

DX News

• Serving DX'ers since 1933 •



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From the Publisher: Here's the first issue of 2011, and we're back weekly for the next couple of months. The DX season is still in full swing, so why not make it your new year's resolution to send your loggings and DX tips in to *DX News*!

John Cereghin has stepped down as editor of College Sports Networks, effective immediately, due to time constraints. John's done a great job with this column for a number of years, and he deserves a great round of thanks. Any member interested in editing this column, please drop a line to <NRCDXNews@gmail.com>.

IRCA has just released the 15th edition of the IRCA Mexican Log. The first mailings have already gone out. There's a discount for NRC members. More details and ordering information may be found on page 14.

Also in this issue – a classic *DX News* article originally printed in 1964 entitled "Understanding Receiver Fundamentals" by Ed Satterthwaite.

A word to those who've tried phoning the number on the back page ... My day job keeps me on the road a lot, especially during the week, so if you haven't been able to reach me, don't take it personally – I'm just not around! I do get your messages eventually. But if you need to reach me urgently (especially around deadline time!), e-mail is usually the best way to do that.

New Members – New members receiving *DX News* or e-dxn.com: Larry Callicutt, Nampa, ID; Melvin Flannagan, Jr., Charlottesville, VA (rejoins); Markku Jussila, Finland; Alexander W. Kaminski, Springfield, OH.; Randy Mahlberg, Two Harbors, MN; Wesley Pierce, Mt. Sterling, OH; Richard Rothar, Metuchen, NJ; Gardiner

Waterbury, Peoria, AZ; and Christopher Wendling, Virginia Beach, VA Welcome, and we hope to hear from you soon!

The DX Time Machine

75 years ago – From the December 31, 1935 *DX News* – The FCC issued a new frequency check schedule; stations are no longer assigned to Sunday morning frequency checks, and many Western stations have had their checks moved up to earlier hours, which should allow for better reception in the East.

50 years ago – From the December 31, 1960 *DX News* – Lars Ryden of Kallhall, Sweden noted that he had received four North American stations one week in October, and his verification from CXKL-1140 in Calgary stated that his was their first report from Europe.

25 years ago – From the December 30, 1985 *DX News* – A list of C-QUAM AM Stereo stations included 331 entries as of December 12, 1985.

10 years ago – From the January 8, 2001 *DX News* – Jean Burnell presented the report from the ninth Newfoundland DXPedition at Cappahayden.

DX News Publishing Schedule, Vol. 78

Deadline	Masthead	22	Feb. 25	Mar. 7
14 Dec. 31	Jan. 10	23	Mar. 4	Mar. 14
15 Jan. 7	Jan. 17	24	Mar. 18	Mar. 28
16 Jan. 14	Jan. 24	25	Apr. 1	Apr. 11
17 Jan. 21	Jan. 31	26	Apr. 22	May 2
18 Jan. 28	Feb. 7	27	May 27	June 6
19 Feb. 4	Feb. 14	28	July 1	July 11
20 Feb. 11	Feb. 21	29	Aug. 5	Aug. 15
21 Feb. 18	Feb. 28	30	Sept. 9	Sept. 19

NRC AM Radio Log, 31st Edition

The Log is unbound and three-hole punched for standard binders.
Price: To the United States, \$19.95 to members, \$25.95 to non-members
To Canada, \$24 to members, \$33.50 to non-members; add \$3.50 for Priority Mail

Airmail to all outside US/Canada: \$34.00

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Order from: NRC, P.O. Box 473251, Aurora CO 80047-3251 or

www.nrcdxas.org

CO residents add 3.5% sales tax.



AM Switch



Bill Hale w_r_hale@sbcglobal.net

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North Richland Hills, TX 76180-5552

Status changes in AM stations, supplied by the FCC, CRTC, and listeners

CALL LETTER CHANGES

<u>Old Call</u>	<u>New Call</u>
600 WBWL FL Jacksonville	WBOB
740 WJIG TN Tullahoma	WHMT
980 WUUS GA Rossville	WDYN
1250 New NV Mesquite	KACE
1340 New ID Wendell	KXSL
1400 New ID Middleton	KXIV
1410 WRHB FL Leesburg	WQBQ
1500 KABR NM Isleta	KMYN
1540 WRTK OH Niles	WYCL



CPs ON THE AIR

730 WLTX SC Charleston – Is now on with U1 5000/103, raising their daytime power.
1360 KNGN NE McCook – Is now on with D1 1000/0 (no change) from a new tower at 40-13-20/100/41/37.
1430 KLO UT Ogden – Is now on with U4 25000/5000.
1490 WRCE NY Watkins Glen – After building a new, shorter, tower adjacent to their former structure, WRCE is now on with U1 880/880. The old tower collapsed in December 2009 and they were operating at approximately 100 Watts from a long wire antenna since February 2010.
1530 WENG FL Englewood – Is on the air with U1 1000/1, adding night authorization.

ACTIONS

1000 KTOK OK Oklahoma City – CP granted for a power increase to U4 5800/5800. Their patterns shapes are unaffected, only a slight increase in coverage area.
1080 KCNM MP Saipan – CP granted for a power decrease to U1 1100/1100 relocating to N15-09-29/S145-43-05.
1380 KRCM TX Shenandoah – CP granted for U1 2800/60.
1470 WMGG FL Egypt Lake – Licensed for U1 5000/500 at Dunedin, WMGG had a CP for U2 3600/800 moving here. They then applied for U2 750/800, which has been approved.

CONSTRUCTION PERMIT AMENDMENTS

910 KKSX WA Vancouver – Licensed for U4 5000/5000, KKSX has a CP for U4 2600/4300 moving to the 3-tower array of co-owned KFXN-1080 at 45-33-30/122-28-57. This amendment requests U4 3300/4300 at that site.
1120 KTXW TX Manor – New station, not yet on the air, has a CP for U4 430/143. This amendment requests U4 5600/153.

APPLICATIONS

650 WSRO MA Ashland – Applies for U4 1500/62.
860 WDMG GA Douglas – Applies for U1 5000/39.
1190 WAFS GA Atlanta – Applies for D4 25000/0 CH 25000.
1250 KZDC TX San Antonio – Applies for U4 25000/920.
1490 WSIP KY Paintsville – Applies to move their transmitter to the site of, and di-plex into, the folded unipole antenna system of co-owned WKYH-600.



APPLICATION AMENDMENTS

1190 WPSP FL Royal Palm Beach – Licensed for U2 690/410, WPSP applied for U2 410/410. This amendment requests U2 2200/2200.

DISMISSALS

1060 WCOK TN Sparta – Licensed for D1 800/0, WCOK first applied for D1 1100/0 then amended the application adding 1100 Watts Critical Hours. That addition to the application has been dismissed leaving WCOK with the initial application.

AM on FM

1280 KVXR MN Moorhead - KPHA (91.3) Mandan
1370 KWTL ND Fargo - KPHA (91.3) Mandan

LICENSE RENEWALS

1340 WBLB VA Pulaski

HEAR AND THAR

- ✿ Returning to the airwaves: KOAN - 1020 Eagle River, Alaska with Talk.
- ✿ Reported as Silent: KZMX-580 Hot Springs, Arkansas went off on 12/13/2010. Their 'Silent STA' application states: "Pipes underneath the station froze and began significant leaking, causing damage to the station equipment and resulting in the station being unable to continue broadcasting. While we hope to be able to minimize the damage, make necessary repairs and restore the station so that employees can return within the next 30 days, we request silent authority in an abundance of caution."; WBIS-1190 Annapolis, Maryland is silent, allowing WAGE-1200 Leesburg, Virginia to complete its upgrade and move to 1190; KBIS-1490 Forks, Washington is off due to a lightning strike; and KUAU-1570 Haiku, Hawaii is off due to water damage suffered from recent heavy rains.
- ✿ Unfine: The Feds cancelled a \$7000 fine issued to WWTM-1400 Decatur, Alabama. Santa is alive!
- ✿ NEWS ITEM: (12/15/2010) Crafton Borough (Pennsylvania) has given the owners of WZUM-1590 Carnegie, Pennsylvania 30 days to remove any equipment from the property where their three towers are located. After that happens, the towers will be razed. The station has been silent since March 2010 and it has been reported that the rent on the land has not been paid in several months.
- ✿ Thanks to Wayne Heinen, Håkan Sundman, and Philip Zmenkowski.

GRAVEYARD DX ACHIEVEMENTS – UPDATE

+ record held by a DXer in USA/Canada where a Canada/USA record exceeds that mileage

<u>Station</u>	<u>City</u>	<u>DXer</u>	<u>DX Location</u>	<u>Miles</u>
<u>1240 kHz</u>				
KXLE WA	Ellensburg	Ron Schiller	Coeur d'Alene, ID	+ 182
<u>1340 kHz</u>				
KLOO OR	Corvallis	Ron Schiller	Coeur d'Alene, ID	+ 379

Domestic DX Jim Tedford Radio_Enthusiast@hotmail.com
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Digest – West Bothell, WA 98012-8133

U.S./Canadian Loggings from Pacific/Mtn/Central Time Zones. All times ELT.

I hope everyone had a wonderful Christmas, and that Santa remembered your DX wish list. You did write a letter to him, didn't you?

Reporters

FO-OK Forest Osborn, Hooker, OK. IC-R70, Hammarlund HQ-150, 4' loop and 200' longwire.
GH-KS Gary Houdek, Munden, KS. GE Superadio
JDS-MN Jeff Steffes, Watertown, MN. Drake R8, Kenwood R-2000, Quantum QX Loop
JJR-WI John J Rieger, South Milwaukee, WI. CC Radio2
JW-CO John Wilkins, Wheat Ridge, CO. Drake R-8, 4-foot box loop.

- MR-UT** **Mike Riordan, Salt Lake City, UT.** Sony CRF-1 Realistic DX-440, Grundig YB400-PE; Radio West modified loop, Select-A-Tenna.
- WH-CO** **Wayne Heinen, Aurora, CO.** Kiwa Loop Drake R8B, E/W Flag, N/S Flag, Dual TG-1 Termination Gizmo w/DX Engineering RPA-1 preamp and Mini DXP5.

