The Illuminator

The monthly newsletter of the Carbon Amateur Radio Club

February 2002

February Meeting

The next regular meeting of the Carbon Amateur Radio Club will be held on Thursday, February 21, at 7:30 p.m. at the EMA Center in Nesquehoning. See you there!

KB3BYT Amateur Radio Demo at Through the Looking Glass Cyber Café in Jim Thorpe

Rob's traveling amateur radio demonstration to potential hams is all set for Thursday, February 28 at 6:30 p.m. at Through the Looking Glass Cyber Café at 111 Broadway in Jim Thorpe. Come on out and support Rob, as well as potential new hams.

2002 CARC Membership Dues

Yes, 2002 Carbon Amateur Radio Club membership dues are being collected. Just $15 buys you membership in this august group for all of calendar year 2002! Please get your membership dues in as soon as possible. A membership application may be found on page 7 of this newsletter.

Traditionally, if dues are not received by April 1, you are dropped from the membership roster and you stop receiving this newsletter. Don't let this happen to you!

Pennsylvania RACES Members Activate for Nursing Home Fire

Hams responded December 15, 2001, after fire broke out at Cedarbrook County Home in South Whitehall Township and soon was upgraded to a four-alarm fire.

Emergency Management Agency Coordinator James Kelly, KA3UQP, began opening temporary shelters in anticipation of the evacuation of the 515 residents. He notified the South Whitehall EMA team that included Jeff Kelly, N3MFT, who is the Township EMA Communications Officer, Lehigh County Emergency Coordinator and RACES Radio Officer. It was agreed that RACES would be activated to staff the shelters and provide additional support.

A net was established, and Deputy RACES Officer Bruce Bobo, KB3FIH, directed operations from the county's mobile command center at the fire scene. RACES members were deployed to the scene as well as at shelter locations and the local trauma center. Over the next 24 hours, more than two dozen RACES members helped to provide communications until temporary shelters had shut down and residents transported to appropriate care.

On December 17, Lehigh County EMA contacted Kelly for RACES to assist in coordinating the return of patients to the facility, which received smoke and water damage. Bobo said RACES was called back in to help because it was determined that the amateur system had the best communications coverage over the four-county area where patients had been sheltered temporarily. More than 20 RACES members from Lehigh and Northampton counties provided support for the safe return of all 515 residents. Authorities expressed appreciation to the RACES teams and for use of the W3OI 146.94, W3OK 146.70 and N3MFT 448.775 MHz repeaters. – Jeff Kelly, N3MFT

Retired Kenwood Executive and Chief Engineer is Silent Key

Shiro Nomura, JA1CB, of Tokyo, Japan, died January 18. He was 70. An ARRL and Japan Amateur Radio League member, Nomura was a Kenwood Communications Corporations chief engineer and research-and-development manager prior to his retirement. He also was the designer of the popular TS-930S transceiver. Between 1989 and 1997, he directed Kenwood USA operations in California. Nomura was a DXCC Honor Roll member (352 mixed) and was active on the air until shortly before he died. Survivors include his wife and the couple's son and daughter. A service was held January 22 in Tokyo. Friends may express condolences to the family via e-mail, ja1cb@jarl.com. – Junji Saito, JA7SSB

New HF Amateur Radio Antenna Installed on ISS

Amateur Radio on the International Space Station gained a new HF antenna January 25 – although there's no HF gear aboard the ISS as yet. The antenna – the second of four slated for installation aboard the Service Module – was put into place during a spacewalk – or EVA – conducted by Expedition 4 Crew Commander Yuri Onufrienko, RK3DUO, and astronaut Dan Bursch, KD5PNU.

The antenna is a flexible-tape design – similar to, but longer than, a VHF-UHF antenna installed during a Jannuary 14 EVA by Onufrienko an astronaut Carl Walz, KC5TIE. ARISS Board Chairman Frank Bauer, KA3HDO, said the antenna would be installed at the end of the Service Module in the 2 o'clock position (6 o'clock is pointing toward Earth).

The HF antenna is a 2.5-meter (8.2-foot) long flexible tape. Bauer thinks it will definitely work on 10 meters and speculated that it might work on 15 or 20 too. Bauer added that he did not know when HF gear would be transported to the ISS nor when it might be made available for use by a future crew.

The EVA lasted several hours and also involved attaching six thruster plume deflectors on the ISS as well as the ham antenna work. Installation involved not only the mechanical deployment of the antenna but routing cables, establishing the RF connection and even photographic documentation.

