

December 16, 2006 - Volume 44, Number 14 - Edition 1396 - ISSN 899-9733

IRCA welcomes **Eric Svajdlenda** in Mukilteo, WA (rejoins). FYI, our next issue will be a SDXM-only issue with a double printed issue following Christmas.

HQ NOTES

It's time to consider who you will want to represent you as IRCA's next president and Board of Directors (their term will start September 15, 2007). Per the IRCA Constitution, Article III, Section 5, Part 2: Nominations shall be open for President, Secretary-Treasurer, and the seven members of the Board of Directors from December 1 (2006) through January 15 (2007). Only one nomination each for President, Secretary-Treasurer, and only seven nominations for the Board, shall be allowed each IRCA member. An eligible member may nominate himself or herself. All nominations must be submitted in written form to the ECC by January 15.

IRCA's Election Committee Chair (ECC) is **Ray Bauernhuber**, who can be contacted at **raydx@msn.com** ("written form" includes an e-mail submission, and that is easiest for Ray) or at his postal address of 151-64 18th Ave, Whitestone NY 11357-3102 if you do not use e-mail.

The 2007 **IRCA/DecalcoMania** convention will be held in Salt Lake City UT on August 24-26, 2007 at the Airport Days Inn, 1900 West North Temple, SLC UT 84116. Telephone (801) 539-8538. Request the IRCA convention discount rate of \$50 per night. Registration fee (not including Saturday banquet) is payable to **Mike Sanburn**, PO Box 1256, Bellflower CA 90707-1256, USA. Hotel website is: www.the.daysinn.com/saltlakecity06838. Trip rewards site: www.triprewards.com. Tourism site: www.utah.travel. Delta airlines web: www.delta.com.

BROADCAST TEST COORDINATOR – DX TESTS

Les Rayburn: les@highnoonfilm.com (times are Eastern) <http://www.dxtests.info>

daily 0100-0600 1560 WMRO Gallatin TN (Bailey)
 Sun 12/17/06+ 0000-0005 1230 WODI Brookneal VA (Marthouse)

WMRO 1560khz Gallatin, TN DX Test Date(s): Midnight to Five AM Central Time October 30th thru ???. Time: Midnight until 5:00AM Central Time. Modes of Operation: "Inventory Insert" 60 Second Long Test. 0.003kw Non-Directional. (One night may include a brief full daytime power test). Programming: Morse Code ID's, Sweep Tones, 60 Second Long "Inventory Insert" during local breaks. Notes: Transmitter audio chain testing. Exact times of the inserted spots will be given closer to the test time period. In general, look for the test to run near the Top of the Hour (TOH). The extreme low power of this station at night should make this one a nice challenge!

This test will likely continue nightly for months to come, so please try for it.

Please note the following change in QSL information: The station now desires to receive reports directly and only via regular Postal Mail. No telephone calls or e-mails, please! Scott Bailey is dealing with a family medical situation, so responses may take several weeks. Be patient and do not make this too much of a chore for him.

Send Postal reports and/or recordings to: Scott Bailey, President & General Manager, WMRO Radio, Magic 1560, PO Box 1445, Gallatin TN 37066. Please include a SASE for reply.

Our thanks Scott Bailey of WMRO, who's always been very DX Friendly! And also to Paul Walker, who helped to arrange yet another test for all of us.

WODI 1230khz Brookneal, VA DX Test Dates: Sunday Morning (Late Saturday Night) Starting October 1st and continuing until further notice. Time: Midnight until 00:05AM Eastern Time (5 Minute test each week). Modes of Operation: Special DX Test. 1,000 Watts, Non-Directional. Programming: Morse Code ID's, Sweep Tones, Voice ID. Notes: This DX friendly station is co-owned by two

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amateur radio operators, and they have decided to conduct this rare, on-going DX test, giving listeners a weekly opportunity to put this station into the log books.

Reception reports are desired via e-mail (first choice) and snail mail (only if e-mail is not available). Station would prefer to receive recordings of the test (MP3, CD, or cassette). Submit reports to: **les@highnoonfilm.com**. Please put "WODI DX Test" in the subject line. All standard mail reports should go to: Les Rayburn, High Noon Film, 100 Centerview Drive Suite 111, Birmingham AL 35216. *SASE Required for reply.

Thanks to Dave Marthouse, N2AAM & Tony DeNicola, WA2IHZ for putting on this unusual, long term DX tests for the benefit of distant listeners!

WESTERN DX ROUNDUP

Nancy Johnson – 265 Waterton Wy – Billings, MT 59102-7755

E-mail: **NancyJohnson@prodigy.net**

WDXR DEADLINES: Each Friday. Please use Eastern Time.

REPORTERS FOR THIS ISSUE:

- (BB) **Bill Block**-7716 E. Thelma Drive-Prescott Valley, AZ 86314 **billwbblock@msn.com**
Drake R8, EWE (20x50x20), Quantum QX loop
- (GH) **Glen Hansen**-1925 Tualatin St.-St. Helens, OR 97051 **skinner@columbia-center.org**
Drake R8B, R-390A, R-388, Hammarlund SP-600, various wires, amplified Sanserino loop, Radio Shack loop
- (PM) **Patrick Martin**-P.O. Box 843-Seaside, OR 97138-0843 **mwdxer@webtv.net**
Drake R8, 1500' Eastern Beverage, term.
- (CM) **Curtis McMenamin**-153 Calle Tepic-Vacaville, CA 95687-6530 **funkiecurtis@juno.com**
Sony ICF-2010, Kiwa loop
- (DP) **Doug Pifer**-3410 Marion St. SE-Albany, OR 97322 **oregon4wd@comcast.net**
Drake R8B, Kiwa loop
- (NP) **Nigel Pimblett**-Box 168-Dunmore, AB T0J 1A0 **ntp@shockware.com**
Kenwood R-5000, K9AY
- (MS) **Mike Sanburn**-P.O. Box 1256-Bellflower, CA 90707-1256 **mikesanburn@hotmail.com**
Sony M-40W, GE Superadio II
- (REW) **Richard E. Wood**-HC 3 Box 11087-Keaau, HI 96749-9221
ICOM R75, LW's 350' to NE, 175' to NNE

- *****
- 540 KNMX **NM**, Las Vegas 12/5 1950 with ID "KNMX." (BB-AZ)
 - 590 KTIE **CA**, San Bernardino 12/1 0900 with "KTIE" ID. (BB-AZ)
 - 630 KHOW **CO**, Denver 11/29 0505 coming out of weather with ID "KHOW Denver's Talk Station." (MS-CA)
 - 680 (KNBR) **CA**, San Francisco 11/28 0400 signing off for maintenance announcement, back on at 0500. Just a mix of stations while off air. (CM-CA) (You heard them off on 11/28???—NJ)
+11/29 0400 man said "KNBR will be off the air for transmitter maintenance. We will be back with more ESPN Radio." Carrier cut, leaving only an empty channel. Below average conditions. Thanks anyway to engineer Lee at KNBR/KTCT. (REW-HI)
+11/29 0400 heard their sign off for maintenance brief announcement at top of hour then gone. Off the air for about 52 minutes. (MS-CA)
 - 710 WAQI **FL**, Miami 11/26 0055 Spanish talk, ID in English as "WAQI Miami," then "Radio Mambi" slogan. (NP-AB)
 - 720 WGN **IL**, Chicago 12/3 2007 with "WGN News Time" way on top of KDWN. (BB-AZ)
 - 740 CHWO **ON**, Toronto 12/3 0115 good on top of KCBS off Eastern Beverage with song "Poor People of Paris," ID at 0115 "PrimeTime Radio serving Southern Ontario and...." (PM-OR)
 - 840 KMPH **CA**, Modesto 11/29 0530 in very good with "This is the new KMPH." Sometimes I can null them, but very hard tonight. Sometimes I can null them down to nothing and hear a mix of stations under them. (CM-CA)
 - 880 CHQT **AB**, Edmonton 11/26 2130 oldies with several "Cool 880" ID's. Big & strong like a local on SP-600 with N-S wire. (GH-OR)
 - 910 KECR **CA**, El Cajon 11/24 0700 ID and mentions of sister station KFRN Long Beach. (MS-CA)
 - KRAK **CA**, Hesperia 12/2 0854 with ID "Stardust 910 KRAK." (BB-AZ)
 - KNEW **CA**, Oakland 12/2 0830 with "KNEW" ID. (BB-AZ)
 - 920 KVEC **CA**, San Luis Obispo 12/4 0930 with ID "KVEC." (BB-AZ)
 - 980 KSVC **UT**, Richfield 12/3 1700 with "KSVC" ID. (BB-AZ)
 - 1010 CBR **AB**, Calgary 12/3 0912 with weather report. (BB-AZ)
 - 1020 KWIQ **WA**, Moses Lake North 11/25 0100 ESPN sports talk, weak but readable in with unID GOS, KINF? Thought I may have had them before, but no. New. On R-388 with E-W wire. (GH-OR)

