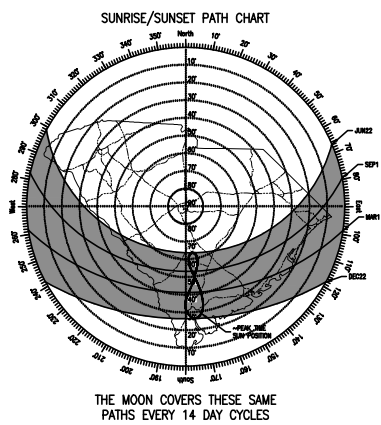
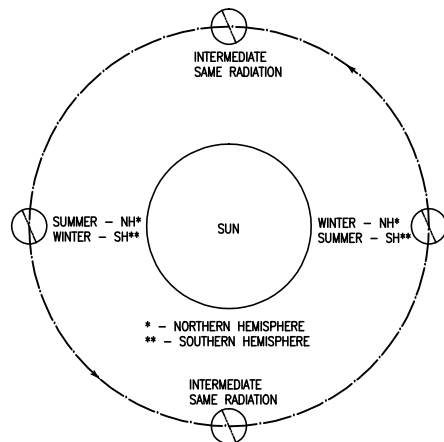
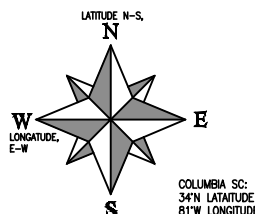


COLUMBIA, SC
LATITUDE: 34°N LAT, 81°W LON
SUN ANGLE
90-(N lat+23.5)=winter solstice (32.6°)
90-(N lat-23.5)=summer solstice (79.4°)

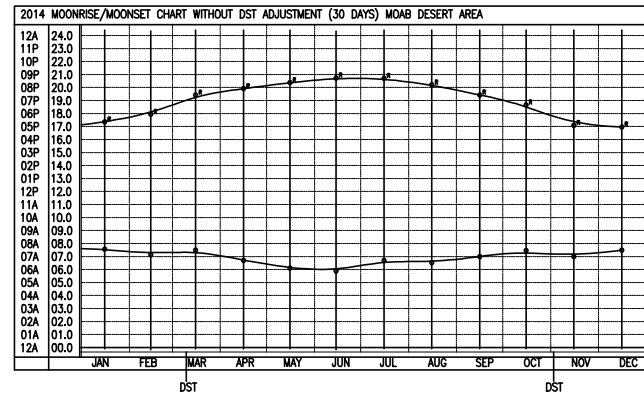
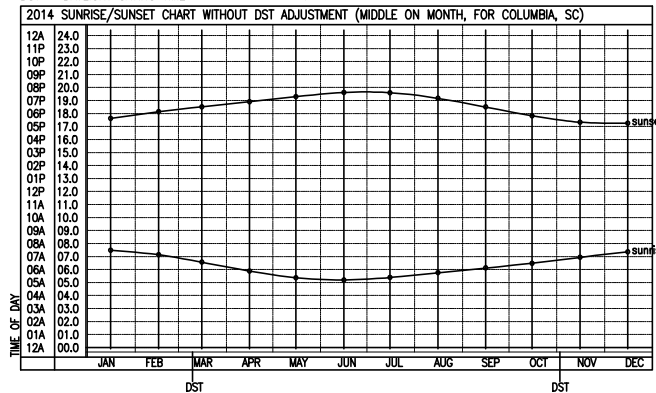


2014 SUNRISE/SUNSET TABLE				
34.004559, -81.0332075, (Columbia, SC)				
34° 0' 1.641" N 81° 1' 59.547" W				
	MAR 1	JUN 22	SEP 1	DEC 22
SUNRISE	98.5°	60.66°	79.5°	118.03°
SUNSET	261.72°	299.31°	280.26°	241.97°
ELEVATION	42.48°	64.02°	53.63°	26.68°
PEAK AZIM	179.9°	180.43°	180.27°	179.98°
PEAK ALT	47.71°	79.45°	63.72°	32.56°
PEAK TIME	12:37	12:26	12:24	17:23
RISE TIME	7:52	6:13	6:57	8:26
SET TIME	19:20	20:38	19:49	18:19