A paper entitled "2001: an Amateur Radio Space Odyssey on the International Space Station," which details the development of ARISS and discusses the four new ARISS antennas is available via the ARISS Web site <http://ariss.gsfc.nasa.gov/EVAs/amsat01.pdf>.

The Expedition 4 crew is tentatively scheduled to speak with students at Butte High School in Montana the week of January 28. The contact was being arranged either via Tony Hutchison, VK5ZAI, in South Australia or via WH6PN at Sacred Hearts Academy in Honolulu.

ARRL DX Bulletin

DX Bulletin 5 ARLD005
From ARRL Headquarters
Newington CT January 31, 2002
To all radio amateurs

This week's bulletin was made possible with information provided by Tedd, KB8NW, the OPDX Bulletin, The Daily DX, PY3FBI, W4TYU, 425DXnews, QRZ DX, DXNL and Contest Corral from QST. Thanks to all.

EQUATORIAL GUINEA, 3C. Mirek is QRV as 3C5/SP1NY from Bioco Island, IOTA AF-101. Activity has been on 30, 12 and 10 meters using CW. QSL to home call.

GEORGIA, 4L. Yuri, 4L6VV has been QRV on 80 meters using SSB around 1500z. QSL via UA6EZ.

SOUTH SHETLAND ISLANDS. Ricardo, CE9R is QRV from Julio Escudero Base on King George Island. He has been active in nets on 15 meters around 1700z. QSL via CE3HDI.

SAINT MARTIN, FS. W4LW and K4FMD will be QRV as FS/K4UP from February 2 to 8. Activity is mostly SSB on 80, 20, 15 and 10 meters. Activity will be mostly in the evening and early morning hours. QSL via K4UP.

WALLIS AND FUTUNA ISLANDS, FW. Guy, FW5ZL has been QRV using RTTY on 20 meters around 0645z and 15 meters around 0830z.

GRENADA, J3. Bill, K4LTA and Ruby, K4UPS are QRV as J37BO and J37RO, respectively. Activity is on all bands, including the newer bands and 6 meters, using CW and SSB. During some of the upcoming contests, they will use J38A. QSL to home calls and J38A via K4LTA.

US VIRGIN ISLANDS, KP2. Norm, K8NI and John, W8LBY are QRV from the WP2Z-Windwood site until February 13. They are signing KP2/homecalls, with activity mostly on the newer bands and using PSK31. QSL to home calls.

NORTH KOREA, P5. Ed, P5/4L4LN is QRV as time permits. Activity has been on 15 meters just after 2300z. He may also be active on 10 meters. QSL via KK5DO.

NETHERLAND ANTILLES, PJ2. Tony, N7BG is active as PJ2/N7BG from Curacao, IOTA SA-006, until February 4. He will participate in the FOC Marathon as PJ2T. QSL PJ2/N7BG to home call and PJ2T via KN7Y.

BRAZIL, PY. Special Event Station ZY3WSF is QRV on 80 to 10 meters using CW and SSB until February 5 from Porto Alegre during the World Social Forum. QSL via PY3FBI.

SEYCHELLES, S7. Karesz, HA8EU is QRV as S79EU from Mahe Island, IOTA AF-024, until February 18. Activity is on 40 to 10 meters using CW and some SSB. QSL via HA2NM.

SOUTH GEORGIA. The VP8GEO team are QRV on 160 to 10 meters using CW, SSB and RTTY. QSL via VE3GCO.

CAMBODIA, XU. Jaak, ES1FB is QRV as XU7ACE. QSL to home call.

AFGHANISTAN, YA. Look for YA0USA and YA5T to be QRV as time permits. QSL YA0USA via K4YT and YA5T via KU9C.

IRAQ, YI. Peter, YI9OM has been QRV on 20 meters between 1830 and 1930z. QSL via OM6TX.

ARRL Propagation Forecast Bulletin

Propagation Forecast Bulletin 4 ARLP004
From Tad Cook, K7VVV
Seattle, WA January 25, 2002
To all radio amateurs

Average sunspot numbers rose over 9 points this week, and average solar flux dropped nearly 8 points, so solar activity was about the same as last week. There weren't any days with big geomagnetic upsets. Saturday was slightly unsettled, with the planetary K index at 4 over two of the 3-hour reporting periods. Because of lower indices earlier, the planetary A index for the day was only 11. As mentioned last week, for information on the relationship between the daily A index and the eight-times daily K index, check http://www.ngdc.noaa.gov/stp/GEOMAG/kp_ap.html.

Latest projections show stable geomagnetic conditions well into next month, with planetary A indices in the low and mid single digits. This is generally good for HF operators because of lower absorption. Predicted solar flux for Friday through Sunday is 225.

