



DX NEWS

*the magazine of the
National Radio Club*

— SINCE 1933 —

VOLUME 44, NO. 18

7 MARCH 1977

If this issue reaches you a day or so late, it's because once again, we're short one column as we type this. This is getting to be a regular occurrence with either DXD or IDXD, but with a 48-pager this time, the hold-up may cause a delay. Our small issues usually can get done in time under these circumstances.

A couple of weeks ago, we noted a source for verie-protector pages, via Ted Langley. We neglected to note the make and model. They are VPD Sheet Protectors, Model M198.

Clarence Freeman noted that we goofed on the latest Apr graph, by omitting two days. That's what happens when you try to update four months at once. At any rate, we've corrected the graphs, and they'll re-appear as space permits.

ON THE INSIDE.....

- * Graveyard DX Achievements - Harry Hayes
- * Verie-Signers - Ernie Cooper
- * Clippings - Various
- * Further Receiver Hot-Rodding Hints - Chuck Hutton
- * Summary of Contents of DX NEWS Volume 43 - HQ
- * Domestic Log Updater, Vol. 6 # 3 - John Gallerman
- * A Frequency Counter for Receiver Tuning - Bob Foxworth
- * Tips for Taping DX and Keeping Same - RJE

NEW MEMBERS

- * David M. Williams, 305 Lindsley Dr., Apt. 4L, Morristown, NJ 07960
- * Ron Kiser, 1818 Mariposa Lane, Fullerton, CA 92633

RENEWALS

J. Conrad, R. Blodorn, C. Bailey, G. Hardison, P. Swearinger, J. Hopkins, P. Finkle,
J. Schmalzer, D. Fox, E. Paulsen.

FLASH TIPS & SUCHLIKE

KYMN-1080 TEST hrd by Dailey, Musco, Arruda, Hansch; not by PT. Good going on you New Englanders hearing KYMN w/WTIC on. WDUZ-1400 notes above. Also hrd by Dailey, and others. No word from anyone on the 2/28 tests from KAAA & CJQJ.

Richard Eckman writes to clarify a misinterpretation about my comments taken from his letter re Urumchi-1525. Two yrs ago, they said in response to a report that they "would not verify home service transmitters". Now, by providing a sked of prgms, and noting the use of Russian language, they are now tacitly admitting what we've known all along — that this IS a foreign service outlet. After all, how many Chinese peasants are fluent in Russian. The 208m. XR noted on the prgm sked. was dropped a few yrs. ago by WRTH, Richard says, and were supposedly 1-2 Megawatts in 1967 per an IDXD report then by Rolf Blodorn. No European receptions of that noted in the interim to our knowledge. However, the path to Europe isn't as favorable as to ECNA, by my reckoning, tho' if they can hear one, they should hear the other if it's on.

THE WORLD'S OLDEST AND LARGEST ALL MEDIUM-WAVE DX CLUB

C. P. C. TEST SCHEDULE

MONDAY	MAR. 07	- 0200-0300 * WQMI-1430 * Ottawa, IL	500 D GWIX
		- 0300-0330 * KYME- 740 * Boise, ID	500 D NRC
SUNDAY	13	- 0200-0400 * CJGX- 940 * Yorkton, SA	10000 U CJGX
MONDAY	14	- 0630-0655 * WOI - 640 * Ames, IA	5000 L INCA
MONDAY	21	- 0200-0300 * WIGH-1490 * Medford, WI	1000/250 U NNRC
		- 0100-0230 * WAKX-1500 * Valparaiso, IN	1000 D NNRC

(Please note that the NNRC-originated TESTS above may not appear. Most of the NNRC TESTS over the past few seasons did not)

DETAILS:

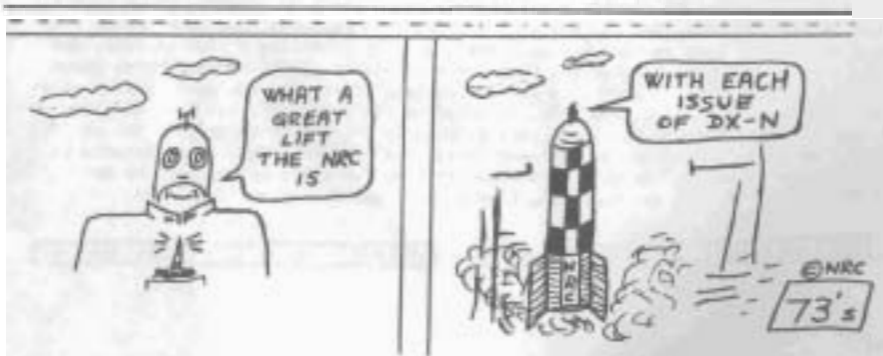
WQMI - TT & IDs. Prepaid calls at (815)-434-6050. V/s: Del Dayton, CE; Box 430, 61350. Arr: Geoff Parrish.