1050 (KCTC) CA, San Mateo 11/28 0200 signing off air announcing that they will be off the air for an hour. Just a mix of stations while they were off, back on 0300. (CM-CA) (You heard them go off on 11/28?—NJ)
 +11/29 0203 went off air, 0250 back on. Revealed only XEG N.L. at below-average strength (poor conditions) and 3 words in English from a possible Canadian (see unID's). (REW-HI)

1070 KVKK MN, Verndale 11/26 0150 all Christmas music, no talk until ID at the hour as "Minnesota's newest star, 10,000 watts of true country, KVKK, Verndale, 1070 AM." (NP-AB)

1090 KVOP TX, Plainview 12/2 1945 with ID "Right here on KVOP." (BB-AZ)

1110 KBND OR, Bend 11/28 1905 with "KBND" ID. (BB-AZ)

1120 KZSJ CA, San Martin 11/28 1959 with ID in English. (BB-AZ)

KMOX MO, St. Louis 11/27 0300 in poor with KMOX ID. Have not heard for a while. (CM-CA)

1230 KSJK OR, talent 12/6 0759 poor to fair, "The news and information service of Southern Oregon University's Jefferson Public Radio, KSJK Talent and KAGI Grants Pass." BBC and CBC programming. New. (DP-OR)

1240 KTIK OR, Pendleton 11/25 1835 sports talk with ID. Very weak with one Spanish unID far under on S-600 with N-S wire. Seldom hear this one. Last heard 9/05. (GH-OR)

1250 KHIL AZ, Willcox 11/29 1932 with ID "Classic Country 1250." (BB-AZ)

1260 KKG0 CA, Beverly Hills 11/23 1300 playing all nostalgia Christmas tunes (on Thanksgiving) prior to their impending format change to country. (MS-CA)

1290 KPAY CA, Chico 11/29 0300 in fair with "KPAY Chico" ID. (CM-CA)

1420 KIJ WA, Walla Walla 11/21 2345 ESPN sports talk. Fair signal with deep slow fades, trading places with semi-local KITI on R-390A with N-S wire. (GH-OR)

1450 KLBM OR, La Grande 11/22 0130 mention of "Supertalk 1450" and news, in a jumble with KFLS and perhaps(?) KXKO. Weak and drifts on R-390A with N-S wire. New. (GH-OR)

KCLX WA, Colfax 11/23 0045 C&W in a mixed up jumble with unID Art Bell talker, probably KONP. Last heard in April. Really weak on R-390A with E-W wire. (GH-OR)

1470 KNFL UT, Tremonton 11/30 2259 Christmas song, ID as "Great songs and great memories, KOGN 1490 Ogden and KNFL 1470 Tremonton," then CNN news. Other than the top of hour ID, other ID's only mentioned KOGN. (NP-AB)

1490 KICO CA, Calexico 11/25 2300 ID "This is KICO 1490 AM Calexico." Noted later playing back to back rock 'n roll hits by David Bowie & Led Zeppelin. (MS-CA)

KRKC CA, King City 11/29 0533 fading up with "KRKC Country" ID. (MS-CA)

KRNR OR, Roseburg 11/29 0030 man said "The station where the legends play, 1490 KRNR," C&W in a mixed up tangle with unID's. Heard only once before back in September. (GH-OR)

DX TESTS

750 KERR MT, Polson 11/29 0205-0528 in good with "Montana's Country Original 750 KERR Polson, Montana, an Anderson Broadcasting station. (CM-CA) (exact time?-pb)

930 KLCY MT, East Missoula 11/29 0200-0400 in very poor with Morse code IDs and sweep tones. (CM-CA) (At what time did you hear them with code & tones? We listened to them around 0240-0250 when they had NOS music & regular voice IDs.—NJ)

1290 KGVO MT, Missoula 11/19 0200-0400 very poor with Morse code and sweep tones. Also heard "KGV" mentioned. (CM-CA) (At what time did you hear the code & tones? We were listening to them 0255-0305, but heard just their normal talk programming & regular ID at the top of hour into news.—NJ)

1490 (KRSN) NM, Los Alamos 11/26 0300-0310, 0400-0410 DX test tried, not heard (possible bits of code at 0309 but likely music sideband). (MS-CA)

UNID

1050 UNID 11/29 0230 English station momentarily on top of dominant XEG, caught only the words "In Montreal... Saturday." Weak. (REW-HI)

Seems odd to have the column end at 1490. Guess everyone has been DX'ing the lower part of the band this week. Nancy 12/8 2100

CENTRAL DX ROUNDUP

John C. Johnson – 265 Waterton Wy – Billings, MT 59102-7755
 E-mail: John_Johnson@prodigy.net CDXR reports ONLY: cdxr@prodigy.net

RIDING GAIN

[NJ-MT] **Nancy Johnson**, Billings, MT NancyJohnson@Prodigy.net
 Drake R8B, Kiwa loop.

[JP-TN] **Jim Pogue**, Memphis, TN jpogue@midsouth.rr.com
 NRD-535, Sony ICF-2010, Wellbrook LA5030 loop, attic longwire, Quantum Phaser.

DOWN THE DIAL

710 KGNC TX, Amarillo. 12-8. 21:04 with ID "...on News Talk 7-10 KGNC." [NJ-MT]

770 KATL MT, Miles City. 12-3. 11:00 with music, ID, ABC News. [NJ-MT]

920 WGNU IL, Granite City. 12-5 weak. 17:34 with traffic report then back into the mix. [JP-TN]

950 KWOS MO, Jefferson City. 11-25 good. 16:58 with local spots, weather forecast, CBS News. [JP-TN]

1250 WSSP WI, Milwaukee. 11-30 weak when they popped to the surface. 20:46 ID. [JP-TN]

1270 WCGC NC, Belmont. 12-3. 17:56 with "Carolina Christian Connection" slogan and Bluegrass music. [JP-TN]

1320 KYHN AR, Fort Smith. 12-6 fair. 17:33 with simulcast of KWHN program, weather forecast. Not a regular so maybe still on day pattern. [JP-TN]

WJAS PA, Pittsburgh. 12-5 weak. 17:59 with adult standards, ID, news. [JP-TN]

1410 WING OH, Dayton. 12-4 weak. 17:40 popped to the surface briefly for an ID then back to ESPN programming. [JP-TN]

WDSK MS, Cleveland. 12-7 good. 17:25 with Southeastern Primetime sports, lots of local spots. [JP-TN]

1420 WIGG MS, Wiggins. 11-27 good. 17:37 with local spots, sports. [JP-TN]

1460 WXRQ TN, Mt. Pleasant. 11-29 weak. 17:10 with ID then back into the noise. [JP-TN]

1470 WNAU MS, New Albany. 11-18 good. 16:51 with oldies and local spots for New Albany and Tupelo. [JP-TN]

1490 WRLA AL, Lanett. 11-26 weak. 02:03 popped to the surface for an "Oldies Radio" slogan, ID at end of news. [JP-TN]

1590 WZRZ MS, Jackson. 12-4 fair. 18:34 with "News Plus" slogan, ID, several PSAs then Glenn Beck program. [JP-TN]

25 YEARS AGO

December 12, 1981 issue of IRCA's "DX Monitor" ... New members included **Paul Swearingen** of Moran, KS ... **Ernest R. Cooper** of Provincetown, MA said his verie total was up to 4210 with new veries including one from HJAZ 1160 ... **Nick Hall-Patch** of Victoria, BC told about his trip to visit **Jef Jaisun** and having to drive through the worst winds storm he could remember ... **John Oldfield** of Surrey, BC logged Cuba, Guatemala, Belize, KORL and KJNO ... **Pat Martin** of Seaside, OR told about the near 100 mph winds and the damage to his antennas.