NASA reported this week that the previous two solar cycles were double-peaked, and the current one is also. At one time we believed that Cycle 23 peaked in mid-2000, but then a larger peak emerged in late 2001. No doubt this explains all that fabulous F2 layer propagation on 6 meters last fall. You can read NASA's story on the web at http://science.nasa.gov/headlines/y2002/18jan_solarback.htm.

Here are some general observations about HF conditions from the continental U.S. over the next few weeks.

Toward Europe, 80 and 40 meters open right after local sunset and stay good until the wee hours after midnight. 30 meters works all day and night, but is weakest during local mid-morning in the east and Midwest, and before sunrise on much of the west coast. 20 meters opens around sunrise. In the Midwest and east, conditions are best an hour or two before local sunset. This decreases as you move west, where 20 meters closes down before local sunset. 17 and 15 meters open around sunrise, and close earlier than 20 meters. 12 and 10 meters open for most of the U.S. about two hours after sunrise

and close a few hours before sunset, but this shortens considerably as you move west.

Toward South America, 80 meters is best three hours after sunset until after midnight, and 40 meters one hour after sunset and closing an hour after 80 meters. 30 meters should be open from sunset until a few hours before sunrise, and 20 meters from before sunset until about four hours before sunrise. 17 and 15 meters should open around sunrise until two hours after sunset, and 12 and 10 meters from after sunrise until sunset.

Toward East Asia (Japan) 80 and 40 meters are best after midnight until an hour before sunrise. But on the West Coast, both bands should stay open until about an hour after sunrise. 30 meters is good from early evening until sunrise in the central states, but should be dead from the east coast during the early evening. On the West Coast 30 meters should be good from the late evening until an hour after sunrise. 20 meters should be best around sunset until the mid to late evening, but on the West Coast 20 meters is best from the mid until late evening, then again from local sunrise until about two hours later. 17 and 15 meters should be best for about four hours centered around local sunset, except on the West Coast where it lasts around six hours. 10 and 12 meters should be open for 1-2 hours around sunset, except on the West Coast where it should last around four hours.

Remember that the sunrise, sunset and times of day are for your location. As an example, local sunset in New York City is around 2200z, and in Central California it is after 0100z.

The above predictions are very general. To get a more accurate reading specific to your location, use W6ELprop to predict paths using the average solar flux for the previous few days. As mentioned in previous bulletins, you can download this free propagation predicting program at http://www.qsl.net/w6elprop/. If you want to check some of the material presented in past bulletins, go to http://www.arrl.org/w1aw/prop/.

Sunspot numbers for January 17 through 23 were 122, 156, 153, 212, 187, 178 and 272 with a mean of 182.9. 10.7 cm flux was 211.8, 210.5, 213.7, 222.2, 224.5, 228.7 and 226.5, with a mean of 219.7, and estimated planetary A indices were 6, 5, 11, 7, 9, 6 and 6 with a mean of 7.1.

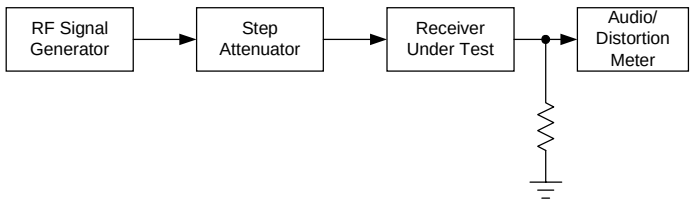
Receiver Performance Measurements

By Bob, K3PH

Recently, one of our members asked a question on the CARC e-mail reflector about receiver performance measurements. Partly as a result of this, I decided to write this description of probably the three most-used receiver measurements: minimum discernible signal (MDS), blocking dynamic range (BDR), and intermodulation dynamic range (IMDR).

Minimum Discernible Signal (MDS) Test

The purpose of the minimum discernible signal (MDS) test is to determine the level of signal that will produce an audio output from the receiver that is 3 dB about the noise floor. The test is conducted with the receiver in CW mode with a 500 Hz filter (or the closest available), and the AGC set to OFF, if possible. A typical test setup is shown in the figure below.



All equipment is turned on and allowed to warm up. Then, the RF signal generator is set to a frequency in the band of interest, say, 14020 kHz, and the receiver is tuned for a peak response. Next, the RF switch on the RF signal generator is turned OFF and the level on the audio/distortion meter is noted. Finally, the RF switch on the RF signal generator is turned ON and the output level is adjusted to increase the reading on the audio/distortion meter by 3 dB. The RF signal level that creates this situation is the MDS.