KYME - TT, soft rock, w/ high modulation. Voice & Code IDs. They are asking KCBS to stand by for the TEST. V/s: Tom Hotchkiss, GM & VP; Box 1619, 83701. Prepaid calls at (208)-376-0740. Arr: Kelly Andrews.

CJGX - Commemorating CJGX's 50th Anniversary. They've been known as a non-verifier, so this may be a good chance to get that verie, but for the TEST, not for old receptions. Will have much commentary on the station, its history & the Yorkton area. V/s: Harry Kerr, CE; Tower Bldg., 53N 102.

WOI - No. pgm. details. V/s: Keith K. Ketchum, Iowa State Univ., 50010. Arr: Mike Spurnum.

Several reporters noted WDUZ - 1400 on at the appointed hour for their TEST. What they hrd was apparently normal RS, per Ross Hansch, whose call to the station netted the info that, yes, Steve Konopka was the CE, but he had NEVER HEARD of NNRC, a TEST, or any George Davis III. Well, this is only the umpteenth time this has happened on an NNRC TEST, and we've received a few comments from members that we should do something about this situation, as it's giving the hobby a bad reputation. WE CANNOT do anything about it, because we cannot interfere in other clubs' affairs. Individual members who ARE NOT EDITORS OR OFFICERS of NRC may choose to write individual letters if they so desire to NNRC and to ANARC. Gene Vanderembse, who is also a member of NRC, was the NNRC CPC Chairman a few years back, but I don't know if he is now. We have said all we're going to officially about it.



Phone 703-354-2135 Before 2200 EDT *All Times Are GMT *Deadlines Are Friday*

Greetings. A completely nothing week here as far as DX goes - no listening to speak of except MM when one new domestic was heard - had to use the old HQ-129X and SM-2 so didn't have the best of equipment available. I have been checking in to the NRC Net on 75 meter SSB lately - I would like to see more NRC members who are hams in this. Mark Connelly, WA1ION joined us for the first time last Sunday evening. This Net could be very useful in passing along last minute info - for instance the people on the net got info on St. Vincent-705 about 10 days before any of the rest of you saw it in print. We are on 3895 khz, plus/minus 5 khz for QRM each Sunday evening at 2300 EST. If you are a ham, join us on the air and if not you're welcome to listen in for the latest in tips. If any of you can't make it Sunday evenings, Tom Sundstrom, WB2AYA and I have a sked on Sunday mornings at 0845 EST, also on 3895 khz. Check in there if you can't make the later one. Call here is K4GLU.

New stations, changes, skeds, etc.

ANDORRA R. Andorra on 701 khz is now sked in FF 0500-2000 and SS 2000-0000. (MWC)

JORDAN Noted on 912 khz (1200 kw) in // to 800, also tested by EBU on 593 khz (1500 kw?) and on 1493 khz. (MWC)

NEW ZEALAND The following short term licenses have been issued. All have a maximum power of 100 watts. 3XF, R. Ferrymead on 1030 khz in Christchurch; 1XB, 950 khz in Auckland; 1XC, Waikato University on 1450 khz; Radio U, 1230 khz, Christchurch; 2XA, R. Active, Wellington on 1260 khz. I see I left the dates of operation out, so here they are: 3XF, 3/12-13; 1XB, 2/21-3/12; 1XC, 2/28-3/13; Radio U 2/21-3/5; 2XA, 2/21-3/9.

Here is a list of frequencies for some of the New Zealand stns after the 1978 Freq Plan goes into effect: 576 2YA, ex570; 585 3YG, ex960; 792 2ZK, ex730; 810 4YA, ex 780; 819 1YZ, ex860; 864 4ZA, ex 820; 945 2ZG, ex 1060; 1035 2ZB, ex 980; 1044 4ZB ex 1040; 1116 2YX, ex 1150; 1314 2YW, ex 1180; 1323 3ZM, ex 1400; 1449 2YM, ex 1410; 1485 3ZO, ex 1550. (MERRILL)

Forgot to mention above, I got new WRTH last Tuesday from Gilfer. Doesn't seem to be much new in it, but I haven't really given it a close going over yet. I had hoped there would be some info on the new frequencies to go into effect next year, but there doesn't seem to be.

