WD2XSH status report: September 1 - November 30, 2007

Prepared by Fritz Raab, W1FR, Experiment Coordinator

December 2, 2007

1. ADMINISTRATIVE ISSUES

WD2XSH stations have over 2000 operating hours during the past three months, bringing the total to 13,849 at the end of October. Ninety-three QSOs have been made, and over 4800 reception reports filed on our web site. Seventeen of the stations have been on the air, although several are temporarily off the air for repairs or other reasons. There have been no interference complaints.

We need to make a decision on additions to the license and to move forward on renewing the license.

Statistics cited here are derived from logs (10/31/07), reception reports on the web site (11/30/07), and the W0RPK activity report on the web site.

2. COMMUNICATIONS

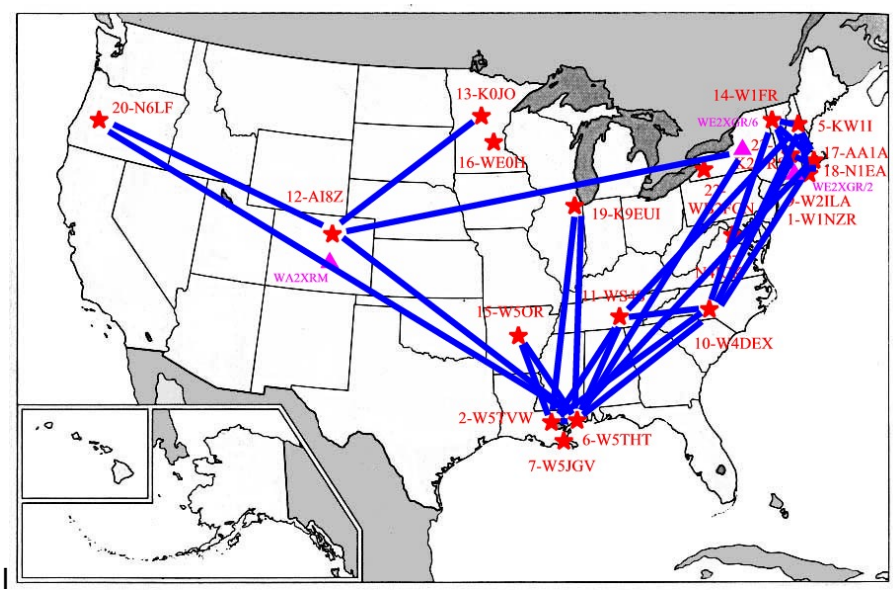
The past three months have seen significant decreases in QRN, and the low numbers of sunspots have improved propagation at 500 kHz significantly. A number of stations have completed repairs on their antennas and improved the operational capability of their stations.

Sky-Wave QSOs

During the past two months, the number of QSOs has increased dramatically and we have seen the first QSOs among several western and midwest stations. Some of the new paths over which contacts have been made are:

STATIONS		DISTANCE, mi
WE2XGR/6	GI4DPE	3,144
WE2XGR/2	GI4DPE	3,028
WD2XSH/6	WD2XSH/20	2,079
WD2XSH/12	WE2XGR/6	1,484
WD2XSH/6	WD2XSH/17	1,234
WD2XSH/6	WE2XGR/2	1,198
WD2XSH/6	WD2XSH/12	1,146
WD2XSH/6	WE2XGR/6	1,086
WD2XSH/12	WD2XSH/20	941
WD2XSH/12	WD2XSH/13	610

One of these was conducted in QRSS3 but the others were normal-speed CW.



WD2XSH QSOs

Stations /6 and /17 have been received frequently in Europe. European 500-kHz operators who have been received in the USA include GI4DPE, DI2AM, DI2BE, OK0EMW, and SM6BHZ.