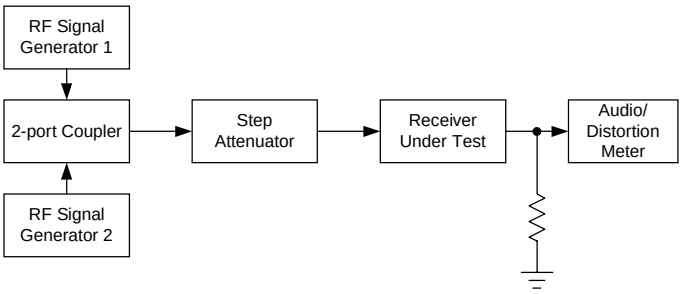
For example, if the RF signal generator is set for –125 dBm output and the step attenuator is set for 10 dB attenuation, the MDS is –125 – 10 = –135 dBm.

If you look at the product reviews published in QST, you will see MDS levels of anywhere from –142 dBm to perhaps –125 dBm. A value of –142 dBm is more sensitive than –125 dBm. However, in the real world, values of better than around –130 to –132

dBm will not be noticed at frequencies below 30 MHz, because atmospheric noise will be far greater than these levels. An MDS of –142 dBm is really just a laboratory curiosity.

Blocking Dynamic Range (BDR) Test
The purpose of the blocking dynamic range (BDR) test is to determine the level of gain compression, or desensitization, that occurs as a result of a signal on a nearby frequency. The BDR is the difference between the MDS and the level of an undesired signal that produces a 1 dB decrease in a weak desired signal. As before, the test is conducted with the receiver in CW mode with a 500 Hz filter (or the closest available), and the AGC set to OFF, if possible. A typical test setup is shown in the figure below.

Note the need for two RF signal generators – one to simulate the desired weak signal and one to simulate the undesired signal. It should also be noted that the 2-port coupler used to couple two RF signals to one receiver usually contributes about 3 dB insertion loss.



All equipment is turned on and allowed to warm up. First, the RF switch on RF signal generator 2 is turned OFF – this will be the undesired signal. Then, RF signal generator 1 is set to a frequency in the band of interest, say, 14020 kHz, and the receiver is tuned for a peak response. The next step is to determine the 1 dB compression point by increasing the output of RF signal generator 1 to a point where a further 10 dB increase only results in a 9 dB increase in the audio output. Once the 1 dB compression point is found, the output of RF signal generator 1 is decreased by 10 dB.

Next, the RF switch on RF signal generator 2 is turned ON and its frequency adjusted for 14040 kHz. Finally, the level of RF signal generator 2 is increased until the audio output from the receiver decreases by 1 dB. The difference between the output level of RF signal generator 2 (attenuated by the 2-port couple loss and the step attenuator) and the MDS is the BDR.

For example, if RF signal generator 2 is set for –12 dBm, the 2-port coupler has 3 dB insertion loss, and the step attenuator is set for 10 dB loss, then the undesired signal level is –12 dBm – 3 – 10 = – 25 dBm. If the MDS is –135 dBm, then the BDR will be –25 – (–135) = 110 dB.

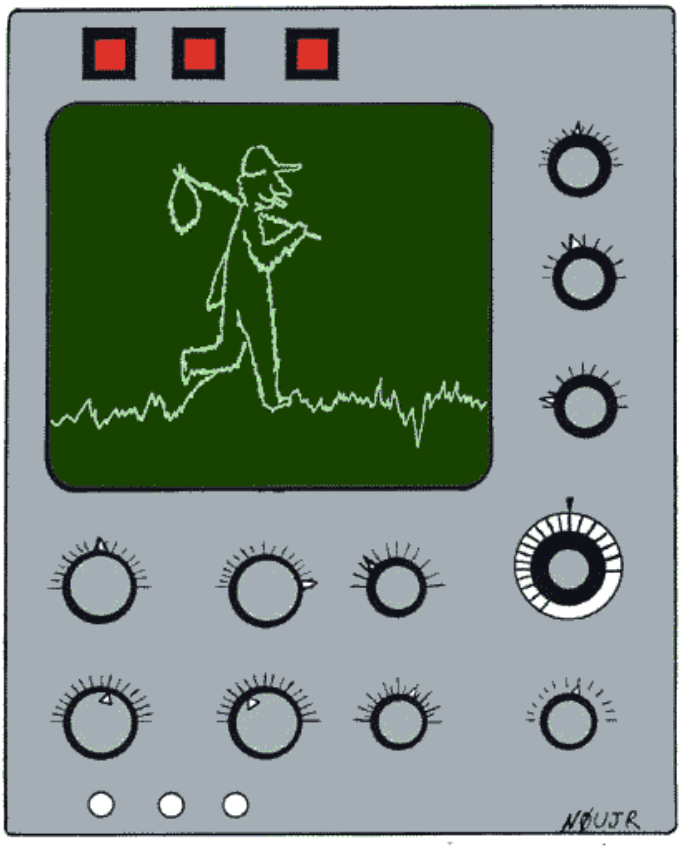
Most modern receivers will have a BDR of well over 100 dB. In general, unless you live right down the street from another amateur or you are trying to run a multi-transmitter arrangement, the BDR will not be nearly as important to you as the IMDR.

