dx news

VOLUME 40 FEBRUARY 28, 1973 NUMBER 17

* "Enclosed are my 1st Class dues for another year in DXing's 1st class club. After 6 years a 7th is a must" (Ken Chatterton, N. Y.) * * *

IN THIS ISSUE...

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NEW MEMBERS THIS WEEK...

*D. Barber, Box 26, Edmonton, Alberta T5J 2G9
*Howard Snure, Jr., 4211 Villa La., St. Clair Shores, Mi. 48080
Welcome to the NRC; contribute your news and loggings often!

THE WERC TEST...

Dave gleason says the first test had severe difficulties in making it through the QRM, the best they did was Nebraska. **The second of the tests made it to New** England, northern Canada, etc. Farthest report to date is from Balmerton, Ontario; 73 reports have been received to date. **Reports are being verified** as quickly as they are received; more info later.

LAST MINUTE TEST INFO...

Monday Feb. 26th; 0100-0130 WUDO-1010, Lewisburg, Pa.; 250 watts, D1. Rock records interspersed with testing ID announcements; reports to K. Gebauer, GM, WUDO, PO Box 93, Lewisburg, Pa. 17837 (Brian Cartwright, IRCA)****** KJRG-950, Newton, Kansas; not sure of date, letter says will be Sunday night/MM but date given as March 11th; guess it will be March 12th. 1:00 AM through 4:00 AM EST; programming unknown. Reports to Carl Weaver, CE. (Boyd & Junker)

NOTES FROM HQ...

The new Domestic Log is progressing nicely; only one worker is tardy in getting his material back to us. **We're now in the typing/printing phase; hopefully we** won't run into any snags. Reserve your copy now and get the DISCOUNT; only $4.50 (book rate), add 75¢ for First Class delivery... Target date still mid-March. ***** The entire HQ crew is down with the flu which is why last week's issue went out a couple days late...

*GPN & BGK

SPECIALS

Sat. March	3	K M Y O	1050	Little Rock, Arkansas	1,000	D-1	1:15 - 1:30	IRCA
Mon. March	5	W A C K	1420	Newark, New York	500	D-1	12:01 - 1:00	IRCA
	5	MYSTERY	860	MYSTERY	MYSTERY		2:00 - 3:00	NRC
Mon. March	12	K X J K	950	Forrest City, Arkansas	5,000	D-1	4:00 - 4:30	IRCA
Mon. March	26	K S Y L	970	Alexandria, Louisiana	1,000	U-1	1:10 - 1:25	NRC
	26	W B R J	910	Marietta, Ohio	5,000	D-3	2:30 - 3:00	IRCA
	26	W L S I	900	Pikeville, Kentucky	5,000	D-1	4:00 - 4:30	IRCA
	26	W F L N	900	Philadelphia, Penna.	1,000	D-1	5:15 - 5:30	IRCA
Mon. April	2	W J A B	1440	Westbrook, Maine	5,000	D-1	12:01 - 1:00	NRC
	2	W R A N	1510	Dover, N. J.	10,000/500	U-4	2:00 -	NNRC
Mon. April	9	W K I K	1370	Leonardtown, Maryland	1,000	D-1	2:00 - 3:30	NRC
	9	W X C L	1350	Peoria, Illinois	1,000	U-4	2:00 -	NNRC
Mon. 5/29-6/15		W C E R	1390	Charlotte, Michigan	5,000	D-3	All Morning	IRCA
Mon. (soon)		T I J C	675	San Jose, Costa Rica	15,000	U-1	2:00 - 5:00	NRC

A couple of TESTs in February upon which we did not get info on here were from WUDO-1010, Lewisburg, Penna., with 250 watts, from 1:00 to 1:30 for IRCA, on 2/26, and WEBO-1130, 1,000 D-3, Waynesboro, Penna., which tested on 2/12 from midnight to 4 a.m. EST, unclubtedly a PoP. This was NRC; and WUDO was IRCA-oriented.

KMYO-1050. This is their regular monthly frequencycheck, and if this doesn't reach you in time, then try for their next check on Saturday, April 7th, same time. Send your reports to Mr. Robert D. David, Chief Engineer; KMYO, Box 2659, Little Rock, Arkansas, 72205. The check is with Commercial Monitoring in Lee's Summit, Mo. and we'd imagine it's with voice IDs and cycle tone. Info, Karl Forth, IRCA.

KXJK-950. This station ought to do quite well on this TEST broadcast, as they use 5,000 watts, non-directional. We do not know what they'll use for modulation, but we think it'll be country/western music and voice IDs. Send your reports to Mr. David Adamson, Chief Engineer, Radio Station KXJK, P.O. Drawer 707, Forrest City, Arkansas, 72335. Some all-nighters to interfere, but do try hard! -Karl Forth.

HEARD SINCE LAST ISSUE (IRCA)

800 C J J C Ex-850 (IRCA) 950 W C T N Ex-WXLN Religious format

"AN" SITUATION

550 C K P G AN-6 960 W E L I AN-6 MoR 1470 C J V B AN-6

560 C H T K NSP 1070 C F A X NSP 1490 C K G O AN-6

730 C K L G NSP (All from IRCA except WELI, NRC) K E D I NSP rr

ERNEST R. COOPER - 438 East 21 St. - Carrier Route 56 - Brooklyn, New York - 11226

A v/f in today from KDDA-1560-TEST, with Chamber of Commerce folder on Dumas. We managed to get in only one morning at the dials this week, and it was - you guessed it - MM 2/12. CKAL-1340 in and out with an AN and a TTer after 2am, and were the best of the FFC quintet today. WHN-1050 was resting this week, and somebody there testing @ 2:51 w/tt, but I didn't get an ID. On 1196, I heard a weak one here @ 2:33 which seemed to be in FF, with a woman announcer, and playing MoR, like U.S. oldies like "Whispering", and faded out around 2:42. That couldn't be the US AFRS station in Germany, could it? The Colombian on 610 was giving WIP A ROUGH TIME AND I got some data but not enough to send a report yet - I'll try to add to it next week. He's on RCN chain. Republic Radio, Guayana-560, is now beginning RS @ 3:15am, and they start "warming up in the bullpen" by 3. On 1330, a station, unID, w/c/w songs noted @ 3:47, but WPOW's 3:53 arrival time killed any hope of an ID here. They were o/WHOT - who were they, Wes Boyd & Jerry Starr? Hi. A very weak signal noted on 1530 @ 4:02, but I couldn't raise him out of the mire. (Too bad, Myer). With a little room, I want to thank those of you who have come to the fore with interesting, DXey Musings. I enjoy those from everybody who lists his DX in them, like Chris Lucas, Jim Poterba, Stan Morss, Bill Feidt, Dan Myers, Jim Critchett, Ken Onyschuk, etc. etc. I have not listed all who are sending in very fine Musings, just a few. New men thinking ofMusing soon? Why not use these members' Musings as your model? Good DX to all, from the guy with Lower

MUSINGS OF THE MEMBERS

ERNEST R. COOPER
438 EAST 21ST STREET
BROOKLYN, NY 11226

R. J. EDMUNDS - Box 946 - Wayne, New Jersey - 07470

Greetings, all. I've not Mused in many moons due to several items limiting my time, among them, heavy DXDDs, more regular DXing, work on articles, the Domestic Log, and also, a busy season at work, many civic activities and the trials of trying to clean up my father's estate. I note from RFS' Muse in the 1/31 issue that he too had planned an article on the general subject of DXers' ethics but had decided to can it because it was "too controversial". I had one in the works on the topic of "DXing is an individual hobby - or is it?" which I also canned, same reason. It's really a shame that this is the case. Over the past ten ydars I've seen the hobby become not only much more sophisticated but also much more intolerant, suspicious, narrow-minded, and even ego-centric. Too many DXers seem to have forgotten the primary intent of DX clubs - to provide tips & info for others similarly inclined, without witch-hunts, personal vendettas ego trips, & so on. I certainly don't mind controversy, but it's sad to have to avoid it like the plague except on such black-and-white issues as we've see during the past year or so. Ah, give me the good old days (?? -RJE) when one could do a speculative or controversial piece without worrying about how everyone else would react, or when one could report a tentative logging to get an assist on it without constantly fearing someone trying to discredit instead of help. Oh well, man never needed psychiatry until he had made sufficient progress as a society to create the need. Remember, as they say in Lake Winston Niles, Rumford, R.I., KAZAK! (Russ, that's a commentary on our times, it's not just DXers! -ERC)

DAVID SINGER - Quad Box 264 - R.P.I. - Troy, New York - 12181

Hi. It's been over a year since I've last Mused, so here is a re-intro: I'm single, 19, and a student at Rensselaer Polytechnic Institute. I actually managed to do a little DXing over the past week or so: On 1/31, I picked up R. Paradise-1265 @ 8pm w/fair signals and religion. They were badly QRMed by WEZE-1260 Boston, & WXYZ-1270, Detroit. Then on 2/6, I picked up WERC-960 on its TEST. Signals were fair but easy to copy, from tune-in @ 4:28 to 4:40. At that time, CHNS-960, Halifax, came up like a ton of bricks, completely burying WERC. I stayed with them for another five minutes, during which WERC was barely audible once or twice, then gave up and went to bed. Hopefully, I'll be able to do a little DXing this semester - my first class on Mondays isn't until 9am which, while not good, is a considerable improvement on the 8am that's been my fate for th4 last two semesters. I'm anxiously awaiting the new Domestic Log. 73s.

JERRY MILLER - 3101 Washington Street #113 - Bellevue, Nebraska - 68005

Greetings. I have found a new (?) way to put up with DXing in a mobile home. I mounted my Drake AL-4 loop outside my trailer using a small stand-off bracket and coupled it to my SP-600 via a 6' cable. Inly about 2½' of the cable are outside and the gain of the SP-600 makes the signal loss bearable. I am getting much excercise running in & out to change directions, though. Although there is slight vertical pick-up, it's thw best working set-up I've had in the trailer. Maybe I can mount my SM-1 outside? Some recent DX with the above combo: 1/28- WFBC-1330 @ 1:20-6am & WRBC-1300 in @ 5:50pm. 1/29- KTGO TEST heard easily, WIZZ-1250 @ 6:45am & KAWA-1010 @ 5:30pm. 1/31- KWRT-1370 @ 7;05 & KCII-1380 @ 7:22am. In the PM, WFHR-1320 @ 4:15, KWOE-1320 @ 4:59 & KSWO-1380 @ 6:20. 2/1- KFDF in very strong @ 7am on 1580. 2/4- KBOK-1310 @ 6:45am, and 2/5- CJRN-710 @ 2:10, WERC TEST in with local-like signal from 2:30-2:59, KCMC-740 @ 3:14-3:30, WOR-710 @ 4 (first time from this trailer), WSPA-950 @ 4:18 & WKAZ-950 @ 4:30am. PM brought KPBA-1590 in nicely @ 5:30. Totals now are 429/325. I hope to hit 500 before the end of the season. Good DX to all.

DO YOU LIKE BOSTON CREAM PIE? HOW ABOUT COMING TO SEE WHERE IT REALLY COMES FROM?

CARL JUNKER - 1920 Malcom Drive - Kettering, Ohio

A Musing sent to Ernie in late December never made it in [illegible] NEWS, so I'll review what I've heard in the past few months. ,, 11/27- KAYQ-1190 @ 2:30am, WAVN TEST in well o/WGAR, CFRA-580 w/WX @ 4:10, and finally, R. Carribean-840 @ 4:45 w/Back to the Bible". **I've been trying for this one for years. 11/29- WJJT-1540 @ 5:30 s/off.** WCOX-1540 @ 5:40pm w/c/w, YVKS-750 @ 7:05 o/WSB. 11/30- A surprise, KLOE-730, Goodland in w/fair signals @ 6:07pm w/NX sponsored by Coors. Same eve, KTLW-920 @ 6:25 first time heard since 1964, also another log on 730, CJNR @ 7:25 w/rr. **MM 12/4, a new state added with KGEM-1140 @ 1:30. I chased after** this one for three years, now only Alaska needed. 12/4- At SSS, KNUJ-860 @ 5:45 s/off, also KSEO-750 @ 6:15 s/off. 12/6- A real surprise w/KFIL in well w/KYW nulled @ 5:25 w/WX, and same evening, KCHF-1520 way under the mess that occured here @ SSS. **A brief ID @ 5:40 mentioning Sioux Falls. 12/7, @ SSS, KOLM-1520 @ 5:30 s/** off coming in like Gangbusters with no interference. Same eve, KWYR-1260 @ 6 s/off. CX during early December were very good to the NW. 12/11- Perhaps the best catch I've ever made, w/ KEN off/on, CKEK-570 rolled in @ 2am. Copy was a little rough for a while due to an almost unnullable KVI, but @ 2:10 theu began to gain in strength when s/off announcement began. **They mentioned // station CFEK-1240** Fernie B.C. I thought I'd tune down there real quick to see if I could get them, hi. Tape and report sent, and verie received 1/25. 12/27- R. Paradise-1265 logged for #2 from St. Kitts. 1/8- WSBS-TEST in well @ 1:20. Only other decent logging was **made 1/15: KJRG-950 w/TT @ 1:20.** I called the station and the CE seemed very interested in DX. Verie in four days, a record for me. Only eight new stations in January, as compared to 52 last year. **Oh well - 73.**

RICHARD LAUHEAD - 591 W. Co. Road B - St. Paul, Minnesota - 55113

Hi all. Finally enough loggings for another Muse. I haven't heard a lot of new ones this season, but the few have been pretty good DX. CX are very good here. MMs have been good to me lately. MM 1/29 saw five new ones added to the log. KCMC-740 Tex. @ 1:15 w/a very poor signal, but then they don't put much power this way. WAPE-69p Fla. w/a fantastic signal @ 1:30, my first Florida heard. They were heard several MMs since. KBMY-1240 Mont. s/off @ 2; KCJB-910 N. D. u/WSUI @ 2:15; and KTGO-1090 N.D. @ 3:03 for the NRC TEST, very strong here. 2/3 brought WZAP-690 Va. f/c @ 1:22. **2/4- KCII-1380 Ia. r/c @ 1:10 and KBIM-910** N.M. @ 7:34pm. MM 2/5- CJWA-1240 solid @ 2:21, my first Canadian GYC. They IDed as CJIC or CJIC/CJWA Wawa. Also 2/5, WERC-960 Special in well w/CFAC QRM. 2/7- WRBC-1300 Miss. heard @ 2:11, and WJOB Ind. @ 3:38, & WJBC Ill. @ 3:05, both on 1230. **2/9- Another one on 690 logged, KBOS Ariz. @ 4am, fair signal. 2/10- KLMX-**1450 N.M. r/c heard @ 2:11. 2/11- KALO-1250 Ark. r/c @ 2. On 2/11 local KRSI-950 was off all afternoon & night. **Thanks to KRSI two new ones logged here, KLIK Mo. @** 6:38 and KFSA Ark. @ 7:55. KLIK seemed the most dominant over the mess on 950 - interesting. Also 2/11, Cuban on 780a heard hetting 780 badly @ 11pm. MM 2/12, another treat. XEIA-830 was heard very well w/semi-cl mx @ 1:45, with local WCCO-830 off from midnight to after 2 (sorry, CST). Others MM: CFAM-950 (thanks again, KRSI!) @ 1:05; CJCA-930 solid @ 4, and finally R. Paradise logged here quite strong @ 4:05 but soon ruined by TT on 1270. **Two veries received, both v/1, from** WEKR & WAPE. This mailed 2/12 - when did you get it, Ernie? 73 & good DX to all. (Received Valentine's Day, Richard -ERC)

ROY H. MILLAR - Box 508 - Everett, Washington - 98201

Fifth & sixth weeks of '73 netted following new catches: 1/29- R. Paradise-165 s/off 10:01pm, weak. 2/5- WWWE-1100 ID 6:59am. 2/6- YNOW-540 "R. Corporacion" s/on 5am. **2/11- CMAF-880 in complete control of channel from 2:55am** tunein till after 6. Verie in from KMUS-1380. Now that I've finally determined ERC's deadline as Thursdays, I will try to synchronize my reports by airmailing Musing on Mondays - I hope this works out better than in recent past. **I have added at least one new logging in each of first six weeks in '73** - above R. Paradise is a new country. 73. (Received here also on Valentine's Day, Roy -ERC)

EVER SEE BOSTON BLACKIE? WELL, COME TO THE N.R.C. CONVENTION AND FIND HIM! REMEMBER THOSE DATES - AUGUST 31, and SEPTEMBER 1 - 2 - & 3. WHERE? BOSTON!