OPEN MIKE

Have you joined this years DX Contest? This column was typed 12-9-06. 73, John

EASTERN DX ROUNDUP

Lee J. Freshwater – 414 SE 3rd St. – Ocala, FL 34471

E-mail: lfreshwater@cox.net

Deadlines: SATURDAY 8 am

STARS OF THE WEEK

(IEN-GA) **Ira Elbert New** Watkinsville, GA
 DRAKE R-8B, 135' N/S L.W., SANGEAN ATS 909
 2412 59th Place, Cheverly MD

(WM-MD) **William McGuire** DX-398

(CJG-KY) **Chris Gray** Lexington, KY KU4A@yahoo.com
 Kenwood TS 2000, Gap Eagle Vertical & Terk Loop

GO BUCKEYES

LOGGINGS

560 MD WFRB Frostburg, 12-5 1657, ID //WTBO. (WM-MD)

WV WJLS Beckley, 12/03/06 1911, Focus on the Family ad along with religious music. Good signal on top of the mix. "A reminder from AM 560, WJLS". (IEN-GA)

690 LA WIST New Orleans, 12-6 2040, Buffalo vs. Tulane college basketball game. (CJG-KY)

LA WIST New Orleans, 12/04/06 1934, The Savage Nation with Michael Savage & New Orleans traffic and weather. Slightly better than decent signal on top of the mix. "AM 690, WIST". (IEN-GA)

790 GA WQXI Atlanta, 12-5 1722, "Sports Talk 790" "The Zone." (WM-MD)

850 AL WXJC Birmingham, 12-4 1700, REL MX heard, ID. (WM-MD)

910 OK KVIS Miami, 12-8 2034, wx forecast, then clear ID, then into gospel music. (CJG-KY)

1160 PA WCCS Homer City, 12-4 2023, ID after song. (WM-MD)

1280 IN WGBF Evansville, 12-4 2147, Local ad, "News Talk 1280"; ID. (WM-MD)

1290 PA WFBG Altoona, 12-4 2038, "The BIG 1290"; ID. (WM-MD)

1320 AR KYHN Fort Smith, 12/06/06 2253, Tammy Bruce Show promo and The Savage Nation. Decent signal mixing with WCOG Greensboro NC "The One You Depend On, 1650, KWHN". (IEN-GA)

Another light week for DX???? Thanks to Ira and William AND Chris... Fresh 12-9-06 1000
GO GATORS!!

DX WORLDWIDE – WEST / TROPICAL BAND DX

Patrick Martin – P.O. Box 843 – Seaside OR 97138

E-mail: mwdxer@webtv.net all times UTC

Bill Block saved the day this week with his tips. Not a lot of activity this week with rising A&K levels.

PAN AMERICAN DX ROUNDUP

- 910 **MEXICO**, Mexicali, BCN, XEAO hrd 12/2 at 1334 with many "Radio Mexicana" slogans. (BB-AZ)
1370 **MEXICO**, Mexicali, BCN, XEHG hrd 12/9 at 1414 with "Radio Nortena" slogan. (BB-AZ)
1390 **MEXICO**, Tecate, BCN, XEKT hrd 12/8 at 1426 with ID "XEKT Tecate, Tijuana, San Diego". (BB-AZ)
1390 **MEXICO**, Puerto Penasco, SON, XEQC hrd 12/9 at 1400 with slogan "La Voz de Puerto Penasco". (BB-AZ)
1570 **MEXICO**, Ciudad Acuna, XERF, very strong at S9+20-30 DB with ID at 0901 on 12/9 "Eqis e ra fefe" "Radio Poderosa... Cuidad Acuna". Best I have ever heard them. (PM-OR)

TRANS PACIFIC DX ROUNDUP

- 693 **JAPAN**, Tokyo JOAB hrd 12/4 at 1408 with JJ talk, fair signal. (BB-AZ)
774 **JAPAN**, Akita JOUB hrd 12/4 at 1410 with JJ talk fair signal. (BB-AZ)
828 **JAPAN**, Osaka JOBB hrd 12/4 1415 with JJ talk and poor signal. (BB-AZ)
1017 **TONGA**, A3Z Good with march music and a man in Tongan at 0834 12/9. Best heard in sometime. (PM-OR)

THANKS TO THESE REPORTERS

- BB-AZ **BILL BLOCK**, 7716 East Thelma Dr, Prescott Valley AZ 86314 billwblock@msn.com
DXing with Drake R8, EWE (20X50X20), Quantum QX Loop
PM-OR **PATRICK MARTIN**, PO Box 843, Seaside OR 97138-0843 mwdxer@webtv.net
DXing with Drake R8, WNW EWE (25X55X25), SW EWE (24X100X24), 1500' Eastern beverage, 45' vertical, Quantum Phasing unit, Palstar MW 550P

DX FORUM

Richard C. Evans – 7416 Hearthstone Wy – Indianapolis IN 46227-7923

E-mail: REvans5435@yahoo.com DEADLINES: Sundays

Deadlines: 12/23, 12/30, 1/6, 1/13, 1/20, 1/27, 2/3, 2/10, 2/24, 3/10, 3/24, 4/7, 4/16 and 5/5

Richard E. Wood, HCR3, Box 11087, Keaau, Hawaii 96749-9221

'Tis the season to order the Tower Site Calendar 2007, published by North East Radio Watch (Fybush.com, Scott Fybush, 92 Bonnie Brae Avenue, Rochester, NY 14618), photography and text by Scott Fybush; good value at \$17.00 postpaid, and all in full color - mostly blue (the sky behind the antenna towers). The cover features WCCO-830 MN (my most-wanted unheard clear channel here in HI), while the bonus 13th page/picture is of the two 500-ft towers at WBZ-1030 MA (extraordinarily well heard here recently, louder than even in my "good old days" here on the Big Island in the 1980s). WBZ illustrates the additional two calendar pages for 2008. My favorite among the twelve regular month pictures is that of the impressive seven 248' towers of KOIL-1020 NE, located across the river in Glenwood, IA. They produce an awesome signal here despite their puny 1400 watt night rating, often beating 50 kW KTNQ CA, 2000 miles closer to me and directional toward me! Another page I enjoy looking at is May, WTIC-1080 CT, not yet heard here but a possibility as I have heard others of approximately similar status such as WINS-1010 NY and WBAL-1090 MD. Although Scott's professional orientation is to the Northeast US and adjacent Canada, pages are dedicated to stations as distant from Fybush's home base as KGO-810 CA. The dates of sign-on, change of ownership, etc. of stations mainly in the Northeast are given on the appropriate calendar spaces. For example, "Friday 2/2, 1957 WLOB-1310 Portland, ME signs on." How that one brings back memories! I began DXing in England that year, and WLOB was a brand-new station, excited to get reports from the likes of me. My only criticism is that Scott does not consistently give a frequency for every historic or current station noted, or give current calls for some older stations whose descendants are still on the air. Consistency in a field as vast as this is difficult, completeness impossible. But, for example, when on Saturday 1/6, 1932 Scott tells us WAGM-950 ME signed on, but it is "now defunct", since WAGM, like WLOB, was one of my earliest DX catches, I would have liked to know when it went silent. It's good to see the calendar has a commercial sponsor. It would have been a boost for IRCA and other

clubs if they had arranged to publish their names, address and dues rates in this popular calendar, or published a paid ad. Next year, let's hope.

Mike Sanburn, P. O. Box 1256, Bellflower, California 90707-1256 mikesanburn@hotmail.com
Greetings - fun stuff DXing the night of the Montana tests. Finally got to log KANA-580 here after years of trying unsuccessfully. KERR came in well too. I first logged that station on a February 1995 DX test. The following week I tried for KRSN-1490 only to find out that it didn't run. Hopefully it will be rescheduled. I recently viewed a Louisiana travel film at a local theater that I support. It was a musically oriented program that featured footage taken at radio stations KROF, KJEF, KJJB and KBON. Much of it was filmed last year just weeks before Hurricane Katrina hit that state. I have an e-mail address where you can order a copy on DVD or VHS. If anybody is interested, contact me. I found some nice items to purchase online at www.wsm650.com. Goodies for next year's IRCA Convention are starting to trickle in. The initial announcement should have appeared in DX Monitor by now. We got a really super rate at the Airport Days Inn, Salt Lake City, UT. \$50 a night for guest rooms, \$25 registration fee. View the hotel at www.the.daysinn.com/saltlakecity06838. I'll work on setting up some cool station tours. I really liked seeing that CHLW logo on the DDXM envelope. Good timing since I just logged that station in November. I hope everybody has a great holiday season and plenty of good DX in 2007. 73

Richard Evans, 7416 Hearthstone Way, Indianapolis, Indiana 46221-7913

Just a few words this time around. I haven't really had a chance to listen since the end of October. The hopes of 800 heard by the end of this year is out the window -- unless I can hear 80 stations in the next three weeks, hi. Late Thursday night, I was reading Wed. morning's Indy Star to find out that my local WXLW-950 had been off the air since Sunday (and telling people that they could hear what should be running on the air over the internet instead). Of all the weeks that I would be working six nights, plus two classes, one at 4 hours one evening and the other at 3.5 hours a different evening, it had to be this one. My notes indicate that there will not be a column this coming week so my next column will be typed Christmas weekend. I hope and trust that you will all have a blessed holiday. 73.

IRCA TECHNICAL COLUMN

Nick Hall-Patch – 1538 Amphion St – Victoria, BC, Canada V8R 4Z6

E-mail: nhp@ieee.org

Software Defined Radio

by Jack Weber

What kind of receiver do you use for MW DXing? I'm sure that many have a communications receiver from AOR, Icom, JRC or one of the other major receiver manufacturers; there'll be a smattering of portables and a handful of older vacuum tube-based receivers too. A few of us, though, use something entirely different – a software-defined receiver, or SDR, which runs on a normal domestic PC.