Station News

- 820 **KUTR** **UT** **Taylorsville** – Since early November, station has been without its IBOC The usual mix of KTIB, KBHB and KLVZ is heard during critical hours. **(MR-UT)**
- 1190 **KNUV** **AZ** **Tolleson** – 12/18 2000 – Up out of the noise with SS ID by little girl then EE ID by lady announcer "You're listening to KNUV AM 1190 Tolleson Arizona" and continued with more ID in SS. In phase null of local KVCU. Later I had a XE call sign and mentions of "Grupo Formula" Steve Frances got the call as XEDF-FM and Finnish DXers had determined that this was being used as programming by KNUV. **(WH-CO)**
- KVSV** **KS** **Beloit** – 12/19 0806 – Coming out of local weather "... Beloit weather of KVSV AM 1190 and FM 105 it's 7:06" this is now back to //FM again. **(WH-CO)**
- CFSL** **SK** **Weyburn** – 12/18 2300 – Out of C&W with people commenting about great country on AM 1190, "Another hour of great country start now on AM 1190." In phase null of local KVCU. No CP news or local weather noted on this one anymore. **(WH-CO)**

DX Loggings (All Times ELT)

- 600 **WMT** **IA** **Cedar Rapids** – 12/19 1732 – Musical memories show of oldies music, big bands, ad for Czech Cottage at Cedar Rapids. **(FO-OK)**
- 690 **KGGF** **KS** **Coffeyville** – 12/19 1742 – Kansas City Chiefs Radio Network with the Capitol-Federal Post Game Show, ad for Hawkins Heating and Cooling in Cherryvale, KS. **(FO-OK)**
- 730 **KLOE** **KS** **Goodland** – 12/19 1715 – Oldies music and ID as "The Lounge, 7-30 KLOE." **(FO-OK)**
- 750 **WNDZ** **IN** **Portage** – 12/23 0815 – Popped on at 0815 with opening announcement by gal: "Good Morning. This is AM 750 WNDZ Portage, Indiana- Chicago..."; a program in Ukrainian followed. Fair with QRM. **(JW-CO)**
- CKJH** **SK** **Melfort** – 12/11 0717 – "The fifties, sixties, and seventies, always on the CK Seven-Fifty" into song: "Sleigh Ride." **(JDS-MN)**
- 790 **WAYY** **WI** **Eau Claire** – 12/11 0730 – Commercial for the Clark Howard Show on News Talk 790 WAYY. **(JDS-MN)**
- 840 **WHAS** **KY** **Louisville** – 12/11 0752 – "Eighty-Four WHAS is live twenty-four-seven" into weather forecast including high of 71 degrees. **(JDS-MN)**
- 850 **KOA** **CO** **Denver** – 12/11 0758 – Station ID: "News radio 850 KOA" followed by KOA time saver traffic, Into: "Straight up six o'clock KOA news." **(JDS-MN)**
- 890 **WLS** **IL** **Chicago** – 12/11 0816 – "Get the whole story here, keeping you connected to the stories that matter most 890 WLS." **(JDS-MN)**
- KQLX** **ND** **Lisbon** – 12/11 0818 – Song: "Drink a Little Drink" Eric Church followed by "Thunder One Of Six One, the valley's favorite country." **(JDS-MN)**
- 900 **CKBI** **SK** **Prince Albert** – 12/3 2215 – Full station ID, into local talk program. **(GH-KS)**
- 940 **KPSZ** **IA** **Des Moines** – 12/19 1815 – ID as "Iowa's Christian Voice." **(FO-OK)**
- KIXZ** **TX** **Amarillo** – 12/19 1816 – *Money Talk* Show, ad for Amarillo business. **(FO-OK)**
- 980 **CFPL** **ON** **London** – 12/15 0732 – Fair - "AM980 traffic on the 2's," station web info. Signal in for over 30 minutes. Unusually strong, wiping out others. **(JJR-WI)**
- CJME** **SK** **Regina** – 12/12 0824 – Spot for CJME toy drive with reference to Regina, into Station ID: "CJME." **(JDS-MN)**
- 990 **KFCD** **TX** **Farmersville** – 12/19 1700 – SS music up to TOH ID and back to SS music. **(FO-OK)**
- 1000 **KOMO** **WA** **Seattle** – 11/27 0130 – Noted with 50 kW power non-directional with very strong local-like signals. At 0300 station went to night pattern, with big drop in signal strength. **(MR-UT)**
- 1060 **WLNO** **LA** **New Orleans** – 12/2 0600 – Station ID: " WLNO New Orleans; New Orleans' Most Powerful Christian Station." **(GH-KS)**
- 1150 **WHBY** **WI** **Kimberly** – 12/15 2034 – Commercials for local businesses, followed by "Eleven-Fifty WHBY" **(JDS-MN)**
- 1170 **KJOC** **IA** **Davenport** – 12/15 2041 – "True oldies Eleven-Seventy, playing more oldies loud and proud, the true oldies channel." Into songs; "I Love You More Today

Than Yesterday" by Spiral Staircase, "I Love Rock and Roll" Joan Jett. **(JDS-MN)**

- 1180 WHAM NY **Rochester** – 12/15 2103 – News, into Station ID: "News radio eleven-eighty WHAM" followed by weather forecast , Into: The Savage Nation. **(JDS-MN)**
- 1190 KVSV KS **Beloit** – 12/19 1804 – ABC news, local weather at 1805. **(FO-OK)**
 KPHN MO **Kansas City** – 12/19 0558 – Out of Radio Disney KPHN ID by a kid, and the usual Radio Disney stuff. **(WH-CO)**
 KXKS NM **Albuquerque** – 12/19 0900 – Out of Emily Barnes syndicated REL program "This is AM 1190 KXKS Albuquerque Radio that changes the way you learn" and "Fellowship of the Cross" REL program. **(WH-CO)**
- 1210 KGYN OK **Guymon** – 12/15 2232 – Weather forecast, Into "US Country Twelve-Ten KGYN," followed by song: "Somebody Done Somebody Wrong Song." **(JDS-MN)**
 ++ 12/17 2205 – Out of local spots "This is US Country 1210 KGYN Guymon" and into Guymon Basketball: mixed with KHAT. **(WH-CO)**
 KHAT WY **Laramie** – 12/17 2056 – "ESPN Radio for South East Wyoming AM1210 KHAT Laramie." **(WH-CO)**
- 1230 KSTC CO **Sterling** – 12/14 0400 – Out of OLD "Playing the Hits from the '50's to the 80's Kool Gold 1230 KSTC Sterling Colorado." to ABC News. **(WH-CO)**
 WFXN IL **Moline** – 12/15 0742 – Poor. Sports chatter; heard, "in Davenport, for traffic info call (phone number)..." Not heard in years! **(JJR-WI)**
 WTKG MI **Grand Rapids** – 12/15 2246 – Station ID: "WTKG Grand Rapids" graveyard station, 426 miles away! **(JDS-MN)**
 KWSN SD **Sioux Falls** – 12/14 0104 – Up briefly with call sign ID. **(WH-CO)**
- 1270 WWWI MN **Baxter** – 12/22 1659 – Area ads; legal ID at 1659:50: "Connected to Minnesota, this is AM 1270 WW-WI-Baxter," CBS news next, followed, I think, by local news at 1703; spotty reception after this; did note one or two "3-W-I" slogans. Been a few years since hearing this one. **(JW-CO)**
- 1280 CJSL SK **Estevan** – 12/9 2102 – Out of C&W song into "Today's New Country and all-time favorites CJ-1280" in local KBNO phase null New One #9 for the season and taped for the collection. **(WH-CO)**
- 1310 KKNS NM **Corrales** – 12/8 2204 – Out of SS Music to call ID with heavy reverb and fanfare poor in KFKA phase null. **(WH-CO)**
- 1320 KCTC CA **Sacramento** – 12/20 0359 – Legal ID in QRM and "ESPN 1320" tags. Still not using their newly-assigned City-of-License West Sacramento. Poor in QRM. **(JW-CO)**
 KCLI OK **Clinton** – 12/5 0905 – Out of Oklahoma State FB promo "... right here on NewsTalk KCLI 99.3 FM and 1320 AM." **(WH-CO)**
 KXYZ TX **Houston** – 12/5 0356 – Out of SS music "This is KXYZ AM" fair signal in the crowd. **(WH-CO)**
- 1330 KNSS KS **Wichita** – 12/19 1800 – ID as "Newsradio 13-30, Wichita." **(FO-OK)**
- 1340 WSOY IL **Decatur** – 12/25 0656 – Poor in local WJYI null. Christmas programming break, "NewsTalk 1340 WSOY." Rare! **(JJR-WI)**
 KTOQ SD **Rapid City** – 12/11 2200 – "Rapid City ... KTOQ Rapid City" and into Fox News then faded through the jumble in local KCFC phase null. **(WH-CO)**
- 1350.05 KDZA CO **Pueblo** – 12/17 2042 – Ads for JR's Country Store, Pueblo Chieftain, and others; back to sports talk at 2046 – sounded like local pre-game show. Fair peaks and causing a growl on the frequency. **(JW-CO)**
- 1350 KABQ NM **Albuquerque** – 12/17 2100 – Guy with ID: "KABQ Albuquerque -this is Albuquerque's Progressive Talk AM 1350"; CNN news followed. Generally fair with fading and QRM. **(JW-CO)**
- 1360 KDJW TX **Amarillo** – 12/19 1757 – EWTN radio program. and ID as Amarillo. **(FO-OK)**
- 1390 KLTX CA **Long Beach** – 12/16 0459 – Mentions of "Nueva Vida" and "California"; then legal ID at 0459:40: "This is...Radio, KLTX Long Beach - Los Angeles...Nueva Vida..." and into SS programming. Fair at best in KGNU null. Last hears several years ago as KGER. **(JW-CO)**
 KXSS MN **Waite Park** – 12/16 0305 – Weather, then "Wake up with...morning show, weekdays...on St. Cloud's Sports Leader, AM 1390 The Fan St. Cloud"; also heard at 0659:50 with legal ID: KXSS Waite Park-St. Cloud." Generally poor in QRM. **(JW-CO)**
 KENN NM **Farmington** – 12/13 0759 – Dual KENN-1390/KVFC-740 legal ID, followed by ABC news. Fair/good in null of local KGNU. **(JW-CO)**

- KCRC OK Enid** – 12/16 0259 – ID by male voice at 0259:50: "...weekdays from 7 to 9 on ESPN Radio 1390 KCRC Enid," followed by sports talk. Rough in QRM with KGNU nulled. **(JW-CO)**
- KJAM SD Madison** – 12/15 2101 – Sung legal ID: "1390 KJAM Madison"; not sure what followed; probably the one heard earlier with Oldies music. Generally poor with occasional fair peaks. New here, SD #35. Now need only 2 more (KJJQ, KZOY) to complete South Dakota. **(JW-CO)**
- 1400 WGIL IL Galesburg** – 12/25 0636 – Poor in (semi local) WRJN null. Calls said 3 times. Rare! **(JJR-WI)**
- 1420 WOC IA Davenport** – 12/19 1753 – On top of channel with "Glenn Beck coming soon on WOC." **(FO-OK)**
- KTOE MN Mankato** – 12/19 1751 – Up briefly with call letter ID before WOC took over. **(FO-OK)**
- 1550 KMRI UT West Valley City** – 11/27 0230 – Station noted on daytime power all night. **(MR-UT)**
- 1590 KVGB KS Great Bend** – 12/19 1740 – Dennis Miller Show, ID as "KVGB, Voice of the Golden Bells" ?? VGB. **(FO-OK)**
- 1660 KQWB ND West Fargo** – 11/22 2130 – Heard with ESPN Radio and add for local businesses in Wells Fargo. **(MR-UT)**

Thanks to everyone for their loggings. 2011 is going to be a great AM-DX season. I can just feel it. See you next time. **(JDT-WA)**

Domestic DX

Digest – East

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U.S./Canadian Loggings from Eastern/Atlantic Time Zones. All times ELT.