MIKE COLLINS - 2021 Main Street - Stratford, Connecticut - 06497

Another Connecticut station has gone AN, W LI-960 New Haven. The AN jock is Dale Reeves, who used to be at WOWO-1190. I believe WELI will still be off MMs however. WELI went AN 2/6. WHAS-840 is now off [illegible] 2-6, & AN MMs. CBS is going "NSP" in April, and will be offering its affiliates newscasts on the hiur AN-7. **Recent DX: KLOU-1580 heard MM 2/5 @ 2 w/ID & NX. On MM 1/22 CJRN,** Niagara Falls, was heard for the first time on 710, u/WOR's OC & TT. CJRN on 710 may ruin chances of ever hearing KIRO now. On Mon. 1/19 (Friday, no? -ERC) WADS--690 was off all afternoon due to a snowstorm, & WXUR-690, Media, Pa. was heard surprisingly well, considering its power & distance. **CHF was also coming in apparently on skywave.** Steve Clark, formerly of WCFL-1000, WOR-FM & WCBS-FM, and most recently at WBAB-1440 Babylon, L.I. is now doing weekends at WWDJ-970. WQQW-1590 Waterbury, Conn. is rr again, after having been EZ for about seven months beginning last June; WQQW is still a CBS affiliate. **XERF-1570 apparently is now running** 500,000w, since it is much stronger here now & overruns CKLW-1570 at times. Another which is playing more contemporary mx now is WHRF-1570 Riverhead, L.I., which had been mostly instrumental MoR until this month. WHN-1050's decision to go c/w fulltime was a big surprise in the radio world; WHN has announced it is retaining its Feminine Forum and sports programming in the switch. Some of the people from Storer's Detroit c/w station, WDEE-1500 are being brought in to WHN. Storer is selling WDEE to the owners of WIXY-1260 Cleveland. **Because of the floods** 2/3 AM, WKER-1500 Pompton Lakes N.J. was on @ 4:30am w/emergency info & mx. A recent trip to Maine revealed WKTQ-1450 South Paris is leaning heavily toward c/w in its mx, it was rr two years ago; it's now Ae. **At Portland I was amazed to hear how** strong WCBS' day signal is; good all day. WTIC-1080, 100 miles closer, was barely audible & unintelligible. WCBS has by far the best signal of any station in the N.E. Surprising so few DXers have mentioned the demise of the two giant NSP pests the Cubans on 600 & 670. I had hoped WSUF-1580 L.I. might be the second L.I. to abandon 10kw open, but a call to them reveals they have been on 250w for the past **month because of a damaged tower & hope to return to 10kw in late February.** The other to drop power was WTHE-1520 which at one time was 10ke & had a cP for 50). 2/6- I took time to null WSUF & caught WCRV-1580 N.J. w/rr & WRDI-1580 N.J. w/MoR from 2:30-3:30pm. When WLDB-1490 went off 12/29 I didn't bother to DX 1490 right away, & within a week they were back on. **So Conn.-N.Y. DXers might try 1580** right away before it's too late. 73.

JEFF ROBERTS - 945 East Moore Street - Decatur, Illinois - 62521

School, my new job, and poor CX have kept me from Musing for a couple of weeks. CX during the lasz two weeks of January were very disappointing compared to the first two. DX: 1/25- KTLW-920 Tex. @ 6:40-6:43 w/c/w & s/off. 1/28- KLEN-1050 Tex. in w/ID, NX, rr from 6:30-6:37pm, very weak, but what can you expect from 250w? **MM 1/29, I logged five Colombians between 1 & 3am. They were:** HJHJ-600 Barranquilla, HJIK-750 Medellin, HJKH-770 Bogota (WABC was off), HJED-820 Cali (WBAP was off, for a couple of hours at least), HJKC-850 Bogota. **HJHJ was** the strongest of these. I heard nothing on the KTGO TEST until 3:07 when they put on a TT. I heard a very weak ID at about 3:08 and the station became progressively weaker after this, N.D. #2 for me. WORD-910 S.C. atop the channel w/rr @ 3:37am, strong, with little interference. YVLL-670 Caracas booming in w/an ID @ 3:58am. This is my first Venezuelan positively IDed, country #[illegible] heard. SSS on 1/29: WHFN-1500 Miss. in w/an ad for a bank in Quitman @ 6:09. KJOE-1480 Ia. very weak u/lots of junk @ 6:25, c/w mx noted on them. **I haven't had much interest in veries,** but the NRC Report Forms make it look so easy that I may give it a try. One last note, I heard WRC, D.C., has changed their format to rr. They IDed tonight as "WRC, the Rock of the Capital" 73s.

KEN ONYSCHUK - 12934 [illegible] Ct. #2 - Blue Island, Illinois - 60406

Greetings to all again. In the best of health lately and I can't complain. Two new to Ye Olde Log Book in the past week. Friday night 2/2 from 11:30 to 12 on 1140 I somehow man ged to get an audible ID from KGEM Boise, on the hour, despite heavy competition from WRVA. **And Sunday night on 1540 just before** KXEL IDed, I caught about the briefest s/off I've ever heard from KZNK, ozark, Ark.

SITING OF DIRECTIONAL MW STATIONS

*Wes Boyd

In construction of directional antenna systems several factors must be considered. #1. Protection to existing stations on the same or on adjacent frequencies. #2. Providing maximum coverage of the city of license. #3. The expense of land in locations that could be used. #4. Coverage of adjacent communities if desired or necessary.

These requirements make transmitter site placement very unique. As an example we shall look at some typical class IV installations. Normally these operate with 1,000 watts daytime, 250 watts night non directional. Most such stations have towers of 150 ft. or a bit taller.

Several stations operating on these frequencies will use excellent antenna systems to obtain maximum coverage. In most cases this also involves coverage to a larger adjacent city. With careful transmitter placement they can obtain coverage in cities several miles away that normally wouldn't be covered.

EXAMPLES::::

WENZ 1450 Highland Springs (Richmond),Virginia: The city of license is about 5 miles east of Richmond. By locating the transmitter about 1½ miles to the west of Highland Springs that city receives excellent coverage. This also places the transmitter about 3½ miles east of Richmond and also provides rather good coverage of that city.

WEXL 1340 Royal Oak,Michigan is some 5 miles north of Detroit. As with WENZ transmitter placement allows coverage of the larger city. In this case the transmitter is 1½ miles south of Royal Oak. Such a location offers excellent coverage of both the city of license and Detroit.

WVON 1450 Cicero,Ill. and WOPA 1490 Oak Park,Ill. both are located in areas that provide excellent coverage of Chicago. These communities are adjacent to Chicago on the cities west side. From here transmitter sites on top of buildings in the area will have great coverage.

Such rooftop installations are not always used to provide maximum coverage. If properly used they can increase or decrease coverage. Location of antennas of one quarter wavelegnth on buildings of the same height will reduce coverage. A shorter building would provide more coverage however not as much as one over one quarter wavelegnth tall would.

Among other stations using transmitter placement to serve communities other than the city of license:: WNIA 1230 N.Y. WJMO 1490 Ohio WLPM 1450 Va. WSMY 1400 N.C. WFOM 1230 Ga. WXVW 1450 Ind.

Several years ago the F.C.C. made an attempt to limit the number of radio stations in larger communities. At the time many stations were licensed to these cities and used the F.C.C.s ruling to become licensed fulltime. If the city had adaquate service they wouldn't license any more fulltime stations for it. This allowed daytimers to relicense the stations to suburban cities without (in the F.C.C.s terms) local service.

These stations would become licensed for fulltime operation. Then with careful transmitter placement be able to serve the larger community anyhow. The coverage was not as good as it could be (or should be) to serve these larger cities. However poor night coverage is better than signing off the air. Some of these included WCUE 1150 Akron,Ohio WVOL 1470 Nashville,Tenn. and KUDL 1380 Kansas City.

During this same era other stations went on the air as daytimers licensed to suburban cities. Then after several years finally were given permission to operate fulltime. In both cases the stations placed transmitters so they would provide coverage of the larger communities. These include WHOT 1330 WPAT 930 KDAY 1580 KQRS 1440 WYOO 980 etc.

In most cases the area to be served determines the shape of the pattern more than the protection to existing stations does. Many stations could have lower power or less complicated patterns if the extra communities were not wanted in the coverage area.

KFXD 580 Nampa,Idaho wouldn't require susm a night pattern if coverage of Boise,Idaho wasn't wanted. On such a low frequency the coverage is tremendous even at low power levels. The large west lobe has enough signal to let the transmitter be several miles from Nampa. Since Boise is about 10 miles east of Nampa the transmitter could be midway between them. Such a location allows the front lobe to serve the city of license while the lobe to the northeast will provide a very good signal in Boise.

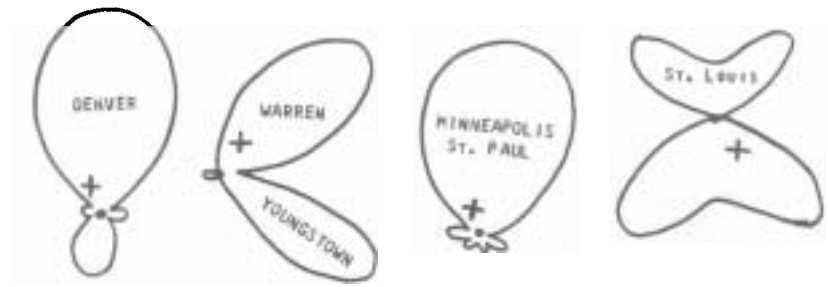
Similar transmitter placement was used by WSAR 1480 Fall River,Mass. With a location west of Fall River the east lobe covers the city of license. At the same time the secondary lobe north/northwest covers Providence,R.I.

WTSN 1270 Dover,N.H. has a location just west of Dover. This allows Dover to be in the main lobe east. The back lobe provides coverage of Rochester,N.H. for a secondary coverage. At the same time the front lobe is powerful enough to provide a good signal in Portsmouth.

WIBX 950 and WRUN 1150 Utica,N.Y. use transmitter placement to provide coverage of Rome,N.Y. (10 miles away) but both used different systems. WIBX 950 has a location to the west of Utica so it lies in the east lobe. This allows Rome to be covered by the lobe to the North. WRUN 1150 is located to the northwest of Utica so it lies in the southeast lobe. The lobe to the northwest then covers Rome.

Dallas/Ft. Worth,Texas provides similar problems in transmitter placement. Of the stations here KLIF 1190 is the most unique. Protection to WOAI 1200 KVOO 1170 and other 1190 stations are required. The pattern used offers this protection but makes coverage of both cities difficult. Transmitter location near Irving,Texas (northwest of Dallas) allows Dallas to be served with the lobe to the southeast. Then the main lobe southwest will cover Ft. Worth with signals of excellent quality. With this pattern coverage of both cities is impossible unless the transmitter is in this area.

In costal areas (New York City and Los Angelos are excellent examples) the stations have transmitters several miles inland. If stations in this area had moderate power and patterns aimed at the larger city they would be almost as strong as stations licensed there. Others are licensed to communities surrounded by larger cities. They place the transmitter 10 miles away from the larger city and with power lobes cover both cities to serve the city of license. KDAY 1580 and KROQ 1500 in California are great examples of this.



KLAK 1600 WHHH 1440 WYOO 980 WIBV 1260

NEW WITH THIS ISSUE OF I D X D!
"THE NRC TAPE-MONITORING SERVICE"

How often do you hear and tape an unID and wish someone else could help you with an ID?

Now, you can send a copy of your tape to IDXD, Box 282, Butler, NJ 07405 and we'll attempt to ID it for you!

We are equipped to handle reel-to-reel tape at 1-7/8 or 3-3/4 ips, or cassette tape.

Please note that THIS IS A FREE SERVICE available to any and all NRC members - another of the vast services available to you through the NRC - the world's leading Medium Wave DX Club!

We ask simply that sufficient postage is enclosed with your tape for its return.

Sorry - we cannot guarantee a bullseye in every case, but have a familiarity with enough languages to give it a go, hi.

... ABOUT THOSE HARMONIC RECEPTIONS:

Harmonics of foreign stations heard in the low-frequency SW bands will be published only if they adhere to one or more of the following criteria:

1)Station rarely or never reported on fundamental;tip should include sufficient programming details to give other DXers a chance to log the station on its fundamental.
2)A new station not previously known to exist
3)Any tip containing sufficiently redeeming DX value as to be "loggable" on its fundamental frequency over a geographical area sufficiently large to be of major significance to a large number of North American DXers.

... TIPS TO REMEMBER WHEN REPORTING TO I D X D

1. Please contain sufficient program details in your reception to make it a valuable aid to other members in search of your catch;e.g. other interfering stations, propagation characteristics, notable hets, type of music or talking, languages used if not obvious.
2. Use only one side of the paper when reporting - all items scissors-cut.
3. It is not necessary to type, but PLEASE WRITE LEGIBLY... when in doubt, hand-print, hi.
4. Give as many details as possible in reporting unIDs: "unID SS on 1000 kHz ID R. Mil at 0030 with LA mx" isn't good enough Attempt to listen to "unIDs" for at least 10 minutes if possible. Include loop bearings if applicable. This is how many "unIDs" become IDs, hi.
5. In the final analysis, DXing is "the hobby of the individual". One DXers "garden variety" catches is another's "rare goodie". Use your own discretion and your own expertise as a measuring tool of the "DX-worthiness" of your reports. Do they help someone else hear your station? Is this your first logging of station XXXX? Is it a schedule change? A new frequency, power or slogan change? In this hobby, a 250-watt Mexican or Cuban can be just as good a catch as a megawatt Libyan.

GOOD HUNTING!

IDXD MONITOR REPORTS

Page* Taylor
BOX 282 BUTLER, N.J. 07405

Deadlines: Fridays of each week; DX phone: 201-838-5721, all prepaid calls welcome daily 1800-2200. Some interesting receptions this week with good LAs, good TPs from the WC, and (voilà!) TAs from the EC -- excellent high-latitude conditions 2/16-2/17. Now, the world's best DX from some of the world's best DXers:

540 VENEZUELA. Caracas(?) R. Variedades 2/12 0800-0830 w/pgm "Venezuela-Despierta y Canta"...much higher class music than I'd expect to Despertarme y Cantar along with..(Sheedy, Calif.) (First off, a big Welcome Back to you, Dan! This slogan not listed new '73 WRTH, can't find it in Venezuelan lists either .. any help from membership appreciated-ed)

540 NICARAGUA. YNTT, Managua s/on 1000 2/6 with "R. Corporación" ID, no call. Surprised at this early s/on; could be confusing. (Millar, Wash.)

555 ST. KITTS. ZIZ Basseterre most likely the carrier heard 2/12 MM 0907 and again at 0959. Cooper reported s/on at 0900, Jensen (IRCA) reported it as 1000. Will have to keep trying. (Pejza, Calif.)(WRTH '73 lists s/on 1000. Ed.)

580 MEXICO. XEFI Chihuahua, Chih. "R. Mexicana" ID at 1014 1/29. (Seaver, Calif.)(Welcome! Ed.)

600 COLOMBIA. HJHJ R. Libertad Barranquilla in well with sports at 0145. (Geoff Trower, Brighton, England)(Welcome, Geoff! Ed.)

625 unID. at least one station in Northern LA region about 0145-0215. (Trower, England)(Probably TIXE, Radio Omega, San José, listed 10 kw. per '73 WRTH. Ed.)

655 NORTH KOREA. Pyongyang (not 665, my typo earlier, sorry-fjp) faint with choral music MM 2/12 0923; good with YL talking 1057(FJP)

*658 HAITI. 4VUE, R. Lumière quite loud and steady MM 2/5 0930. (Don Reynolds, Calif.)(Welcome, Don! Ed.)

660 NEW ZEALAND. 2YC presumed the one looping SW with classical music MM 2/12 apparent EE announcement at 0931, with titles of pieces played; followed by aria. Believe this is the first time heard from San Diego for me. (Pejza, Calif.)

710 COLOMBIA. HJFT "Ecos del Combeima" Ibagué heard for first logging when WOR was absent. (Trower, England)(Geoff, if possible, please try to give dates and times, OK? Tnx. Ed.)

725 NORTH KOREA. Kim Chaek fair with KK man talking 2/12 1010.(Pejza)

730 COLOMBIA. HJCU R. Melodía Bogotá hrd well w/nice ID 0735, 1/29 (Myers, Ohio)

740 unID. SS mentioned (yelled would be more appropriate) sieto-cuarento (siete-cuarenta-ed), and sounded like R. Lah-TEEN (accent on 2nd syllable) mentioned twice in what sounded very much like typical LA ID(i.e. tin-can production, hi-dm). Hrd 0804 1/29; have tape if any thinks they can help (RFS?)(Myers)

746 SOUTH KOREA. HLKH Kwangju. Probably the KK(glottal stops unlike JJ/CC) here 1135-1200 2/12, loud with orch. music and pips on the hour.. 3 short/lov, 1 long/high..(Sheedy, CA)(Tnx exc info. Ed.) Presumed the carrier 1012 MM 2/12. (Pejza)
UFO hrd 2/5 0920, sounded Korean, prob. FJP's HLKH nom, 750 (Seaver)

750 JAMAICA. JBC Port Galina. BBC-like news 0955 2/12, nice but not all that interesting... (Sheedy, Calif.)(Agreed. Ed.)

760 GUATEMALA. TGHS Guatemala City. Likely the one here 2/12 1145 and on, God-awful violin music & lots mentions of Guatemala. (I was hoping for HJ..)(Sheedy, Calif.)