The basic concept of using software, rather than hardware, to carry out the functions of a radio receiver originated in secret military research dating back to the 1970s, though it wasn't publicly acknowledged until the '90s. Today, SDRs are widely used in professional monitoring circles including surveillance, military communications, broadcast monitoring and so on. More specialized versions are also becoming common in mobile telephone base stations and are being developed for wireless computer networks. DXers and radio amateurs haven't been left behind though, and there is now a rapidly growing list of reasonably priced SDRs available to hobby users.

I've owned SDRs for nearly three years now. I've also written receiver reviews for Monitoring Monthly magazine (and, before that, for the now-defunct Short Wave Magazine), and that's given me the rare opportunity of having been able to use every model of general-coverage SDR that's been released in the UK. In the next instalment, I'll round up what's on offer and see how they compare in MW performance. But first, I'll look at how an SDR works and what it has to offer.



Fig. 1 The hardware part of most SDRs is fitted into an external box that connects to a USB or other port on the PC. This is the FlexRadio SDR-1000, which is larger than most because it's designed as an amateur transceiver but, with transmit disabled, makes a good general coverage receiver.

The basic idea behind the SDR is remarkably simple, even if it's quite complicated to put into practice. Think of it by analogy to digital music on a CD. The music starts out as analog sound, but is then digitised to produce a stream of numbers that describes the varying waveform. Once it's been converted to digital form, it can be amplified, filtered, mixed and modified in all sorts of ways simply by manipulating the numbers. Modern recording studios are almost all digital, so the music remains in this numerical form throughout the whole production and distribution process and doesn't need to be converted back to analog until it's time for you to play the CD at home.

SDRs do exactly the same for radio signals. Suppose you could digitise the fluctuating voltage that comes out of your antenna, then all the functions of a receiver, including bandwidth filters, mode setting, passband shift, AGC, notch filters, tone controls, etc. could be done just by manipulating the numbers. The output would only need to become analog again to drive the speaker or headphones.



Fig. 2 The G3 series of SDRs from Australian company WinRADIo is available either as external boxes or as PCI cards that plug into one of the expansion slots inside the PC.

This kind of pure SDR is possible but isn't often used because it still presents many technical challenges. Instead, most current SDRs start with a fairly conventional hardware front end to amplify the weak signal from the antenna and convert it to a lower intermediate frequency (IF), just as a superhet receiver does. It's this IF signal that is digitised. From that point on, everything is done by computer software until the final stage, where a digital-analog converter produces the audio output.

The complex work of filtering and demodulation is done by a specialised chip called a Digital Signal Processor (DSP). This is really just another computer processor, but specifically designed for this kind of work. Some SDRs are self-contained and come with their own DSP chip, others take advantage of the convenient fact that the soundcard in your PC already has DSP built into it. By using this familiar and cheaply available PC hardware, SDRs manage to provide a level of performance that wouldn't normally be available at that price, especially if you already have a PC and don't include its cost in the equation.

Compared to everyday software such as word processors or web browsers, SDRs make big demands on a PC, largely because they have to handle a continuous stream of real-time data. However just about any PC from the last couple of years should manage this, as will many older ones. A clock speed of 2 GHz or more should present no problems, but even 1 GHz machines will usually be fine so long as you don't ask them to do other things at the same time.



Fig. 3 Every SDR provides a real-time bandscope to display a range of frequencies around the one that you're tuned to. You can see here that there are signals visible on every European and American channel.

As we've seen, the point at which the radio signal is converted from its natural analog form into a stream of digits is usually in the final IF stage. Unlike a conventional all-hardware superhet, which often has a final IF of around 455 kHz, many SDRs have their final IF at around 11 kHz. This puts it pretty much in the centre of the audio frequency range and so it's well suited to being processed by a computer soundcard or other relatively affordable DSP.

In any situation where an analog signal needs to be digitised, there are two important parameters that affect the performance. One is sampling rate, the other is bit resolution. Sampling rate refers to how many times per second the ADC (Analog to Digital Converter) samples the incoming waveform. And bit resolution tells you how many bits (ones and zeroes) are used to describe each sample.

The effects of changing sampling rate are summed up in Nyquist's Theorem which states that the sampling rate must be at least twice the highest frequency you want to digitise. So, in order to digitise music, which has an upper limit of around 20 kHz, you'd need a sampling rate of at least 40 kHz. For various reasons it's much better to allow a margin and not use a sampling frequency that's too close to the Nyquist limit. Hence the 44.1 kHz sampling rate that's used for music CDs and is available on all computer soundcards. Using this, or the next highest rate of 48 kHz, any SDR can digitise 20+ kHz of IF bandwidth at a time.

Many professional soundcards that are designed for music recording now offer 96 and even 192 kHz sampling and some SDRs are able to make use of these higher rates. As we'll see, this extends the features that SDRs can offer, especially as some models make use of the two stereo channels to effectively double the available bandwidth. If you're not tied to using a soundcard, then there are ADCs available that can sample at over 200 MHz. However, they're significantly more expensive and also tend to operate with a lower bit resolution.

Bit resolution matters because it defines the dynamic range that any digital processing system can achieve. This is very important in a receiver because it affects the ability to hear weak signals and to cope with nearby strong signals – exactly the situation we face on MW.

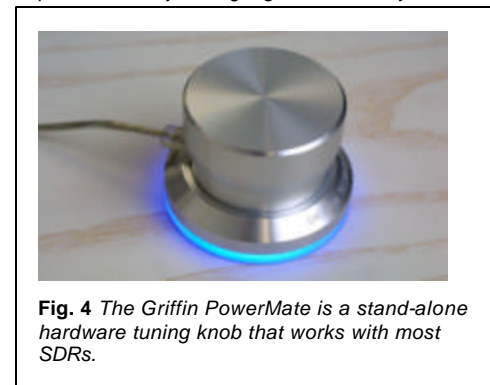


Fig. 4 The Griffin PowerMate is a stand-alone hardware tuning knob that works with most SDRs.

By adding more bits we increase the dynamic range and produce a better receiver. The SDRs available to us currently range from 14-bit (corresponding to a dynamic range of 84dB) to 24-bit (corresponding to 144dB).

A dynamic range of 84dB is worse than you'd get from a good analog communications receiver, while 144dB is much better. In fact, the theoretically possible value is never fully achieved, but even so a good SDR should be at least as good in this respect as the best analog receivers.

That apart, there are several other major advantages to implementing a radio in software. The first, which is not unique to SDRs but is particularly easy to implement in an SDR, is that it enables you to use digital filters of a quality that would be impossible to achieve with analog technology. Not only do the digital filters provide a superb shape factor with very steep sides and minimal ringing, but they are infinitely adjustable over a wide range. Rather than having to choose between, say, a 2.4, 3.5 or 6.0 kHz filter as you may have to on a conventional receiver, you can smoothly vary the bandwidth in steps as small as 1 Hz. Combined with the steep sides, this means that you can slide your bandwidth precisely up to an offending carrier and still cut it out very effectively. It also makes it easy to provide notch filters, synchronous detection and IF Shift – all of them features that can be particularly useful on MW.

Second, it's very easy in an SDR to provide a real-time spectrum analyser (also known as a bandscope or panadapter) to show a section of bandwidth either side of the tuned frequency. Analog bandscopes have been around for ages, but they've always been expensive and are generally much less detailed and accurate. With an SDR, you get to see 20 kHz or more of spectrum and this provides a remarkable aid to DXing because you will see the presence of a carrier long before it becomes strong enough to deliver any audio. This is particularly useful if you are looking for stations on the frequency splits because there are obviously no local stations on most of them so you can see instantly if a particular channel is worth listening to or not. It also provides a very quick indication of where any splatter is coming from and what you might be able to do about it.

The third big advantage of using an SDR is that you can make spectrum recordings. Unlike in a conventional radio, where you can record only the audio output, an SDR lets you record the IF, which effectively means that you're recording a chunk of the radio spectrum. When you play this back, it gets fed into the receiver's DSP system as if it were the IF from live reception and so you can re-receive it in whatever way you want. You can tune around, adjust the filters, even change the demodulation mode, just as if you were receiving the signal at that moment. Again, this can be particularly useful on MW where the settings that seemed best when you started recording in the evening may not be the best ones to use later on in the night.

Obviously there's a limit to the width of spectrum you can record. Currently, it ranges from 15 to 190 kHz in the consumer models (though two SDRs don't offer this facility at all). Even 15 kHz is enough for two adjacent MW channels if you set the receiver to halfway between them. And 190 kHz is quite a

substantial block of frequencies to capture simultaneously. These figures will definitely rise as the hardware evolves. In ten years time, I fully expect that we'll be able to record the whole of MW in one pass and do all our listening later.