REPORTERS

- BC-NH Bruce Conti, Nashua** – WinRADIO Excalibur, MWDX-5, variable termination Split SuperLoop east, SuperLoop south.
- HF-MI Harold Frodge, Midland** – Drake R8B + 125 ft. bow-tie; 85 ft. RW & 180 ft. center-fed RW
- HJH-PA Harry Hayes, Wilkes-Barre** – Grundig S350, Kiwa Pocket Loop
- KK-VA Kraig Krist, Manassas** – NRD-545, Kiwa loop
- TLK-FL Terry L Krueger, Clearwater** – JRC NRD-535; ICOM IC-R75; Hammarlund HQ-180A; Aqua Guide 705 Radio Direction Finder; Sony ICF-7600GR; GE SuperRadio III; RadioShack DX-399; roof dipole; in-room random wire; RadioShack 15-1853 passive MW loop; Scotka active MW ferrite loop.
- JM-PA John Malicky, Pittsburgh** – Superadio III
- IEN-GA Ira Elbert New, III, Watkinsville** – 2003 Isuzu Rodeo In-Dash Audio System 4340
- JJR-MI John J. Rieger, L'Anse** – CCRadio 2
- MKB-ON Mike Brooker, Toronto** – Grundig G5, Grundig YB-400PE, Sony SRF-39FP, Panasonic RF-2200 (receiver emeritus)

UNIDs

- 660 UNID --** 12/18 1225 – Very weak under Radio Progreso (Cuba) with talk show, female "Obamacare" bashing, 800 number (presumably syndicated satellite-fed program). Didn't think about WORL in Orlando until after the fact, but their noon block for Saturday is listed as a local cooking show hosted by a black dude. Format not fitting SC, LA, TX, AL stations on 660. What's the status of WNFS, White Springs, FL? I find no URL, just the FCC database listing as 50 kW daytime. Part of the FCC's web has really been crapping out a lot of late, I might add. **(TLK-FL)**
- 720 UNID --** 12/10 2233 – Religious-sounding program with talk and music in an echoey hall. Well under WGN. Probably not Las Vegas. **(HF-MI)**

- UNID -- 12/11 1714* – Sign off announcement with SSB, well under WGN. Noted again on 12/13 peaking almost equal to WGN at times. Anthem started at :14 but cut off after 15 seconds. **(HF-MI)**
- 990 UNID -- 12/21 1727 – Under CKGM (Montreal's "Team 990") sports talk with SS gospel talk by woman, many mentions of Jesus Christo. Presumed to be WXCT Southington, CT unless WDCX Rochester, NY added some SS programs. **(MKB-ON)**
- 1710 UNID -- 12/10 2210 – Man in FF taking phone calls. Mainly on top with Latino and Christmas music challenging at times. **(HF-MI)**

DX TEST

- 1420 WASR NH **Wolfeboro** – 12/25 0015 – Short-notice test tried for but not heard. Stayed on frequency until 0100, heard only usual pest WHK and someone playing medley of non-stop Christmas tunes, which may have been them. Also noted ESPN sports, which turned out to be WRSA (see logging below). **(MKB-ON)**

LOGGINGS

- 540 WFLF FL **Pine Hills** – 12/23 0601 – In mix with news, local weather promo "The 5-40 WFLA weather channel... weather updated around the clock on WFLA... on 5-40 WFLA... Orlando and around the world wide web..." **(KK-VA)**
- WXYG MN **Sauk Rapids** – 12/20 1716 – Poor slow up and down fades with quick call ID, 3 more songs then "serving the Sauk Rapids area, WXYG, the G" into more Christmas music. Enjoyable listening to power drop at 1726. NEW! **(JJR-MI)**
- 560 WJLS WV **Beckley** – 12/12 1906 – Good signal over WFIL with gospel music. Had "WJLS Winter Storm Watch" with forecast for 10 to 14 inches of snow. Slogan, "The Most Listened to Station in Southern West Virginia." Rarely heard. **(HJH-PA)**
- 570 WKBN OH **Youngstown** – 12/20 0637 – Poor and alone with "News-Talk 570 WKBN" ID. No usual WNAX. Cannot remember when or if ever heard this well here. **(JJR-MI)**
- CKGL ON **Kitchener** – 12/21 0734 – Poor with local news, "on the North side in Kitchener, I'm ... 570 News." **(JJR-MI)**
- 580 WCHS WV **Charleston** – 12/22 1705 – Alone on frequency with ABC news, ad for City National Bank into local traffic report ending with station promo "that's your Time Saver Traffic on 58 WCHS." **(MKB-ON)**
- CFRA ON **Ottawa** – 12/21 0736 – Poor over others with "...580 CFRA" ID, man and woman reading news. **(JJR-MI)**
- CKWW ON **Windsor** – 12/22 0707 – Poor in null of others with oldies, slogan "AM 580 Motor City Favorites", male DJ chatter. **(JJR-MI)**
- 600 WMT IA **Cedar Rapids** – 12/23 0605 – Mixing with WVAR and WCAO, man and woman discussing Salvation Army, ID as "WMT radio. 6 hundred WMT." PSA for lead free kids dot org. "14 [degrees] at broadcast house. AM 6 hundred WMT" by woman into talk about "snow headed our way." **(KK-VA)**
- WVAR WV **Richwood** – 12/23 0605 – In WMT/WCAO mix with oldies and Christmas songs, mentioned "...white Christmas in West Virginia... no doubt..." **(KK-VA)**
- 680 CJOB MB **Winnipeg** – 12/20 0753 – Poor in and out with Winnipeg mentions over UNID station. Not common. **(JJR-MI)**
- 690 KFXN MN **Minneapolis** – 12/20 1730* – Poor with sign-off announcement, mention to tune K-FAN 1130, carrier drops off quick. **(JJR-MI)**
- 710 KNUS CO **Denver** – 12/20 0748 – Poor and alone with "on NewsTalk 710 KNUS" and Dennis Praeger promo. **(JJR-MI)**
- 730 WJMT WI **Merrill** – 12/14 1736 – In and out over CKDM with Christmas tunes, ad for Christian Science, slogan "Country 7-30, the Patriot", local Merrill ads. WI #58 **(HF-MI)**
- CKDM MB **Dauphin** – 12/14 1736 – C&W songs, slogan "the Heartland's best, 7-30 CKDM." In and out with WJMT. **(HF-MI)**
- 750 CKJH SK **Melfort** – 12/21 0741 – Poor with oldies, "CK 750, 6:41" into chatter, way over WSB. **(JJR-MI)**
- 860 KNUJ MN **New Ulm** – 12/20 0923 – Poor with many school closings, "keep it on KNUJ" station promo into news. **(JJR-MI)**
- 880 KLRG AR **Sheridan** – 12/16 1900 – Over nulled WCBS with "the Talk Giant...KLRG Sheridan-Little Rock, it's 6 o'clock" ToH ID into SRN news, gone by 1901,

probably due to night power cut and pattern change. QSLed as KGHT in 1991. (MKB-ON)

- 900 CHML ON **Hamilton** – 12/24 0533 – Man with ID and station promo "CHML. Hamilton's news talk leader." (KK-VA)
- 940 WIDG MI **St. Ignace** – 12/22 0858 – Poor with long list of contributors, giving local area addresses, mention of "Baraga Broadcasting", local weather. No ToH ID heard. Rare! (JJR-MI)
- 950 CKNB NB **Campbellton** – 12/24 1628 – Over WWJ and other usual pests with station promo "...on your community station, 95 CKNB", ad for Central Garage in Atholville, "CKNB" jingle into choral version of "Silent Night." (MKB-ON)
- 960 KLTF MN **Little Falls** – 12/20 0917 – Poor but steady with sports, local ads. "AM 960 KLTF" ID and "Fallsradio.com" mentions. (JJR-MI)
- WFIR VA **Roanoke** – 12/24 0535 – Man with news and station promo "WFIR Fox news. You're tuned to 9-60 WFIR." (KK-VA)
- 980 CJME SK **Regina** – 12/20 0823 – Poor over others with local weather (-20C!) "News-Talk 980 CJME" ID into ad. (JJR-MI)
- 1050 KLOH MN **Pipestone** – 12/21 1720 – Fair to fade, way over CHUM with woman doing local weather, C&W song, Ag spot (*Does "Ag" refer to agricultural, or silver bullion? Mike*), rare. (JJR-MI)
- 1080 WHOO FL **Kissimmee** – 12/9 1725 – Good with sports interview, promo for college football awards show in Orlando on "ESPN 1080 the Team", then taken out by WKJK. (JM-PA)
- WKJK KY **Louisville** – 12/9 1726 – Good until night power cut with Kentucky News Network local news, traffic from "84 WHAS", promo for gun show and other ads, slogan "Talk Radio 1080 WKJK. (JM-PA)
- WKGX NC **Lenoir** – 12/9 1712* – Fair with bluegrass tunes, quick sign-off announcement: "at this time WKGX 1080 AM is now signing off for another broadcast day", SSB played on a fiddle. (JM-PA)
- KNDK ND **Langdon** – 12/20 0913 – Poor with "KNDK 1080 and Maverick 105 morning show" station promo, weather advisory, chatter over KYMN. (JJR-MI)
- 1090 WTSB NC **Selma** – 12/8 1744 – In briefly with "...write to us at...WTSB" into bluegrass music. (JM-PA)
- KTGO ND **Tioga** – 12/20 0820 – Fair with ads for Tioga Hardware Hank, Tioga Drug, and Farmers in North Dakota, "KT1090 Sports" slogan. (JJR-MI)
- WCZZ SC **Greenwood** – 12/8 1703 – Fair with PSAs, Christmas gospel tune by the Temptations, slogan "Faith 1090." (JM-PA)
- 1100 WZFG MN **Dilworth** – 12/8 1753 – Presumed over/under WTAM with Michael Medved show and SRN news. (JM-PA)
- 1130 WCLW NC **Eden** – 12/10 1702 – Fair with PSA mentioning Madison, NC into southern gospel tune, then faded out under WBBR. (JM-PA)
- 1140 CBI NS **Sydney** – 12/23 2059 – Excellent; "This is CBC Radio One, 90.1 FM in Bay St. Lawrence; Canada lives here," and promo into CBC news. (BC-NH)
- 1160 KHPP IA **Waukon** – 12/21 1011 – Poor over WYLL with "AM 1160 K-Soft" slogan. First time heard with new AC format. (JJR-MI)
- 1170 WCXN NC **Claremont** – 12/23 2100 – Good; "Qué Buena" non-ID on the hour, Mexican music. New log. (BC-NH)
- 1200 WRKK PA **Hughesville** – 12/2 1653 – Fair over WPHT-1210 IBOC slop with Sean Hannity show on "News Talk 1200, 1400 and 94.1", then gone. (JM-PA)
- WMIR SC **Atlantic Beach** – 12/7 1753 – Fair-good over/under CFGO with station promos "where gospel and soul music lives, AM 1200 WMIR" and "musical soul food and the best in gospel music" on the Cedric Bailey Show (syndicated program out of Virginia Beach, VA). (JM-PA)
- WOAI TX **San Antonio** – 12/7 1800 – Fair after WMIR fade-out with ToH ID and news. (JM-PA)
- 1210 KOKK SD **Huron** – 12/20 1749 – Poor with C&W, ad for Dwayne's Carpet in Huron, ads to fade, but over WPHT. (JJR-MI)
- 1230 WGRY MI **Grayling** – 12/22 1830 – Very poor though clear "WGRY" ID in and out to graveyard mud. (JJR-MI)
- KGHS MN **International Falls** – 12/20 1631 – Poor with ad mentioning "...furniture in International Falls", slogan "Good Time Oldies on KGHS radio" into 70s oldie. Third time heard. (JJR-MI)