Intermodulation Dynamic Range (IMDR) Test
The purpose of the intermodulation dynamic range (IMDR) test is to determine the range of signals that can be tolerated by the receiver while producing no discernible spurious response. To perform this test, two signals of equal amplitude, spaced 20 kHz apart, are applied to the receiver input and the receiver is checked for a spurious response 20 kHz away from either of the applied frequencies. For example, if the two applied signals are at 14020 kHz and 14040 kHz, the receiver is checked for a spurious response at 14060 and/or 14000 kHz. As before, the test is conducted with the receiver in CW mode with a 500 Hz filter (or the closest available), and the AGC set to OFF, if possible. The BDR test setup is also used for the IMDR test.

All equipment is turned on and allowed to warm up. First, RF signal generator 1 is set to 14020 kHz and RF signal generator 2 is set to 14040 kHz (both set to the same output level), and the receiver is tuned for a peak response at 14060 kHz. Then, the RF switches on both RF signal generators are turned OFF and the audio output of the receiver is noted. Finally, the output levels of both RF signal generators are adjusted for a 3 dB higher indication on the audio/distortion meter, i.e., a spurious response is barely audible in the receiver. The IMDR is the difference between the MDS and the output level of the RF signal generator (attenuated by the 2-port coupler and attenuator).

For example, if both RF signal generators are set to –20 dBm, the attenuator is set for 24 dB loss, and the 2-port coupler has 3 dB loss, then the signal level is –20 dBm – 24 –3 = –47 dBm. If the MDS is –135 dBm, then the IMDR will be –47 – (–135) = 88 dB.

Most modern receivers will have an IMDR of 85 dB or greater, with some even approaching 100 dB. For most routine amateur operation, an IMDR of 80 dB will be more than sufficient.



A digital storage oscilloscope records a 16 nanosecond AC line transient.

Check out http://incolor.inetnebr.com/n0ujr for other cartoons and to purchase N0UJR's book, "N0UJR and His Friends."

Carbon Amateur Radio Club
2002 Membership Application Form

Please complete this form and send to the Carbon Amateur Radio Club, P. O. Box 622, Lehighton, PA 18235-0622, or drop it off at the monthly CARC Meeting, at the Carbon County EMA Center, Route 93. The meeting is on the third Thursday of each month at 7:30 PM.

Callsign _____ Name _____

Address _____

City _____ State ____ Zip Code _____

Phone Number _____ Check if unlisted __

Email address _____ URL _____

Check if ARRL Member___

Membership (check one): Full ($15.00)____ Associate ($10.00)____
Additional family member ($5.00, up to a maximum of $25.00 per family)____

I would like to receive the Newsletter via (check one): Postal Mail ____ Web ___

Check here if you would like to be subscribed to the CARC Email Reflector _____
(Requires email address above. Do not check if you are currently subscribed to the reflector)

What are your interests in ham radio? _____

_____

What activities would you like to see at CARC this year? _____

_____

I'm interested in (check all that apply): Newsletter Writing ___ Tee Shirts ___ Coats ____

Foxhunting ___ Special Events Station ___ RACES ___ QRP ___ DX ___ Contests ___

Carbon Amateur Radio Club – 2001-2002 Officers

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Services

W3HA Repeater: 147.255 Mhz + PL 131.8

CARC Website: http://www.cpals.com/~elitehom/carc/
Webmaster: Rob, KB3BYT roomberg@ptd.net

CARC Email Reflector: see www.qth.net CarbonARC list for details

CARC Membership Information

Regular Membership is $15.00, which includes autopatch privileges.

All amateur radio operators are invited to join the CARC ARES / RACES net held 21:00 local time every Wednesday on the W3HA repeater at 147.255 MHz + offset, PL 131.8. Any amateur radio operator or anyone with an interest in ham radio is welcome to attend our monthly meetings which occur the third Thursday of each month at 7:30 PM at the Carbon County EMA Center on Route 93 in Nesquehoning.

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