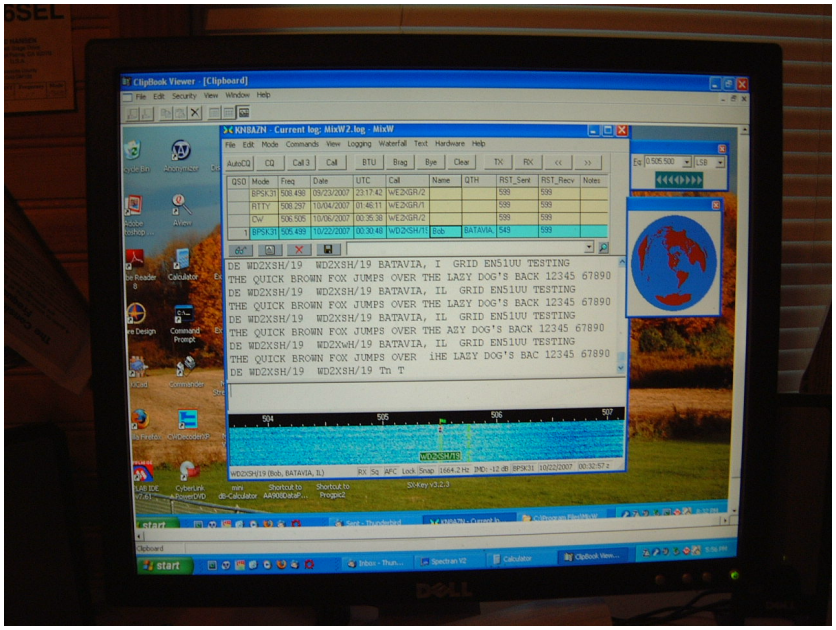
Digital Modulation

Digital modes were enabled in September by filing notice with the FCC under Section 5.77. The modulation modes now permitted for WD2XSH stations are:

- CW/QRSS 150HA1A
- PSK-31 62H0J2B
- FSK-31 62H0F1B
- MSK-31 62H0G1D .

PSK and MSK offer the best bit-error rate for a given average power. MSK eliminates the need for a linear amplifier and provides the best bit-error rate for a given peak power. FSK does not make optimum use of power, but may prove useful in propagation environments with rapidly changing phase.

Unfortunately, only one WD2XSH station has to date made digital transmissions. Station /19 (K9EUI) has twice successfully made daytime ground-wave transmissions to W0RPK over a 278-mi path using PSK-31. PSK-31 signals from /19 have also been received in Ohio via sky wave, and the WE2XGR stations have made several QSOs using PSK-31 and other digital techniques.



PSK-31 from WD2XSH/19 received by KN8AZN in Ohio.

Ground-Wave Tests

A few more ground-wave tests have been conducted during the past three months. A partial summary of successful ground-wave transmissions follows.

STATIONS		Z	MONTH	mi	MODES / COMMENTS
WD2XSH/19	W0RPK	22	Aug	278	QRSS3, CW, PSK-31, multiple repeats
WE2XGR/2	KN8AZN	22	Sep	390	PSK-31
WE2XGR/6	KN8AZN	17	Oct	186	
WD2XSH/20	KK7B	00	Jul	149	
WD2XSH/20	WS7N	21	Jul	108	
WE2XGR/2	WD2XSH/17	22	Sep	121	PSK-31/PSKFEC-31
WE2XGR/2	WE2XGR/1	18	Sep	96	CW
WD2XSH/17	WD2XSH/5	14	Jul	83	CW
WD2XSH/9	WD2XSH/17		Jan	60	CW
WD2XSH/17	W1XP	15	Jul	57	CW
WD2XSH/23	WD2XSH/5	19	May	53	CW
WD2XSH/2	WD2XSH/6	21	Jan	87	Multiple repeats,

3. INTERFERENCE

There have been no reports of interference, however, we are continuing to monitor two potential interference problems.

NDB OF

We have arranged with K0HW to compare the signal strength of NDB OF with those from our midwest stations. He is located on the northern edge of the service area of OF so his measurements will tell us whether there is potential of harmful interference. If our signal levels are sufficiently below those of OF, the restriction on 508 - 510 kHz can be lifted for our midwest stations.

NEED

We continue to hear NEED on 505 kHz from time to time. DF measurements place NEED somewhere in the Norfolk - Virginia Beach area. I have determined that it is an intermittently operated NDB. We think it is operated by an agency of the U.S. government that prefers not to be identified publically. Since we have not received any interference complaints during the past year, it appears this is not an issue.