Now, whats been heard. If no credits, item is from Mark Connelly

- 529 -ALGERIA Ain Beida good w/slow AA vocal and guitar plucking //548, 2352 2/17.
- 548 -ALGERIA Oran "old reliable" here, loud //529, 2350, 2/17. Kint, (taking out domestics on 550), w/drum beating, flute and violins, 2317, 2/18.
- 558 -UNID Weak carrier here hetting 560 domestics on 2/21, 0740. Can't find anything listed for here. (Hayes)
- 566 -IRELAND Athlone, the suspected one here 0800 plus w/inst mx vy weak on 2/21. (Hayes) Correct location for this now is Tullamore. (ED)
- 575 -ALGERIA Bechar noted w/AA mx, audio garbled by WEEI slop, 2355, 2/17.
- 601 -CUBA (Tentative) per earlier reports, CMKV is allegedly the drifter raising havoc here w/potent sig; African-influenced Caribbean mx, then SS talk, 2356 on 2/17.
- 638 -SPAIN La Coruña to fair peaks w/man in SS surfacing o/slop and pronounced 1 Hz SAH, 2359, 2/17.
- 640 -CUBA CMQ Havana 2/14 1125 w/89 plus sig. Mx, m/ancr, full ID w/IS "R. Liberacion de Havana Cuba" at 1130. KFI off, of course! (Lobel)
- VENEZUELA Puerto la Cruz, YVQP loud during semi-auroral cx, clobbering the Cuban, no trace of CBN; Onda Portaña ID followed by fast LA dance mx, seemingly //YVLH-650, 0023, 2/20. (Lobel)
- 647 -USSR Vladivostok 2/14 1100-1114. Strong suspect in KK, a ancr. Perhaps nx.
- 650 -HAWAII KOKL Honolulu 2/14 1100 TC of 1:00 AM must have been this one. Hawaiian time at 1100 would check to 0100 HST. (Lobel)
- 663 -UNID weak carrier here at 0750 on 2/21, looping toward SA. RFS makes note of an unld here in Nov. IDXD, but on 663.5. This, however, was right on 663. (Hayes)