- WTIV PA Titusville – 12/17 1900 – Caught part of ToH ID in graveyard mush: "...on the Allegheny Talk Network...this is WTIV Titusville" into Fox news. **(MKB-ON)**
- 1240 WSDR IL Sterling – 12/22 1700 – Poor in under others with ToH call letter ID, CBS news. **(JJR-MI)**
- WJON MN St. Cloud – 12/20 1000 – Poor with very quick ToH legal ID into ABC news over KDLR. **(JJR-MI)**
- KDLR ND Devils Lake – 12/20 1000 – Very poor under WJON with ToH ID into CBS news. **(JJR-MI)**
- WRTA PA Altoona – 12/24 0333 – In mix with ESPN station, WRTA ID in Doug McIntyre's "Red Eye Radio." **(KK-VA)**
- WOMT WI Manitowoc – 12/20 0719 – Fair and surprisingly loud with detailed weather, call letter ID, sports. **(JJR-MI)**
- 1260 KDUZ MN Hutchinson – 12/21 1005 – Poor with detailed weather report after ABC news, call letter ID into more ads. **(JJR-MI)**
- WSKO NY Syracuse – 12/22 1940 – Poor in with WSDZ, slogan "Central New York's Score", "The Score - 1260" and Sporting News Radio sports talk. No usual WNDE. **(JJR-MI)**
- 1270 KWEB MN Rochester – 12/21 1030 – Poor with many ads, several fades, more "in Rochester" ads over WKBF and WMKT. Not common. **(JJR-MI)**
- 1280 CFMB QC Montreal – 12/24 1557 – Wiping out usual WHTK sports talk with Jose Feliciano's "Feliz Navidad", talk in Italian by man, including a CFMB call ID, into news in Italian at 1600. **(MKB-ON)**
- 1290 KKAR NE Omaha – 12/21 0803 – Poor under CFRW with traffic report "on K-Kar." **(JJR-MI)**
- 1310 KGLB MN Glencoe – 12/21 1031 – Poor to fade out over WIBA with old C&W, call letter ID. Not common. **(JJR-MI)**
- 1320 WJAS PA Pittsburgh – 12/21 1820 – In mix with oldies, station promo "Pittsburgh's radio station... WJAS Pittsburgh..." **(KK-VA)**
- 1330 WLOL MN Minneapolis – 12/13 1655 – Slogan "Twin Cities Catholic Radio AM 13-30", "Relevant Radio AM 13-30 WLOL Minneapolis-St. Paul; this is listener-supported Relevant Radio." Fair, on top. Last logged as WMNN. **(HF-MI)**
- WEBO NY Owego – 12/11 0802 – Over usual WFNN pest with John Lennon's "And so this is Christmas", ToH (more or less) ID as "Tioga County and the Southern Tier's local news leader is 1330 WEBO Owego-Binghamton" into local weather and promo for WEBO's local weather reports every half hour. **(MKB-ON)**
- WSPQ NY Springville – 12/20 1735 – In WHBL mix with Christmas songs and station promos "the greatest hits ever made. Classic hits 13-30 WSPQ." "Your hometown station. AM 13-30 WSPQ Springville..." **(KK-VA)**
- WHBL WI Sheboygan – 12/20 1735 – Sports talk in mix with WSPQ and others, "WHBL" ID by man at 1835. **(KK-VA)**
- 1340 WSTV OH Steubenville – 12/14 1811 – In mix with "AM 13-40 WSTV Steubenville..." ID during Pittsburgh Penguins hockey game. **(KK-VA)**
- 1350 WARF OH Akron – 12/15 1908 – In mix with ad for "Grape and Granary off route 8...", "Fox Sports Radio... WARF..." ID. **(KK-VA)**
- 1360 WDRC CT Hartford – 12/15 1820 – In mix with Steve Mossburg Show, station promo "The talk of Connecticut Michael Savage weeknights at 9..." **(KK-VA)**
- WTOC NJ Newton – 12/15 1820 – Oldies in mix with WNJC, WDRC, et al. "This is WTOC..." ID by man. **(KK-VA)**
- WNJC NJ Washington Township – 12/15 1820 – noted "...13-60 AM WNJC Saturday mornings..." station promo in WTOC/WDRC mix. **(KK-VA)**
- 1370 KSUM MN Fairmont – 12/20 1837 – Poor with C&W, mentions of "...in Fairmont", "...funeral home", then woman with local weather, "here's the KSUM forecast." **(JJR-MI)**
- WXXI NY Rochester – 12/14 2005 – In WSPD mix with woman interviewing about Michael Jackson's new CD. "I'm Michael Martin for NPR News", station promo "...tomorrow evening at 8 on WXXI..." **(KK-VA)**
- WGIV NC Pineville – 12/16 1801 – Fighting off usual pests (WXXI, WSPD) with promo for WGIV's Christmas party at the Jet Ultra Lounge in Charlotte, slogan "the Soul of Charlotte." **(MKB-ON)**
- WSPD OH Toledo – 12/14 2005 – Sean Hannity show in mix with WXXI, "13-70 WSPD" ID. **(KK-VA)**

- 1390 **WFBL** NY **Syracuse** – 12/11 1909 – In mix with WEED and WSPO, "...6 till 9 CNY Talk Radio", "WFBL weather..." **(KK-VA)**
- WEED** NC **Rocky Mount** – 12/11 1909 – In WSPO/WFBL mix with oldies, slogan "Old school 13-90", station promo "... all of eastern Carolina... old school... every night... AM 13-90...", ad for Golden Beach Mall in Rocky Mount, more station promos: "Old school. Back to the day 13-90." "It is now official. North Carolina is now old school. Old school 13-90." **(KK-VA)**
- WSPO** SC **Charleston** – 12/11 1909 – In WEED/WFBL mix with Sporting news radio, ad for Edwards Cigar Bar, station promo "weekdays at 3 on WSPO" into "Sporting News Radio" jingle and ad for "NFL Today." Slogan "13-90 WSPO the sports leader." **(KK-VA)**
- 1400 **WMAN** OH **Mansfield** – 12/20 1730 – Briefly on top of graveyard jumble with station promo "Sean Hannity on News Radio 1400 WMAN" into local news. **(MKB-ON)**
- 1410 **WPOP** CT **Hartford** – 12/11 1902 – In KQV mix with basketball game recap. Many mentions of Hartford. **(KK-VA)**
- WHLN** KY **Harlan** – 12/20 1805 – Fighting off oldies and sports talk stations with local weather, ad for Harlan Family Dentists, 118 South First Street in Harlan, then lost to WDOE. **(MKB-ON)**
- WING** OH **Dayton** – 12/20 1802 – Poor with mention of Ohio State Buckeyes, no less than 6 promos for "1410 ESPN Radio." Not common. **(JJR-MI)**
- KQV** PA **Pittsburgh** – 12/24 0433 – In mix with "Bloomberg Business Week," station promo: "We're smaller, but we try harder. Thanks for listening to KQV." **(KK-VA)**
- 1420 **WRSA** VT **St. Albans** – 12/25 0100 – While trying for hastily-arranged WASR DX test (not heard), noted over usual WHK with "ESPN radio 1420 WRSA Saint Albans" ToH ID into report on Tulsa beating Hawaii in Hawaii Bowl game. **(MKB-ON)**
- 1450 **KMRY** IA **Cedar Rapids** – 12/20 0809 – Poor with mention of "...at the Target store on the west side in Cedar Rapids..." **(JJR-MI)**
- WHTC** MI **Holland** – 12/20 0708 – Poor in fade-in with "news, sports and weather on demand at WHTC.com" station promo. **(JJR-MI)**
- WNBY** MI **Newberry** – 12/22 2119 – Very poor, chance fade-up mention of "in Newberry" and lost to mud again. Rare despite closeness to my location. **(JJR-MI)**
- KFIZ** WI **Fond du Lac** – 12/22 0828 – Poor in fade-up with promos for "KFIZ.com" and "KFIZ Breakfast Club", also mentioned "923-1450" station phone number. Rare! **(JJR-MI)**
- 1460 **WKAM** IN **Goshen** – 12/22 0701 – Poor but alone, finally caught a legal ToH ID in EE after 3 days of in and out SS. **(JJR-MI)**
- KKAQ** MN **Thief River Falls** – 12/20 1700 – Poor with AM-FM call letter ID, ABC news over CJOY. **(JJR-MI)**
- KLTC** ND **Dickinson** – 12/21 2042 – Poor in KXNO null over WBRN with call letter ID, oldie C&W. **(JJR-MI)**
- 1470 **WSAN** PA **Allentown** – 12/20 0834 – Over WNYX with Fox Sports talk on NFL, Auto Zone ad, local traffic report with mentions of Allentown and Bethlehem, "that's your look at traffic and weather on AM 1470 the Fox." **(MKB-ON)**
- 1480 **WGVU** MI **Kentwood** – 12/20 0700 – Poor with "Real Oldies 1480 and 850" slogan, oldies, University of Michigan mentions. No usual WLVM. **(JJR-MI)**
- 1490 **KRIB** IA **Mason City** – 12/21 2033 – Poor with sports play-by-play, call letter ID, local ad. **(JJR-MI)**
- KLGR** MN **Redwood Falls** – 12/20 0932 – Poor and alone with local ads, web promo, call IDs. **(JJR-MI)**
- 1510 **KCTE** MO **Independence** – 12/21 1758 – Poor in tight WLAC null with full legal ID at :58, ESPN sports talk. **(JJR-MI)**
- KMSD** SD **Milbank** – 12/21 2030 – Poor through nice fade up over WLAC with "Merry Christmas from 1510 KMSD." Pretty good for 14 watts, assuming they were actually using their post-sunset power! **(JJR-MI)**
- 1520 **WMLM** MI **St. Louis** – 12/21 0816 – Poor with "WMLM AM 1520 sports report." Rare. **(JJR-MI)**
- 1530 **KQNK** KS **Norton** – 12/22 2100 – Very poor but clear AM/FM ToH legal ID into news from UNID network. Slogan "Hometown Radio Station", "My Life" by Billy Joel, "China Grove" by Doobie Brothers heard in WCKY null. Daytimer on late. **(JJR-MI)**