The fourth big benefit of the SDR is that it can be upgraded simply by installing a software download. With any conventional receiver, you're stuck with whatever features and performance possibilities it had when you bought it. By contrast, an SDR can have new modes and features added to it and can have faults put right at any time. This marks an important difference between SDRs and receivers, such as the JRC NRD-545 or Ten-Tec RX-340, that have IF DSP with digital filtering and demodulation. These radios share some of the benefits of an SDR, but they don't offer the same potential for continuous improvement. In general, SDR manufacturers have been very good at providing free updates to their radios. They've also been responsive to user feedback. For example, when FlexRadio Systems, who make the SDR-1000, introduced step-tuning, they didn't include a 9kHz step. I logged a request for it on their website, got a reply within hours, and the updated receiver software was made publicly available the next day. With the best will in the world, that sort of responsiveness wouldn't be possible if it involved a hardware re-design.

What about disadvantages? The biggest, especially for first time users, is not having a physical front panel with a real tuning knob. Operating the receiver involves a mix of keyboard and mouse that may feel quite alien at first. Of course, if you've already got used to controlling a conventional receiver from your PC or even if you just use the keypad of an AR7030, then this won't be too big a transition. One way of restoring some of the traditional feel is to buy a Griffin PowerMate. This is a solid metal knob that connects to the USB port of your PC and can be used for tuning most SDRs. It costs about £35.

A criticism that's sometimes levelled against DSP-based receivers is that they have a characteristic "digital sound" that's less pleasant than analog. I think this effect does exist and some receivers display it more than others but let's not confuse listening with DXing. For pleasurable listening to a strong local station, a good analog radio might indeed be better. When you're DXing, intelligibility is more important than fidelity and digital processing is particularly effective at pulling weak signals out of the background. A few years ago, when IF DSP started to appear in hardware receivers, there was a lot of discussion about the poor quality of digital IF filters, in particular their tendency to cause a burbling sound often described as "monkey chatter". That criticism had some justification, but technology has moved on very rapidly and I haven't noticed this effect on any SDRs.

The other potential disadvantage is that you may encounter interference from the PC. In fact, this turns out to be no more of a problem than if you put a PC near to a conventional receiver. SDR manufacturers have done a superb job of shielding their products so, for example, my Winradio G313, which is physically inside the PC casing, suffers less from PC interference than some of my conventional receivers. Attention to earth loops is essential, also make sure you fit ferrites to all cables and keep antenna lead-ins away from all computer cables. However, all of this applies equally if you put a PC next to a conventional receiver, so there's no need to worry that getting an SDR will make it worse.

Despite the need for some initial adjustment in operating technique, I was a complete convert as soon as I used my first SDR. The experience of DXing with a realtime bandscope in front of you is such a revelation that it rapidly becomes very difficult to go back. Although I still have, and use, some very good traditional receivers, I find them quite awkward without that second channel of communication between receiver and brain. It's really as if one starts to tune a receiver more by eye than by ear. The other feature that makes SDRs irresistible for me is the ability to make spectrum recordings. Being able to record more than one channel simultaneously, and then to re-receive them over and over again with different settings, is immensely valuable. Ultimately, though, the crucial factor is that I hear more DX on my SDRs. They're not perfect, and some have annoying quirks that I'd be glad to be rid of, but they simply pull in more DX. And that's a compelling enough reason to use them.

Next instalment, I'll look at all the different models of SDR that cover MW, and I'll try to pick out some of their strengths and weakness for the MW DXer. (this article originally appeared in Medium Wave News, the magazine of the Medium Wave Circle, and is reprinted with permission of the author and MWC)

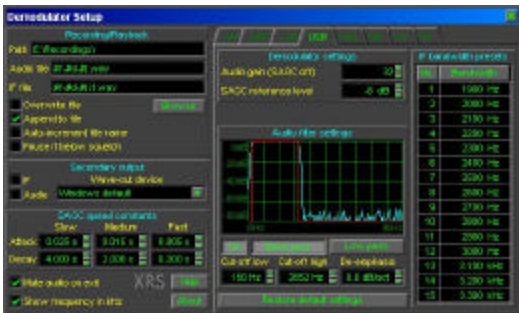


Fig. 5 This Setup window belongs to the WinRADIo G313. Among other things, it can be used control the way that IF or audio recordings will be named and saved.

GEOMAGNETIC INDICES

Compiled by: Phil Bytheway

E-mail: phil_tekno@yahoo.com

Geomagnetic Summary August 17 2006 through December 13 2006
Tabulated from email status daily.

Date	Flux	A	K	Space Wx							
8/17	86	2	1	no storms	x	10/16	71	15	2	no storms	8
18	86	4	1	no storms	x	17	70	8	1	no storms	6
19	89	10	2	no storms	4	18	70	8	1	no storms	x
20	89	25	6	moderate	9	19	x	x	x	x	x
21	88	26	2	moderate	3	20	70	2	0	no storms	x
22	88	24	2	no storms	x	21	70	4	4	no storms	x
23	81	20	4	no storms	7	22	71	12	4	no storms	x
24	78	7	1	no storms	3	23	x	x	x	x	x
25	78	5	3	no storms	x	24	x	x	x	x	x
26	77	1	0	no storms	6	25	76	4	2	no storms	x
27	76	1	0	no storms	3	26	75	6	2	no storms	x
28	79	15	3	minor	9	27	75	9	1	no storms	x
29	76	10	1	no storms	6	28	72	1	1	no storms	x
30	73	8	0	no storms	5	29	72	3	3	no storms	x
8/31	74	7	1	no storms	6	30	73	20	4	no storms	x
9/ 1	83	7	2	no storms	9	10/31	76	11	2	no storms	x
2	77	12	2	no storms	7	11/ 1	80	5	2	no storms	
3	76	8	2	no storms	7	2	87	5	2	no storms	
4	77	6	1	no storms	4	3	88	9	3	no storms	
5	79	26	3	moderate	8	4	87	10	2	no storms	
6	80	12	1	no storms	5	5	86	6	2	no storms	
7	84	7	2	no storms	5	6	85	7	1	no storms	
8	87	8	2	no storms	5	7	84	2	1	no storms	
9	87	8	1	no storms	x	8	85	1	0	no storms	
10	86	2	1	no storms	1	9	86	0	0	no storms	
11	87	6	1	no storms	5	10	89	7	3	no storms	
12	85	8	1	no storms	3	11	91	35	3	moderate	
13	84	4	1	no storms	6	12	97	22	3	no storms	
14	83	5	0	no storms	3	13	97	9	1	no storms	
15	83	5	1	no storms	x	14	95	2	0	no storms	
16	80	1	0	no storms	1	15	95	2	1	no storms	
17	79	2	1	no storms	4	16	96	6	1	no storms	
18	78	8	4	no storms	6	17	94	9	1	minor	
19	74	23	4	minor	7	18	90	7	1	no storms	
20	73	15	2	no storms	7	19	89	2	1	no storms	
21	71	6	1	no storms	4	20	85	4	1	no storms	
22	71	5	2	no storms	x	21	81	0	0	no storms	
23	72	3	2	no storms	4	22	78	0	0	no storms	
24	70	9	3	no storms	9	23	77	1	3	no storms	
25	70	10	2	minor	x	24	77	15	2	minor	
26	70	23	3	no storms	x	25	77	16	2	minor	
27	71	7	1	no storms	6	26	79	12	3	no storms	
28	72	5	1	no storms	5	27	78	14	3	no storms	
29	73	2	1	no storms	2	28	82	10	1	no storms	
9/30	77	5	2	no storms	5	29	86	7	2	no storms	
10/ 1	78	15	2	no storms	6	11/30	86	6	1	no storms	
2	78	15	2	minor	x	12/ 1	84	20	1	minor	
3	78	25	1	no storms	x	2	84	5	2	no storms	
4	77	7	2	no storms	2	3	87	3	1	no storms	
5	77	6	2	no storms	x	4	87	2	0	no storms	
6	77	3	0	no storms	x	5	92	0	0	no storms	
7	76	3	1	no storms	4	6	102	3	1	strong	
8	77	7	3	no storms	5	7	103	24	4	strong	
9	75	8	1	no storms	5	8	96	22	3	strong	
10	75	8	1	no storms	x	9	96	25	3	moderate	
11	75	5	0	no storms	x	10	92	5	2	moderate	
12	74	4	0	no storms	4	11	x	x	x	x	
13	74	3	2	no storms	x	12	92	12	2	minor	
14	73	23	4	no storms	9	12/13	102	22	4	minor	
10/15	72	19	3	no storms	4						

SPORTS ON RADIO

Compiled by: **Bob Pietsch** (aka *The Rocklin Rocket*)

