

W5LUU WEEKEND MOONDATA – 2010
For Sundays at 0000 UT

2010	Dec. deg.	RA hrs.	144 MHz Temp. K	Range Factor dB	DGRD, dB		Moon Phase	CONDITIONS
					144 MHz	432 MHz		
Jan 03	14.8	9.1	166	0.19	0.2	0.2	FM+2d	EXCELLENT
10	-22.3	15.2	426	1.67	4.1	2.6		Poor
17	-14.3	21.2	336	2.34	4.6	2.9	NM+2d	Poor
24	19.7	2.7	352	1.40	3.8	2.1		Moderate
31	11.8	9.8	183	0.04	0.4	0.1	FM	EXCELLENT
Feb 07	-24.1	15.9	491	1.69	5.3	2.8		Poor
14	-10.9	21.8	323	2.54	4.5	3.1	NM	Poor
21	22.0	5.3	365	1.65	4.0	2.3		M
28	8.6	10.2	188	0.09	0.5	0.2	FM	EXCELLENT
Mar 07	-25.4	16.6	668	1.64	6.5	3.2		Very Poor
14	-7.3	22.3	264	2.28	3.7	2.7	NM-2d	Moderate
21	23.8	4.4	362	1.38	3.9	2.0		Moderate
28	4.9	10.8	201	0.29	0.9	0.5	FM-2d	EXCELLENT
Apr 04	-25.3	17.3	935	1.60	4.8	3.5		Poor
11	-3.6	22.7	244	2.20	3.4	2.5	NM-3d	Moderate
18	24.8	5.9	412	1.20	4.2	3.0		Poor
25	0.7	11.3	216	0.54	1.3	0.7	FM-3d	Very Good
May 02	-25.0	17.8	2210	1.63	11.5	5.5		Very Poor
09	-0.0	23.3	244	2.13	3.3	2.4		Moderate
16	25.1	5.6	494	0.94	4.6	2.1	NM+2d	Poor
23	-3.9	11.9	249	0.72	2.0	1.1		Good
30	-24.7	18.3	2735	1.75	12.3	6.2	FM+2d	Very Poor
Jun 06	3.5	23.6	247	2.10	3.3	2.4		Moderate
13	24.6	6.2	500	0.68	4.4	1.8	NM+1d	Poor
20	-8.5	12.6	306	0.86	2.8	1.4		Moderate
27	-23.0	18.8	1295	1.92	9.4	6.0	FM-1d	Very Poor
July 04	6.8	0.6	259	2.11	3.5	2.5		Moderate
11	23.7	6.8	410	0.49	3.5	1.3	NM	Moderate
18	-12.6	13.5	315	0.86	2.9	1.3		Moderate
25	-21.2	19.6	633	2.08	6.7	2.7	FM-1d	Very Poor
Aug 01	10.2	1.2	275	2.13	3.7	2.5		Moderate
08	22.2	9.4	381	0.42	2.8	1.2	NM-2d	Moderate
15	-16.0	13.9	334	0.77	3.0	1.4		Moderate
22	-18.8	20.1	378	2.19	4.9	2.9	FM-3d	Poor
29	13.4	1.7	290	2.12	3.9	2.6		Moderate
Sept 05	20.1	7.9	267	0.49	1.9	0.9	NM-3d	Good
12	-18.6	14.5	371	0.68	5.3	1.4		Poor
19	-15.8	20.7	337	2.23	4.5	2.9		Poor
26	16.4	2.3	316	2.03	4.1	2.5	FM+3d	Poor
Oct. 03	17.3	7.6	200	0.63	1.2	0.8		VERY GOOD
10	-20.6	15.1	411	0.65	3.6	1.5	NM+3d	Moderate
17	-12.7	21.3	539	2.23	4.5	3.4		Poor
24	19.0	2.8	357	1.86	4.4	2.5	FM+1d	Poor
31	13.7	9.2	166	0.75	0.7	0.8		EXCELLENT
Nov. 07	-22.1	15.6	450	0.75	4.1	1.6	NM-1d	Moderate
14	-9.4	21.6	518	2.20	4.3	3.4		Poor
21	21.1	3.4	364	1.65	4.2	2.3	FM	Poor
28	9.5	9.9	185	0.75	1.1	1.6		Very Good
Dec 05	-23.37	16.3	539	0.78	5.0	2.0	NM	Poor
12	-6.3	22.3	265	2.20	2.6	2.5		Moderate
19	22.7	4.0	560	1.48	4.0	2.7	FM-2d	Moderate
26	5.2	10.2	197	0.61	1.1	0.9		Very Good