- 1540 KXEL IA **Waterloo** – 12/11 1849 – Sean Hannity Show in CHIN mix, "15-40 KXEL. News talk 15-40 KXEL" IDs. **(KK-VA)**
- WREJ VA **Richmond** – 12/5 1725 – Gospel music. Good signal only to fade into the mix after the ID. "Rejoice 1540." **(IEN-GA)**
- CHIN ON **Toronto** – 12/11 1849 – Mixing with KXEL, woman with local ad mentioning phone number "416 917 1456" (416 is Toronto area code). "...Ottawa...China Radio International..." into CRI news. **(KK-VA)**
- 1550 KESJ MO **St. Joseph** – 12/22 2013 – Very poor with ESPN sports, promo for "Mike & Mike and the Herd on ESPN 1550 KESJ." Later, "mid-Missouri" mention, ads for M&I Bank, "Case/IH...in Savannah." **(JJR-MI)**
- 1570 WBGX IL **Harvey** – 12/22 1753 – Poor with local church info "at 91st and Cottage Grove." Been in past few days, but something finally ID'able. **(JJR-MI)**
- CJLV QC **Laval** – 12/18 0617 – In graveyard-like mush (nothing really dominant) with oldies, station promo "...pour les nouvelles, le sport...à Laval..." into local weather. Now rare, but used to blast in during their CKLM heyday. **(MKB-ON)**
- 1590 WPVL WI **Platteville** – 12/22 2000 – Poor with dual ID's for WPVL & WGLR, ESPN sports talk. Rare. **(JJR-MI)**
- WGBW WI **Two Rivers** – 12/22 0838 – Very poor though clear "WGBW" ID with 3 to 5 others fighting it out. **(JJR-MI)**
- 1670 WFSM GA **Dry Branch** – 12/18 1221 – Fair with sports talk, a high noon logging as we near the winter solstice. **(TLK-FL)**
- CJEU QC **Gatineau** – 12/22 2210 – Poor but steady under WTDY with "Billy Jean" by Michael Jackson, "Telephone" by Lady Gaga and FF children chatter. NEW! **(JJR-MI)**
- 1700 KVNS TX **Brownsville** – 12/22 2228 – Poor-fair with some fade-ups over KBGG. "Go ahead, sing along! 1700 KVNS" station promo and oldies. **(JJR-MI)**

International DX Digest

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Loggings of stations outside the Lower 48 and Canada. All times UTC.

TRANS-ATLANTIC DX

- 189 ICELAND *Ríkisútvarpid*, Gufuskálar (64°54'N 23°55'W) DEC 7 1100-1110 – Strong at this late hour with top-of-hour fanfare, announcement in presumed Icelandic, news by man with reference to Reykjavik. At 1103 end of news into teletalk until 1110 tune-out. [DeLorenzo-MA]
- 198 ENGLAND *BBC Radio 4*, Droitwich et al. DEC 10 2304-2316 – Two men in English, interview re Brit authors. Minor beacon interference. [Frodge-MI]
- 531 ALGERIA *Chaîne 1*, El Ain Beida (35°49'N 7°19'E) DEC 10 2054-2103 – Loud and clear with Arabic rap(!), man in Arabic, brief instrumental music bridge, time pips at 2100 into news by woman in Arabic. Parallel to 549 kHz. [DeLorenzo-MA]
- 531 FAROE ISLANDS *Kringvarp Føroya Útvarpid*, Akraberg (62°01'N 6°46'W) DEC 10 2133-2226 – Noted for the first time this season at fair level under loud Algeria with local folk vocals and man in presumed Faroese parallel to webstream via radiotime.com. News by man at 2200 and back to music at 2205. Played "Jingle Bells" in a Nordic language at 2226 tune-out. DEC 11 2220-2259 – In again fair under Algeria with pop and American Country & Western music parallel to webstream. Played "It's Alright" by The Traveling Wilburys at 2220. [DeLorenzo-MA]
- 549 ALGERIA *Chaîne 1*, Les Trembles (35°17'N 0°34'W) DEC 11 2113 – Loud and clear with dramatic presentation by man in Arabic and traditional Middle Eastern music mixed in every few seconds. [DeLorenzo-MA] DEC 24 0320 – Excellent; Arabic parallel 531 kHz. [Conti-NH]
- 603 FRANCE *France Info*, Lyon-Tramoyes (45°53'N 4°57'E) DEC 4 2146 – Fair over Spain with news by alternating man and woman in French. [DeLorenzo-MA]
- 603 SPAIN *RNE5* synchros DEC 4 2143 – Fair with fútbol match in Spanish. [DeLorenzo-MA]

- 639 **SPAIN** *RNE1* La Coruña et al. DEC 4 2139 – Fair with futbol match in Spanish. Excited announcer yelling, "Valencia!" several times. [DeLorenzo-MA] DEC 24 0322 – Good; telephone talk parallel 585 and 648 kHz. [Conti-NH]
- 648 **SPAIN** *RNE1* Badajoz (38°53'N 6°58'W) DEC 24 0258 – Excellent; "Let It Snow" bumper music, time marker and fanfare into news. [Conti-NH]
- 693 **SPAIN** *RNE1* synchros DEC 23 0259 – Over/under *BBC5*; "Let It Snow" bumper music leading up to news parallel 648, 747, 774, and 855 kHz. [Conti-NH]
- 693 **UNITED KINGDOM** *BBC Radio 5*, Droitwich et al. DEC 4 2209 – Fair discussing the opportunity of hosting the 2018 FIFA World Cup in Britain. [DeLorenzo-MA]
- 756 **GERMANY** *Deutschlandfunk*, Braunschweig & Ravensburg DEC 4 2228 – Good with man and woman in German reading from a book, parallel to 6190 kHz. [DeLorenzo-MA]
- 774 **SPAIN** *RNE1* synchros DEC 4 2240 – Good with fútbol in Spanish. [DeLorenzo-MA]
- 864 **FRANCE** *France Bleu*, Villebon-sur-Yvette (48°41'N 2°14'E) DEC 4 2252-2300 – Fair with pop music, French ballad, ID at 2300, "France Bleu." [DeLorenzo-MA]
- 945 **FRANCE** *France Info*, Toulouse (43°21'N 1°20'E) DEC 24 0200 – Good; fanfare, "France Info, les trois heures..." into news. [Conti-NH]
- 954 **SPAIN** *Onda Cero*, Madrid DEC 24 0200 – Good; time marker, time check, fanfare, "Noticias de Onda Cero." [Conti-NH]
- 1242 **FRANCE** *France Info*, Marseille (43°16'N 5°18'E) DEC 24 0200 – Fair; fanfare into news parallel 945 and 1206 kHz. [Conti-NH]
- 1413 **SPAIN** *RNE5* synchros DEC 23 2145 – Excellent; telephone talk. [Conti-NH]
- 1422 **ALGERIA** *R.Algérienne*, Algiers (36°40'N 3°09'E) DEC 23 2157 – Excellent; contemporary Middle Eastern vocal. 2202 news in French; faded up over Germany. [Conti-NH]
- 1422 **GERMANY** *Deutschlandfunk*, Heusweiler (49°21'N 6°55'E) DEC 23 2200 – Fading up with *Deutschlandfunk* ID and time marker over Algeria time marker. [Conti-NH]
- 1457.58 **ALBANIA** *CRI* Fllakë (41°22'N 19°31'E) DEC 23 2130 – Loud het against 1458 kHz, readable audio in LSB mode. [Conti-NH]
- 1467 **FRANCE** *TWR* Roumoules (43°47'N 6°09'E) DEC 23 2150 – Excellent; Arabic vocal. [Conti-NH]
- 1503 **IRAN** *IRIB Sarasary*, Bushehr (28°58'N 50°51'E) DEC 23 2149 – Good, over Spain; flute instrumental. [Conti-NH]
- 1521 **SAUDI ARABIA** *BSKSA* Duba (27°20'N 35°45'E) DEC 4 2055 – Fair with man in Arabic. [DeLorenzo-MA] DEC 23 2146 – Excellent; woman in Arabic. [Conti-NH]

PAN-AMERICAN DX

- 640 **CUBA** *R.Progreso*, Guanabacoa, Ciudad de la Habana (presumed site) DEC 15 0040/DEC 16 0033 – Noted sporadic wobbling on this one. Always nice to hear a wobbie. [Krueger-FL]

Contributors

Bruce Conti, Nashua NH; WiNRADiO WR-G31DDC Excalibur, 7 x 19.5-m variable termination Split SuperLoop at 60°, 15 x 23-m variable termination north/south SuperLoop.

Marc DeLorenzo, South Dennis MA; JRC NRD-525, 75 x 75 x 60-ft east/west dual feedline Delta with remote variable termination, 350-ft north/south longwire, Mini MWDX-3 phaser.

Harold Frodge, Midland MI; Drake R8B, 125-ft bow-tie, 85-ft random wire, 180-ft center-fed random wire.

Terry L. Krueger, Clearwater FL; JRC NRD-535, ICOM IC-R75, Hammarlund HQ-180A, Aqua Guide 705 Radio Direction Finder, Sony ICF-7600GR, GE SuperRadio III, RadioShack DX-399, 1 X roof dipole, 1 X in-room random wire, RadioShack 15-1853 passive MW loop, Scotka active MW ferrites loop.