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2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - AKRON ZIPS (per www.goziptv.com/ViewArticle.dbml?DB_OEM_ID=10800&KEY=&ATCLID=312158)

1300-WERE-Cleveland OH 1350-WARF-Akron OH (Flagship)

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - ALABAMA-BIRMINGHAM BLAZERS (per uabsports.cstv.com/sports/m-baskbl/spec-rel/120406aab.html)

1410-WIQR-Prattville AL 101.1-WYDE-Cullman AL (Flagship)

98.3-WTRB-Ashland AL

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - BOSTON COLLEGE EAGLES (per graphics.fansonly.com/photos/schools/bc/genrel/auto_pdf/BC-Radio-Affiliates-06.pdf)

610-WGIR-Manchester NH 1440-WVEI-Worcester MA
640-WNNZ-Westfield MA 1450-WRKD-Rockland ME (a)
850-WEEI-Boston MA (Flagship) 1450-WTSA-Brattleboro VT
900-WJJB-Brunswick ME 1490-WMRC-Milford MA
900-WGAM-Nashua NH 1540-WGIP-Exeter NH
930-WGIN-Rochester NH 97.5-WIGY-Madison ME (a)
1250-WARE-Ware MA 102.1-WGUY-Dexter ME (a)
1280-WFAU-Gardiner ME (a) 103.7-WEEI-Westerly RI
1310-WLOB-Portland ME
1320-WARL-Attleboro MA (a) Partial schedule

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - BOWLING GREEN FALCONS (per graphics.fansonly.com/photos/schools/bgu/sports/m-baskbl/auto_pdf/m-baskbl-06-07-mediumguide.pdf)

1230-WCWA-Toledo OH 107.5-WZRX-Fort Shawnee OH
105.7-WZOM-Defiance OH 107.7-WPFX-North Baltimore OH (Flagship)

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - CAMPBELL FIGHTING CAMELS (per www.gocamels.com/m_basketball/media_guide/this_is_campbell.pdf)

1340-WAGR-Lumberton NC (a) 90.1-WCCE-Bules Creek NC (Flagship)
1460-WEWO-Laurinburg NC (a) (a) Partial Schedule
1490-WAZZ-Fayetteville NC (a)

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - CENTRAL FLORIDA GOLDEN KNIGHTS (per graphics.fansonly.com/photos/schools/ucf/genrel/aut_pdf/06-isp-portfolio.pdf)

740-WQTM-Orlando FL (Flagship) 1350-WMMV-Cocoa FL
1240-WMMB-Melbourne FL 1350-WDCF-Dade City FL
1340-WROD-Daytona Beach FL 1400-WZHR-Zephyrhills FL

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - CLEMSON TIGERS (per clemsonigers.cstv.com/sports/m-footbl/spec-rel/081205aac.html)

1050-WIQB-Conway SC 93.7-WXJY-Myrtle Beach SC (a)
1240-WKDK-Newberry SC (a) 93.9-WJXY-Georgetown SC (a)
1260-WHYM-Lake City SC (a) 94.1-WHZQ-Cross Hill SC
1340-WQSC-Charleston SC 94.7-WICI-Sumter SC
1340-WRHI-Rock Hill SC 102.7-WPUB-Camden SC (a)
1410-WPCC-Clinton SC (a) 102.7-WGOR-New Ellenton SC
1450-WHSC-Hartsville SC 102.9-WQKI-Orangeburg SC
1460-WDOG-Allendale SC 103.3-WOLT-Greer SC
1590-WCAM-Camden SC 104.9-WCCP-Clemson SC (Flagship)
92.1-WBHC-Hampton SC 105.3-WAGI-Gaffney SC
93.1-WZMJ-Batesburg SC (a) Partial Schedule

2006 COLLEGE BASKETBALL (WOMEN'S) NETWORKS - CLEMSON TIGERS (per clemsonigers.cstv.com/sports/m-footbl/spec-rel/081205aac.html)

1240-WKDK-Newberry SC (a) 102.9-WQKI-Orangeburg SC
1410-WPCC-Clinton SC (a) 104.9-WCCP-Clemson SC (Flagship)
1450-WHSC-Hartsville SC 105.3-WAGI-Gaffney SC
93.1-WZMJ-Batesburg SC (a) Partial Schedule

2006 COLLEGE BASKETBALL (WOMEN'S) NETWORKS - CONNECTICUT HUSKIES (per www.uconnhuskies.com/SPORTS/WBasketball/2007/Media%20Guide/183-208a.pdf)

600-WICC-Bridgeport CT 1400-WILI-Willimantic CT
800-WLAD-Danbury CT 1350-WNLK-Norwalk CT
1080-WTIC-Hartford CT (Flagship) 1420-WLIS=Old Saybrook CT
1150-WMRD-Middletown CT 102.3-WXLM-Stonington CT
1400-WSTC-Stamford CT

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - DUKE BLUE DEVILS (per www.goduke.com/ViewArticle.dbml?DB_OEM_ID=4200&ATCLID=187716&SPID=1845&SPSID=22745)

590-WCAB-Rutherfordton NC 1280-WSAT-Salisbury NC
620-WDNC-Durham NC 1440-WLXN-Lexington NC
730-WOHS-Shelby NC 1450-WGNC-Gastonia NC
850-WRBZ-Raleigh NC 1490-WSVM-Valdese NC
900-WAYN-Rockingham NC 1580-WZKY-Albemarle NC
910-WWWR-Roanoke VA 1590-WCSL-Cherryville NC
990-WEEB-Southern Pines NC 96.7-WKRX-Roxboro NC
990-WNRV-Narrows-Pearisburg VA 97.9-WTRG-Gaston NC
1050-WLON-Lincolnton NC 98.3-WDLZ-Murfreesboro NC
1050-WBRG-Lynchburg VA 98.3-WIST-Thomasville NC
1150-WBAG-Burlington-Graham NC 100.7-WZJS-Bonner Elk NC
1230-WCBT-Roanoke Rapids NC 104.5-WCCG-Hope Mills NC
1240-WCNC-Elizabeth City NC 106.1-WNMX-Waxhaw NC
1250-WBRM-Marion NC 107.9-WNCT-Greenville NC
1260-WZBO-Edenton NC

2006 COLLEGE BASKETBALL (MEN'S and WOMEN'S) NETWORKS - EAST TENNESSEE STATE BUCCANEERS

(per www.etsubucs.com/info/broadcasts/info)

910-WJCW-Johnson City TN (Flagship) 1370-WRGS-Rogersville TN
940-WNRG-Grundy VA 1570-WSWV-Pennington Gap VA
1240-WBEJ-Elizabethton TN 100.7-WMJD-Grundy VA
1270-WLIK-Newport TN 105.5-WSWV-Pennington Gap VA
1320-WKIN-Kingsport TN

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - EAST CAROLINA PIRATES (per ecupirates.cstv.com/multimedia/m-baskbl-tv-radio.html)

560-WGAI-Elizabeth City NC 1250-WKDX-Hamlet NC
850-WRBZ-Raleigh NC 1350-WHIP-Mooresville NC
1070-WNCT-Greenville NC 1540-WTXY-Whiteville NC

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - EASTERN WASHINGTON EAGLES (per goeags.cstv.com/links/ewas-ewutvradio.html) (Thanks to O, Howit Hertz)

790-KJRB-Spokane WA (Flagship) 1340-KTCR-Kennewick WA
920-KGTK-Olympia WA 1400-KITZ-Silverdale WA
1050-KEYF-Dishman WA (Flagship)

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - FLORIDA GATORS (per www.gatornetwork.com/basketball/?page=affiliates)

540-WFLF-Pine Hills FL 1250-WHNZ-Tampa FL
590-WDIZ-Panama City FL 1260-WIYD-Palaska FL
620-WDAE-St. Petersburg FL 1340-WDSR-Lake City FL
730-WWTK-Lake Placid FL (a) 1350-WDCF-Dade City FL
760-WEFL-Tequesta FL 1450-WWJB-Brooksville FL
850-WRUF-Gainesville FL 1450-WSTU-Stuart FL
850-WFTL-West Palm Beach FL 1570-WOKC-Okeechobee FL
900-WMOP-Ocala FL 1600-WKWF-Key West FL
920-WMEL-Melbourne FL 93.3-WGWD-Gretna FL
930-WFXJ-Jacksonville FL (Flagship) 95.3-WXCV-Homosassas Springs FL
930-WLSS-Sarasota FL 98.1-WTKE-Holt FL (a)
1130-WWBF-Bartow FL 103.7-WRUF-Gainesville FL
1230-WONN-Lakeland FL (a) Partial schedule
1230-WSBB-New Smyrna Beach FL (a)
1240-WFOY-St. Augustine FL
1250-WQHL-Live Oak FL (a)