765 EL SALVADOR. YSKL San Salvador. Just messing around whilst logging 760 & caught "K-L" ID 2/12 1145, fair to middling signal (Sheedy, Calif.)
@ R. Cadena YSKL in very loud MM 2/5 even after 1215. (Reynolds, CA)
@ Heard best MMs after 1100, finally caught ID at 1200 2/5. (Seaver)
770 JAPAN. JOUB Akita NHK2 powerhouse heard every MM no matter what Afr is. Has EE lessons up to 0955, then EE news. Best ever TP, even better than Peking-1040 in heyday. (Seaver, Calif.)
@ Coming through loud MM 2/12 after 1130. JOIB (750) also heard well and JOBB (830) somewhat weaker under QRM. (Reynolds, Cal,)
@ Heard w/EE lessons 2/12 0940-and on and on..just pounding in.. if I listen long enough I could improve my diction..(Sheedy, CA)
@ With man and woman in JJ MM 2/12 0938; WABC nulled. (Pejza, CA)
*830 VENEZUELA? Radio Sensación presumed new slogan for Radio Miranda, good around 0200. (Trower, England)
840 PANAMÁ. HOL-80 Panamá best level yet heard 1/28, 1000; think must be s/on. (Millar, Wash.)
840 MÉXICO.XEFG Celaya, Gt. apparently the XE booming away 1255-1310 recording period 1/28. (Millar, Wash.)
844 GILBERT & ELLICE ISLANDS. VSZ1 Tarawa 2/12 0745-0902 first time for arm-chair copy; 0740-BBC nx (with Gilbertese translations, sounds like), couple 90-second instrumentals (Sandy Nelson drums) then male blabbing away 'til 0755 fade; 0836 back again with childrens' chorus to 0853 when the ubiquitous YL began..0902 harp or xylophone IS(?) and male with supposed ID..(Sheedy, Calif.)
@ Just about nightly here after about 0730. Sometimes they are very loud and clear. Usually off about 0930. (Reynolds, Calif.)
850 GUATEMALA. TGX, Guatemala City "Radio Ciro's" presumed the one with several mentions of Guatemala and phone calls 2/5 1135-1145 No positive ID heard. (Seaver, Calif.)(Hey, does anyone out there know, is it "Ciro's" or "Ciros" without apostrophe? Ed.)
860 PANAMÁ. HOL55 Chitré beautiful R. Reforma IDs after XEMO s/off along 1/29 0932 ID. (Myers, Ohio)(Not often hrd, nice catch!Ed.)
875/876 unID. 876 had what seemed to be Wonsan, PRNK with light classical music and YL 1053-1100 2/12, tuned back a bit later and lower and caught R. Mundial ID by man followed by YL sounding much like the LVDC lady & rendition of "El Condor Pasa"..to keep it interesting by 1240 2/12 878 kHz. had KK, same pgmming as 876, tho by that time I was kind of wasted..(Sheedy, Calif
880 CUBA. CMAF Pinar del Río assumed powerful Cuban heard at 0800 0900, 1000 2/11. Just what we need on 880, hi.(Millar, WN)(Yeah! Ed)
880 unID. with non-stop classical music, including marimba version of part of "Grand Canyon Suite", no announcements MM 2/12 0942. Just had a Latin flavor. (Pejza, Calif.)(Sounds like Cuban,Father.Ed
885 MONTSERRAT. Plymouth. When did this go to 1 kilowatt? Good signals after 1000 most AMs and fair-poor in eves to 0300 c/d. (Seaver, CA)
895 [illegible]. Tehran very weak at sign-on 0230 about 2/3. (Trower, England)
*900 ARGENTINA. R. Provincia de Corrientes LT7 hrd on 2/7 at 0200 with Milan-899 silent, stations farther east than Athens always very weak but on 899 USSR just readable with Argentina looped - this is Yoshkar Ola. (Trower, England)
900 BARBADOS. R. Barbados, Bridgetown 2/12 1040 and on with local ads, ASF TCs & a nice cut of "Whistling Willie"..(Sheedy, Calif.)
**921 MÉXICO. Culiacán, Sinaloa XECQ hetting 920 (XEBH-Cal stns) eves, IDed with "C-Q" and many cuckoo calls 1/16 0227. (Seaver, Calif.)
950 MÉXICO. XEFA Chihuahua, Chih. 2/12 1010 and on, thot 'twas something nice, got Radiorama ID then "La Nueva F-A, Chihuahua.." Ah, well..(Sheedy, CA)(Trade you for France-944, hi! Ed.)
970 HAWAII. KPUA Hilo. SID and weather for Hilo heard 2/3 at 0805 through KCHV. Hawaii #22. (Seaver, Calif.)

1015 EL SALVADOR. R. Internacional YSC, San Salvador quite good at 1110 MM 2/12. (Reynolds, Calif.)
1020 VENEZUELA. YVRS R. Margarita very quick ID in amongst SS talk 1/29 0948. (Myers, Ohio)
1035 HAITI. Cap Haïtien 4VEF loud and clear MM 2/12 at 1100 with religious pgm in EE. (Reynolds, Calif.)
1040 BRAZIL. Sao Paulo PRG2 "R. Tupi" quite consistent SM 2/4 between 0700 and 0800 with many clear "Rah deo Too pee" IDs between musical selections. Have it on tape but waiting for better items for written report. (Famous last words, hi.-dr)(Reynolds, CA) (Nice reception, Dan--not hrd in awhile. Ed.)
1055 NICARAGUA. R. Masaya YNLL heard to ID at 1120 on MM 2/5 with KNX off. Often hrd faintly in evenings but KNX splash too much.(Reynolds
*1065 unID. SS very weak 2/5 1102, 1120. (Seaver, CA)(Won't someone pse ID this one soon? Sounds and seems Ecuadorian here, but can't be sure. Ed.)
1080 VENEZUELA. YVQJ Barcelona, "R. Barcelona" s/on 1/29 at 0956.(Seaver)
*1100 NEW ZEALAND. 3ZB Christchurch in as soon as KFAX s/off 1100, 1/29; unneeded, but nice to hear. (Millar, Wash.)(Wow! Ed.)
1110 VENEZUELA. YVQT Carúpano s/on 1000 very nice "R. Carúpano" ID's and music, 1/29. (Myers, Ohio)
1135 GUATEMALA. LV de la Costa Sur, TGVR (listed 1130 kHz.-dr) very good after 1100 on MM 2/5 but barely audible on 2/12 (Reynolds, CA)
1140 PHILIPPINES. Poro VOA probably the Vietnamese program here 2/12 1220-1256 possible VV ID at 1230, faded on the hour, naturally.. (Sheedy, Calif.)(Is there any other way? Ed.)
1150 MÉXICO. XERM Mexicali, BCN 2/5 1100 w/call and "R. Mexicana" (S'ver)
1155 EL SALVADOR. YSCF San Miguel; have heard in eves through slop, but IDed 2/5 1131 with call and "Ondas Orientales". (Seaver, CA)
**1170 JAPAN. JOUK Akita NHK1 atop KVOO 2/12 1225 for a little bit..if KOHO is on, however...JJ from Japan sounds a lot like JJ from Hawaii, hi. (Sheedy, Calif.)(Suppose..I wouldn't know since we here on EC fail to have such esoteric problems, hi! Ed.)
1178 RYUKYU ISLANDS. Okinawa, good carrier but no audio hetting WHAM 1028 MM 2/12 (Pejza, Calif.)
@ VOA Okinawa 2/12 1211-1225 w/CC and leads me to suspect 1170 was JOUK as Hawaiians weren't in at all this madrugada. (Sheedy, Calif.)
1178 JAPAN. VOA-Okinawa very loud at s/on 1100 MM 2/12 with Yankee Doodle and opening announcements in EE before going into foreign language. (Reynolds, CA)(Japan is correct, as Ryukyus conferred by treaty back to Japan last year. Ed.)
1190 COLOMBIA. R. Cordillera Bogotá HJCV ID, TC 0831 1/29. (Myers, Ohio)
1265 ST. KITTS. Radio Paradise, Basseterre finally logged at s/off 1/30 at 0300. Not much but weak "R. Paradise" ID and brief anthem hrd, but all I've been able to dig out so far. (Millar, Wash.)
@ In very well at 1000 s/on MM 2/12, deteriorates fast after 1030 or so. (Reynolds, Calif.)
@ Heard 2/12 0915, got audio, possibly s/on 'round this time? Religious pgm(locally done) thence to beautiful ID at 0929:"You're in tune with R. Paradise being from St. Kitts on 1265 kHz. in the MW (band) with a power of 50,000 watts," followed by Morning Devotions - religious request program at 0931. (Sheedy, Calif.)
@ Has been heard with Gospel mx in early eves around 0230 and after 0915 in AMs but no IDs yet. Quite weak for 50 kw-885 usually better. Directional? (Seaver, Calif.)(Could be, but not sure. Ed.)
@ Heard with clear ID 0901 MM 2/12. Troubled with slop from KGIL-1260 KFJZ 1270. First time I tried for it with local XEAZ-1270 off. Country #45, I believe. (Pejza, Calif.)

XX 1220 VENEZUELA. A Maracaibo station with indistinct slogan hrd on 1/22 instead of usual "Voz de Apure" is "Radio Regional" in '72 WRTH in that city? Maybe Los Morochas is a suburb?(Trower , UK) (Out of order-sorry. Los Morochas doesn't show in my Hammond Citation Atlas, so don't know...Ed.)

*1330 PARAGUAY. ZP4 "Radio Chaco Boreal" in well with jazz and MoR instead of usual Belem, Brazil 0330 2/5. (Trower, England)

*1349.5 MEXICO. XEMM San Luis de Rio Colorado, Sonora "Radio Amor" IDed well w/call and city 1/26 at 0102, then s/off. Note call change. (Seaver, CA)(Tnx info, Randy! Believe name of place is without the "de". Ed.)

1380 HAWAII. KPOI Honolulu finally found atop for report at 1059-1102 1/28; not new, but unverified. (Millar, Wash.)

1380 MEXICO. XEGW C. Victoria, Tam. seemed to be the XE apparently s/on 1140 1/28; far from sure on this. (Millar, Wash.)

1380 VENEZUELA. "Ondas del Mar" is now the best YV station here up the high end, since last autumn HISC Santiago not hrd.(Trower,UK)

1380 unID. HELP! Who is SS/AN here? Can't read any Colombian net ID, "R. Eco" (XECO) or anything else on this weak baby; no gongs, ??? (Millar, Wash.)

**1385 MARSHALL ISLANDS. WXLE Eniwetok AFRTS station heard well MM 2/12 from 0907 til s/off at 1005½ with SSB. Recorded pop music & vocalists with all announcements in EE. Several TCs given which would make their time GMT + 13 hours (??-ed) instead of GMT plus 12 as shown in WRTVH. Station announcement is "You've been listening to American Forces Radio and Television Service over WXLE... Eniwetok...Radio 13 on your dial." Air distance from here is 5275 miles and power is only 250 watts. A phone call to AFRTS in Los Angeles got the following address: Report to Station Commander, AFRTS Station WXLE, Eniwetok, APO San Francisco, CA 96333. (Not shown in '72 or '73 WRTH). They say power is still 250 watts. I have last several minutes nice and clear on tape. Report in mail for country #76 verified. (Reynolds, Calif.)(Nice! Ed.)

@ The station IDing as WXLE on 1385 kHz. has moved from Marshall Island (sic) to Canton Island in the GMT -11 time zone. Runs 250w. and heard in New Zealand around 0900. (Arthur Cushen's "DX World" broadcast on Radio New Zealand 11780 kHz. 0645GMT 7 February, info via Glenn Hauser)(Tnx, Glenn! Ed.)

1394 SPAIN. EAK48 Radio Popular de Astorga for first logging at close of "Carretera" 0200. (Trower, England)

*1412 SPAIN. EAJ16 Radio Granada last SER station to sign off 0200.(T'wer)

*1472 COLOMBIA. "Voz de Honda" HJBM heard several times early February closing 0320 with anthem. (Trower, England)

*1475 ETHIOPIA. AFRTS Asmara copyable with news at 0320 but weak on most occasions. (Trower, England)

*1502 POLAND. Warszawa with EE dance music and pop program closes just 0200. Very strong digging for new Spanish stations made difficult. The usual two late s/offs are R. Popular de Sevilla and R. Popular de Bilbao; 0203. (Trower, England)

1546 UNITED KINGDOM. England, Bristol. First noted signal here 2/12 [illegible] 0557 w/jazz but clobbered by WQXR-1560 splatter(1-amg) Bits of EE noted at 0605 and 0621. Faded up nicely at 0632 when conclusion of news, weather forecast and ID as "BBC Radio Bristol" was taped. 2 kw.? (Angel M. Garcia, Flushing, NY)(Welcome to IDXD! Ed.)

1555 unID. SS 2/12 1120-1130 w/YL-OM talks and harp between dialogues; heard much garbled "aqui en Salapunco" at 1130. I'd much like some help on this one, thanks. (Sheedy, Calif.)(Perhaps HJLP, Tulua, but "Salapunco"??? Ed.)(PS -- whatever "Salapunco" is, I hope I don't catch it, hi. Ed.)

**1575 UNITED ARAB EMIRATES. Sharjah weak, signs on at 0230 in Arabic, which is "Double Dutch" to me; usual chants which make reports difficult. (Trower, England)

1580 THAILAND. VFA (VOA) Ban Patchi. 2/12 1229-1234 in oddball langauge (AWP sez Burmese in IRCA Foreign Log-ds) & wonder of wonders 1229 ending strains of Yankee Doodle.. made my whole day. (Sheedy, Calif.)(Congrats! Ed.)

**1594 DENMARK. The chance of Denmark logging as supposed in #13 DXN of January 31 is out. 1594-channel closed during 1972. See WRTH '73. So is life! (Bengt Ericson, Växjö, Sweden)(Tnx, BE! Ed.)

Thanks to the following supporters this week; nice to see the WC coming to life once again... now, where's the EC? Hi.

Bengt Ericson, Växjö, SWEDEN	(1)
Angel M. Garcia, Flushing, NY	(1) HQ180AC, SM1
Roy Millar, Everett, Washington	(9)
Dan Myers, Toledo, Ohio	(6) HQ180A, 3' box loop
Don Reynolds, Glendora, California	(12) HQ180A, 24" Sanserino loop w/amp
Randy J. Seaver, San Diego, Calif.	(14)HQ180A, Sanserino loop
Dan Sheedy, Encinitas, Calif.	(16)SPR4, Sanserino loop
Geoff Trower, Brighton, Sussex, ENGLAND	(15)
Father Jack Pejza, San Diego, CA	(9)HQ180A, 2½' Sanserino loop
Glenn Hauser, Von Ormy, Texas	(1)HQ160, 560' LW NW/SE

HORIZON BLOCKAGE: Can Fresnel Diffraction Be Ignored? (Or Why Is a Transylvanian Vampire Like a Mountain on the Medium Wave Band?)

*Gordon Nelson

As part of our unsuccessful project to experimentally measure the arrival angle of MW DX signals by taking advantage of skyline blockage, we were forced to come to grips with several possible sources of uncertainty in the calculated angles of signal arrival resulting from propagation effects.[1] Once we worked our way around those problems and satisfied ourself that we had indeed calculated some fairly realistic values, we bravely set out to compare measured skyline blockage angles with calculated values in an attempt to determine the propagation modes for MW DX signals.

We soon made a most interesting and important discovery. Not only were we unable to measure skyline blockage angles but further research strongly suggests that we must rethink the entire question of skyline blockage of MW DX signals. **As we shall show, skyline blockage blockage maps and predictions** may be not only valueless but quite misleading in actual practice.

It appears we've all been guilty of ignoring or at least seriously underestimating the importance of an effect not previously considered on the medium wave band: Fresnel diffraction. Not only has this effect been totally ignored by MW DX'ers, but a fairly thorough literature search here in the MIT libraries has failed to turn up any past research on the topic. Many puzzling past observations of MW DX reception patterns now make sense - particularly the behavior of DX reception noted on a car radio while driving through hilly country. We have experimentally verified the most important predictions of diffraction theory as applied to MW DX signals; other diffraction effects to be described should also be observable and we hope this article will not only help the MW DX'er to understand reception patterns but will stimulate further research on this apparently virgin topic.

Diffraction is usually thought of as primarily an optical phenomenon. The limits of resolution of microscopes and telescopes are determined by the diffraction of light, for example, and much work on optical diffraction has been done in the past century.[2] Light, microwaves, TV and MW signals are all electromagnetic waves however; they differ only in wavelength. Maxwell's equations provide a complete description of all electromagnetic waves regardless of wavelength and as a result certain effects normally thought of as belonging to the domain of optics can also be evident on the BCB if one just knows where to look...