68) -SPAIN RNE in weak to fair w/ID 0230, 2/18. Seemed like nx pgm. (Hayes)
 705 -ST VINCENT Kingstown - per NRC DX Net (75 meter ham band) tip, this is now on. Carrier and talk by man (which sounded like BBC nx) noted briefly thru WOR/WKCO slop, 0003, 2/22.
 719 -PORTUGAL Norte poor in WGN slop w/PP talk, 0002, 2/18. Good w/pop mx, PP talk, 2318, 2/18.
 737 -SPAIN Barcelona in w/SS talk - good when CBL didn't modulate, fair during CBL talk, poor w/CBL mx, 0004, 2/18.
 746 -UPPER VOLTA Ouagadougou good, clear in long peaks w/drums and chants 2343-2358; man in FF, IS, s/off by f in FF 0000 2/19. In again same time 2/20 but thru heavy QRN. (DeLorenzo) * Fair w/talk in FF, 0005, 2/18. (Connelly) Thought this one s/off at 0000 nightly? (ED)
 755 -PORTUGAL Lisboa good w/cl violin mx, 0006, 2/18.
 764 -SENEGAL Dakar sometimes better than WABC; FF talk here at 2210, 2/16. Overpowering WABC/WJR w/AA talk, 2319, 2/18.
 773 -SPAIN Caceres/San Sebastian good w/SS pgm, jamming WABC, 2305, 2/17. Good, 2320, 2/18.
 782 -PORTUGAL Miramar CSB9 likely w/cl mx, talk o/fast SAH, 0009, 2/18. PP talk above low-pitched audible het, 2321, 2/18.
 810 -COLOMBIA HJCY Bogota, overpowering WGY at 0233 on 2/17. (Hayes)
 818 -MOROCCO Rabat dominant, at good level, w/AA mx (chanting w/sitar- like accompaniment), 0011, 2/18.
 827 -UNID Hard rock o/AA mx and a multiplicity of SAH's, 0013, 2/18. The rock stn seems to be the dominant lately - noted well o/others at 2324, 2/18, fading into a mess of carriers before any ID was given.
 834 -BELIZE 2/21 0940 w/British anc and mention of Belize. Ballad type mx. Many long fades. S8 plus when at peaks. (Lobel)
 845 -UNID Woman talking then mx on 2/19, 0130. (Hayes)
 850 -BRAZIL R. Mundial, Rio fair w/US rock and PP folk mx 0642-0650 2/21; "Mundial" jingles, v/ clear. (DeLorenzo)
 -DOMINICAN REPUBLIC HILLR 2/14 0935 w/talk of Santo Domingo. (Lobel)
 -MEXICO XEMO Tijuana, BC 2/21 0353 in Navajo Indian language w/some EE. Was religious pgm trying to teach the Navajo's Christianity. Pgm name was the "American Indian Christianity Show". Sure sounded weird! (Lobel)
 -UNID 2 stns here, 3.8 hz SAH, traces of f vocal; while RF level was good, neither stn was running adequate audio, 0016, 2/18.
 -SPAIN/UNID strong 8 hz SAH here, 0019, 2/18.
 -UNID LA Freddy Fender EE/SS C&W song, 0022, 2/18.
 -COLOMBIA HJOP Barranquilla, hrd w/standard Sutatenza mx flourishes and annts u/strong WINS/GFRB on 2/17 at 0203. (Hayes)
 -UNID BBC presumed here w/strong OC and bad het from unid on 1052.9, 0053 2/18.
 -CUBA Baracoa potent w/soft orchestral mx, 0052, 2/18.
 -PORTUGAL Norte good to xint rolling in w/cl mx, 0050, 2/18.
 -ENGLAND Crowborough BBC fair to good RF level, talk o/u WBAL slop, 0048, 2/18.
 -COLOMBIA HJZW Riochala, in v/ well at 0233 on 2/17. Many Almirante IDs. (Hayes)
 -VENEZUELA YVOZ Caracas 2/14 0740 w/R. Tiempo ID mx. Weak w/QRN. WQAI off. Better by 0755 when I got back to rx from raiding the refrigerator. (Lobel)
 -CAYMAN ISLANDS R. Cayman fair in EE, 0043, 2/18. (Connelly) * Fair w/BBC drama 0031 2/16, //1555. (DeLorenzo)
 -FRANCE Bordeaux fair w/man in FF way o/fast SAH (presumably from R. Cayman), 2242, 2/18.
 -CUBA Good w/vocal mx, SS talk in WCAU null, 0042, 2/18.
 -CZECHOSLOVAKIA Prague-Melnik to fair peaks w/operatic vocal, 0040, 2/18.
 -ST PIERRE & MIQUELON R. France fair w/FF group vocal, 0036 and good w/FF talk and slow m folk vocal, 2311, 2/18.
 -FRANCE Lille strong, hetting 1375, noted for a few minutes until 0035, 2/18, at which time the carrier went off.
 -GUINEA Conakry powerful w/OC here at 0031, 2/18. Guinea frequently runs OC without audio (like St Kitts-555) so the problems Lobel and other DXers have noted of getting strong carrier but no audio my result from these OC periods.
 -MONACO TVR Monte Carlo, fair sig w/GG pgm and mx at 0510, 2/19. Seemed to go off abruptly at 0515. (Hayes) * Weak to fair w/EE talk at a time when few other high-end TAs were noted, 2315, 2/18.
 -BARANAS ERSI Rananan 2/21 0859 weak w/mention of R. Bahana's. Some ERGD-1550 slop. Soft mx. EEEL at 0059:15 ruined any further chances of logging. Did get enough for a good report, sent. Another new country for me! (Lobel)