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - FLORIDA STATE SEMINOLES (per seminoles.cstv.com/sponsorship/radio-affiliates.html)

640-WJNA-Royal Palm Beach FL 850-WFTL-West Palm Beach FL
790-WAXY-South Miami FL 960-WGRO-Lake City FL

1080-WHOO-Kissimmee FL
1220-WIBQ-Sarasota FL
1270-WNLS-Tallahassee FL
1330-WEBY-Milton FL
1350-WDCF-Dade City FL
1360-WKAT-North Miami FL
1370-WOCA-Ocala FL
1380-WELE-Ormand Beach FL
1400-WZHR-Zephyrhills FL
1420-WAOC-St. Augustine FL

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - GEORGIA TECH YELLOW JACKETS
(per ramblinwreck.cstv.com/multimedia/geot-mhoops-on-air.html)

630-WNEG-Toccoa GA
790-WQXI-Atlanta GA (Flagship)
790-WSFN-Brunswick GA (a)
850-WCUG-Cuthbert GA
1030-WEBB-Calhoun GA (a)
1240-WGGA-Gainesville GA
1270-WJJC-Commerce GA
1300-WMTM-Moultrie GA (a)
1300-WIMO-Windor GA
1310-WPLV-West Point GA (a)
1350-WFNS-Blackshear GA (a)
1370-WLOP-Jesup GA (a)
1420-WPEH-Louisville GA (a)
1450-WKEU-Griffin GA
1450-WGNC-Gastonia NC (a)

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - IDAHO VANDALS
(per www.uiathletics.com/default.asp?PageID=227)

620-KWAL-Wallace ID
1080-KVNI-Coeur d' Alene ID
1140-KGEM-Boise ID
1230-KORT-Grangeville ID
1300-KLER-Orofino ID

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - IDAHO STATE BENGALS
(per graphics.fansonly.com/photos/schools/idsu/sports/m-baskb/auto_pdf/2006-07MBBMediaGuide.pdf)

930-KSEI-Pocatello ID (Flagship)
1230-KRXK-Rexburg ID
1270-KTFI-Twin Falls ID

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - ILLINOIS FIGHTING ILLINI
(per graphics.fansonly.com/photos/schools/ill/sports/m-baskb_auto_pdf/05-06_mbk_guide07.pdf)

560-WIND-Chicago IL
590-KFNS-Wood River IL
740-WVLN-Olney IL
930-WTAD-Quincy IL
1190-KRFT-Desoto MO
1220-WLPO-La Salle IL
1230-WHCO-Sparta IL
1240-WTAX-Springfield IL
1240-WSDR-Sterling IL
1290-WIRL-Peoria IL
1320-WKAN-Kankakee IL
1340-WSOY-Decatur IL
1350-WJBD-Salem IL
1360-WVMC-Mount Carmel IL
1390-WFIW-Fairfield IL
1400-WDWS-Champaign IL
1400-WGIL-Galesburg IL
1440-WROK-Rockford IL
1480-WJBM-Jerseyville IL
1490-WDAN-Danville IL
1520-WHOW-Clinton IL
1550-WJIL-Jacksonville IL
1570-WBGZ-Alton IL

1430-WLKF-Lakeland FL
1460-WZNZ-Jacksonville FL
1470-WHBO-Dundein FL
1620-WNRP-Gulf Breeze FL
93.5-WBGF-Belle Glade FL
94.9-WTNT-Tallahassee FL
100.9-WJAQ-Marianna FL
101.1-WYOO-Springfield FL

1450-WMVG-Milledgeville GA
1470-WCLA-Claxton GA
1480-WALG-Augusta GA
1590-WALG-Albany GA
1590-WTGA-Thomaston GA
91.1-WREK-Atlanta GA (a)
92.3-WSGA-Hinesville GA
100.1-WQMJ-Forsyth GA
101.9-WJFL-Tennille GA
103.9-WDDK-Greensboro GA (a)
107.1-WTSH-Rockmart GA

(a) Partial schedule

1310-KLIX-Twin Falls ID
1400-KRPL-Moscow ID
1400-KSPT-Sandpoint ID
1450-KBFI-Bonnars Ferry ID

1490-KCID-Caldwell ID
98.1-KGTM-Rexburg ID

1570-WTAY-Robinson IL
1580-WDQN-Du Quoin IL
92.9-WSEI-Olney IL
93.7-WTRX-Pontiac IL
93.9-WYEC-Kewanee IL
94.1-WGFA-Watseka IL
95.7-WCRC-Effingham IL
95.9-WHOW-Clinton IL
97.3-WTIM-Taylorville IL
97.5-WHMS-Champaign IL
97.5-WBBA-Pittsfield IL
98.9-WJEZ-Dwight IL
100.1-WJBD-Salem IL
101.3-KUUL-East Moline IL
101.7-WTYE-Robinson IL
102.1-WDNL-Danville IL
102.3-WRMJ-Aledo IL
102.7-WZZT-Morrison IL
103.9-WQCY-Quincy IL
104.9-WPXX-Paxton IL
105.3-WAOX-Staunton IL
106.1-WSMI-Litchfield IL

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - INDIANA HOOSIERS
(per graphics.fansonly.com/photos/schools/ind/sports/m-baskb/auto_pdf/0607-mg-3-11intro.pdf)

930-WHON-Centerville IN
960-WSBT-South Bend IN
1010-WCSI-Columbus IN
1220-WSLM-Salem IN
1230-WTCJ-Tell City IN
1240-WHBU-Anderson IN
1270-WXGO-Madison IN
1340-WTRC-Elkhart IN
1350-WIOU-Kokomo IN
1370-WLTH-Gary IN
1400-WEOA-Evansville IN
1400-WBAT-Marion IN
1450-WAVG-Jeffersonville IN
1490-WDND-South Bend IN
1540-WBNL-Boonville IN
1560-WRIN-Rensselaer IN
1590-WRCY-Mount Vernon IN
1600-WBTO-Linton IN

89.9-WBRO-Marengo IN

2006 COLLEGE BASKETBALL (WOMEN'S) NETWORKS - INDIANA HOOSIERS
(per graphics.fansonly.com/photos/schools/ind/sports/w-baskb/auto_pdf/0607-wbintro1-8.pdf)

790-WKRD-Louisville KY
1220-WSLM-Salem IN
1230-WJOB-Hammond IN
1230-WTCJ-Tell City IN
1280-WGBF-Evansville IN
1330-WTRE-Greensburg IN
1420-WIMS-Michigan City IN
1540-WBNL-Boonville IN
1560-WRIN-Rensselaer IN
1590-WRCY-Mount Vernon IN
1620-WWLV-South Bend IN

93.5-WHTY-Hartford City IN

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - IOWA HAWKEYES
(per www.learfield.com/gestalt/go.cfm?objectid=30207B77-9ECO-4E6B-B4B7EB439316998D)

600-WMT-Cedar Rapids IA
740-KBOE-Oskaloosa IA
800-KXIC-Iowa City IA
980-WPRE-Prairie du Chien WI (a)
1040-WHO-Des Moines IA
1070-KILR-Estherville IA
1080-KOAK-Red Oak IA
1220-KJAN-Atlantic IA
1300-KGLO-Mason City IA
1320-KNIA-Knoxville IA
1340-KROS-Clinton IA
1360-KSCJ-Sioux City IA
1370-KDTH-Dubuque IA
1420-WOC-Davenport IA
1440-KCHE-Cherokee IA
1490-KBUR-Burlington IA
1510-KIFG-Iowa Falls IA
1530-KDSN-Denison IA
1570-KQWC-Webster City IA
1580-KCHA-Charles City IA

92.1-WZDM-Vincennes IN
93.3-WBTU-Kendallville IN
93.3-WQTY-Linton IN
96.1-WQLK-Richmond IN
96.7-WHTI-Alexandria IN
96.7-WORX-Madison IN
97.1-WLHK-Shelbyville IN
97.9-WSLM-Salem IN
99.3-WSCH-Aurora IN
100.1-WFLQ-French Lick IN
102.3-WLHM-Logansport IN
103.1-WXCH-Versailles IN
104.7-WITZ-Jasper IN
104.9-WINN-Columbus IN
104.9-WAXI-Rockville IN
105.1-WHCC-Ellettsville IN (Flagship)
105.5-WQRK-Bedford IN
106.7-WYFX-Mount Vernon IN

93.7-WQKC-Seymour IN
94.3-WKWH-Rushville IN
94.5-WRZR-Loogootee IN
96.5-WAZY-Lafayette IN
96.7-WORX-Madison IN
97.9-WSLM-Salem IN
98.1-WIBN-Earl Park IN
100.1-WNUY-Bluffton IN
102.3-WCBK-Martinsville IN
105.1-WHCC-Ellettsville IN (Flagship)
105.5-WQRK-Bedford IN
106.7-WYFX-Mount Vernon IN