What is Fresnel diffraction and how does it affect your MW DX? Diffraction is a direct consequence of the interaction of electromagnetic waves and matter. It permits electromagnetic waves - BCB DX signals included - to effectively bend around and over solid objects. On the broadcast band these diffraction effects are most important and obvious for very large obstacles - mountains for instance... **It's important to realize that diffraction on the BCB** has nothing to do with ground-waves or other familiar aspects of propagation; neither is it related to trop, ducting, or other VHF/UHF refraction effects. Rather, diffraction is an odd and unintuitive process with few obvious manifestations in everyday life. The mathematical theory of diffraction has existed for at least a hundred years, though, and its predictions have been confirmed in countless experiments on light waves[2] and high frequency radio signals.[12] By

applying the similarity law of diffraction as formulated by Summerfeld[2] we have evaluated the Fresnel diffraction equations for MW signals taking into account the BCB wavelength. **The results are extremely interesting and of great** importance to any DX'er interested in horizon blockage of MW DX signals and related subjects.

Consider first the reasonable and common-sensical view of skyline blockage which neglects diffraction effects. We'll call this the naive theory of horizon blockage; **in optics it's called the geometrical optics approach.** Figure 1 shows an intentionally extreme case of skyline blockage: the DX'er is located 2.6 miles from the base of a sheer vertical cliff rising straight up to a height of 5,000 feet; furthermore this cliff is part of a mountain range extending for many miles in both directions. A worse situation can hardly be imagined: the cliff will block the horizon to a height of 20°. Naive horizon blockage theory holds that signals arriving from angles steeper than 20° will skim in over the top of the mountain and be heard as well as if the mountain were not there; signals on angles below 20° on the other hand will be blocked by the mountain and cannot be heard.

Another way of looking at this is to consider that the mountain casts a shadow for arriving MW signals. If you're in the shadow for a particular signal (or alternatively if the arrival angle is below the skyline blockage) it will be inaudible; if you're outside the shadow the signal will be audible. The edge of the shadow is the shadow boundary; at that point on the ground the **horizon blockage angle equals the signal arrival angle. This is the point** where the signal should drop from full strength to complete inaudibility as you move a portable receiver across the boundary into the shadow. **The "sharpness" and** indeed the very existence of the shadow boundary for a MW signal has always been taken for granted by MW DX'ers and it underlies all articles and discussions of "skyline blockage". **This is a fundamentally incorrect assumption,** however, as we shall see...

Figure 2 shows the same situation, this time taking into account diffraction of the MW signal over the top of the mountain. As far as the DX'er is concerned, the effect of diffraction is the same as if a small low-powered relay transmitter were located on the edge of the cliff. **The signal radiated from this** "diffraction transmitter" will be audible throughout the shadow region where naive theory predicts complete inaudibility! Actually there is no such transmitter, of course, but it is a useful fiction for the purpose of getting a "feel" for diffraction effects. **The precise origin of the diffracted signal audible in** the shadow region can be explained only in terms of the highly sophisticated mathematics of the Maxwell and Fresnel equations; we'll defer discussion of the mathematics until the end of the article and instead concentrate on the observable effects of consequence to the DX'er.

The critical question is: how much effective signal can get diffracted into the shadow region where instinct tells us nothing should be audible? In the past we'd known that some diffraction would occur but we had assumed it would be a negligible effect; since then we've learned from the equations and confirmed by experiment that this is most definitely not the case... How important can diffraction be? Figure 3 takes our extreme case of horizon blockage one step further - not only is there a 5,000 foot cliff practically in the back yard but we want to hear a signal coming in right off the horizon at the lowest possible arrival angle of 0°. **Naive theory predicts that the signal will be completely** inaudible until the receiver is moved so far away from the cliff that the mountain drops below the horizon due to the curvature of the earth : out somewhere

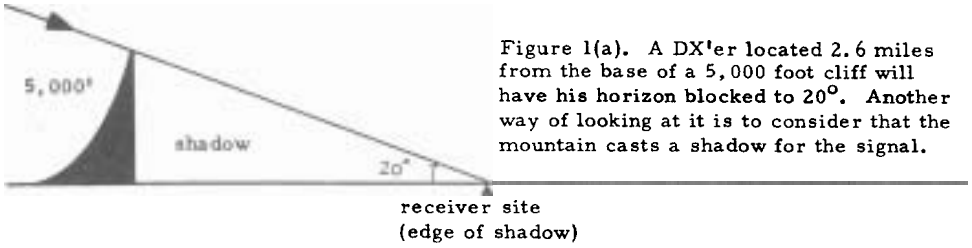


Figure 1(a). A DX'er located 2.6 miles from the base of a 5,000 foot cliff will have his horizon blocked to 20°. Another way of looking at it is to consider that the mountain casts a shadow for the signal.

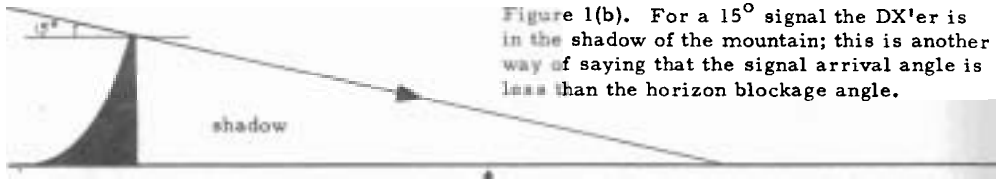


Figure 1(b). For a 15° signal the DX'er is in the shadow of the mountain; this is another way of saying that the signal arrival angle is less than the horizon blockage angle.

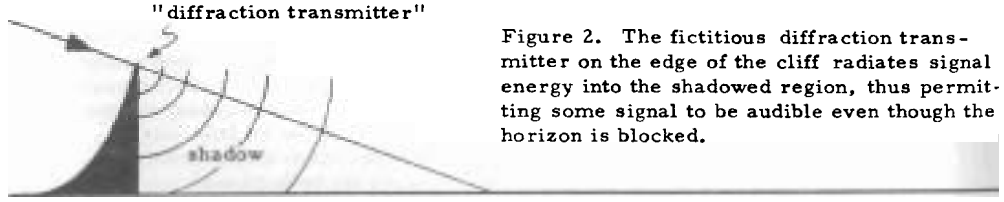


Figure 2. The fictitious diffraction transmitter on the edge of the cliff radiates signal energy into the shadowed region, thus permitting some signal to be audible even though the horizon is blocked.

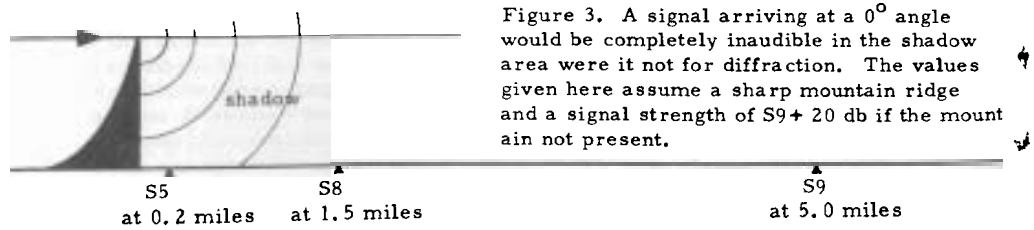


Figure 3. A signal arriving at a 0° angle would be completely inaudible in the shadow area were it not for diffraction. The values given here assume a sharp mountain ridge and a signal strength of S9+20 db if the mountain not present.

around 83 miles from the base of the 5,000 foot cliff. Since the horizon will be blocked all the way out to 83 miles, naive theory predicts that no trace of our 0° test signal should be audible. **But what happens if we take diffraction into** account?

Let us assume that the signal in question is coming in right off the horizon (0°) and would be quite strong, S9+20 db, if there were no mountain in the way. Suppose we start off at the foot of the cliff with a good portable receiver with an accurate S-meter and measure the signal strength at various distances from the base of the mountain. **The further we go from the cliff the lower the horizon** blockage angle of the mountain (see Figure 3). Right at the base of the cliff nothing will be audible from our test station - no surprise there! Moving away from the cliff, though, the signal will begin to become audible - very weak compared with what it would be if there were no mountain but still detectable. The diffraction equations predict that the signal may be as strong as S5 at a distance of only 0.2 miles from the cliff; at a mile and a half it can be as much as S8 - this with the cliff blocking the horizon to a height of 32°! Incredible as it seems (remember we said this was an unintuitive effect...), this is the effect of Fresnel diffraction. **At 5 miles the horizon is blocked about 12° but the** signal can be almost S9. Continuing outward the signal continues to increase in strength; at 30 miles it will be about S9+11 db. The more the horizon is blocked the weaker the signal will be heard but if it's strong enough to begin with it can be audible quite close to the base of the cliff.

The mind boggles! But old Professor Fresnel predicts some equally bizarre happenings when we consider signals coming in not from the horizon (as in the last example) but from more realistic skywave angles. **Let's go back** to the original case of an S9+20 db signal this time arriving at an angle of 20° above the horizon. Due to Fresnel diffraction there can be a detectable signal even at the foot of the cliff as long as the angle of signal arrival is greater than zero degrees. For a 20° signal, as much as an S6 signal may be heard at the base of the mountain. Moving away from the cliff with a portable receiver as before, the signal will slowly get stronger: at one mile it may be over S8. At two miles, it will be up to about S9+12 db - in spite of the fact that the horizon is blocked to a height of 27° **and the signal is coming in at 20°. At 2.6 miles** we come to the edge of the "shadow boundary" where the horizon blockage angle is the same as the signal arrival angle, 20°. **But the signal will be only S9+14** db... Due to diffraction, the value of the signal strength at the edge of a shadow boundary is exactly one-half of the value it would be if the mountain were not **present. Why?** Without recourse to the equations we can't say exactly; you won't be too far wrong, though, if you consider that the direct ray skimming in over the top of the mountain combines with the signal from the (fictitious) "diffraction transmitter" on the peak of the mountain - at the shadow boundary they are out of phase and a partial cancellation takes place.

Strange stuff - but things get even odder... Let's continue out past the edge of the shadow. There the horizon blockage angle will be less than 20° and naive theory predicts that the mountain will have no further effect on the received signal strength. The signal from the "diffraction transmitter" is still felt, though, and the signal will continue to get stronger. **At 4.1 miles where the** horizon blockage angle is 13° the signal reaches the original value of S9+20 db. At 4.6 miles the signal is even stronger - it will be up to about S9+22 db. At this distance the diffraction effect from the mountain tends to focus the signal somewhat and the result is a slight but measurable increase in signal strength over what it would be if the mountain were removed! **In terms of our imaginary** cliff-top diffraction transmitter, this is the point where the signals add in phase.

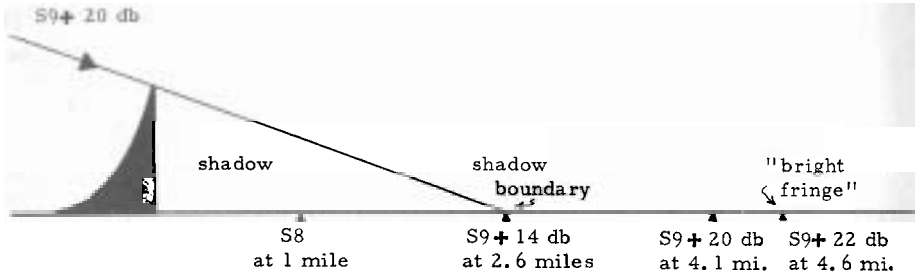


Figure 4. The arrival angle of the signal is 20° and the assumed strength is S9+20 db were the mountain removed.

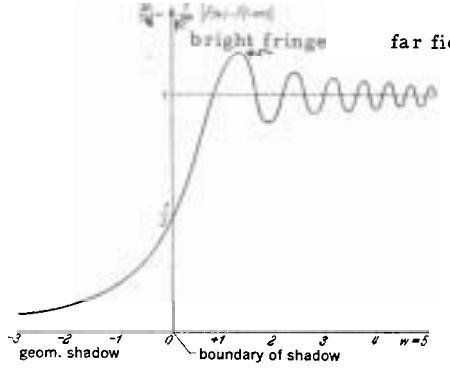


Figure 5. The basic Fresnel diffraction pattern showing the variation in amount of diffracted signal in different areas of the pattern. The relative signal will depend on the value of the parameter W defined in the Appendix.

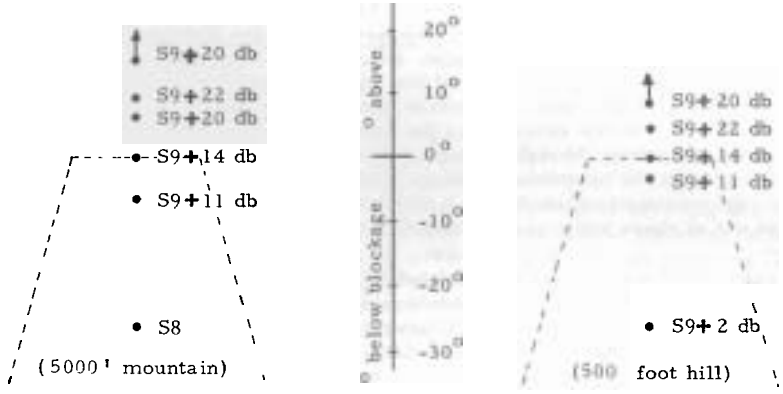


Figure 6. Horizon blockage diagrams taking diffraction into account. The incoming signal arrives at 20°; the above diagrams show the amount of signal audible due to diffraction at different receiving site locations. **The 0° point** is the shadow boundary at 2.6 miles.

Beyond this point the signal strength falls off again, fluctuates back-and-forth a bit, and quickly settles down to S9+20 db for good. For the purposes of MW DX'ing therefore, the mountain will continue to affect reception even though the signal is arriving on an angle quite far above the horizon blockage. **This is** shown in Figure 4.

The diffraction pattern will be similiar to what we have shown regardless of the height of the obstacle or the signal arrival angle although the numbers will be different. **It is convenient to consider 4 separate regions to be found** in all cases of horizon blockage: (1) The shadow zone. This is the region close to the base of the obstruction where instinct says no signal should be audible. The skyline blockage angle is greater than the signal arrival angle in the shadow zone and naive horizon blockage theory predicts no signal will be audible at all. **A substantial amount of signal may be diffracted into this shadow zone** in actual practice and the amount of diffracted signal increases the closer one gets to the shadow boundary. **(2) The shadow boundary. This is the point where** the skyline blockage angle equals the signal arrival angle. On the shadow boundary the signal strength is exactly one-half the value there would be if the mountain were removed. **(3) The "bright fringe". Somewhere beyond the** shadow boundary the signal will reach a maximum value of about 2 db over the original signal strength. **This is a focussing-type effect caused by the presence** of the obstacle. In optical diffraction patterns this looks like a bright ring or line. (4) The far field. Beyond the bright fringe the signal falls off again, oscillates back-and-forth a bit, and settles down to the original value. At distances far beyond the edge of the shadow boundary the presence of the mountain no longer has any affect on the strength of the received signal. **This basic** diffraction pattern is graphed in Figure 5.

Folklore has it that a vampire won't cast a shadow[3]; neither will a mountain for a MW signal but it's not superstition it's Fresnel diffraction!

There are some additional important features of diffraction of MW signals over mountains. The amount of signal diffracted into the shadow region depends on the absolute height of the obstacle. By this we mean that the diffraction effect will be different for a 20° horizon blockage produced by a distant mountain than it will be for a 20° blockage from a nearby hill. More signal is diffracted over a small obstacle than a larger one. This means that distant mountains will hurt your DX reception more than nearby hills even though the horizon is **blocked by the same angle.** Figure 6(a) shows the effect of diffraction as displayed on a typical horizon blockage diagram; the mountain is 5,000 feet high and we show the received signal strength for various values of blockage angle compared to the 20° signal arrival angle. **We also show in Figure 6(b) the** same for a nearby 500 foot hill; notice that there is more signal diffracted into the shadow in the case of the hill and that the effect on DX reception will be correspondingly less.

There is also a frequency effect. The lower the frequency the more signal will be diffracted into the shadow region, all else being equal. The numbers given in this article are based on 1070 kHz, the middle of the band. As the frequency is increased the diffraction will be reduced. **On TV and** microwave frequencies it is still very important and much work has been done on diffraction of these signals.[4-7] By the time the frequency is so high that we are dealing with visible light, a true sharp shadow will be cast and naive geometrical optics will be observed.

The numbers we have given are not to be taken as exact, especially in the

deep shadow region. The exact numbers depend upon frequency, the nature of the ground beneath the antenna, and details of the shape of the mountain-top. These assumptions and approximations are discussed in the Appendix. **The** possible variations due to these effects are most important deep in the shadow region; around the edge of the shadow boundary the calculated values will be very close to actual measured values. **These details influence the exact values** of the diffracted signal but not the shape of the pattern.

DX'ers interested in observing and measuring these diffraction effects are referred to the Appendix where we suggest several possible experiments.

CONCLUSIONS.