1555 -CAYMAN ISLANDS R. Cayman fair w/mush mx (Johnny Mathis), 0028, 2/18.
 1580 -COLOMBIA HJZQ R. Principe alone on channel w/SS rock and ID 0743 2/21. (Hayes)
 1586 -WEST GERMANY Langenberg fair overall copy, relatively weak sig but no QRN, noted w/f MoR vocal, 0024, 2/18.
 545 -DOMINICA R. Jumbo, Roseau for report of 11/15. V/1 signed by Patrick Meter, Directeur General; dated 2/1/77, received 2/14. (Lobel)
 656 -USSR Murmansk. Usual repeat of no verbe policy of R. Moscow for domestic broadcasts, though does say I was listening to their "Atlantika" pgm which is prepared by correspondents in all sea-ports including Riga and Murmansk. It's intended for merchant navy and fishing fleets and also for people learning Russian. (Vernon)
 810 -FIJI Labasa, 2.5 kw. V/q, signer A. Aisake for Engineer. For report of 8/4/75. Real Speedy! (Maguire) This stn has drifted up to 811 khz per a report in NZRDXL - might be worth looking for on the WC. (ED)
 1295 -USSR AZERBAIJAN SSR Baku verbe from Radio Baku, v/f in EE, blanks for date 10/29/76 time 2345-0034 and frequency plus broadcast "Mayak" no v/s. USSR #1 after many, many tries and my best catch! Thought this was Dushanbe, as per WRTH, see IDXD issue #7, hi. (Vernon) For what its worth, Dushanbe is listed here w/1000 kw, and is carrying the Mayak pgm at the times you heard them. Baku also listed here w/150 kw, but scheduled to be off at the times you reported. This in new 1977 WRTH. (ED)
 1555 -CAYMAN ISLANDS V/i received 2/16, same details a previously reported. (Lobel)
 The reporters for this issue
 Mark CONNELLY - Arlington, Massachusetts R390A/URR, SM-2
 Marc DELORENZO - Centerville, Massachusetts HQ-100, SM-1
 Harry HAYES - Gouldsboro, Pennsylvania R390A/URR, Zenith Trans Oceanic, SM-2
 Albert LOBEL - San Diego, California DX150A, Sanserino loop
 Norm MAGUIRE - Honolulu, Hawaii SPR4, Sanserino loop
 Brian VERNON - Manibridge, Manitoba
 MWG - Medium Wave Circle
 NZRDXL - New Zealand Radio DX League
 That is it. See you in ? 73 - DX - Report, and don't forget the NRC DX Net on 75 meter \$SB - come and join us if you get a chance!

via Bob Foxworth

THE NEW YORK TIMES, TUESDAY, FEBRUARY 22, 1977

Spanish Radio Station In Miami Goes Off Air After Losing Its License

Special to The New York Times

MIAMI, Feb. 21—An all-Spanish radio station here ceased broadcasting today on orders from the Federal Communications Commission. An effort will be made later this week in Congress to renew its license, temporarily at least.

The station, owned by the United Broadcasting Company, Washington, lost its license because of a 1974 F.C.C. ruling that it had engaged in "double-billing." Double-billing means that a station in collusion with local advertisers bills the advertisers for much more than the real value of their radio spots. Since many of the advertisers share publicity costs with national manufacturers, the cost is

passed on to the manufacturer, who reimburses the local advertiser.

"For years double billing in our industry had been commonplace, but many of offenders got off with a \$2,000 fine," said Tomás García Fusté, general manager of WFAB. "That's why I believe that in our case the F.C.C. sentence was not only harsh but also plainly discriminatory. As a result, 30 persons are jobless for something they didn't do and the community has lost an important voice."

A 5,000-watt station, WFAB was the second strongest and second in ratings among Spanish-language radio stations here. Two of the four remaining stations are licensed to operate 24 hours a day, one of them has a weak signal audible in parts of the county.

Representatives Claude D. Pepper and Dante B. Fascell, Democrats of Dade County, introduced a private bill last week that would allow WFAB to operate for 90 days to give its lawyers time for another appeal to the commission.

"The lawyers had the opportunity to do so last year," Mr. García Fusté said. "But inexplicably they didn't do it."

If the Congressional action fails, several groups, including one Hispanic and one black, plan to apply for the WFAB license. The process is long as well as costly. Experts say that up to three years and as much as \$150,000 might be required to obtain an F.C.C. license.

CLIPPING CORNER



Editor: Eric Rittenhouse
2315 Dwight Way #101
Berkeley, CA 94704

Hi All,

Another DDXD is upon us! This one a bit tough getting off the ground, as typewriter troubles and other stuff seemed to be out to get me this week. Regardless, le DX...

Change:

1390 KKOA ND MINOT, ex KLPM noted s/off MMs @0158 ELT. (NZ-NE)

RCs:

1st Fri 960 KFVS ND CAPE GIRARDEAU, TT 0101-0114, ID 0108. (JK-ON)
1470 WBTV VA BROADWAY, gd w/TT/ID 1209, 1214. (JK-ON)
1st Sat 1460 WRVK KY MT VERNON, per list. (JWB-PA)
1470 WBFC KY STANTON, per list. (JWB-PA)
1570 WSWV VA PENNINGTON GAP, per list. (JWB-PA)
1st Sun 950 WYWY KY BARBOURVILLE, per list. (JWB-PA)
1570 WLBQ KY MORGANTOWN, per list. (JWB-PA)
2nd Mon 1350 WJEB MI GLADWIN, per list. (JWB-PA)
2nd Wed 1430 KTYN ND MINOT, TT per list. (NZ-NE)
2nd Thu 1580 KAMI NE COZAD, not on list, TT 0130-0145 ELT. (NE-NE)
2nd Sat 1240 WSFC KY SOMERSET, per list. (JWB-PA)
1470 WFSR KY HARLAN, per list. (JWB-PA)
1550 WGRK KY GREENSBURG, 0544-0549, YL IDs start/end, TT.(JWB)
3rd Mon 1580 WKIG GA GLENNVILLE, w/Cabaret 0300-0310. (DS-DE)
3rd Tue 1300 KOLY SD MORBRIDGE, not on list, TT 0105-0115 ELT. (NZ)
3rd Thu 940 KVSH NE VALENTINE, w/TT off 0120. (DS-DE)
3rd Fri 1440 WCDL PA CARBONDALE, w/TT. (DS-DE)
5th Mon 1590 WGOE VA RICHMOND, gd u/WAKR w/tlk ending 0104. (JK-ON)