4. INTERNATIONAL AND OTHER

WE2XGR

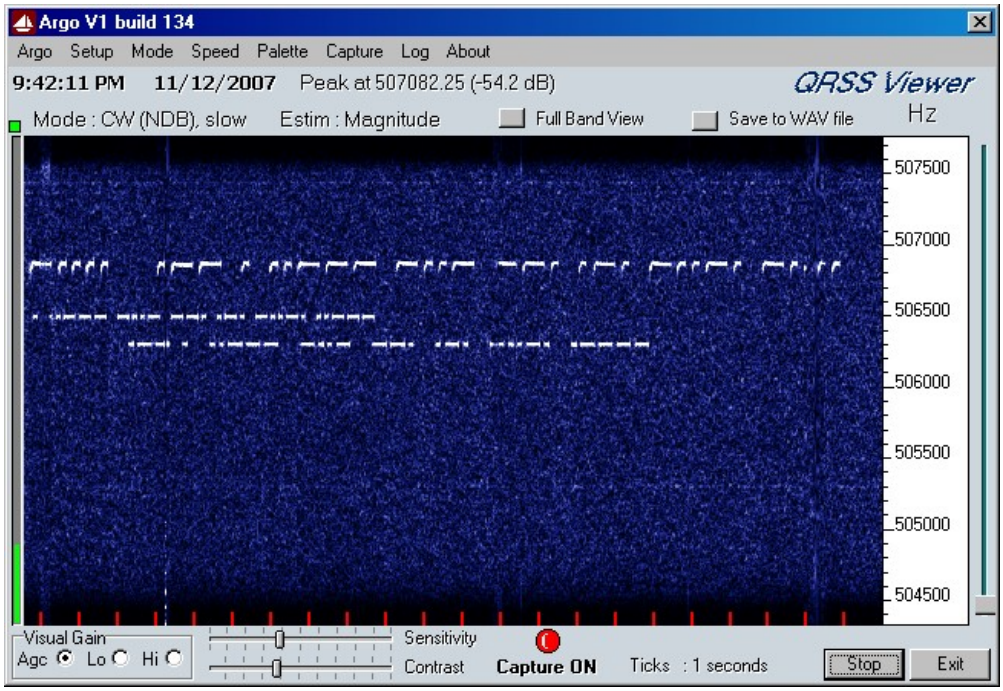
Warren Ziegler (K2ORS and WD2XSH/23) received experimental license WE2XGR in September. His license includes five operators and six locations:

WE2XGR/1	K2ORS	Wayland, MA
WE2XGR/2	W1VD	Burlington, CT
WE2XGR/3	W1TAG	Holden, MA
WE2XGR/4	Bill Ashlock	Andover, MA
WE2XGR/5	Bill Ashlock	Ellsworth, NH
WE2XGR/6	W2ZM	Penn Yan, NY

Two of these operators were invited to join the initial WD2XSH group, but declined. The key parameters of this license are:

- 505 - 515 kHz,
- 200 W ERP,
- Portable operation within 300 km,
- Wide variety of modulation modes, and
- Communication with foreign amateurs.

Stations 1, 2, 3, and 6 are on the air, and several QSOs have been made between the XGR and XSH stations. Access to a part of the NDB band (510 - 515 kHz) required coordination with the FAA. It was approved because there are no NDBs in New England in this frequency range. This suggests the future possibility of amateurs using this part of the spectrum on a regional basis.



WE2XGR/6, /2, and /1 received in Ohio by KN8AZN.

WE2XGR has added several new stations to the band and provided more opportunities for QSOs and ground-wave tests. We expect WE2XGR to provide useful insight into the performance of various digital modes on this frequency. However, WD2XSH/23 is now operating as WE2XGR/1. Another downside is that WE2XGR stations are not required to keep logs and this will make analyzing their experiment and adding their hours to ours difficult.

Other US Experimental Licenses

KL1X has applied for an experimental license for QTH near Anchorage, Alaska. He has requested 505 to 515 kHz, which will require coordination with the FAA.

K1ENT has modified his application so that the frequency range is now 505 - 515 kHz rather than the initial request of 500 - 510 kHz.

New Museum Stations

Two new coastal-station license have been issued for MF operation. The applications have been inspired by the Maritime Radio Historical Society in its efforts to preserve historically

accurate 500-kHz maritime communications. A 5-kW power level is authorized. The stations are:

CALL	OPERATOR	LOCATION	FREQUENCIES, kHz
KDR	James Dalke	Bellvue, WA	500, 482
WFT	Joseph Venable	Palmeto, FL	500, 486

A couple of years ago, most of the former marine radio officers were opposed to amateurs having access to 500 kHz. Things changed when the German Ministry of Transport proposed using 500 kHz for NAVTEX. The majority of the ex-R/Os now sees amateurs as their best hope for keeping CW on 500 kHz and ensuring long-term operation of museum stations.

Appendix 13

WRC-07 suppressed Appendix 13 of the ITU regulations. This removes the designation of 495 - 505 kHz as a distress/calling frequency. It is now simply allocated for maritime telegraphy. This means amateurs could petition for shared access. Of course, it also means other would-be users can also petition for access. It is not clear whether this automatically flows down to the FCC rules (Section 2.106, Paragraph 5.83) or whether the FCC rules must be explicitly changed to reflect the ITU action.