DX Tool Box

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Improving your DX skills – tips from new and veteran members

Greetings once again from the Heart of the Continent and welcome to the DX Tool Box Column number 24. This month we will look at speakers to use with your radio equipment.

Many DX'ers use all sorts of speakers with their receivers and all claim that they work well or even great. This article will be based on my personal experiences over the last . . . , well it has been a long time since I started to DX. I have tried the whatever-I-happen to-own system at first. It seems most homes have an old speaker or two laying about that a DX'er can hook up to their receiver(s). This worked as I could get to listen to the radio without using my headphones or the small tinny sounding speaker that came in the radio. I must admit that even the built-in speaker in my trusty old ICOM ICR-70 is not the best speaker in the world to listen to for long periods of time. While visiting another DX'er I got to listen to his rig through a "proper" speaker as he called it. This was a communications grade speaker made for DX'ers.

These communications speakers are manufactured by various companies and I am not about to tout one over the other. I will speak about what I have used so please see this more as my personal opinion rather than a definitive statement about the "best speaker" for you and your DX'ing. If you look at a basic speaker you can buy almost anyplace these days you will find that they have a response of 20 to 20,000 Hz. The ICOM IC-SP3 and SP-20 speakers have a response of 100 to 9000 Hz. The human voice goes from (depending on the source of the info) 80 Hz to 1200Hz. These communication grade speakers allow human voice to be well heard while clipping off all kinds of other sounds that you don't want to hear when trying to identify a station. By clipping off or partially clipping the other sounds above this 9000 Hz level some of the "junk" you do not need, but can be heard when using other speakers with a higher response level, is gone.

This is not to say that these communications grade speakers will clean up all of the "hash" that regular speakers will allow you to hear, but they do help. As well as the matching IC-SP3 ICOM speakers for both my ICOM ICR-70 and IC-R7000 receivers I do own a matching MS8 speaker from the Drake R8. Now this is probably over kill but it is nice to have the matching speakers for all three receivers so as I move from one to the other I know I have a good speaker on the go. To top this set up off I do have an ICOM SP-20 speaker also. This is attached to the Versacorder I use to tape what I am hearing. This too is a communications speaker but it also has four push buttons on the front. This allows me to select between two high and two low filters to help modify the sound. This has proven very valuable when trying to ID a station off the tape recording. By selecting one of the high and one of the low filters you can make a difference in what you are hearing.

As I said these speakers are not the complete answer to enhance what you are hearing as you would need to use a special audio unit or computer program to clean up the recording to get rid of all the "hash." Besides, using these types of specialized audio equipment while DX'ing would be interesting to say the least. A good matching communications speaker is an affordable way to improve what you are listening to on the radio.

Bits and Bites from the NRC listserv:

Have money left over from the Holidays?

From: Gary DeBock <D1028Gary@aol.com> – Subject: Tecsun PL-606 DSP Receiver Review

Hello All, For those interested in the latest technological advances in AM-DX'ing portables, a full 6-page review of the newest Ultralight radio sensation (the compact PL-606 AM-FM-SW-LW receiver) has been uploaded to dxer.ca at: <http://www.dxe.ca/file-area/cat_view/87-ultra-light-radio-files-area/94-ultralight-radios> the first option, to the Ultralightdx Yahoo group file site, and also to: <http://www.mediafire.com/?gcu6zgyxb724cy2_>. Detailing Tecsun's successful effort to combine the class-leading 100 mm loopstick (of the PL-310 model) with 1 kHz DSP selectivity in a very small cabinet, the article includes many photos, information on PL-606 quirks and advantages, and the results of a four-band competitive performance test against the PL-380 and PL-310 models. At \$39.95 (plus \$20.00 shipping from Hong Kong), this breakthrough Ultralight model may well be the best combination yet of AM sensitivity, selectivity and portability. 73 and Good DX, Gary DeBock (in Puyallup, WA, USA)

Another one bites the dust

From: Marc DeLorenzo <midcapemarc@aol.com> – Subject: Greenland closes SW and MW on Feb 11 2011

From Stig Hartvig Nielsen on the Yahoo mwdx list. On February 11 2011 at 8 AM local time all medium wave stations carrying KNR (Radio Greenland) – Upernavik (810 kHz), Uummannaq (900 kHz), Qeqertarsuaq (650 kHz), Nuuk (570 kHz) og Simiutaq (720 kHz) – will be switched off for good, and the transmitters will be dismantled. On the same day the relays of KNR newscasts twice daily via Tasiilaq 3815 kHz will also cease. The decision has been taken by the Ministry of Housing, Infrastructure and Transport in the Government of Greenland. After February 11 2011 KNR will only be available via Low Power FM-radio in inhabited areas of Greenland. Thus no coverage of the waste country outside the towns and villages – and KNR will no longer be available for the fishermen at sea nor the Inuit population in Canada. The decision was made because the transmitters were getting old and too costly to maintain. Besides – very few people are using the MW transmissions. Weather forecasts will be available for fishermen and others via VHF coastal radio. At a point it was considered replacing the aging MW transmitters with one or two new SW

AM-transmitters near Nuuk, but it was estimated that it would cost 4 million DKK (535.000 euro) to establish such a new SW operation. It was also felt that few listeners would invest in a SW receiver and the quality would be 'doubtful' – suffering from 'atmospheric phenomena'. So these plans were given up. Full report (in Danish) here: <<http://www.radionyt.com/artikel/default.asp?id=18070>> Best 73s Stig Hartvig Nielsen.

Winter weather can be as bad as summer time storms.

From: Patrick Martin <mwdxer@webtv.net> – Subject: Storm on OR coast

We had another rain & wind storm last night. I did not think the wind was that strong, but it did shake the house a couple of times. Got up this morning and noticed the termination on the NW EWE had snapped. When I went out to repair it, I saw no TV antenna and the pole had snapped and antenna was hanging by the coax behind the shed. Too wet and windy today to do much. I did repair the NW EWE and I also found the junction box broken. The cows were in the backyard the other day, so that was probably what happened there, so I fixed that. The TV antenna, I disconnected to mast and found the front of the antenna bent where it fell, so I straightened that out. Then reconnected the broken 5 foot piece of the mast and pounded it into the soft ground and repointed it North and it works fine. We are supposed to have a somewhat dry day tomorrow, so I bought a new mast from Home Depot, so hopefully I can get the antenna back up tomorrow. If not, it may be days, as it will be rain rain rain all week. 73, Patrick Patrick Martin Seaside OR

No matter how close you live or how long you DX there is always something new:

From: Jim Renfrew <jrenfrew@rochester.rr.com> – Subject: New station from Rare State

1634 EST 1450 WSNO VT Barre "News Talk 1450", "FOX 44" promo. Although an adjacent state, Vermont is not easily heard here. This is probably only the 4th or 5th station from VT I've logged. Others that come to mind: 970, 1100, 1390.

Here's something I've never experienced in 45 years of DX'ing: 1701 EST 1450 WTSA Brattleboro VT and WSNO Barre VT both being heard at once! The only other VT Combo is on 1340.

This month's DX Tool Box web site is:

The FCC TIS/HAR search site

<http://www.fcc.gov/mb/audio/bickel/tis.html>

I have noted that the loggings of TIS/HAR stations have been picking up in *DX News*. It seems that even with all the stations in the expanded band these low powered stations are still making it further than they were intended to. This month's site will allow you to search for TIS/HAR stations by several methods. This link above is the lead page and to do a search you need to click on the "TIS via General Menu Reports, Site/Frequency Query" link towards the bottom of the page. This will take you to a new page where you can do your searches. In the "Service Selection" area make sure you click the "All Services" in the drop down box. You can select any state or go for all of them if you are not sure of which state you need. When you put in the frequency or frequencies you want to search make sure you use the kHz buttons and type in 1610 or 1660 etc for the searches. In the "Query Options" area I use Callsign and Currently Licensed facilities for my searches. After that go to the bottom of the page and click on the "Submit Query" button. This will cause a new page to appear with your list of stations. Go through the list to see which station on the list is the most likely station that you think you are hearing. I do hope you find the site useful when DX'ing for these great low powered stations.

73 for this time Shawn **Remember On A Clear Day You Can Hear Forever**

The IRCA Mexican Log

15th Edition (Winter 2010)

***** JUST RELEASED *****

The IRCA MEXICAN LOG lists all AM stations in Mexico by frequency, including call letters, state, city, day/night power, slogans, schedule in UTC/GMT, formats, networks and notes. The call letter index gives call, frequency, city and state. The city index (listed by state, then city) includes frequency, call and day/night power. The transmitter site index (listed by state, then city) tabulates the latitude and longitude of transmitter sites. This is an indispensable reference for anyone who hears Mexican radio stations. Size is 8 1/2" x 11".

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Understanding Receiver Fundamentals

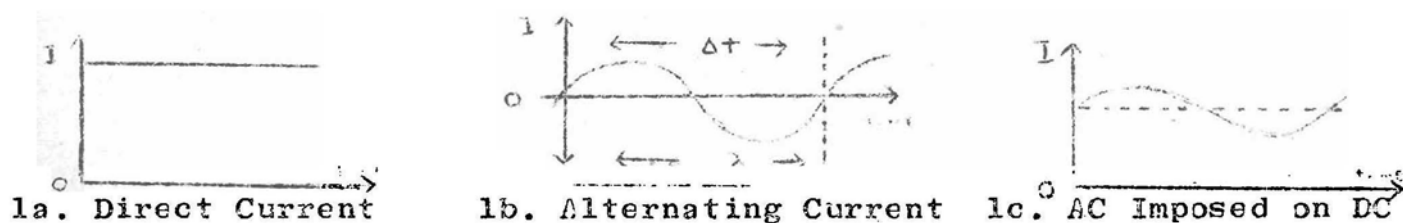
Ed Satterthwaite, Jr. (May 16, 1964)

This article originally appeared in Volume 31, No. 31 of DX News.

Introduction. This paper begins a series on radio theory that will appear from time to time in *DX News*. Interested members are urged to collect these in one place as they appear; it is hoped that eventually a practical reference for the BCB DXer will result. These papers are presented to (1) make the receiver something more than a black box for the DXer; (2) help in the choice of a suitable receiver; (3) make the DXer aware of the capabilities and limitations of his receiver; and (4) suggest practical methods of eliminating receiver problems where possible. Other members are urged to contribute to this series also, but it is requested that the writer not describe equipment, modifications, etc., that he has not actually made work as claimed.

Basic Concepts. To provide a vocabulary for the rest of this paper, some electrical terms must be introduced. Treatment is of necessity brief and inadequate for a complete understanding; however, only a qualitative grasp of the concepts involved is required for what follows.

