Universal Window Times
January 1980 thru December 1980

HOW TO USE PUBLICATION NO. 229

The following Universal Window times are based on the specifica-
tions outlined in AS-49-12. The European Universal Window is always
during positive declination. The start of the window is two hours from
the setting moon time in Frankfurt, Germany. The end of the window is
when the moon sets at this same location. Keep in mind that Western
Europe can still see the moon for another hour, or so, after the moon
sets at Frankfurt. Also, the Western Hemisphere can still see the moon
for many more hours. Quite often the European and U.S. stations will
operate during negative declinations, and just before moonset in Europe,
if the times are convenient. There is a good chance for activity on
weekends on frequencies from 144.000 to 144.010 MHz.

Also included are the times each month for the new moon. When the
moon and sun are at almost the same G.H.A. and declination, the moon
cannot be seen because of the visible radiation from the sun. The radio
frequency radiation will be sufficient to obliterate any echoes. The
more antenna directivity a station has, the closer to the sun it can be
used. There is a limit however. With a 160 element collinear on 144 MHz,
it is usually possible to operate successfully one day before and one day
after new moon.

1980	New Moon	Perigee	Apogee
January	17	20	8
February	16	17	5
March	16	16	3,30
April	15	14	26
May	14	12	24
June	12	9	21
July	12	4,30	19
August	10	27	15
September	9	25	12
October	9	23	9
November	7	21	5
December	7	19	3,30

JANUARY - 1980		FEBRUARY - 1980		MARCH - 1980	
Day	UT	Day	UT	Day	UT
1	0358-0558	1	0456-0656	1	0356-0556
2	0454-0654	2	0526-0726	2	0422-0622
3	0541-0751	3	0554-0754	3	0446-0646
4	0622-0822	4	0618-0818	17	1630-1830
5	0656-0856	5	0642-0842	18	1750-1950
6	0726-0926	19	1858-2058	19	1910-2110
7	0752-0952	20	2016-2216	20	2024-2224
8	0814-1014	21	2130-2330	21	2134-2334
9	0836-1036	22-23	2240-0040	22-23	2236-0036
22	2000-2200	23-24	2344-0144	23-24	2332-0132
23	2116-2316	25	0044-0244	25	0018-0218
24-25	2230-0030	26	0144-0344	26	0058-0258
25-26	2340-0140	27	0218-0418	27	0132-0332
27	0048-0248	28	0256-0456	28	0200-0400
28	0151-0351	29	0329-0529	29	0226-0426
29	0246-0446			30	0250-0450
30	0336-0536			31	0314-0514
31	0420-0620				

APRIL - 1980		MAY - 1980		JUNE - 1980	
Day	UT	Day	UT	Day	UT
14	1520-1720	11	1252-1452	8	1152-1352
15	1641-1841	12	1412-1612	9	1309-1509
16	1800-2000	13	1532-1732	10	1426-1626
17	1914-2114	14	1649-1849	11	1540-1740
18	2024-2224	15	1802-2002	12	1650-1850
19	2124-2324	16	1908-2108	13	1752-1952
20-21	2216-0016	17	2006-2206	14	1846-2046
21-22	2258-0058	18	2054-2254	15	1930-2130
22-23	2324-0134	19	2134-2334	16	2008-2208
24	0006-0206	20-21	2208-0008	17	2038-2238
25	0032-0232	21-22	2236-0036	18	2106-2306
26	0056-0256	22-23	2302-0102	19	2130-2330
27	0118-0318	23-24	2325-0125	20	2152-2352

JULY - 1980		AUGUST - 1980		SEPTEMBER-1980	
Day	UT	Day	UT	Day	UT
5	0940-1140	1	0728-0928	1	1017-1217
6	1056-1256	2	0845-1045	2	1125-1325
7	1210-1410	3	1000-1200	3	1225-1425
8	1324-1524	4	1115-1315	4	1317-1517
9	1434-1634	5	1225-1425	5	1402-1602
10	1538-1738	6	1330-1530	6	1440-1640
11	1636-1836	7	1429-1629	7	1511-1711
12	1724-1924	8	1519-1719	8	1538-1738
13	1805-2005	9	1602-1802	9	1603-1803
14	1839-2039	10	1638-1838	10	1626-1826
15	1907-2107	11	1709-1909	25	0401-0601
16	1932-2132	12	1736-1936	26	0523-0723
17	1956-2156	13	1800-2000	27	0644-0844
		14	1821-2021	28	0802-1002
		29	0629-0829	29	0914-1114
		30	0747-0947	30	1019-1219
		31	0904-1104		

OCTOBER - 1980		NOVEMBER - 1980		DECEMBER - 1980	
Day	UT	Day	UT	Day	UT
1	1116-1316	1	1149-1349	1	1105-1305
2	1204-1404	2	1214-1414	16-17	2320-0120
3	1242-1442	3	1238-1438	18	0038-0238
4	1315-1515	4	1259-1459	19	0157-0357
5	1344-1544	19	0022-0222	20	0314-0514
6	1408-1608	20	0142-0342	21	0427-0627
7	1430-1630	21	0304-0504	22	0533-0733
23	0251-0451	22	0424-0624	23	0627-0827
24	0414-0614	23	0540-0740	24	0714-0914
25	0536-0736	24	0650-0850	25	0751-0951
26	0653-0853	25	0749-0949	26	0821-1021
27	0804-1004	26	0840-1040	27	0847-1047
28	0908-1108	27	0919-1119	28	0910-1110
29	1000-1200	28	0951-1151	29	0932-1132
30	1044-1244	29	1019-1219		
31	1119-1319	30	1044-1244		