2006 COLLEGE BASKETBALL (WOMEN'S) NETWORKS - IOWA HAWKEYES
(per graphics.fansonly.com/photos/schools/iowa/sports/w-baskb/auto_pdf/weekly-release.pdf)

600-WMT-Cedar Rapids IA
800-KXIC-Iowa City IA

1040-WHO-Des Moines IA

(a) Partial schedule

2006 COLLEGE BASKETBALL (MEN'S+ AND WOMEN'S*) NETWORKS - IOWA STATE CYCLONES
(per www.cyclones.com/ViewArticle.dbml?SPSID=4256&DB_OEM_ID=10700&ATCLID=536268 and admin.xosn.com/pdf1/45068.pdf?SPSID=611108&SPID=4253&DB_OEM_ID=10700)

540-KWMT-Fort Dodge IA+*
960-KMA-Shenandoah IA+
1130-KILJ-Mount Pleasant IA+*
1230-KFJB-Marshalltown IA*
1270-WKBF-Rock Island IL+
1360-KKKB-Fort Madison IA+*
1380-KCIM-Carroll IA+*
1430-KASI-Ames IA+*
1460-KXNO-Des Moines IA*
1480-KLEE-Ottumwa IA+*
1590-KWBG-Boone IA+
1600-KCRG-Cedar Rapids IA+*
1650-KCNZ-Cedar Falls IA+*
92.1-KCHE-Cherokee IA+*
95.7-KQWC-Webster City IA+*
96.5-KSOM-Audubon IA+
97.7-KHBT-Humboldt IA+
99.5-KKMA-Le Mars IA+
100.3-KDRB-Des Moines IA+
101.1-KXIA-Marshalltown IA+
103.5-KNEI-Waukon IA+
104.9-KLMJ-Hampton IA+*
105.1-KCCQ-Ames IA+*
107.1-KDSN-Denison IA+
107.3-KIOW-Forest City IA+*
107.7-KICD-Spencer IA+*

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - JAMES MADISON DUKES
(per www.jmuspports.com/Audio.asp)

550-WSVA-Harrisonburg VA (Flagship)
910-WWWR-Roanoke VA
990-WNRV-Narrows-Pearisburg VA
1160-WMET-Gaithersburg MD
1310-WGH-Newport News VA
1480-WTOY-Salem VA

2006 COLLEGE BASKETBALL (MEN'S) FLAGSHIPS - KANSAS STATE WILDCATS
(per admin.xosn.com/pdf3/51020.pdf?DB_OEM_ID=400)

810-WHB-Kansas City MO
1070-KFTI-Wichita KS
1150-KSAL-Salina KS
1190-KVSV-Beloit KS
1270-KSCB-Liberal KS
1290-KWLS-Pratt KS
1340-KSEK-Pittsburg KS
1350-KMAN-Manhattan KS
1370-KALN-Iola KS
1400-KVOE-Emporia KS
1420-KJCK-Junction City KS
1490-KKAN-Phillipsburg KS
1530-KQNK-Norton KS
1550-KKLE-Winfield KS
1570-KNDY-Marysville KS
92.5-KQMA-Phillipsburg KS
94.5-KSKL-Scott City KS
95.3-KINZ-Humboldt KS
96.9-KFIX-Plainville KS
98.1-KSKZ-Copeland KS
98.9-KKRK-Coffeyville KS
100.3-KDVV-Topeka KS
100.9-KCLY-Clay Center KS
101.5-KMKF-Manhattan KS
102.5-KKCI-Goodland KS
102.5-KBLS-North Fort Riley KS
103.9-KNZA-Hiawatha KS
106.1-KXKU-Lyons KS
106.7-KQNK-Norton KS
107.9-KZLS-Great Bend KS

2006 COLLEGE BASKETBALL (WOMEN'S) NETWORKS - KANSAS STATE WILDCATS
(per admin.xosn.com/pdf5/51276.pdf?&KEY=JKJPMBWEKNNTFXU.20061110211326&DB_ACCOUNT_TYPE=AGENT&DB_MENU_ID=286&DB_LANG=C&DB_OEM_ID=400)

All stations except flagships air partial schedule
1070-KFTI-Wichita KS
1150-KSAL-Salina KS
1190-KVSV-Beloit KS
1290-KWLS-Pratt KS
1350-KMAN-Manhattan KS (Flagship)
1360-KAHS-EI Dorado KS
1370-KALN-Iola KS
1420-KJCK-Junction City KS
1490-KKAN-Phillipsburg KS
1550-KKLE-Winfield KS
92.5-KQMA-Phillipsburg KS
94.5-KSKL-Scott City KS
95.3-KINZ-Humboldt KS
96.9-KFIX-Plainville KS
98.1-KSKZ-Copeland KS
100.9-KCLY-Clay Center KS
102.5-KKCI-Goodland KS
102.5-KBLS-North Fort Riley KS (Flagship)
102.9-KQTP-St. Marys KS
106.1-KXKU-Lyons KS
107.9-KZLS-Great Bend KS

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - KENT STATE GOLDEN FLASHES
(per www.kentstatesports.com/ViewArticle.dbml?DB_OEM_ID=11400&ATCLID=715182)

640-WHLO-Akron OH (Flagship)
1420-WHK-Cleveland OH
1440-WHKZ-Warren OH

2006 COLLEGE BASKETBALL (MEN'S) NETWORKS - KENTUCKY WILDCATS
(per www.ukathletics.com/doc_lib/mbb_200607mg_190.pdf)

630-WLAP-Lexington KY (Flagship)
680-WCTT-Corbin KY
840-WHAS-Louisville KY
860-WSON-Henderson KY
970-WFSR-Harlan KY
1060-WFLE-Flemingsburg KY
1110-WKDZ-Cadiz KY
1140-WMMG-Brandenburg KY
1230-WHOP-Hendersonville KY
1240-WFTM-Maysville KY
1240-WSFC-Somerset KY
1270-WAIN-Columbia KY
1290-WCBL-Benton KY
1310-WDOC-Prestonburg KY

1340-WCMI-Ashland KY
1400-WFTG-London KY
1420-WVJS-Owensboro KY
1440-WEZJ-Williamsburg KY
1490-WFXY-Middlesboro KY
1490-WOMI-Owensboro KY
1490-WSIP-Paintsville KY
1520-WLGC-Greenup KY
1530-WCKY-Cincinnati OH
1550-WMSK-Morganfield KY
1580-WPKY-Princeton KY
92.5-WBKR-Owensboro KY
92.7-WRVC-Cattlesburg KY
93.1-WDHR-Pikeville KY
93.5-WMMG-Brandenburg KY
93.5-WAIN-Columbia KY
93.9-WKTG-Madisonville KY
94.3-WKYX-Golconda IL
95.1-WFLE-Flemingsburg KY
95.1-WGGC-Glasgow KY
95.3-WMSK-Morganfield KY
95.5-WQHY-Prestonburg KY
95.7-WQMF-Jeffersonville IN
95.9-WFTM-Maysville KY
95.9-WGKY-Wickliffe KY
96.3-WIVY-Morehead KY
97.1-WSEK-Somerset KY
97.7-WWKY-Providence KY
98.1-WBUL-Lexington KY
98.7-WHOP-Hendersonville KY
98.9-WSIP-Paintsville KY
99.1-WCBL-Benton KY
101.1-WSGS-Hazard KY
102.1-WLLE-Clinton KY
102.3-WUGO-Grayson KY
102.3-WDXC-Pound VA
103.1-WPKE-Coal Run KY
103.5-WASE-Radcliffe KY
103.7-WKED-Frankfort KY
103.9-WWEL-London KY
103.9-WXKQ-Whitesburg KY
104.1-WCKQ-Campbellsville KY
104.3-WXBC-Hardinsburg KY
104.3-WEZJ-Williamsburg KY
104.9-WJRS-Jamestown KY
104.9-WKHG-Leitchfield KY
104.9-WAVJ-Princeton KY
105.1-WTUK-Harlan KY
105.1-WRNZ-Lancaster KY
105.5-WKYA-Greenville KY
105.7-WLGC-Greenup KY
106.5-WKDZ-Cadiz KY
106.5-WKNR-Williamstown KY
106.7-WLFX-Berea KY
107.3-WCTT-Corbin KY
107.7-WKCA-Owingsville KY

The IRCA is a non-profit organization devoted to the hobby of hearing distant stations on the Broadcast Band (510-1720 kHz). **DX Monitor**, the official publication of the IRCA, is published in "soft" form 35 times a year (weekly from November through March, twice monthly from April to November) and in printed form 30 times a year (weekly November through March, monthly April to November). **DX Monitor** contains members' loggings, articles on radio stations, receiver reviews, technical articles, DX tips, and other material of interest to Broadcast Band DX hobbyists.



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