Current (I) is the rate of flow of charge (electrons). There are two basic types of current: direct (DC) and alternating (AC). A direct current is constant in direction, while an AC current periodically reverses its direction of flow. They might be graphed as follows:



AC is of primary interest in radio work. Figure 1b. shows what is called a sine wave. It should be noted that the graph repeats itself after a time Δt and can be considered to be built of basic units (labelled Λ) which repeat themselves in a continuous chain. A useful analogy to an alternating current is the flow of ripples across a smooth water surface. If we station ourselves at a given point, we can count the number of ripple crests passing that point in one second. This is called the frequency. Common units are:

$$1 \text{ Megacycle/sec. (Mc.)} = 1000 \text{ kilocycles/sec. (kc/s)} = 1,000,000 \text{ cycles/sec.}$$

The same terminology can be applied to alternating currents. Those from approximately 20 to 20,000 cycles/sec. can be coupled to loudspeakers to produce audible sounds; they are therefore called audio frequencies (AF). Frequencies from 15 kc. up to several thousand Mc. are classified as radio frequencies (RF). They are of great importance because current in wires (antennas) at these frequencies produce electromagnetic radiation of the same frequency. (Other familiar examples of such radiation are light, heat radiation, X-rays, etc.) This radiation is able to travel from one place to another by various means of propagation and to cause currents in distant antennas corresponding to those in the original transmitting antenna. Sometimes the wavelength of electromagnetic radiation is given. This corresponds to measuring the distance between two consecutive crests of the water wave ripples. It can be calculated with the formula:

$$\text{wavelength (meters)} = 300,000 / \text{frequency (kc.)}$$

Also worth mentioning here is the fact that mathematical analysis (Fourier synthesis) shows that almost any complex wave, such as human speech and music, can be considered to be formed from the addition of a large number of sine waves of various frequencies.

Voltage can be considered the force tending to produce a flow of electrons in a charge carrier; resistance is the opposition of carrier to such flow. In linear circuits, voltage (V), current (I), and resistance (R) are related by Ohm's law: $V = IR$ (or $V = IZ$ for AC circuits, where Z , called the impedance, is roughly an "equivalent resistance" that varies with frequency). Finally, power (P) measures the rate at which electrical energy flows in a circuit; it is given by $P = I \times V$.

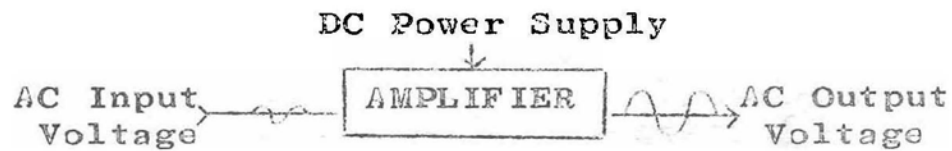
Next we need to mention three basic electronic circuits. Whole technologies are built around the exact design of such circuits; we shall only point out that they exist and can perform certain functions. The first of these is called a mixing circuit (this is descriptive although technically not entirely correct). One finds that when voltages of two different frequencies are imposed on "non-linear" circuits (such as vacuum tubes or transistors) operating under certain conditions new

frequencies equal to their sum and difference are found in the output. For example, if the input frequencies are denoted by A and B , we would expect $A+B$ and $A-B$ in the output:

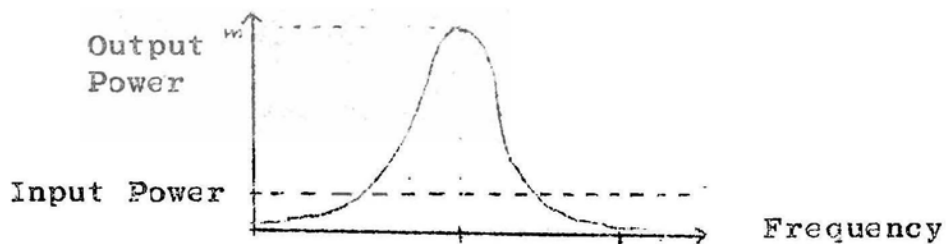


There are many types of mixers, and different types are most effective under different conditions. In some, many other frequencies are created from such combinations as $A+A$, $A+B+B$, etc.

Another essential circuit is the tuned amplifier. Its action can be represented schematically in the following way:



A small input voltage is used to control a relatively large DC current; this DC current is used to produce an AC voltage in the output much greater than the original. Such amplifiers can be designed to amplify a relatively restricted band of adjacent frequencies. Within certain limits, the extent ("width") of this band and the center frequency can be chosen as desired. For example, if we impose a voltage of constant amplitude but varying frequency upon the input circuit, measure the output power at that frequency, and plot the results, we might obtain a curve similar to the following:

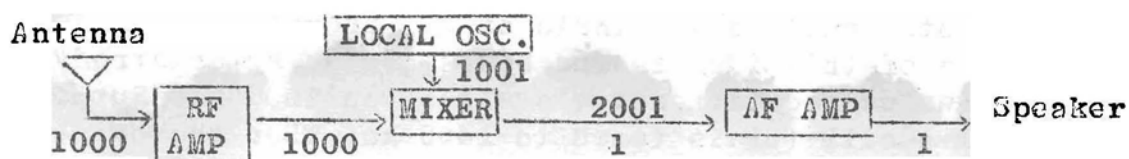


We notice that an input at frequency A is greatly amplified, but one at B is actually attenuated (rejected). In this case, the circuit is said to have selectivity. The bandwidth of an amplifier can be defined in several ways, but usually it is given as the number of kilocycles between two points on the output curve at which the output power is some specified fraction of the maximum output power. For similar circuits, it is found that the selectivity is approximately a constant fraction of the center frequency. Thus an amplifier with a selectivity of 4.5 kc. at 450 kc. would have one of 0.5 kc. if retuned to 50 kc.

The final circuit of interest is the oscillator. We note only that it is a circuit capable of producing electrical energy at some desired frequency.

The TRF Receiver. Now suppose that we want to receive some information being transmitted at a distance point on, say, 1000 kc. We know that by erecting an antenna of the proper length, we can produce a 1000 kc. current and hence voltage at our location. Such a voltage would be extremely small, however, if we are any distance from the transmitter. Also signals of all other radio frequencies would be present to some extent. Our first impulse might be to apply this voltage to an amplifier tuned to 1000 kc. This would provide some selectivity by rejecting signals on other frequencies and would also provide enough power to drive a speaker. If we needed more selectivity or power, we could add more amplifiers tuned to 1000 kc. The only difficulty is that our speaker would be driven at 1000 kc. Even assuming that the speaker could vibrate this fast, we could not hear the desired signal, since the upper frequency limit of human hearing is 15 to 20 kc.

We are now ready to use our other two basic circuits. Suppose that we operated an oscillator on 1001 kc. and applied the output of this as well as that of the 1000 kc. tuned amplifiers to a mixer. We would expect the output of the mixer to include 2001 ($1001+1000$) and 1 ($1001-1000$) kc. The latter is in the audio range; we could feed it to an audio frequency (AF) amplifier, which would reject the 2001 (and original 1001 and 1000) kc. signals and provide further amplification of the 1 kc. signal. Our receiver can now be diagrammed as follows:



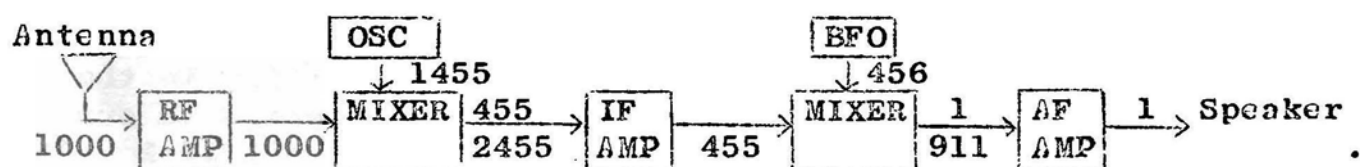
Note that if the 1000 kc. input signal disappears, the 1 kc. output disappears also. With a suitable code, e.g., Morse, we could transmit and receive information by turning the transmitter on and off.

Suppose now we want to receive signals from other stations. It is not difficult to make an amplifier tunable, i.e., with a center frequency that can be changed at will. Thus if we wanted to hear a signal on 1500 kc., we could retune the RF amplifier to 1500 and the local oscillator to 1501 kc. If there are many stations operating in the desired frequency range, however, problems arise. Returning to our first example, suppose another station were operating on 1010 kc. This would combine with the local oscillator to produce an output of 9 kc. (1010–1001). This also falls in the audible range, and we would experience interference. Moreover, even with the local oscillator turned off, the 1010 and 1000 kc. signals would combine in the mixer to produce an audible (10 kc.) signal. We could eliminate much of this interference by designing the audio system to accept only very low frequencies. This is impractical for speech transmission, as we shall see later. Another approach is to retain the basic circuit and add more and/or better tuned RF amplifiers until the 1010 kc. signal is eliminated before reaching the mixer. The result is called a tuned radio frequency (TRF) receiver.

With very selective RF and audio amplifiers, the TRF design has been the basis of some fine receivers for the very low radio frequencies (15-500 kc.), but it leaves a great deal to be desired on the BCB. Its main fault is the need for tuning the selective RF amplifiers. Recall that the bandwidth is roughly a constant fraction of the center frequency of the amplifier. Let us assume that all stations of interest in the BCB are separated by 10 kc. Further suppose that we designed our tuned circuits for a selectivity of 10 kc. at 540 kc. When we retune to 1600 kc., the bandwidth will increase to almost 30 kc. and we will be unable to separate adjacent stations. One might be tempted to work for a 10 kc. bandwidth at 1600 kc. instead; this, however, has other disadvantages. It would, for example, be difficult to achieve with ordinary tuned amplifiers without stability. One might be tempted to work for a 10 kc. bandwidth at 1600 kc. instead; this, however, has other disadvantages. It would, for example, be difficult to achieve with ordinary tuned amplifiers without stability problems and difficulties in retuning all circuits to exactly the same frequency each time one wants to hear a different station. In addition, the amplification of each stage changes with frequency, and it is difficult to make more sophisticated devices for increasing selectivity operate over a wide frequency range. Many of these problems can be overcome by further refinements, but another basic design is so well suited to our requirements that we shall abandon the TRF.

The Superheterodyne Receiver. As early experimenters added more and more stages to their TRF receivers, they found that the sets became unwieldy to tune, and the next development was to “gang” all the amplifier tuning controls, that is, to connect all of them to one shaft, which could be used to set all the RF stages at one frequency. The next logical development would be to tie in the local oscillator so that a 1 kc. beat note would be available at all frequencies.