The practical implications of Fresnel diffraction on the BCB are of considerable interest to the MW DX'er. **Many puzzling aspects of DX reception may** prove to involve diffraction effects, particularly when the relative merits of various receiving sites are being discussed. **Some of the consequences of** MW diffraction are:

1. Little definite information will be gained from horizon blockage maps because diffraction will erase the necessary sharp shadow boundary. **Signals coming** in on angles below the horizon blockage angle will be weakened but not completely eliminated. This helps explain why some West Coast sites with blocked horizons are better than others for low-angle TA reception in an overall sense. **But if conditions are good enough, sufficient signal may** diffract into even the worst sites to permit marginal reception.
2. Horizon blockage measurements cannot easily be used to measure signal arrival angles on the medium wave band.
3. Within a small area the effect of diffraction over a horizon blockage may actually improve reception of a particular station by a small amount.
4. In an area with a blocked horizon, reception of diffracted signals improves significantly as the ground beneath the receiver becomes more conductive. This is due to the effect of ground on the vertical pickup pattern of the receiving antenna.[8]
5. You're better off having your horizon blocked by nearby hills than by distant mountains.
6. Diffraction explains why nighttime skywave signals do not suddenly snap in and out when you drive through hilly country; because the MW shadow boundaries are not sharp but rather are blurred, signals tend to fade in and out in a more gradual fashion than if diffraction were absent. **If diffraction did** not occur, signals would drop from full strength to complete inaudibility within just a few feet as one crosses the shadow boundary.
7. While we have restricted ourselves to diffraction over a hill, MW signals may also diffract around a vertical obstruction such as the edge of a mountain. This may give rise to "dead zones" - areas on the ground where the vector sum of all the diffraction "transmitters" is zero for stations on certain bearings and arrival angles. **This may well account for many of the** observed oddities of skywave reception noted at receiving sites separated by only a few wavelengths but with different skyline blockages.
8. Setting up a receiving site at the foot of a cliff will not guarantee that all signals from the blocked direction will be rendered inaudible. **Weakened**, yes; completely eliminated, no.
9. Because of the possibility of diffraction around the edges of a hill or mountain, direction finding bearings may be substantially deviated.

APPENDIX I: The Mathematical Description of Fresnel Diffraction

Consider a single vertically polarized plane electromagnetic wave directed against the sharp (in terms of the wavelength) edge of a reflective surface as shown below. **The initial signal amplitude is V_o and we wish to know the value** of the diffracted signal, V, at some point x:

The classical expression for such "knife edge" diffraction is given by:

$$V/V_o = \frac{1}{\sqrt{2}} \left\| \int_o^{\infty} e^{i\frac{\pi}{2}\tau^2} d\tau - \int_o^{-\infty} e^{i\frac{\pi}{2}\tau^2} d\tau \right\|$$

$$= \frac{1}{\sqrt{2}} \left\| \int_o^{W} e^{i\frac{\pi}{2}\tau^2} d\tau - \frac{i+1}{2} \right\| \qquad \text{Eq. 1}$$

where W is the dimensionless quantity given by:

$$W = \frac{d}{\sqrt{a\lambda/2}} \qquad \text{Eq. 2}$$

Equation 1 unfortunately cannot be solved in closed form. Two simple series expansions are used for numerical evaluation. The expansion of the integral is:

$$F(w) = w\left(1 + \frac{i}{1!3}\frac{\pi}{2}w^2 - \frac{1}{2!5}\left(\frac{\pi}{2}w^2\right)^2 - \frac{i}{3!7}\left(\frac{\pi}{2}w^2\right)^3 + \cdots\right)$$

Eq. 3

which converges everywhere and is of greatest utility for $W \geq -2$. For large negative values of W, that is, deep inside the shadow region, the following asymptotic expression is more suitable for computation:

$$F(w) = \frac{1+i}{2} + \frac{e^{i\frac{\pi}{2}w^2}}{i\pi w}\left(1 + \frac{1}{i\pi w^2} + \frac{1\cdot 3}{(i\pi w^2)^2} + \frac{1\cdot 3\cdot 5}{(i\pi w^2)^3} + \cdots\right)$$

Eq. 4

With accuracy suitable for our purposes, this latter series may be approximated by its first term which gives the following simple expression:

$$V/V_o = \frac{1}{\sqrt{2}\,\pi W} = \frac{0.224}{W} \qquad \text{Eq. 5}$$

We have used equations 3 and 5 to prepare the sample values in this article; for most purposes the graph of Figure 5 along with Equation 5 for $W \leq -2$ will be adequate for practical **purposes on the MW band.**

i = square root of -1
π = 3.14159
λ = wavelength of signal; same units as a & d

COMPLICATIONS.

1. The signal may not arrive normal to the surface as shown. In this event the entire coordinate system may be rotated to give an equivalent a and d.[9]
2. The vertical pickup pattern of the receiving antenna (assumed to be a loop)[8] cannot be neglected, especially deep in the shadow region where the signal will arrive from a steep vertical angle. **The values in this article have been corrected for this effect; we have assumed poor ground beneath the loop ($\epsilon = 10$) & $\sigma = 1$ mmho. Note that the signal pickup for a loop for signals at steep almost** vertical angles can vary as much as 18 db depending upon the ground constants; any attempt to observe or measure signals deep in the shadow region should take this into account.
3. The expression we have used for Fresnel diffraction assumes that the edge of the mountain is relatively sharp. **If the mountain or hill is more rounded than** ridge-like the "knife edge" equation must be replaced by a more general expression which takes into account the contour of the obstacle.[9] **It can be shown** that only the topmost part of the obstacle actually determines the nature of the diffraction pattern[10] and laboratory experiments with both light and microwaves have shown the resulting diffraction pattern to be remarkably independent of the exact shape of the top of the obstacle.[11,12] The equation we have used may be replaced by a related expression for diffraction over a spherical surface since the small portion near the peak responsible for the diffraction pattern can always be approximated by a segment of a sphere. **Furutsu[9] has shown that even the** equation for diffraction over such a spherical mountain is equivalent to the classical formulation for "knife edge" diffraction (our Equation 1) as long as we don't get too deep into the shadow region. **This result is consistent with** microwave observations of diffraction into valleys over the edge of mountains.[7] Precise evaluation for the value of signal strength deep in the shadow of a spherical mountain requires Furutsu's full equation.[13] We've tried it and the predicted values are close enough to those of Equation 1 for real mountain dimensions that we'll stick to the simpler Equation 1 for this article.

APPENDIX II - SIMPLE DIFFRACTION EXPERIMENTS

1. Two DX'ers as close together as practical should listen simultaneously to distant stations in a direction chosen to provide horizon blockage at only one of the receiving sites. **Choose stations far enough away so that the arrival angle** should be well below the blockage; see Fr. Jack Pejza's curves[14] for a first guess **on arrival angle. With identical receiving equipment and antennas the blocked** signal should be consistently weaker than the unblocked one; this is a measure of the amount of signal being diffracted into the shadow region. **We have found** this to be definitely the case using KORL and a 7° blockage.
2. Take a portable receiver across the shadow boundary and observe the signal variation; have an identical receiver on the top of the hill to provide a reference measurement. We find the shadow edge to be very diffuse and ill-defined.
3. If you've got a good prominent horizon blockage, check the relative signal strengths of stations at various distances in the direction of the blockage relative to stations at the same distances but in an unblocked direction. **When the dist**ance for the limiting ray in the blocked direction is reached the stations should weaken but remain audible.
4. Try DX'ing from the base of a cliff in an attempt to obtain QRM-free reception in the forward direction. **West Coast DX'ers might try blocking out stations** such as KOA and KOB; Easterners might try to get interference-free reception of Algiers - 890, etc. at the base of sea-cliffs. While weakened, the interfering stations should remain audible in many cases; the higher the blockage in feet the more complete the screening should be.

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12. "Optics of the electromagnetic spectrum", C. Andrews, Prentice Hall, 1960.
13. "On the multiple diffraction of electromagnetic waves by spherical mountains", K. Furutsu, J. Res. Labs. Japan, No. 14, 1956.
14. "Skyline blockage", Fr. Jack Pejza, DX NEWS, Vol. 40, No. 15, 2/15/73.

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Author's note: After we'd written the above article we finally found a report of **some similiar work. In a paper entitled, "Influence of isolated obstacles on** medium wave propagation" (Elektrosvyaz, Vol. 22, No. 6, 1968; Moscow, in Russian), V. Kashirovskiy and F. Kuzubov discuss the theory of skyline blockage for MW signals. **While the geometry of their derivation is a bit different** from ours, the results are identical to ours (always a good feeling!) except they neglect the important matter of the antenna vertical pattern. **They present** data taken on an expedition to Central Asia in 1961 to measure MW signal diffraction (mostly on Radio Alma Ata) over mountains; their results generally agree with the predicted values within about 6 db. **Agreement would probably** be better if they had taken the antenna vertical pattern into account as we have done. ***GPN**

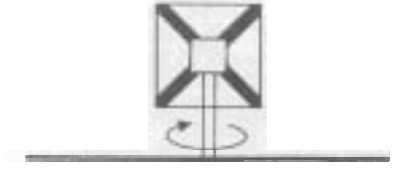
The Vertical Pickup Pattern of the MW Loop Antenna

*Gordon P. Nelson

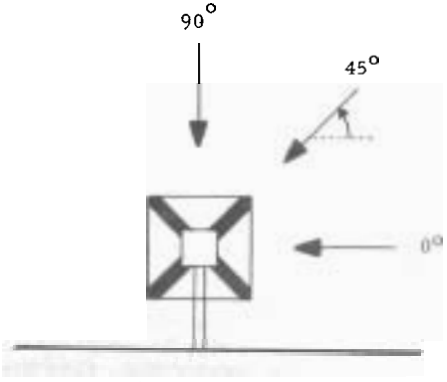
Any DX'er who has used a MW loop antenna is familiar with the horizontal pickup pattern: as the antenna is rotated, signals show two peaks where the reception is strongest and two nulls where reception is weakest. **The peaks** occur when the plane of the loop is pointing at the signal; the nulls are broadside to the face of the loop.[1]

The exact specifics of the pattern for any particular loop and signal (that is, how much signal will be picked up, how deep the nulls are, etc.) depend upon quite a number of factors. Textbook descriptions of loop performance fail to describe accurately the behavior of real loops because of several crippling assumptions made in the derivation of their equations. **We have taken all of** these complications into account and have derived the basic loop antenna equations from first principles.[2] While the resulting equations are very complicated, they predict all aspects of loop behavior extremely well.

While the primary concern of the MW DX'er is usually the horizontal pickup pattern of a loop because he wishes effective nulling of unwanted stations and accurate direction-finding, it is sometimes important to know the vertical pickup pattern as well. **The pickup of a practical loop antenna depends very much upon the arrival angle of the signal above the horizon.** In actual practice the pickup of a loop is greatest for signals arriving at very low angles above the ground; thus loops are most sensitive for signals arriving right off the horizon at zero degrees. The pickup of the antenna will fall off smoothly and steadily as the angle of signal arrival is increased until the pickup falls to its minimum value for signals arriving from directly overhead (90° arrival angle).



The horizontal pickup pattern for a loop antenna describes what happens to the signal strength as the antenna is rotated. Signals are strongest when the plane of the loop points at the station; the null (or minimum pickup) occurs when the station is broadside to the plane of the loop.



The vertical pickup pattern of a loop describes how much signal is picked up for different signal arrival angles above the ground beneath the antenna. If the signal arrives parallel to the ground (the lowest possible skywave signal), the arrival angle is 0° and the loop exhibits maximum sensitivity. As skywaves arrive from higher and higher angles the pickup of the loop falls off steadily.

The vertical pickup pattern for a real loop antenna becomes important for several aspects of MW propagation research, particularly for the accurate prediction of signal diffraction over skyline blockages.[3] If the antenna is accurately pointed directly at a station, the variation in signal pickup for different arrival angles depends only upon the nature of the ground underneath the DX'er. The effect of real ground on loop performance is both important and complicated to explain. **Two independent quantities must be taken into account if the effect of the presence of ground is to be fully described.** One of these factors is the familiar ground conductivity - the factor which determines just how far a MW signal will carry by groundwave. **The second quantity is the dielectric constant** of the ground. While the latter quantity is not important for groundwave signal **propagation, it greatly influences the behavior of a near by loop antenna.** We have included a table from Terman[4] showing the expected variations in both of these factors for various types of receiving sites.

We are providing two graphs to show the effect of signal arrival angle on the pickup for a loop antenna - one assuming a very "poor" ground, and one for a very conductive ground. **Most DX'ers will have intermediate ground properties** and the pickup equations will yield curves somewhere between the two we have given. **The plots show the loss in pickup as the signal arrival angle is increased** compared with the pickup of the same antenna for a signal arriving at zero degrees (or groundwave). **If, for example, you live over very conductive** ground the pickup for a signal arriving at an angle of 30° above the horizon will be about 24 decibels weaker than it would be if the same signal arrived at 0°; this is about a 4 S-unit drop.[5] If you're over very rocky and nonconductive ground instead, the corresponding reduction in pickup would be only about 1-1/2 S-units. **Thus it pays to live over poor ground if you're interested in getting** the maximum pickup on a loop for signals coming in at relatively steep angles.

This significant dependence of vertical pickup on the local ground constants is just one of the many factors which must be taken into account when attempting to rationalize the differences in reception experienced at various sites.

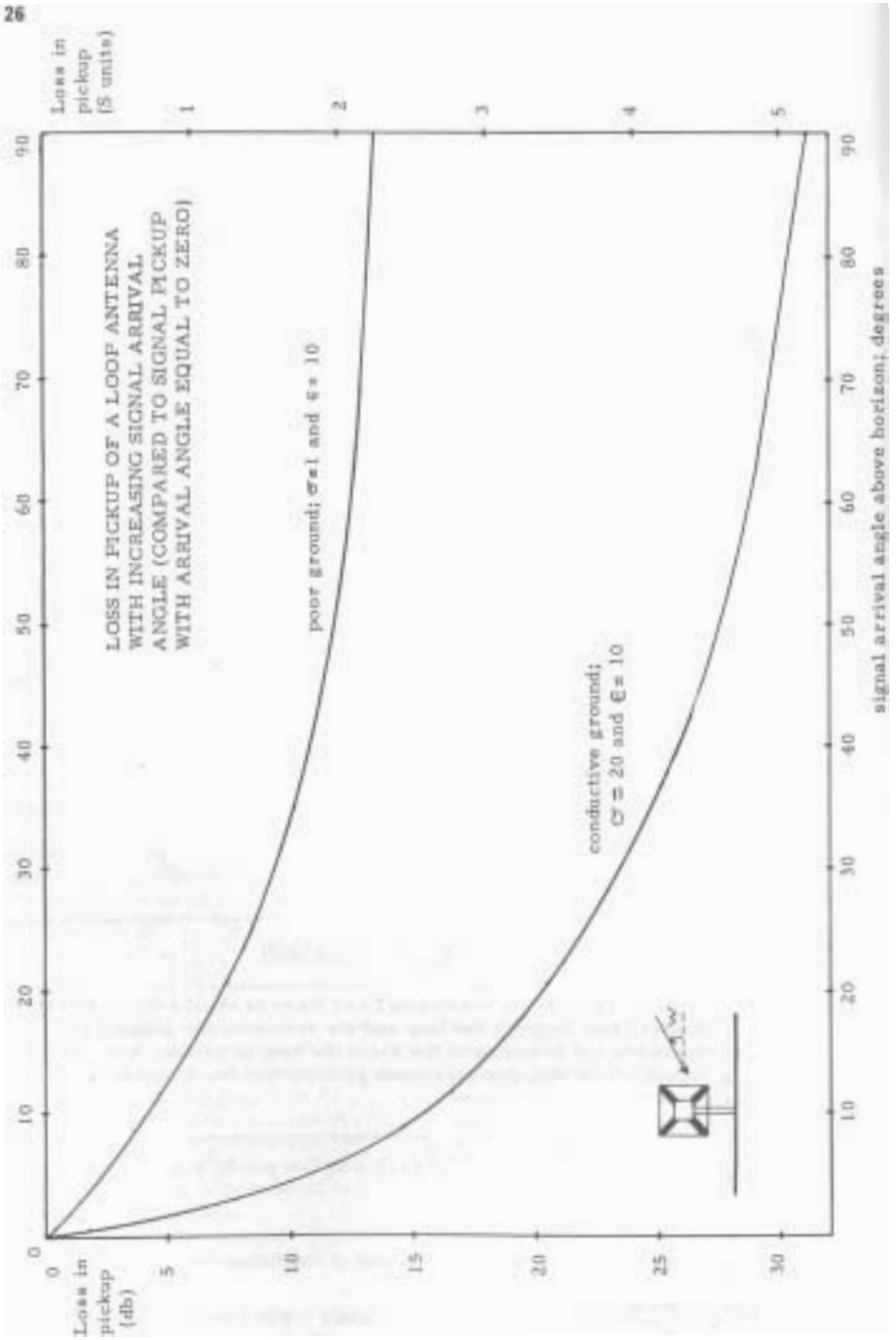
MATHEMATICAL JUSTIFICATION

If the loop antenna is properly constructed and there is absolutely no signal pickup on the feed line between the loop and the receiver, the general loop equation[2] reduces to the following in the event the loop is pointed directly at the incoming signal (which will give maximum pickup); that is, θ equals 0°.

$$\frac{\text{pickup for signal arriving at an angle W above horizon}}{\text{pickup for signal at } 0^\circ} = \sqrt{(0.5 - R_v \cos \mu - R_v^2)}$$

where R_v is the modulus and μ the argument of the following complex quantity:

$$\frac{\sin W - \sqrt{\epsilon' - \cos^2 W}}{\sin W + \sqrt{\epsilon' - \cos^2 W}} \qquad \text{and } \epsilon' = 6i\sigma \cdot 10^{12} + \epsilon$$



and W = signal arrival angle, above horizon
ϵ = dielectric constant of ground; air is unity
σ = ground conductivity (emu units)
λ = wavelength of signal in meters
i = square root of -1

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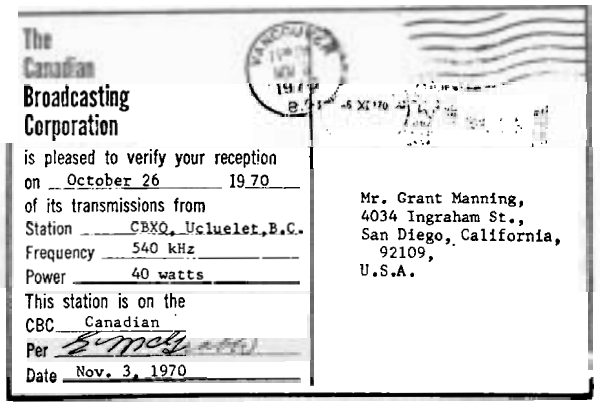
5. Assuming a receiver with 6 db per S-unit - the most common value.