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MOONONDATA UPDATE-2010 AND RELATED COMMENTS

By Derwin King, W5LUU

The best EME conditions occur when: 1) the earth-moon distance is at the absolute minimum and 2) the moon is in the coldest sky region along the moon path. The effect of distance is independent of frequency, but sky temperature decreases with frequency, up to ~1 GHz and then levels out. The EME signal-to-noise ratio, in dB, is degraded, from the minimum, by a factor (**DGRD**, see below), which varies over hourly, daily, weekly, monthly and yearly time periods. As a guide for the basic weekend EME conditions for 2010 the **W5LUU WEEKEND MOONDATA 2010** lists the **DGRD**, in dB, for **144** and **432 MHz**, and other pertinent EME information for each **Sunday at 0000 UT**. Factors such as local noise, antenna beam width, side lobes, polarization, etc. can also affect the s/n ratio of moon bounce signals. Low sunspot activity in 2010 minimizes disruptive ionosphere disturbances. Good conditions will prevail.

For frequencies below 1296, 2010 will be the best EME year until 2019 or later. Some Good and Excellent days occur on weekends, but more during the week. Days listed below have a 144 MHz **DGRD** that is a minimum at **d**, day and **h**, hour and may last for + or - several hours.

January: 02d/2310h (0.18 dB) and 30d/1051h (0.02 dB); **February:** 26d/2215h (0.60dB); **March:** 19d/1930h, (0.41dB); **April:** 22d/1430h, (0.65dB); **May:** 19d/1930h (0.68dB);
June: 16d/0233h, (0.5dB); **July:** 13d/1034h, (0.25dB); **August:** 09d/2056h, (0.13 dB);
Sept.: 06d/0730h, (0.23 dB); **October:** 04d/1822h, (0.66dB) and 31d/0003h, (0.75 dB); **November:** 27d/0534h, (0.81dB); **December:** 24d/1150h, (0.63dB).

Definitions:

DEC. (deg): Moon declination in degrees north and south (-) of the equator. This is cyclical with an average period of 27.212221 days. The maximum declination during a monthly cycle, plus and minus, ranges from 18.15 up to 28.72 degrees with a period (maximum to minimum and back to maximum) of about 19 years. **Last maximum was on 09/15/2006.**

RA (hrs): Right Ascension, in hours, gives the East-West position of the moon against the sky background. Average period of RA cycle is 27.321662 days but it can vary by a day or so due to effects of the sun on the earth and moon motion.

144 MHz Temp (K): The 144 MHz cosmic (sky) noise in direction of moon expressed as absolute temperature.

Range Factor (dBr): The additional EME path loss, in dB, due to earth-moon separation distance being greater than absolute minimum (348,030 km surface-to-surface). Varies from a low of (0 to 0.7 db) at perigee up to 2.33 ± 0.1 dB at apogee.

DGRD, (dB): The degradation in EME signal-to-noise, in dB, due to: (1) the excess sky noise temperature, in dB, at the stated position of the moon compared to the lowest cold sky temperature and the system noise temperature (all at the frequency of interest); plus (2) the earth-moon range factor, **dBr**, for the listed time and date. The tabulated **DGRD** is referenced to the lowest possible sky noise temperature along the moon path, for a system noise temperature of 80 K at 144 and 60 K at 432, an antenna beam width of $\sim 15^\circ$ and to the absolute minimum earth-moon (surface-to-surface) distance. The **dBr** affects **DGRD** equally at all frequencies, but sky noise decreases rapidly as frequency increases. During a monthly lunar cycle **DGRD** can vary by 13 dB on 144 and 8 dB on 432. **DGRD** varies less with small antennas than with large.

Moon Phase: Shows new moon (**NM**) and full moon (**FM**) along with the number of days (d) or hours (h) before (–) or after (+) these events. At **NM** sun noise is a problem while at **FM** the EME conditions (at night) are usually more stable.

Conditions: Summary of EME conditions as controlled by **DGRD** at 144 MHz and **NM**. Conditions may be worse, due to ionosphere disturbance, local noise and polarity, but not better than indicated. In general, **144 MHz DGRD <1.0 dB is considered Excellent, 1.0 to 1.5 is Very Good, 1.5 to 2.5 is Good, 2.5 to 4.0 is Moderate, 4.0 to 5.5 is Poor, and over 5.5 is Very Poor. Within a day of New Moon (NM), high sun noise can make conditions Very Poor regardless of the DGRD.**