HOW FAR AWAY IS THE HORIZON	
Height (ft)	Distance Miles
3	0.6
6.6	3.0
9.8	3.7
13.1	4.3
16.4	4.8
19.7	5.3
23.0	5.8
26.2	6.1
29.5	6.4
32.8	6.8
36.1	7.1
39.4	7.4
42.7	7.7
46.0	8.0
49.3	8.3
52.6	8.6
55.9	8.9
59.2	9.2
62.5	9.5
65.8	9.8
69.1	10.1
72.4	10.4
75.7	10.7
79.0	11.0
82.3	11.3
85.6	11.6
88.9	11.9
92.2	12.2
95.5	12.5
98.8	12.8
102.1	13.1
105.4	13.4
108.7	13.7
112.0	14.0
115.3	14.3
118.6	14.6
121.9	14.9
125.2	15.2
128.5	15.5
131.8	15.8
135.1	16.1
138.4	16.4
141.7	16.7
145.0	17.0
148.3	17.3
151.6	17.6
154.9	17.9
158.2	18.2
161.5	18.5
164.8	18.8
168.1	19.1
171.4	19.4
174.7	19.7
178.0	20.0
181.3	20.3
184.6	20.6
187.9	20.9
191.2	21.2
194.5	21.5
197.8	21.8
201.1	22.1
204.4	22.4
207.7	22.7
211.0	23.0
214.3	23.3
217.6	23.6
220.9	23.9
224.2	24.2
227.5	24.5
230.8	24.8
234.1	25.1
237.4	25.4
240.7	25.7
244.0	26.0
247.3	26.3
250.6	26.6
253.9	26.9
257.2	27.2
260.5	27.5
263.8	27.8
267.1	28.1
270.4	28.4
273.7	28.7
277.0	29.0
280.3	29.3
283.6	29.6
286.9	29.9
290.2	30.2
293.5	30.5
296.8	30.8
300.1	31.1
303.4	31.4
306.7	31.7
310.0	32.0
313.3	32.3
316.6	32.6
319.9	32.9
323.2	33.2
326.5	33.5
329.8	33.8
333.1	34.1
336.4	34.4
339.7	34.7
343.0	35.0
346.3	35.3
349.6	35.6
352.9	35.9
356.2	36.2
359.5	36.5
362.8	36.8
366.1	37.1
369.4	37.4
372.7	37.7
376.0	38.0
379.3	38.3
382.6	38.6
385.9	38.9
389.2	39.2
392.5	39.5
395.8	39.8
399.1	40.1
402.4	40.4
405.7	40.7
409.0	41.0
412.3	41.3
415.6	41.6
418.9	41.9
422.2	42.2
425.5	42.5
428.8	42.8
432.1	43.1
435.4	43.4
438.7	43.7
442.0	44.0
445.3	44.3
448.6	44.6
451.9	44.9
455.2	45.2
458.5	45.5
461.8	45.8
465.1	46.1
468.4	46.4
471.7	46.7
475.0	47.0
478.3	47.3
481.6	47.6
484.9	47.9
488.2	48.2
491.5	48.5
494.8	48.8
498.1	49.1