TABLE 1.—SOME TYPICAL GROUND CONSTANTS*

Type of terrain	Dielectric constant ϵ	Conductivity, emu σ
Fresh water	80	1×10^{-3}
Sea water, minimum attenuation	81	6.64×10^{-3}
Pastoral, low hills, rich soil, typical of Dallas, Tex., Lincoln, Neb., areas	20	3×10^{-13}
Pastoral, low hills, rich soil, typical of Ohio and Illinois	14	10^{-13}
Flat country, marshy, densely wooded, typical of Louisiana near Mississippi River	12	7.5×10^{-14}
Pastoral, medium hills and forestation, typical of Maryland, Pennsylvania, New York, exclusive of mountainous territory and seacoasts	12	6×10^{-13}
Pastoral, medium hills and forestation, heavy clay soil, typical of central Virginia	13	4×10^{-14}
Rocky soil, steep hills, typical of New England	14	2×10^{-14}
Sandy, dry, flat, typical of coastal country	10	2×10^{-14}
City, industrial areas, average attenuation	5	10^{-14}
City, industrial areas, maximum attenuation	3	10^{-14}

* From Standards of Good Engineering Practice Concerning Standard Broadcast Stations, *Federal Register*, p. 2862, July 8, 1939.



DOMESTIC DX DIGEST

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Greetings. All of a sudden nobody's DXed SSS this time, hi. Oh, well, onward anyhow.

changes

+	620	WHJB-PA	Delete CP for 5000 watts day power. Will remain 1000 watts. I believe we'd even run that this was on.....
+		KGW -OR	CP is on
+	690	CB..-ON	Ear Falls, 40 U1 // CBW in EE
+	960	WELI-CT	SCH: 24 hrs, SP MM 0000-0530 (MC, TRS, PT, RjE)(WB)
+	1100	WWWE-OH	SCH: SP MM -0430 now (WB)
+	1240	KPRB-OR	ANT: U1 (may be run already)
+	1270	WEIC-IL	SCH: delete AN. (Sid Steele, Charleston, IL)
+		KWRL-NV	ex-KBUB
+	1340	KENT-AZ	Letter returned marked "Out of Business" by P.O., so..... (PKH)
+		KHLB-TX	ANT: U (again, maybe run b4)
+	1450	CHEF-PQ	CP for 10 kw days is on per annct. (Andy Rugg, Pointe Claire,
+		CHMO-ON	Moosonee is this freq. (per CFS questions list) P.Q.)
*	1470	KTRI-IA	Has regular Sat AM maint. pd 0100-0400 (PKH)
+	1490	KOJO-WY	SCH: 0730-0200; AN Sat, Sun AMs (Pete Skinner, Laramie, WY)
*	1580	WSUF-NY	Currently running 250 watts until repairs to tower are completed (MC)

f/c's

JANUARY: 3rd MM: KWLA-1530, KUDI-1450, KVOP-1400; 3rd TH: WHII-1570, WJOE-1080.

FEBRUARY: 1st MM: KDXU-1450, KNOX-1310; 1st TU: WIOS-1480, KVOL-1330; 1st WM: WGRA-790; 1st TH: WONS-1410, KTCB-1470; 1st SU: KCII-1380, KJLT-970, WDAN-1490; 1st SA: WGRY-1590, WMOV-1360, WDDY-1420; 2nd MM: WCAZ-990, WORV-1580, WLSV-790; 2nd TH: WPCF-1430, WIDG-940; 2nd FM: WHBG-1360, WWBZ-1360, WSLT-1520, WBLO-1470; MM wk w/ 15th: WNYR-680; 3rd FM: WWDR-1080, WSKE-1050, WVOS-1240, WFOY-1240. 2nd TU: WHLN-1410, WKDO-1360.(2nd TU=JAN...)

daytime

860	unID	East Indian chanting w/WAYE nulled 1/28 1400-1430, faded up only twice in ½ hr pd. CJBC & WAMO also noted o/u it. Any ideas?? I know WTEL has foreign lang. pgms., but doubt this. Also loop bearing tends to rule this out. (ML) ** Held over from last week due to space problems. My guess is WTEL. Your loop bearing would seem irrelevant since you were governed in your bearing by nulling WAYE. Even if not, WAYE's strength would skew the bearing considerably -RjE

sunset & evening

1060	WNOE-LA	In o/KYW to power cut; noted strong ard 1830 2/9, fairly regular on SSS of late. (MC)
1090	KAAY-AR	Noted u/WBAL w/rr 2/9 1830-1845 when disappeared due to patt. chg. (MC)
1180	WLBS-IL	W/WHAM w/ s/off 1729 2/5 - in for abt 25 mins b4 this w/spots and several IDs (JMP) ** Nice catch ! -RjE
1260	KWYR-SD	Nx, wx 1900 2/5 (RNA)
	KSNO-CO	Wx 1940, s/off 1945 2/5 (RNA)
1270	KSCB-KS	Hrd w/ MOR 1953, Ai nx 2000 2/5 (RNA)
1280	WGSO-LA	NBC nx 2000, rr 2005+ (RNA)
1370	WJWS-VA	Vy gd w/ s/off no SSB 1744 2/7. (JMP)
	WHEE-VA	S/off 1759 2/7 after wx for "The Piedmont Districts of N.C. & VA. " (JMP)
1520	KOMA-OK	U/ and briefly o/WKBW w/rr & ID jingle 2/8 1900-10 (MC)
1570	WHEL-IN	Hrd on tape replay w/ vy wk s/off 1813 2/9 w/ SSB (RjE)
	WPTW-OH	Hrd on tape replay w/ s/off u/WHEL SSB 1814 2/9 (RjE)
1580	WRDI-NJ	Hrd o/u WCRV w/MoR and many local mentions w/ WSUF on lower power (see "changes" sect. -RjE) usually from 1430 on (MC)
	WCRV-NJ	Hrd o/uWRDI afternoons 1430+ w/rr w/WSUF on lower pwr. (MC)
1600	WHBT-TN	Tentatively the one w/ s/off ment. 5kw to return to air @ 0715 LT. Hrd 1815 2/8 (JMP) ** If so, a good catch -RjE

MORE R/C STUFF. CHANGES PER LETTERS VIA PKH:

1st MM: KENT-1340. Delete check. See remarks in "changes" section
1st SA: KTRI-1470. Delete check. Check is now 3rd FM, 0605-20.
2nd MM: KIKS-1310. Delete check. Check is now 1st TH, 0115-30. Sometimes runs 2nd TH.

midnight to sunrise

	600	KOGO-CA	Hrd w/rr 0353, then nx, sx, wx 0400 1/22 (RNA) (RjE)
	680	WRKO-MA	Hrd w/ ET-TT o/u CFTR,XELG,KNBR 0220 t/in-0255 s/off 2/12
	690	unID	Hrd w/ varying TTs o/u Cuban 0303 t/in-0330 t/out 2/12. Loop bearing west to west-southwest. (RjE)
	710	CJRN-ON	Atop WOR 2/12 0225-0240, not noted the three MMs WOR was off tho" (DS)
			Hrd MM 1/22 ard 0200 thru WOR OC/TT, first time here (MC)
	740	WKIS-FL	In/out of SS garble w/ID 0155 1/29 (dm)
		KSSS-CO	Hrd w/ KRMG off w/ MoR 0148 1/29 (RNA) RjE
		WBAM-AL	Hrd w/ MoR o/KRMG 0112 1/31. Testing?? (RNA)*Quite probably-
*	780	WBBM-IL	Noted off MM 2/5 0210 (DS)
	790	WEAN-RI	W/ID, TC, SID 2330 alone after nulling WAEB. Good level, a surprise after all these years of trying 2/6. (TRS)
	860	WAMO-PA	DX TEST noted early 0223 2/12, fair sig, (DS)
			Hrd 2/12 0200 s/on for TEST, mostly big band mx. (TRS) RjE
*	880	WCBS-NY	Noted off MM 2/5 0229 (DS) ** For quarterly tower inspection-
	900	WFIA-KY	S/on SSB 0559, into "Morning Melodies" w/gospel mx 0601 2/4
	920	WPTX-MD	ET w/instr mx & IDs 2/12 0145-49 killing channel(WB) (RNA)
			W/ ET-TT-mx w/ instr jazz w/ ID 0103 2/5 atop channel (RjE)
		CKCY-ON	Hrd o/KELP & WOKY w/rr 0440, nx, sx 0502 2/5 (RNA)
	930	KHJ -CA	Hrd u/WKY OC/TT w/ rr 0545 2/4 (RNA) (JMP)
		WSOC-NC	Vy gd o/WPAT-WBEN w/ MoR, SIDs 0305 2/10. Wierd cx this day
		WGNT-WV	Hrd 1/29 MM w/ rr, ID 0213 (dm)
	940	WIDG-MI	Vy strong 2/4 0630 s/on w/ CBM off. WINE s/on 0645 killed it then. (DS)
	960	WERC-AL	DX TEST 2/5 L&C 0308-38. (DS)
			Hrd vy strong & steady 0300 2/5. Frequent IDs & phone # given. Rec'd many calls from NRCers. (WTL)
***		WELI-CT	W/ f/c new time due to sked change(noted chgs. sect. -RjE) annct. 0012:30 2/12, lost to ZFB by 0015. Not hrd 0105 during listed time. (TRS)
	970	WAVE-KY	O/WWSW-WWDJ for a change 2/7 0205-10+ (WB)
	980	CHEX-ON	Ending nx & wx 2/11 0503-06 (WB)
	1000	KTOK-OK	Alone as usual but quite strong 0304 2/12. (JMP) ** No LA hets ??? -RjE
*/	1060	KYW -PA	Noted on AN MM 2/12 for POW releases (DS)
	1070	WINA-VA	Hrd w/ nx, Prudential wx, promo ID 0124-28 u/KNX 2/12.(RjE)
		unID	ET-TT-OC o/KNX,WINA 2/12 0108 t/in-0126 t/out. Strength & bearing suggest WKOK. (RjE)

	1090	KTGO-ND	Not so good on TEST, march mx better than TT. One voice ID taped but vy wk (dm) ** WHEN?? -RjE
	1130	WEEO-PA	Good here on TEST 2/12 (WB)
			Very rough here on TEST, copied 0051-0105 2/12. Nulls this way anyhow. WNEW,WCAR in there too. (DS)
			TEST not hrd here w/ strong WNEW 0315 check-in 2/12. Last one made it w/ TT only... (RjE)
	1140	KSOO-SD	Whilest looking for KGEM found this w/ s/off 0159 1/29 (dm)
		KGEM-ID	State # 49, hallelujah!! w/ s/off 0159 2/5 (dm)
			Hrd o/WRVA w/ "Night Line" phone-talk 0450 1/21 (RNA)
*	1170	WWVA-WV	Noted off 2/4 0517. This must be that 1st SM SP they once spoke of, hi (DS)
	1190	KLIF-TX	Believe was off all MM 2/12 (WB)
		KRDS-AZ	Dominated freq. all AM 2/12 w/ KLIF off (WB)
		KEX -OR	Finally !! State #48 betw. 0220-0335+ in KRDS fades. Had "Hr of Decision" to 0230, then more relog. to0300, then MoR. 25 sec. jingle ID 0227 2/12. Great tape. (WB)
		KAYQ-MO	Strangely in well u/KRDS-KEX all AM 2/12 (WB)
		unID	0230 wx 2/12 w/ fcst of 6-8 ins. snow in places o/6000 ft., locally 2-3 ins. Temps nr Zero, then MoR. CFSL??(WB) ** Quite probably -RjE
**	1230	WJBC-IL	Noted AN 2/5 w/ID 0257, new sked ?? (dm)
+	1240	CFLS-PQ	Tape replay of prev. unID yielded this w/ s/off in entirety follo femme vocal, then FF O'Canada by male vocal group 2/5 0102-05 (RjE) (RNA)
	1260	WTJH-GA	Hrd o/CFRN & KYA testing w/ gospel mx 0400, s/off 0415 1/21.
*		WFBM-IN	Now mostly oldies format, still AN-6 (WB)
		WWOK-FL	Fair reception 2/4 2320 w/rr (WTL)
	1270	WUOK-MD	Hrd s/off 2/6 0109 w/SSB o/WXYZ. New , fair sigs. (TRS)
	1280	WKST-PA	Noted AN 1/29 w/rr; ID 0247 w/jingle (dm) (TRS)
	1290	WFIG-SC	Hrd w/ ID, TC 2/9, PSAs 2355 above din on freq. w/WHIO nulled
**		KCUB-AZ	Copied AN 2/5 strong at times. Must be NSP now. Looking for KOWB's IRCA TEST, but no go. (PKH)
	1300	KWCK-AR	Testing again 2/5 0145-0215 (PKH)
		WFBR-MD	Pest noted on OC SM 2/11 0548. Was also cuing tapes right on air at time. (DS)
***	1320	CHQM-BC	Just atop w/ quick ID 0358 2/5. WILS QRM. Province # 9 (JMP) *** Excellent catch, Jim! -RjE
		WGMA-FL	Briefly atop channel w/ nx, ID 0104, more nx 2/17 (RjE)
	1340	WWPA-PA	On ET w/ rr 2/9 0123-36 (WB)
**	1350	KDIO-MN	W/1kHz TT w/ short breaks every 10 sec. One ID audible thru mess on freq., annc'ed f/c . Hrd 0144-56 2/13, then lost (WB)
		unID	Noted AN 2/5. ID 0300 covered by WSLR. Wx rpt. mentioned "interior regions", and "along the coast" 0307. (DS) ** WCVU ??? -RjE
		WGSW-SC	S/on noted 2/4 0631 right after WNLK. Signal faded up during SSB, held on during s/on anncts, then f/out. (DS) *** Dave, please include states in your listings so I don't have to go reaching for the log every five minutes... -RjE
		WEZY-FL	Musta been my last week's unID. Caught a "WEEZY RADIO" ID 0111 2/12 abt = WSLR. New here this season. (DS) ** Haven't hrd that in o/8 yrs here in NJ -RjE
	1360	WKAT-FL	Noted 1st time in several yrs o/.u WDRC 0043-0100 2/12. (RjE)
		unID	PoP-type test u/WDRC-WKAT w/ possible ID at break 0043 2/12.
	1370	WDEA-ME	Hrd w/mx, s/off u/WFEA OC 0055-0102 2/12, new (RjE) (RjE)
+		WCOA-FL	Hrd w/ID for WCOA AM & FM Stereo 0104 2/12 u/WSPD w/ s/off. Change log. (RjE)
+			S/off still 0108 w/SSB, but really killing WSPD-WFEA 2/9 (WB)