Tests:

780 WBBO NC FOREST CITY, hrd by Arruda, tent by Rugg.
850 WIVS IL CRYSTAL LAKE, hrd bk Kay, Kitt, tent by Arruda, W'ski.
1080 KYMN MN NORTHFIELD, hrd by Arruda, Hansch, Schmidt.
1250 KHIL AZ WILCOX, hrd by Kitt, not hrd by Arruda.
1380 WNRI RI WOONSOCKET, hrd by Wessolowski, Kay.
1430 WVVX IL HIGHLAND PARK, not hrd by Arruda.
1500 WKXO KY BEREA, hrd by Arruda, Brauner, not hrd by Wessolowski.

Sunset to Midnight:

630 WEJL PA SCRANTON, 2/19 fair 1600 w/nx. (JK-NJ) (HJH)
640 KFI CA LOZZANGELES, 2/17 gd 2320 w/rr. Never hrd this early.
WXGI VA RICHMOND, 2/18 fair 1740 w/C&W. (JK-NJ)
WNTY CT SOUTHWINGTON, 2/17 poor 1747 w/local announcements.(JK-NJ)
1000 WKBQ NC GARNER, 2/15 1754 atop w/C&W, "Country KBQ". (DS-DE)
WKDE VA ALTAVISTA, 2/15 1758-1800, C&W, then long s/off w/God Bless America, ments other gp stns (WPTX,WRNB,WCRE). (DS)
1070 WKOK PA SUNBURY, 2/16 gd 1732 after WKMB s/off. (JK-NJ)
1190 CHTN PEI CHARLOTTETOWN, 2/12 1832 alone w/"winner's wkend". 1836 w/C&W back on top. (JK-ON)
1260 WJJJ VA CHRISTIANBURG, 2/16 1758-1800, two spots, s/off way atop after 2 yrs, hi! S/off ments WVVV-FM. (DS-DE)
1270 WHLD NY NIAGARA FALLS, 2/28, 30, 31, on well past sunset (past 10 PM twice) due to storm o/WXYZ. (JK-ON)
30 WFSF DE SEAFORD, 1/19 1642-1700 o/WTUX splash w/C&W. Net now Ae. change Log. (DS-DE)

WYVE VA WYTHEVILLE, 2/19 1800 w/end of s/off, ments SR s/on. (DS)
1290 WQIN PA LYONS, 2/20 s/off 1745 w/warblely tape, ments 0600 s/on.
1310 CFGM ON RICHMOND HILL, 1/31-2/3 s/off 2300, DJ said XR being (DS) adjusted. (JK-ON)
1410 WDOV DE DOVER, 2/19. MPOP usually dominant, but WDOV atop today w/9-40 1745. (JK-NJ)
1460 CKRB PQ ST GEORGES, 2/16 good 1749 w/FF pgming. (JK-NJ)
1550 WKBA VA VINTON, 2/17 s/off 1800. (JK-ON) (JK-ON)
1560 WWBK NY BROCKPORT, 2/12 1703 local wx almost wiped out by WQXR.
1570 WQTW PA LATROBE, 2/8 s/off 1801. (FAW-PA)
1580 WANB PA WAYNESBURG, 2/8 s/off 1800. (FAW-PA)
WSRF FL FT LAUDERDALE, 2/19 fair to poor w/bad fades 1812 w/album, T-40 mx. (JK-NJ)

Midnight to Sunrise:

