would like more information on the computer screen, you can go back to examine the PC instructions. To cover this information twice is redundant.