	1380	WSYB-VT	W/ET 2/10 w/TT. IDs 0016, 0018. S/off 0018. W /exc. sig (TRS)
+	1400	WFPA-AL	Hrd atop w/ ID, SID, rr 0111 2/12, so runs later than listed s.off, especially MMs, hi. (RjE)
		CKFL-PQ	Atop w/ FF // 1380, etc/ 0111+ 2/12, but no ID (RjE)
	1410	WING-OH	Hrd w/ MoR 0525 1/29 (RNA)
***	1420	WDDY-VA	New time, day for r/c per call to stn. is 1st SA 0530-40w/ 1kHz TT, IDs every 2 mins. (dm)
***		WKCW-VA	Hrd w/ ID in annc'd f/c 0204 2/12. Unlisted. (RjE)
			Hrd in ET w/ c&w again 0050-0105+ 2/7 (WB)
		WTCR-KY	ET w/ mucho TTs 0021-0100+ 2/13 (WB)
	1430	WPCF-FL	2/8 vy poor w/only 1 ID readable in midst of DT 0210 w/ severe QRM de WNJR,CKFH. A far cry from the good sigs. from this one w/ one of the first tests I ever hrd in '58. (TRS)
			Hrd weak DT u/ unbearable CKFH-WNJR mess on replay of remote tape from DX TEST. No ID hrd 0210, rate. (RjE)
***	1450	KVSL-AZ	W/ f/c 0230-45 2/5. Hrd same pd. 1st MMs 8/71, 1/72,2/72 also. All w/ 1kHz TT (PKH)
	1460	unID	Again! W/ wk TT u/WCMB/WOKO/WBNS mess, looping abt NW 0031 t/in. Break 0033, poss. ID, then off 0037 w/ another poss. ID. Too far down to be readable. I highly doubt WAXC, but maybe WPVL testing new nite rig. This 2/16. (RjE)
	1490	WHSL-NC	W/nx, spot, wx, jx, mx 0118 - 21 2/13 (WB)
	1500	WKER-NJ	Hrd o/WDEE 2/3 0430-45 w/EB for floods. MoR mx. (MC)
	1530	KFBK-CA	2/12, much better than usual sig. w/WCKY off 0143+ w/ ad for a local restaurant. (TRS) ** Here too -RjE
	1540	KPOL-CA	ET w/ MoR 0320. s/off 0330 1/22 (RNA)
	1550	WBVM-NY	Noted w/another ET w/mx, IDs 0203-15+ 2/5 (DS)
	1560	WKOG-GA	AN 2/10 for local snow emerg. (WB)
	1570	WGHC-GA	S/on in mess 0559 1/29 (dm)
	1580	WLIJ-TN	ET 2/9 0108-0120+ (WB)
		WORV-MS	0255 w/ ID that clobbered KLOU, which was having trouble staying o/KDAY. (TRS) 2/12.
		KLOU-LA	Testing after 0302 RS s/off. ID hrd 0330:30 2/12 (TRS) (RjE)
		unIDs	Guess that clears up who the other two IDs I had here were,hi
**		WCLS-GA	Hrd w/ ET-TT-OC 0330-0400 when RS s/on (1 hr earlier than last week) so guess MM s/on kinda irreg. (RjE)
		KLOU-LA	Hrd w/ nx, rr 0200-10 2/5 atop channel, first time hrd (MC)
		WJVA-IN	W/ another ET concluding 0337 2/5 (DS)
	1590	WNOS-NC	Hrd s/ rather long s/on 0600 1/29 (dm)
	1600	WRBN-GA	Jingle hrd above rumble but naught else 0605 1/29 (dm)
		WLNG-NY	S/on 0600 2/4 noted signal well atop all. WNEU s/on 0601 killed it.(DS)

NOTES TO LIVE BY DEP'T: Music (sic) has reached a new low in variety, creativity in lyric, etc. w/ Loudon Wainwright II 's latest "song" entitled "Dead Skunk in the Middle of the Road"..... Now that's profound.....

73's de RjE

REPORTERS THIS ISSUE:

Richard Noel Allen (RNA) - Billings, OK - Pioneer SX-300T w/ SM-2
Wes Boyd (WB) - Youngstown, OH - HQ-180A w/ 4' altaz loop
Mike Collins (MC) - Stratford, CT - Grundig 3001 w/ 150' LW w/SM-1.
Paul K. Hart (PKH) - Ft. Worth, TX - Modified SX-28A w/ 4' altaz loop; Fisher 90T
William T. Lount (WTL) - Patchogue, N.Y. - Collins R-388 w/ SM-1 (Welcome-RjE)
Dan Myers (dm) - Toledo, OH - HQ-180A w/ 3' box loop
Jim Poterba (JMP) - Yardley, Pa. - HQ-200 w/ SM-1
Dave Schmidt (DS) - Wilmington, DE - HQ-180A, 3½' spiral loop
Tom Sundstrom (TRS) - Willingboro, N.J. - HQ-150 w/ SM-2 & DX-150A w/ LW
Russ Edmunds (RjE) - Wayne, N.J. - HQ-150 w/ 4' altaz loop & Fisher 100T w/ SM-1.

SUPREMACY RATINGS ***

Norm Maguire
2877 Kalakaua Ave.
Honolulu, HI 96815

##	DXer	Location	T.V.	CTYS	For.	Europe	Best
41	*L. Kruse	Iowa	4080	15	77	—	
34	W. Stone	Ontario	2910	32	2497	—	
36	N. Maguire	Hawaii	2843	54	2819	17	Nantes 1366 10kw
40	G. Allen	California	2777	57	503	3	AFN Normandy 1204 1kw
59**	S. Drake	Pennsylvania	2415	56	315	31	Tallinin II 1214
46	H. Holbrook	Maryland	2319	100	701	46	AFN W.Germany 1223 1kw
31	F. Wheeler	Pennsylvania	1644	23	184	—	
33	R. Sperry	Connecticut	1632	41	239	14	R. Tirana, Albania 1394
?	*R. Anderson	Virginia	1440	101	425	128	Kalundborg II, Denmark
60	A. Rugg	Quebec	1406	58	1215	50	Sofia 827
39	*C. Freeman	California	1381	61	342	15	Linz II 1025
33	D. Reynolds	California	1348	75	468	30	BBC 1214 60kw
58	A. Merriman	Virginia	1315	85	287	75	R. 1270 1215 10kw
54	*J. Starr	Ohio	1119	50	190	19	R. Veronica 1562
58	*E. Wesolowski	Nebraska	1081	20	110	—	
47**	R. Luton	North Carolina	1044	23	142	3	Hilversum 746
?	W. Willis	California	925	55	129	17	Athlone 566
64	*D. Whatmough	Ontario	865	11	?	2	?
34	H. Gustafson	Illinois	837	98	291	106	Fredekikstad 1578 10kw
64	B. Reynolds	Missouri	800	24	100	—	
67	R. Eddie	Missouri	609	12	36	—	
62	*C. Mohr	New York	565	22	103	5	R. Caroline 1520
58	*D. Phillips	Kentucky	562	26	40	5	Wales 861
63**	G. Scrimgeour	Ontario	526	47	440	18	Tallinin 1034
64	B. Porter	Washington	460	22	52	1	BBC 647
65**	R. Richman	New York	412	10	60	—	
58	B. Dangerfield	Pennsylvania	412	111	336	147	HV-2 Vatican 782 2kw
64	*M. Sorensen	Ontario	402	8	299	—	
67	*J. Renfrew	Maryland	366	16	52	—	
66	J. Burger	Holland	341	82	339	167	UKE Sender 1313 300w
?	H. Wilkinson	California	332	62	319	14	RTF Bordeaux 1205
58	*R. Leamy	Ohio	305	44	110	20	R. Veronica 1562
?**	J. Neff	New York	302	29	87	10	RNE, Spain 773
39	H. Robie	Massachusetts	261	88	146	56	CSB-81 Azores
62	T. Kerfoot	Ontario	251	6	192	?	
68	J. Pejza	California	223	22	45	1	BBC 1214
69	B. Karchevski	California	204	8	29	—	
?**	J. Shannon	Pennsylvania	187	9	8	—	

My sincere apologies for such a long absence. Between getting married, moved, getting settled and a further move coming up, I just did not get this column out. My temporary address is: 211-4 Kawaihae Street, Honolulu, Hawaii 96825. Mail to the old address in the Bulletin will reach me OK.

Congratulations to Hank Holbrook for attaining that almost impossible goal of 100 countries. Well done, Hank. He becomes the third NRC member in the Supremacy Ratings to reach that goal that are currently active. Hilding Gustafson is nearing that elusive mark and I sure hope he may reach it this season. Good DXing to all. Please get your listings up to date. Hope to be on a more regular schedule from now on. 73 and Aloha, Norm

Corrections to NRC Night Pattern Book (Not in DX News v40 #11)

560	#10	is Beckley (ref: NRC Log, Exxon roadmap Del.Md.Va.W.Va. pub. 8/72)
620	# 7	is Beckley (ref: as above)
670/		
680	#14	is Escanaba (ref: ENCO roadmap 12/71)
770	# 6	is Albuquerque
960	#10	is WERC (ref: page 1, DX News 40/11)
910	#34	is KJJJ
1100	# 1	is WWWE
1250	#19	is CKOM (CFOM is po:1340)
1260	# 5	is Charlottesville (ref: as 560 #10)
1270	#17	is Bismarck-Mandan (ref: EXXON roadmap 10/72; correct both names)
1270	#18	is GILLETTE (ref: ENCO 4/72)
1280	# 3	is Gardiner (ref: EXXON 7/72, NRC Log)
1280	#22	is Moorhead (ref: EXXON ND-SD_Neb. 10/72, NRC Log)
1310	# 9	is Asheville (ref: Esso 5/72)
1310	#29	Location of WJLK grossly inaccurate, move dot SE on shoreline)
1320	#14	is Kitchener
1330	#23	is KPOJ (ref. NRC Log)
1350	# 4	is Pembroke (ref: NRC Log)
1360	# 9	is Cincinnati (ref: Humble roadmap 12/71)
1360	#18	is KEYZ
1430	# 7	is Morganton. (do not confuse with spelling of WAJR-1440 which IS shown correctly.)
1440/ 1450		1450 listings (1,2) shown ahead of 1440 listings; not in accordance with format for other multiple listing pages.
1440	#27	Sec. location spelling is Comax (although not shown in NRC Log).
1470	# 2	is Lewiston (ref; As 1280 #3)
1480/ 1490		Same remarks as 1440/1450 in re item (1).
1480	#13	Same as 1360 #9.
1500	# 9	is KROQ.
1530	# 2	Same as 1360 #9.
1530	# 4	Delete 1590 reference; po here.
1590	# 2	is WQQW.
1590	#21	is KUUU.
1590	#24	is KBBQ.
1600	#12	is WCWC.

Corrections to NRC Night pattern book correction list in DXN 40/11

1460	#12	is not San Sabastian, as indicated. Sp is: San Sebastian. (ref: Nat'l Geo. Soc map "West Indies", Jan. 1970)
1600	# 7	City is not "Riviera". It is "Riviera Beach" (ref: Exxon 9/72 Fla.)

Completeness is not intended or implied in or by this list. Further changes and/or corrections should be sent to NRC HQ, Box 99, Cambridge, MA 02138 - B.Foxworth

IDXD INTERNATIONAL DX DIGEST
PROPAGATION & FEATURES
GORDON NELSON 48 HARDY AV. WATERTOWN, MA 02172

REPORTEDLY IN OPERATION...

ST. LUCIA. A new commercial station came on December 15th, 1972 on 660 kHz. It is primarily programmed in French and the slogan is Radio Soleil; sked is 0530-093o local time. (Chenal, via SCDX) The mystery English speaker noted by several of our members recently? (Ed)

JAPAN. JO8AO on 530 kHz is now off the air; JOQG, formerly on 970, Morioka is now on 530. (SCDX)

BOTSWANA. Radio Botswana is testing a new 50 kw transmitter on 971 kHz during local daylight hours preparatory to initiating regular service. (SDXC)

PHILIPPINES. DYLA, nominally on 1550, is actually being heard on about 1555, easily separable from AFNT on 1550. (Ryden, Japan)

JAPAN. The power increase of NHK2 Kumamoto (on Kyushu) JOGB from 10 to 150 kw was completed in early December and on December 13th JOGB moved from 1590 to 870 kHz. Consequences: Fukuoka 1 (JOLB) moved from 870 to 980 and decreased power from 100 to 50 kw. Furthermore, JOIQ Wakkani, JOFG Fukui and JOKG Kofu moved from 980 to 930. Kumamoto 1 (JOGK) moved from 930 to 640. And finally Kukuoka 2 moved from 1480 to 1600. All of these changes were anticipaded and included in the 1972 WRTVH; however, since they did not materialize until early 1973, they were taken out in the 1973 Edition. So the 1972 Edition is correct! (Lars Ryden, Japan)

KAZAKH SSR. The programs of Radio Alma Ata are heard with very powerful signals on 1493 kHz; my guess is that this is a relay from an East Siberian station. (Ryden, Japan)

USSR. 1475 is still active (since November) with foreign service Radio Moscow in Chinese at 1500 GMT (Ex - 1528??). Not as strong as some years ago, so probably they have rebuilt antennas for beaming to China instead of Japan.

GIBRALTAR. Wellington Front on 1484 is now 2 kw and was recently hrd by a visiting ARC member. Still unheard in North America. (Editor)

FRANCE. Radio Campus, the low-powered station operated by students at Lille University, is now operating on 759 kHz and 255 kHz LW. (SCDX)

EGYPT. Cairo II, nominally on 710, noted on 712 kHz 1/28. (Ericson, Sweden)

GERMANY. Rolf Blodorn in Germany reports that AFN Frankfurt on 872 is unintentionally picking up Radio Luxembourg and rebroadcasting it weakly in the background of their regular programming.

SURINAM. SRS on 725 is now running only 25 kw. RADHIKA has moved from 642A up to 660 kHz. (MWN) Or is this the one being heard? (Editor)

HUNGARY. New station being heard in Sweden on 1016; no details. (Ericson)

CANARY ISLANDS. R. Clube Tenerife on 1412 kHz is now 10 kw. (EDXB)

LATEST EBU MONITORING DATA

(Updates all previous information here in IDXD)

610.8 Unid Iraqi station noted in Italy.
827 EAK35, Las Palmas, Canary Is. now here
908 Unid noted by Lisbon at night; Gambia?
953 New Spanish station here
962 New Russian here
1052 New Russian noted by Helsinki
1079 Casablanca A, Morocco, 1 kw now here
1448 New Yugoslav here
1612 Unid Russian noted here
1614.5 Unid Yugoslav
1625 Unid Yugoslav

DOMINICAN REPUBLIC. Member Victor Jaar supplies information on three Domican stations owned by his cousin. HICV, R. Barahona, "La favorita del Sur", operates with 1 kw on 1240 from Barahona. HIPK, R. Neyba, "ondas del Lago Enriquillo", operates on 1580 with 1 kw from Neyba; and HIPZ, R. Pedernales, "La Voz de la Frontera", operates with 1 kw from Pedernales. Reception reports for any of these stations to be sent directly to Victor's cousin: Sr. Rodolfo Z. Lama Jaar, Apartado 25, Barahona, Republica Dominicana.

MALTA. The BBC relay station is definitely off the air now for good; formerly on 1511 and 1546 with 10 kw; on the latter channel it was logged by quite a few NRC members in North America. (Editor)

PLANS, GOSSIP, AND RUMORS...

MASIRAH ISLAND. Following up the rumored frequency change proposal recently reported here in IDXD, Bengt Ericson called the BBC Schedule Engineer in London to get further details. He informed Bengt that he was unaware of any projected changes and that the present freqs will be valid at least until September. He did say however that they had been testing on 1412 kHz in an attempt to escape the het during the Mideast transmissions...

DENMARK. The state monopoly on broadcasting in this country will cease in the future; local noncommercial stations will be permitted. (ARC)

PIRATES, BOOTLEGS, AND CLANDESTINES...

N. KOREA? A new station is "Toug-il-e Hyongyongdang Mok Sori Bangsong" or "The Voice of the Revolutionary Part for Reunification" is being heard on 1135 kHz; location believed to be the North. (SCDX)

SCOTLAND? Radio Caroline Scotland, 150 watts, is on 0000-0115 and 1400-1800 on Sundays on 1358 kHz; this is a bootleg operation unrelated to the offshore pirate Radio Caroline. (SPEEDX)

RADIO CAROLINE. On December 28th the station had to cease operation as "something was going on" on deck, which later turned out to be a real fight caused by the fact that the crew hadn't been paid for 3 months. The ship, the "Mi Amigo" was towed to Ijmuiden port where it remained until Jan. 2 when the Irish owner, Ronan O'Rahilly, arrived and paid the wages. It returned to its offshore spot & is now NSP in Dutch and EE on 1187. (SCDX)

AUSTRALIA. From the Australian DX News: "1500a 2DR, Radio Resistance, Sydney (Clandestine). Scheduled 11/6 for 1st transmission... Newspaper reports 11/9 stated that they broadcast illegally one-hour programs 11/6-8... (The 'Daily Mirror' of 11/15 stated the frequency was 1530 kHz. I have 2 newspaper clippings about the station, which I may use later. At present I wish to give the station minimum publicity because of its use by Communist front organizations such as Black Power and Women's lib." (Suspect Angela Davis wouldn't be too popular down there, hi. Editor)

U.S.A. According to the latest SCDX sheet, an "E.H.I. Communications" in Appleton, Wisconsin began testing January 20th on a variety of SW freqs plus 1525 kHz. Few details were given and the whole operations sounded a bit odd so we contacted the "owner" for further details. Turns out to be a teen-aged bootleg operation, strictly unlicensed... We explained that 1525 was regularly monitored for auroral propagation research purposes and asked them to stay off the channel; they said they would. We also warned them of the usual fate of such operations... (Editor)

LAST MINUTE INFORMATION...