A slight extension of this idea is the basis of the superheterodyne. Suppose again that we wanted to receive a signal on 1000 kc. Suppose also that the local oscillator is tuned to 1455 kc. Then the output of the mixer would include 2455 kc. and 455 kc. Now we can follow the mixer with amplifiers tuned to 455 kc. (which we shall call “intermediate frequency” or IF amplifiers) to add further gain and selectivity. Finally we can follow the 455 kc. amplifier with another mixer and another oscillator (called the “beat frequency oscillator” or BFO) operating on 456 kc. to obtain the desired 1 kc. output. Schematically:

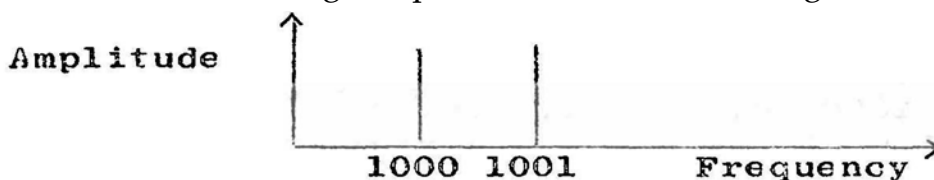


So far it appears we have gained only complexity. There are several important advantages in conversion to a lower radio frequency, however. For one thing, more amplification per stage is available at the lower frequency. More important is the increase selectivity. Recall again that the bandwidth is roughly a constant percentage of the center frequency for similar circuits. Let us

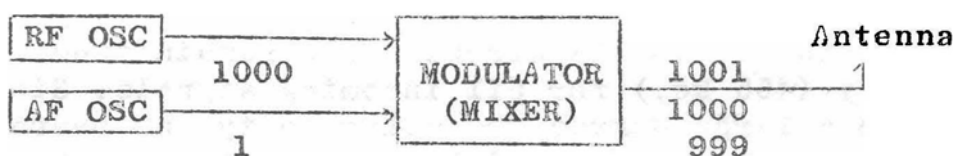
consider 1010 kc. interference. At the original frequency, the difference between this and the desired signal is 10 kc. or 1%. Ordinary RF amplifiers would pass this nearly as well as the 1000 kc. signal, and both would reach the mixer. The 1010 kc. signal would produce an output of 445 (1455–1010) kc. instead of 455 kc. The frequency difference is still 10 kc., but the percentage difference is slightly over 2%. This perhaps sounds like a small difference, but it is, in fact, a significant one. Finally, suppose we ganged the first oscillator with the RF stage tuning so that it always operates 455 kc. above the incoming signal (e.g., for 540 kc., at 955; for 1600, at 2055, etc.). Analysis shows that one output of the mixer is always 455 kc. This points out the final and biggest advantage of the superheterodyne: the IF circuits can remain tuned to one intermediate frequency (455 kc.) for all incoming signals. Since the IF stages determine to a large degree the selectivity and overall gain, these characteristics remain essentially constant over the entire band. We might also note that, as a practical matter, very selective tuned amplifiers are most easily constructed for a single frequency and that it will be extremely helpful to convert all signals to one frequency if we later add crystal or mechanical filters in more sophisticated designs.

Nearly all receivers made today, from 4 tube AC-DC sets to the most advanced communications receivers are basically superheterodynes. (Of course, not all use an IF of 455 kc.; this was chosen only because it is the most common. Selection of an IF frequency will be discussed in a later article.) On some less expensive sets, the RF amplifier is eliminated and the signal fed directly to the mixer. Fair performance is possible with this design, but the RF stage performs three important functions and is therefore quite desirable. These are: (1) Image rejection. Suppose that we are tuned to 1000 kc. again; then the local oscillator would be tuned to 1455 kc. Now further suppose that a signal on 1910 kc. reached the mixer also. One output would be on $1900-1455 = 455$ kc., exactly the IF frequency, and this undesired signal would be heard in the output. The solution to this problem is, of course, to prevent the 1910 kc. signal's reaching the mixer. In a good receiver, the selectivity to do this is provided by one or more tuned RF stages. (2) Increased sensitivity. It can be shown that an amplifier introduces much less thermal noise (the hiss one hears when the antenna is disconnected and all the gain controls advanced) than a mixer. Since such noise tends to mask signals, the first stage of the receiver (when signals are weakest) should be an amplifier. (3) Prevent local oscillator radiation. Recall that in the receiver we now have a (10w-power) oscillator operating on the BCB band. If its output reaches the receiver's antenna, a signal will be radiated and cause local interference to other listeners. An RF stage provides the isolation necessary to prevent this.

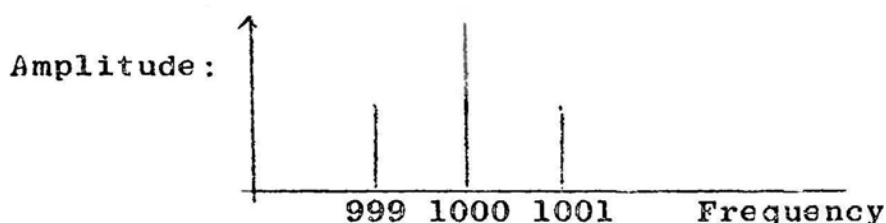
Voice Transmission. In the previous discussion, we could have simplified our receiver somewhat by transmitting two signals, say one on 1000 kc. and one on 1001 kc. With the local oscillator on 1455 kc., output will result on 455, 454, 1, 2455, and 2456 kc. Provided our IF selectivity is not too great, both the 455 kc. and the 454 kc. signals will be amplified by the IF stages and reach the second mixer. Here the output will include 1 kc., an audio frequency tone, and it is obtained without the use of a BFO. We might represent the transmitted signal as follows:



It is, of course, inconvenient and expensive to operate two separate transmitters to convey the same information. Suppose, however, that one includes a mixer stage in his transmitter and supplies it with 1000 kc. and 1 kc. energy. This is diagrammed below:

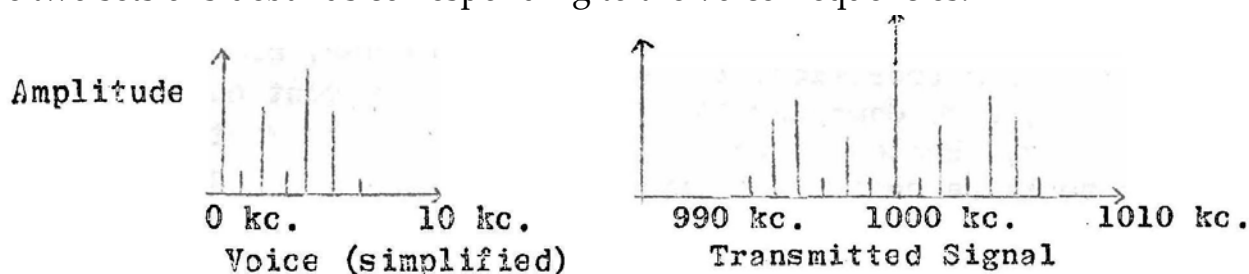


Output is obtained on $1000+1 = 1001$ and $1000-1 = 999$ kc. We intentionally design the mixing circuit (called a modulator in this case) to be quite "leaky" so that a substantial 1000 kc. output is obtained also. This process is called modulation. Using the analysis above, we find that the 1000-1001 pair produced a 1 kc. output after passing through the receiver, as does the 1000-999 pair. (The 2 kc. output from the 999-1001 pair expected is not normally obtained; this points out the fact that our picture is very simplified.) We may represent our signal by the following convention:



The 1000 kc. signal is called the carrier, and those on 999 and 1001 are known as sidebands. Note that two sidebands, upper and lower, are always produced in this process. The tuned circuits following the modulator in the transmitter are seldom selective enough to attenuate either. It is reasonable to expect that for the best results, the sideband and the carrier producing an audio frequency should be of equal amplitude. This is true; however, there are two sidebands and only one carrier, so even in the ideal case one-half power appears in the carrier and each sideband carries only one-quarter power. This ratio is, in fact, rather critical. If the carrier is attenuated in our receiver, distortion results, while if the sidebands are attenuated, the audio output is very weak. Note that this now implies there is a limit to the amount of selectivity we can use in the receiver; for maximum effectiveness, the passband can be no less than 2 kc.

Clearly we must still key one or both of the oscillators in the transmitter in a code to transmit information. Such a signal is referred to as modulated c.w. (MCW). There is, however, no reason why we could not have fed a 2 kc. signal to our modulator also and produced outputs on 998 and 1002 kc. as well as 999, 1000, and 1001. As mentioned, the voice can be considered to consist of a large number of simple frequencies rapidly changing in emphasis and amplitude. If we convert such speech to electrical signals using a microphone and use these to modulate the transmitter, we will have two sets of sidebands corresponding to the voice frequencies.



An analysis of the output resulting from the carrier and each separate sideband frequency, similar to the above, shows that the original audio frequency signal is exactly reproduced at the output of the second mixer. (To convince yourself of this, consider voice made up of two arbitrary frequencies, then three, etc.) Note that again the receiving selectivity we can use is limited. Since speech frequencies range up to at least 15 kc., this suggests that we need a passband of 30 kc. This is true for exact reproduction of the original signal (high fidelity); however, experiments have shown that for intelligibility, frequencies between .5 and 3 kc. are sufficient. This allows us to narrow our passband to 6 kc. for communications work with much better adjacent channel separation. (For the purposes of the DXer, it is often advantageous to restrict the passband to half this; ideal selectivity and means of obtaining it rate an article in themselves, however.)

Automatic Volume Control. We have now discussed all the essential elements of an AM receiver. Many refinements are possible. Future articles will consider these more sophisticated circuits and review the basic ones more critically. One non-essential circuit is used so universally that it merits mention at this point, however. This is automatic volume control (AVC), also called (more accurately) automatic gain control (AGC). Usually we are interested in receiving many stations on our receiver, and these vary greatly in strength. If we set the gain of the various amplifiers for comfortable audio output on a strong signal, we are likely to miss weak signals in tuning across the band. On the other hand, if we advance the gain enough to hear the weakest signal, strong ones will blast through in a rather unnerving fashion. It is possible, however, to take part of the voltage produced at, for example, the second mixer and connect this to the preceding amplifiers in such a manner that increased voltage causes decreased amplification. When a strong signal reaches the mixer, amplification in these stages will be reduced correspondingly and blasting eliminated. (Of course, the voltage fed back to the amplifiers will then also decrease, but with proper design a steady state is reached almost immediately.) Very weak signals receive full amplification; as a result, receiver output remains relatively constant in tuning across the band.

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