FIND THE MOON AND SUN USING PUBLICATION 229

by Joe Reisert W1JR (ex-W1JAA; ex-W6FZJ)

Finding the moon and sun using "Tables of Computed Altitude and Azimuth - HO214" was described in AS49-1 (Ref. 1) and QST (Ref. 2). In some sections of the country this publication is no longer available. It is slowly being re-placed by a new version called "Sight Reduction Tables for Marine Navigation, Publication Nr. 229" (ref. 3).

The differences between HO214 and Pub. 229 are subtle but both can be easily used to obtain accurate results. HO214 is easier to use when the decli-nation is constant and multiple points are needed (such as plotting during a schedule). Pub. 229 is preferred when only one heading is needed since multiple bearings will require page changes.

The format of Pub. 229 is different from that of HO214. Each page starts with a different LHA (Local Hour Angle). Zero LHA is located on your meridian. For instance, Boston is approximately 71° west longitude. Thus when the moon has a GHA of 71° it is on the Boston local meridian and the LHA is zero. If the moon is to the east, the LHA is found by subtracting the GHA from your longitude. If the moon is to the west, subtract your longitude from the moon GHA. For example, if the GHA is 61°, your LHA is 10°. Likewise if the GHA is 81° your LHA is still 10°. You must remember whether the moon is east or west of your longitude.

Now, how do we proceed? Let's use the examples in Ref. 1.

GHA 71° Declination $N2^O$ [These moon data from the Nautical Almanac for year, month, day and time (GMT) in question].

Local coordinates 122°W. Longitude, 36° North Latitude.

Example #1:

1. Subtract GHA from your longitude to find LHA (122 - 71 = 51°).
    Locate the page with 51°, 309° L.H.A. Latitude same name as
    Declination.

2. Move down the declination column to 2° and then go across this
    line until you are below the column marked 36° (your latitude). The
    set of numbers in the Hc column is your local elevation and the set
    under the Z column is the local azimuth for the moon. In this case
    the values are 31°57.6' and 113.7° respectively.

Example #2:

If the GHA in example #1 had been 173° (vice 71°) your local hour angle
would still have been 51° (173 - 122 = 51°) but west of your longitude.
Therefore subtract the indicated azimuth from 360° to obtain the true
value (360 - 113.7° = 246.3) or 246.3°. The elevation remains the same.

Example #3:

GHA 181° Declination S2° (from Nautical Almanac).

Local coordinates 122°W Longitude, 36° North Latitude.

1. To find the LHA you must subtract your longitude from the GHA since
    the moon is west of your longitude. Therefore the LHA is 59
    (181 - 122 = 59).

2. Since the Declination is south (and you are in the northern hemisphere)
    turn to the page marked "Latitude Contrary Name to Declination LHA59°,
    301°. Move down the declination column to 2° and across to the column
    headed 36°. Read the elevation as 23°19.4' and the azimuth as 111.1°.
    Since the moon is west you must subtract the azimuth from 360° to

obtain the correct azimuth of 248.9° (360 - 111.1 = 248.9).

Don't let the use of the HO214 or Pub. 229 frighten you. It actually takes longer to read this write-up than it does to learn to use the tables. Try a few practice examples to become more proficient. After a few trials you'll see how easy it really can be.

Ref:

1. "Use of Tables of Computed Altitude and Azimuth" by Joe Reisert, W6FZJ, Eimac Note AS49-1.

2. "EME Scheduling, When and Where", by J. H. Reisert, W6FZJ, QST, July 1974 pp. 25 - 29.

3. "Sight Reduction Tables for Marine Navigation". Publication Nr. 229, Volume 3 covers latitudes 30 - 45° inclusive. Other volumes are needed for different latitudes. Price is $9.40 and it is available at many marine supply houses, government book stores or the U. S. Government Book Store, Room G-25, JFK Federal Bldg., Boston, Mass., 02203.

Brian Manns, K3VGX, has supplied the following additional address to obtain Publication 229.

Defense Mapping Agency

Office of Distribution Services

Attn: Code DDCP

6101 McArthur Blvd.

Washington, DC 20315

Ask for "Publication Nr. 229, Vol. 3, Sight Reduction Tables for Marine Navigation". Volume 3 is for latitudes 30° through 45° inclusive. Make the $9.40 check payable to the Treasurer of the United States.

CALENDAR FOR THE YEAR 1980

JANUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FEBRUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MAY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

AUGUST

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

SEPTEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NOVEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

DECEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

NEW MOON   ✕

PERIGEE   ◯

APOGEE   ▢

UNIVERSAL WINDOW   —