IRAN. A whole batch of new high powered Iranian stations began operating on January 26th; locations are Ahwaz, Qasr-e Shirin, Yazd and Ilam. The outlets at Ahwaz and Qasr-e Shirin are 400 kw and are beamed to the West. Other new MW stations at Hamadan, Khorramabad and Abadan came on the previous week. No frequencies known yet. (Editor)

SUDAN. A new station under construction at Sennar will run 1,200 kw on the MW band; there will also be relay stations at Port Sudan, Nyala, and Juba. (Editor)

BULGARIA. A new station at Shumen came on the air February 1st; frequency unknown; believed to be relatively powerful. (Editor)

The unshaded part of the map indicates the area in which satisfactory reception should be obtainable during hours of daylight. After dark, the coverage may be severely restricted because of interference from other transmitters.

BBC RADIO BRISTOL

Wavelength	194 metres
Frequency	1546 kHz
Power	2 kW
Transmitter site	BBC Clevedon
National Grid Reference	ST 400 697

(courtesy Bill Bailey)

@ 7pm. It timed to about 15 seconds! No SSB. Otherwise on a most discouraging night, on 1170 with usual dominant WWVA missing, KSTT Iowa at about 10:45 w/rr, ID, in pretty good alone. Sun. 2/4 @ SSS: KWKH-1130 La. in L&C w/"Golden Weekend 62" promo, and a nice Walter Brennan tune @ 6:15. KVOO-1170 ok L&C w/bank ad and c/w @ 6:23 w/local ads and a promo for c/w show in town. WCNE-980 O. w/a nice 50° & a Tammy Wynette song @ 6:27, WMIX-940 Ill. & WGRT-950 "Shinin' Black" s/off at 5:30, with 950 open afterwards. WCPC-940 Miss. in solid w/religion program @ 5:32. KRMG-740 ok, fading in/out @ 6:34 w/instrumentals, then total fade. KXOW-1420 Ark. dominated frequency @ 6:40 w/religious songs, then bank ad one minute later, followed by WX peomo from Little Rock. 1500, unID in weak w/c/w request program @ 6:53 probably KDFN. KOMA-1520 OK in o/KMPL @ 6:55 w/Coke ad, drag race progp WX, 61°. Finally KKJO-1550 Mo. @ 6:05 in well w/local announcer o/WOKJ, then another drag race ad. Well, I will close for now. I hope to make it to Big Ern by Thursday if all goes well. Just a throw-in, I haven't picked up ex-XELO-800 in a few years when they were in the Record Roost format. Anybody out there in the SW tune in? I once sent in for a "Cousin Billie Green Antenna Topper" and have an XELO verie in my collection. Number here is 312-388-2744 daily after 3:30, and all weekend. I always glad to exchange RX talk. C U soon. 73s.

DAN MYERS - 2650 104th Street - Toledo, Ohio - 43611 419-726-4348

Back again after missing a week. Bet you missed me, right ERC, hi? (I've been worrying all week, Dan, hi -ERC) I ended January w/169 new stations heard, & so far in February as of 2/11, 31 newies. CX have deteriorated mucho lately. They haven't gotten impossible though, because I did log state #49 last MM in KGEM-1140 s/off 1:59 2/5. Also I found out about a new r/c in case anyone is interested. WDDY-1420, first Sat., 5:30-5:40, 1000 cps TT, & IDs every two minutes. They were there last Sat. w/another unk TT (who went right into s/on @ 6am) u/WHK/KTOE. I got a couple of other mysteries, if anyone can help: MM 1/29, 5:59 s/on, what sounded exactly like WNRE on 1570 (except that WNRE-FM was just granted permission to build AM and has absolutely no equipment, per call to station; DJ didn't even know what frequency!). I have tape, & it's bothering the '----' out of me. Also on 740 same day, @ 3:04am, SS with what sounds like "Radio Latin" (accent on second syllable); did mention 740; many Colombians in that night, & this looped same direction, but no stretch of the imagination could get R. Eco from R. Latin. And further in the mystery department: 2/6 @ 6:39pm on 730, Garner Ted (on CHIR) gave us a break (about three seconds, hi) which was enough for someone to stick a WPA- in there. Only thing that fits would be WPAL in S.C. but they should long since be off. KTGO-1090 TEST came fair with thermarch mx being the loudest, and do have one voice ID on tape. WPCF-1430 on TEST covering frequency. I hope WEEO & WAMO show tomorrow. Owners of WEEO have just purchased local WTTO-1520. I don't expect any change, since both are Top 40 rr. CoF locally: WCWA-1230 AN-6, SP first MM 12-6am, & WSPD-1370, WOHO-1470 & WTTO-1520 all NSP. WSPD has MoR/chicken rr, WOHO talk AN except SM & MM when it's rr, & WTTO, rr. Out of things to say so 73s & best of DX.

WILLIAM M. BLAZEK - 2716 Bellbrook Street - Hillcrest Heights, Maryland - 20031

DX here for the past few months has been limited almost exclusively to SS & MM, so totals are climbing somewhat slowly. 12/30 brought a surprise in KMIS-1050 w/s/off & SSB @ 5:58pm, @ 6:15 came wanted WESY-1580 s/off. WCIA-1470 on 2/1 w/s/off @ weird time of 6:19pm. 2/3- WSWV-1570 r/c. 2/5- WKST-1280 @ 2:56-3:12am- for some reason I'd never heard this station before, though seemingly not a difficult catch. 2/5- WERC TEST heard 3:28-3:48am tune out w/local-like signal. This one was apparently heard by every DXer in the E, each of whom called in, hi. 2/9- WHEL-1570 w/s/off @ 6:15pm. Unfortunately, my tape recorder was in the hospital, so no report to this one - very frustrating. Verie total currently stands at 320, & so far this year, v/ls: WOPI, WMNA, WFHM, XEVIP, WEIC, WLOR, WCKB, WCIA, KMIS. v/qs- WFAA, WNOE, WBEN, WSUN, WFBC. v/fs- KATZ, KNOE, WCIN, WBIG. v/cs- WGET, WCFR, WHBQ, WSJC. v/r- WBSC. Before closing I think a compliment should go out to Jim Poterba for his very excellent support of both the NRC and the IRCA this past year. 73s.

EVER TRY FRIED BOSTON SCROD? COME TO THE N.R.C. CONVENTION AND HAVE A GO AT IT!

JAMES E. CRITCHETT - 1504 Glenwood Drive - San Diego, California - 92103

Southwest USA DXers are advised to listen on the second MMs of the month for other stations on frequencies covered the rest of the month by usually NSP stations. Feb. 12th, KIAC-570 was off, and WFAA Dallas was heard @ 6:47am beside KLUB, for the first time in years. KABC-790 was off, w/KULF Houston on top, KCBE Tucson IDing @ 4:05am and KJRB perhaps the third there. KDEO-910 was off, w/KJJJ Phoenix and KNEW Oakland IDing @ 4:42 & 4:45, respectively. XELO-800 was either off, or quite weak; CKLW Windsor was on top of an SS, possibly PJB, @ 4:34am. Others heard during silent periods of nearer stations were KCBC-1390 @ 3:08 ending NX on the hour and Des Moines WX. WKIS-740 was heard u/KCBS' OC and MCMC Texarkansa AN program; KRMG Tulsa said testing @ 3:35am. Reporting to KCMC. KLMS-1480 ended test @ 4:18; no KWIZ Santa Ana, and no KRED Eureka; possibly KLEO the other here. XEFA-950 the "Nueva Effay Ah" IDed @ 4:56 in Cnihuahua, w/KJR Seattle "Touching You" program @ 5, XEGM off. KBUY-1540 Fort Worth IDed @ 7:31 u/ KXEL, who came on @ 5:58. Reception reports have gone to KCUZ-1490 for 2/5 listed r/c; to KWXY-1340 Cathedral City for RS, heard 2:33-2:44am on 2/5. XELO-800 Ciudad Juarez 2/6 for Vitamin E and record offers, 6:29-6:47am; they're still using that call 2/7 @ 8:42am, no XEROK. KRKC-1490 King City, Cal. on @ 9:30; KOWL, Lake Tahoe Cal. 3:40 & @ 5 Fri. 1/26. (KRKC heard Tues. 1/23). KIQS-1560 Willows, Cal. @ 10:28am Thurs. 1/25 u/KPMC. VOA-1140 in Philippines ID @ 7am through KGEM. 1/29- WFBL-1390 ID @ 4:59 MM 2/5. KINO-1230 Winslow, Ariz. on @ 8am 2/8. Keep listening!

JIM REID Jr. - 4 Clancy Street - Swansea, Massachusetts - 02777

DX here in the late Autumn and early Winter has given me quite a bit of satisfaction. In mid-November, weak split on 1225 turned out to be R. Victoria-1225 in SS & EZ mx on 11/18 @ 12:30am. 12:42 saw HCVP2-675 fair-to-good, mention of Ecuador & slow SS ballads; TIOS-825 w/ID as R. Titania in the clear @ 1am; Nice-1554 weak w/mx & FF talk; 2:06, CMGB-1560 ID R. Reloj Nacional fair on top & mention of Cuba; 2:29m good signal from WCLS-1580 on top of frequency w/rr. 11/23- WOBR-1530 heard giving stiff competition to WCKY @ 4:43pm during CH, ID, & MoR w/ slow fades, in apparently on skywave; this station was believed to be heard around 1pm w/a very weak signal this same day w/loop to SW, but had rough time securing ID w/noise level. If so, this catch represents longest 250w groundwave & best coastal propagation to date, since his signals were very steady for a good while, as no other skywa e was heard @ 1pm. At 5:01pm, WKBA-1550 noted ID & religious mx & comment o/WRIZ/WNTN/WEXT/CBE/WVBA off or not noted. 5:18, WSRF-1580 ID, brief WX, ads for rr concert, all alone at this time. 11:22, TIGPH-1125 w/SS rr mx; WKBW -1520 w/tremendous daytime skywave signal noted here all day 11/25. 12/4, 10:55pm, CHOK-1070 in w/CBA w/many ERs & commercial for Sarnia. 12/6- 3:29pm, long-sought WPNO-1530 strongest o/bunch, good w/ID & rr. 3:53, WEEE??-1300 briefly strong w/ commercial for Schenectady, then into good mx format. (I question this one because first, I heard no ID while it was readable, and secondly, I heard recently WQBK-1300 for the first time at s/off which gave no location but only promo for WQBK-FM and they had about the same kind of mx format. Is WQBK ex-WEEE & if not, where is WQBK? (WQBK is indeed ex-WEEE -ERC) 3:59, WPNH-1300 weakly on top following commercial, ID, NX & big jumble. 4:06, WHAZ-1330, good but lotsa fade; the People's Station, NX/talk show. 4:30, WTBQ-1110 ID, then s/off & asking for program comments. 4:47, WTHM-1530, a surprise w/no WCKY, commercial, ID & NX. 5:08, CBD-1110 o/WBT w/CBC NX & comments; CBH-860 for first time this evening also.

STAN MORSS - Route 3 - Bradford, Massachusetts - 01830

2/5- Signal on 1562 didn't seem to be Veronica - no commercials - maybe Swiss, 1:10am. CKLM off & good old XERF in @ 1:30. KLOU--1580 RS 1:50. WTRX ET & KWWL s/off 1:59am on 1330. WBVM-1550 Utica ET 2:15. CJCH AN this MM. WRKO-680 now on to 3 or later MMs. CKLM back by 2:45. KKHI s/off 2:?? & uninterrupted mx & SS on afterward. WERC DX in fair with big QRM from CHNS & some from R. Sutatenza after 3:55 - tape & report sent & I called in @ 3:50. Dave said mine was first call from Mass. Where were you, Big George? Two FF carrying same speaker on 1140 & 1150 @ 4:0? - not another network, I hope? TT OC on 790 @ 4:23am but no ID here. 2/9- Arabic on 764 chanting @ 6pm - very wavey signal from very good to nothing and back. 2/12- WAMO-860 @ 2:17 with "weekly AXR test". CKAC-730 off @ 2:20. Two SS there. XEPRS-1090 loudest ever @ 3:20.

(Stan Morss) WBEN OC-TT-930 w/WPAT/CFBC QRM 3:40-4 & on. 1030 had a new SS AN w/ XEQR, many mentions of Colombia but no positive ID. CJBR-900 @ 4. P.O.W. Return Show on 1600 u/WWRL, too weak for ID. Veries, Triana-1457 & WGMF. Avoid tooth decay - drink Dr. Pepper. (What I drink'll make Bud wiser, Stan -ERC)

JIM POTERBA - 949 Queens Drive - Yardley, Pennsylvania - 19067

Greetings, all. The WERC-960 TEST on 2/5 was 30 o/S-9 here. I called Dave Gleason & it appears they were this way all over the EC (per talks w/ several DXers. Other DX of interest: 1/29 AM: CJRN-710 all AM w/WOR off; 2:20 WTTO w/WKBW-1520 off; 4:30 HIAM-660 s/on u/WNBC OC. 5pm, WEMS-1280 topping channel there. 1/30- Grenada-535 @ 9:50pm. 2/1 PM- 4:45 WHLD-1270; 5, WHEE-1370. 2/3- WBCM-1440 atop all AM. 2/4- WLKW-990 finally heard w/WIBG @ 6:58am s/on; WHKL -910 7:30am. PM: WDEL-1150 remarkably weak here, & logs on WBAG N.C., WDIX S.C., & WTYC S.C. between 4:59 & 5:50pm. Also WAPI-1070 atop, 5:59pm. 2/5- KGEM-1140 s/off 1:58am, HJJM-660 R. Uno 4:26am. PM: WLDS-1180 s/off 6:30pm. 2/7- WJWS-1370 s/off 5:44pm. 2/8- WHBT-1600 6:13 s/off. 2/10- WKOG-1560 on for Emergency Broadcast due to 12" of snow on the ground in Gordon, Ga. I called and talked to GM. It was snowing at the rate of 1' an hour. And he said they didn't have the apparatus, etc. to keep the roads clear, hence, the EB. They were all alone @ S-9. WSOC-930 3:05am, & XERA-690 3:29 w/PST TC. 2/12- Washout here, KTOK-1000 in all AM, along w/HJJX-650 Emisoras Monserrate, superpest, running rr; a format change on this one? I thought they were KORL for a while. Best catch of the week was on 2/5, when I managed to get an ID from VHQM-1320 Vancouver, for Province #9 here. Even some veries: KDDA WSUX WATR CKCY CJBK WNBP WJDX CBI CJGX WONE WAHM WAVA WARU CKCW WSSA WBIM WWSW WDKR WMWM WNBF CHAM KFDF. Dave Schmidt had dared me to verie SARM - all it took was one phone call to the station (and six reports, hi). That's about all I have to say this trip, so 73s till next time.

JEFF ROBERTS - 945 East Moore Street - Decatur, Illinois - 62521

I share the concern of several members over TTs that don't ID. I must have heard a dozen TTs on MM 2/12, but only two or three IDed. I guess if you want the station badly enough, you'll have to write them a letter and ask them to ID for you. DX: 2/6- WGOK-900 Ala. atop w/ID @ 6:30pm, KPAC-1250 Tex. very strong w/MoR @ 6 57pm, WDOD-1310 Tenn. w/c/w followed by an ID @ 7pm, KZAK-1330 Tex. in fair w/c/w @ 7:05pm. 2/8- WOSU-820 O. o/WAIT w/talk @ 5:41pm, WSLM-1220 Ind. in poorly w/rr @ 5:57pm. 2/11- KALO-1250 Ark. heard w/r/c @ 2 10-2:15am, w/ strong TTs and IDs noted. No school on 2/12 so I IDed AN. WEEO-1130 Pa. wiping out WNEW w/TT, ID & mx @ 1:55am. They said it was a PoP. No chance for the KOTA TEST because of WMEE & other pests. CJRS-1510 Que. w/mx & FF talk @ 2:30. KDON-1460 Cal. heard weakly under, or at times even w/WBNS from 2:50 to after 3. Who was the TTer on 1460 at about this time? HJCN-1100 "R. Reloj" Bogota in w/a nice ID @ 3:39am. HJJX-650 "Emisoras Monseerrate" Bogota, w/instrumental mx & an ID @ 3:58am. KRIG-1410 Tex. in u/WING w/MoR @ 4:45am. 73s.

RONALD F. SCHATZ - Box 2814 - AMF - Miami, Florida - 33159

Big news here is the latest breakthrough on getting something out of the Paraguayan on 645k, for two seasons our outstanding DX mystery. My taped ID, replayed to the bone, sounds like: "R. San Jose (enramos) en la 'O'. A burst of QRM prevented me from making out the word in parenthesis, which may or may not be a 1P-present verb form or the fourth word in the station name. The "O" is likely the local nickname for the location, Coronel Oviedo, There IS a "San Jose" on my map of Paraguay, coincidentally located some 30km. WSW of Cnel. Oviedo. Both places are in the "departamento" of Caaguazu. Tentative conclusion: "R. San Jose" is a name change from "R. Caaguazu" & they may have moved to San Jose, a "suburb" of Cnel. Oviedo, the major city served. Otherwise, I expect to be in Santo Domingo during the weekend of 2/23; y'all stand by for a possible DX TEST from there. Both tests from WERC-960 made it in fine for the first hour - until R. Sutatenza (HJHN) drowned it out. The regular AN DJ ran the show - Dave White, who, at first called us the "National Radio Club of America." 73 from the forgotten convention.