501.4	49.4
504.7	49.7
508.0	50.0
511.3	50.3
514.6	50.6
517.9	50.9
521.2	51.2
524.5	51.5
527.8	51.8
531.1	52.1
534.4	52.4
537.7	52.7
541.0	53.0
544.3	53.3
547.6	53.6
550.9	53.9
554.2	54.2
557.5	54.5
560.8	54.8
564.1	55.1
567.4	55.4
570.7	55.7
574.0	56.0
577.3	56.3
580.6	56.6
583.9	56.9
587.2	57.2
590.5	57.5
593.8	57.8
597.1	58.1
600.4	58.4
603.7	58.7
607.0	59.0
610.3	59.3
613.6	59.6
616.9	59.9
620.2	60.2
623.5	60.5
626.8	60.8
630.1	61.1
633.4	61.4
636.7	61.7
640.0	62.0
643.3	62.3
646.6	62.6
649.9	62.9
653.2	63.2
656.5	63.5
659.8	63.8
663.1	64.1
666.4	64.4
669.7	64.7
673.0	65.0
676.3	65.3
679.6	65.6
682.9	65.9
686.2	66.2
689.5	66.5
692.8	66.8
696.1	67.1
699.4	67.4
702.7	67.7
706.0	68.0
709.3	68.3
712.6	68.6
715.9	68.9
719.2	69.2
722.5	69.5
725.8	69.8
729.1	70.1
732.4	70.4
735.7	70.7
739.0	71.0
742.3	71.3
745.6	71.6
748.9	71.9
752.2	72.2
755.5	72.5
758.8	72.8
762.1	73.1
765.4	73.4
768.7	73.7
772.0	74.0
775.3	74.3
778.6	74.6
781.9	74.9
785.2	75.2
788.5	75.5
791.8	75.8
795.1	76.1
798.4	76.4
801.7	76.7
805.0	77.0
808.3	77.3
811.6	77.6
814.9	77.9
818.2	78.2
821.5	78.5
824.8	78.8
828.1	79.1
831.4	79.4
834.7	79.7
838.0	80.0
841.3	80.3
844.6	80.6
847.9	80.9
851.2	81.2
854.5	81.5
857.8	81.8
861.1	82.1
864.4	82.4
867.7	82.7
871.0	83.0
874.3	83.3
877.6	83.6
880.9	83.9
884.2	84.2
887.5	84.5
890.8	84.8
894.1	85.1
897.4	85.4
900.7	85.7
904.0	86.0
907.3	86.3
910.6	86.6
913.9	86.9
917.2	87.2
920.5	87.5
923.8	87.8
927.1	88.1
930.4	88.4
933.7	88.7
937.0	89.0
940.3	89.3
943.6	89.6
946.9	89.9
950.2	90.2
953.5	90.5
956.8	90.8
960.1	91.1
963.4	91.4
966.7	91.7
970.0	92.0
973.3	92.3
976.6	92.6
979.9	92.9
983.2	93.2
986.5	93.5
989.8	93.8
993.1	94.1
996.4	94.4
999.7	94.7