WRC-11

WRC-07 put an item on the provisional agenda for WRC-11 "to consider an allocation of about 15 kHz in parts of the band 415-526.5 kHz to the Amateur Service on a secondary basis, taking into account the need to protect existing services." The first Conference Prepatory Meeting (CPM) was held at the end of WRC-07 and designated Working Party 5A to perform related studies. Paul Rinaldo W4RI is chairman of the Working Group that will perform the studies. The next CPM will be held in February 2008 and will likely determine what studies are to be conducted. Studies must be concluded by July 2010.

5. PLANS

The winter offers low QRN levels. The number of sunspots will probably be lower this winter than at any time for the next ten years or so. Consequently, the D layer should be relatively weak and conditions for long-range reception and contacts should be excellent. The operators will no doubt want to take advantage of this and spend their time this winter on long-distance QSOs.

Most operators will be making improvements to their stations. One must remember that operating on 500 kHz is not as simple as cutting a jumper in a commercial transceiver to allow it to operate on 5 MHz. The 500-kHz stations are put together from a variety of different equipment and even things as simple as T/R switching to facilitate QSOs generally requires some work.

I am going to encourage more activity in three areas that are needed to demonstrate the capabilities of 600 meters for amateur emergency communications:

- Digital operation (all three modes, ground-wave and sky-wave),
- Ground-wave tests, and
- 24-hour tests.

The objective of the "24-hour test" is to show that regional communication can be maintained around the clock. This can be demonstrated by beginning communications in the afternoon when the D layer is strong, continuing through sunset, and continuing for some time into the evening. This will also tell us whether mixed-mode MF propagation is sufficiently stable for PSK/MSK, or whether FSK will be required at certain times. Since this sort of operation is not as exciting as long-range QSOs, we may need to find an incentive for participating, or a disincentive for not participating.

It is imperative that we discuss the recommendations for additions to the license [M07-7] so that we can get this process underway. Seventeen qualified candidates for addition to the license have been identified. The additions will expand geographic coverage, provide additional opportunities for ground-wave tests, and provide additional digital-capable operators. Other possible additions include expanded frequency range, digital modes, and communication with other stations.

Finally, we will support studies for WRC-11 as requested.

APPENDIX. STATISTICS

STATION	CALL	STATUS	07/31/07		10/31/07		COMMENT
			HOURS	QSOs	HOURS	QSOs	
WD2XSH/1	W1NZR	ON	3:07	3	4:52	3	
WD2XSH/2	W5TVW	OFF	12:31	22	12:31	22	Family illness
WD2XSH/3	WD5CVG	DROPPED	-	-	-	-	
WD2XSH/4	WD4PLI	DROPPED	-	-	-	-	
WD2XSH/5	KW1I	ON	18:21	40	18:33	38	Antenna repair
WD2XSH/6	W5THT	ON	1500:27	33	2052:57	37	
WD2XSH/7	W5JGV	MOVED	-	-			
WD2XSH/8	N4ICK	OFF	0	0	0	0	
WD2XSH/9	W2ILA	ON	9:07	25	9:37	26	
WD2XSH/10	W4DEX	ON	519:49	17	543:14	17	
WD2XSH/11	WS4S	ON	761.28	11	809.42	12	
WD2XSH/12	AI8Z	ON	1394:56	0	3581.28	0	
WD2XSH/13	KOJO	ON	460.22	0	626:49	0	
WD2XSH/14	W1FR	ON	17:09	3	20:17	3	
WD2XSH/15	W5OR	ON	873:30	2	873:30	2	Antenna repair
WD2XSH/16	WE0H	ON	2:28	0	2:38	0	

WD2XSH/17	AA1A	ON	429:40	23	553:18	23	
WD2XSH/18	N1EA	ON	0	0	2119:04	0	24/7 beacon
WD2XSH/19	K9EUI	ON	1158:01	3	1192:13	3	
WD2XSH/20	N6LF	ON	1775:04	0	1857:48	0	
WD2XSH/21	W0RW	DROPPED	652:42	0	652:42	0	
WD2XSH/22	WB2FCN	MOVED	-	-	-	-	Ready
WD2XSH/23	K2ORS	ON	110:10	0	110:10	0	Log error
TOTAL		17 ON	9,239	91	13,849	93	

Note:
Operating hours and QSOs are derived from logs through October 31, 2007.
Total number of QSOs is half the total shown for individual stations