540 KDLT UT DELTA, 2/10 0935 w/C&W, MST TC, 2 IDs, fair but murky.
620 WRTZ TN KNOXVILLE, 2/13 0139, left air "for some XR main-tainance" after short announcement. (JK-ON)
710 WOR NY NEW YORK, 2/21 on OC 0050, loud SS/CJRN under. (DS-DE)
740 WGSW NY HUNTINGTON, 2/17 0144-0200+ ET/OC/rr, IDs every 15 min. (DS-DE)** 2/17 loud on ET w/Jim Croce record 0157, ID 0200. (HJH-PA)
790 WBAM AL MONTGOMERY, 2/17 on ET 0200+ w/TTs, SID 0227 into C&W.
KABC CA LOS ANGELES, 2/14 0600 w/ID, Ai nx.
KULF TX HOUSTON, 2/14 0540, a report of some sort just ending at t/in, "This is Carl..."; a southern accented OM replied "Thank you Carl", and mentioned KULF (I think, audio pretty distorted). Poor in KABC null. When is MM s/on for this. (NHP-BC)
WQXI GA ATLANTA, 2/7 0247-0252 nx/sx, CHIC off. (JK-ON)
810 CFDR NE DARTMOUTH, 2/21 gd atop w/pop vocals, AST TCs 0125. (MD)
CKJS NB WINNIPEG, 2/14 w/rr o/u KCMO 0248. (JK-KS)
850 KOA CO DENVER, 2/14 s/off 0212, s/on 0500. (FAW-PA)
920 WMEL FL MELBOURNE, 2/21 way o/CKCY w/rr, CBS nx 0200. (MD-MA)
940 KIOA IA DES MOINES, 2/17 0125 in Punto Fijo's null. Wk to fair w/rr, SIDs. Format like WABC. First time. (HJH-PA)
950 WPEL PA PHILADELPHIA, 2/21 the sideband pest noted on OC this AM 0130, loud SS/WWJ/WLOF under. (DS-DE)
960 WSBT IN SOUTHBEND, 2/4 0112 s/off o/u KFVS f/c. (JK-ON)
990 WIBG PA PHILADELPHIA, 2/21 s/off noted w/electronic SSB, to return 0500. (DS-DE) (MD-MA)
1050 WNOX TN KNOXVILLE, 2/21 ET/C&W 0222-0232 loud on ND day pattern.
WHN NY NEW YORK, 1/31 0217-0232 C&W, CHUM off. (JK-ON)
UNID ?? Canadian 2/3 0134-0154 w/CHUM off, playing MoR o/u WHN //CHAX-FM 100.9 (CJIC?) Help! CJIC a good bet, CJNB also a possibility if EE. If FF, maybe CKSB. No CHAX listed.
1070 KNX CA LA, 2/21 nice thru WIBG/UNID. "The 50kw nx voice ECR of S. CA" ID 0331. (HJH-PA)
WFLI TN LOOKOUT MOUNTAIN, 2/3 0220-0230 ET/mx fr u/CHOK. (JK-ON)
1220 CJSS ON CORNWALL, 2/17 good 0000 w/nx/wx/etc. (JK-NJ)
1240 WKOY WV BLUEFIELD, 2/16 0526 w/sports, PSA, rr. Log change; s/on listed for 0530. (DS-DE)
1250 WDCO CT WATERBURY, 2/21 w/ET/OC, IDs; 2 given at 0202. (DS-DE)
WDVA VA DANVILLE, 2/21 ending ET 0203 w/long ID ments return at 0430 w/RS. Not NSP as in Log. (DS-DE)
WTMA SC CHARLESTON, 1/31 OM announcing test 0259. (JK-KS)
1290 CHRМ PQ MATANE, 2/13 0156 w/FF nx in progress, topping freq. (DS)
WTUX DE WILMINGTON, 2/16 0520 ET/OC/mx, often WMs, no IDs. (DS)
1300 WOOD MI GRAND RAPIDS, 2/14 0540 w/OM talking about vehicle (GH-registrations, dog licenses, the mx good. First time. KS)
1310 CHGB PQ LA POCAHONTE, 2/14 prob the one atop w/standard CBC nx, then mx, no CKOY/CFGМ 0002. (DS-DE) (DS)
1340 WWPA PA WILLIAMSPORT, 2/14 0302-0320+ w/loop east; mostly atop w/CBS nx, MoR, Jack Frost pgm, evidently a Log change.
WROD FL DAYTONA BEACH, 2/14 0253 promo for \$ bill serial # contest, then rr. Atop w/loop south. (DS-DE)

ASHLAND, 2/16 0150-0310 t/out, "Request line for KY, OH, and WV" and "13-WCMI" IDs, rr. best after WCVI-PA 0300. (HJH-PA)