DST = DAYLIGHT SAVING TIME



THE ORBIT OF THE MOON AROUND THE EARTH IS NOT AN EASY PROCESS. THE MOON MAKES A COMPLETE ORBIT AROUND THE EARTH APPROXIMATELY ONCE EVERY 28 DAYS. THIS MEANS THAT THE MOON ORBITS THE EARTH AROUND 13 TIMES IN A YEAR. THE COMPLEX PART POPS UP BECAUSE THERE ARE SEVERAL WAYS TO CONSIDER A COMPLETE ORBIT OF THE MOON, BUT THE TWO MOST FAMILIAR ARE: THE "SIDEREAL MONTH" BEING THE TIME IT TAKES TO MAKE A COMPLETE ORBIT WITH RESPECT TO THE STARS, ABOUT 27.3 DAYS; AND THE "SYNODIC MONTH" BEING THE TIME IT TAKES TO REACH THE SAME PHASE, ABOUT 29.5 DAYS. THESE DIFFER BECAUSE IN THE MEANTIME THE EARTH AND MOON HAVE BOTH ORBITED SOME DISTANCE AROUND THE SUN.

WITH RESPECT TO THE BACKGROUND CONSTELLATIONS THE MOON WILL BE ABOUT 13.2 DEGREES FURTHER EAST EACH DAY. SINCE THE CELESTIAL SPHERE APPEARS TO TURN 1 DEGREE ABOUT EVERY 4 MINUTES, THE MOON CROSSES OUR CELESTIAL MERIDIAN

2014 MOON PHASES FOR COLUMBIA, U.S.A. - SOUTH CAROLINA

LUNATION	NEW MOON	FIRST QUARTER
1126	JAN 1 6:14 AM	JAN 7 10:40 PM
1127	JAN 30 4:39 PM	FEB 6 2:22 PM
1128	MAR 1 3:00 AM	MAR 8 8:27 AM
1129	MAR 30 2:45 PM	APR 7 4:31 AM
1130	APR 29 2:15 AM	MAY 6 11:15 PM
1131	MAY 28 2:40 PM	JUN 5 4:40 PM
1132	JUN 27 4:09 AM	JUL 5 5:59 AM
1133	JUL 26 6:42 PM	AUG 3 8:50 PM
1134	AUG 25 10:13 AM	SEP 2 7:11 AM
1135	SEP 24 2:14 AM	OCT 1 3:33 PM
1136	OCT 23 5:57 PM	OCT 30 10:49 PM
1137	NOV 22 7:33 AM	NOV 29 5:07 AM
1138	DEC 21 8:36 PM	DEC 28 1:32 PM

AVG 238,000 MILES FROM EARTH, EVERY 29d 13.5hr, 1 ROTATION EVERY ~24h52.8m

~ABOUT 13.2 X 4 = 52.8 MINUTES LATER EACH DAY.

NAME	VALUE (DAYS)	DEFINITION
SIDEREAL MONTH.....	27.32166155.....	WITH RESPECT TO THE DISTANT STARS (13.36874634 PASSES PER SOLAR ORBIT)
SYNODIC MONTH.....	29.53058886.....	WITH RESPECT TO THE SUN (PHASES OF THE MOON, 12.36874634 PASSES PER SOLAR ORBIT)
TROPICAL MONTH.....	27.321582.....	WITH RESPECT TO THE VERNAL POINT (PRECESSES IN ~26,000 YEARS)
ANOMALISTIC MONTH.....	27.554550.....	WITH RESPECT TO THE PERIGEE (PRECESSES IN 3232.6054 DAYS = 8.850578YEARS)
DRACONIC (NODAL) MONTH.....	27.212220815.....	WITH RESPECT TO THE ASCENDING NODE (PRECESSES IN 6793.4765 DAYS = 18.5996 YEARS)
BLUE MOON	THE TERM BLUE MOON IS USED COMMONLY TO DESCRIBE A SECOND FULL MOON IN A SINGLE SOLAR CALENDAR MONTH, WHICH HAPPENS EVERY TWO TO THREE YEARS (SEVEN TIMES IN THE 19 YEAR METONIC CYCLE)	

FULL MOON	THIRD QUARTER	DURATION
JAN 15 11:53 PM	JAN 24 12:19 AM	29d 10h 24m
FEB 14 6:53 PM	FEB 22 12:16 PM	29d 10h 21m
MAR 16 1:09 PM	MAR 23 9:46 PM	29d 10h 45m
APR 15 3:43 AM	APR 22 3:52 AM	29d 11h 30m
MAY 14 3:16 PM	MAY 21 8:59 AM	29d 12h 26m
JUN 13 12:12 AM	JUN 19 2:39 PM	29d 13h 29m
JUL 12 7:25 AM	JUL 18 10:09 PM	29d 14h 33m
AUG 10 2:10 PM	AUG 17 8:26 AM	29d 15h 31m
SEP 8 9:38 PM	SEP 15 10:05 PM	29d 16h 01m
OCT 6 6:51 AM	OCT 15 3:12 PM	29d 15h 43m
NOV 6 5:23 PM	NOV 14 10:16 AM	29d 14h 35m
DEC 6 7:27 AM	DEC 14 7:52 AM	29d 13h 04m
		29d 11h 38m