1360 KEYZ ND WILLISTON, 2/14 0717. OM doing sports (?), then SID "Mx American Style K-E-Y-Z". 99% sure of this, but sig poor, audio murky. Does anyone know if KEYZ uses this jingle. (NHP-BC) Drool... I've been after this one for five years--ECR

1400 WIXZ PA McKEESPORT, 2/21 0120 ET/C&W way o/WDRG. (DS+DE)
 WDUZ WI GREEN BAY, 2/21 TT almost steady 0200-0300 but no ID. Only 100 mi away, never hrd, or really tried. (Ross)

KFRU WO COLUMBIA, 2/21 0200-0206 nx. (Ross)
 WKWK WY WHEELING, 2/21 0044 atop w/rr, calls self "14 WK". (DS)
 1410 WDOV DE DOVER, 2/21 MM s/off still noted 0105 w/SSB. (DS-DE)
 1420 KXOW AR HOTSPPRINGS, 1/27 ET/TT/OC 0630. (JK-KS)
 1450 WMOH OH HAMILTON, 2/11 w/spot for WMOH Bridal Fair 0117. (W'ski)
 1490 KOTN AR PINE BLUFF, 2/14 0234 w/rr strong. (JK-KS)
 1520 WKBW NY BUFFALO, 2/14 noted off 0100-0200. (DS-DE)
 1530 WTTI GA DALTON, 2/21 0025 w/another ET/rr o/u WCKY. (DS-DE)
 1550 WOKJ MS JACKSON, 2/19 in wk w/Soul, local spots 0150. (HJH-PA)
 1560 WDXR KY PADUCAH, 1/30 0105 s/off after NBC nx. (JK-ON)** 2/19 fair after WQXR off w/nx/T-40 0130. (JK-NJ)

1570 CKLM PQ MONTREAL, 2/14 noted on OC 0038, back by 0230. (DS-DE)
 WSSA GA MORROW, 1/31 1221 "On air for technical maintainance" in CKLM null.

1580 WSRF FL FT LAUDERDALE, 2/14 w/non-stop rr 0215 on, bumper sticker promo and "surf-16" ment only tip it was them. (DS-DE)
 KRZI TX WACO, 2/14 0559 ID, then Glen Campbell's "Galveston" gone by 0603. (GH-KS) (DS-DE)

1590 WRXB FL ST PETERSBURG BEACH, 2/14 0158-0214 ET/Soul, ID at end.
 WQIQ PA CHESTER, 2/14 off this AM. (DS-DE)

1600 WEUP AL HUNTSVILLE, 2/14 0324 w/Soul, "Action City" wx. (DS-DE)
 WUNR MA BROOKLINE, 2/14 0200 s/off ments AM-FM u/WWRL. (JK-ON)
 WXVI AL MONTGOMERY, 2/21 fr atop jumble w/Soul 0248-0330, "16 XVI" IDs. (MD-MA)

Thank you for your report on the reception of Radio Nahu's broadcast for Mayak

Date 2/18/76
 File 23.45-00.54
 Frequency 12.95 (23166 mc)

our report has been checked with our records and in correct in every detail.

Best wishes from
 RADIO NAHU
 Aguadulcan

And...

1580 WGTW FL MT DORA, 2/21 0256-0310+ ET e/schmaltz MoR, IDs for "Prefered Radio", call noted only once. (DS-DE)

In response to my question in 44 #15, Andy Rugg and Bryan Griffiths note that CHPR-1110 is 4kw daytime only. Thank for the info guys...

Reporter people:

RA	RAY ARRUDA	New Bedford, MA	SX-122, SM-1
JWB	JOE BRAUNER	Punxsutawney, PA	A2515, Box loop
MD	MARC DELORENZO	Centerville, MA	HQ-100, SM-1
BG	BRYAN GRIFFITHS	Kirkland, PQ	RX, antenna
MHP	NICKY "TAs" HALL-PATCH	Victoria, BC	Transmogriofied HRO
Ross	ROSS HANSCH	Madison, WI	HQ-180AX, NRC loop
HJH	HARRY HAYES	Gouldsboro, PA	T-0, SM-2
GH	GARY HOUDEK	Munden, KS	Western Auto
JK-ON	JEFF KAY	Toronto, ON	TRF, LW
JK-KS	JEFF KITT	Neosho Rapids, KS	DX-160, LW
JK-NJ	JOHN KROMKA	Montville, NJ	DX-160, LW
AR	ANDY RUGG	Ile Des Soeurs, PQ	RX, antenna
DS	DAVE SCHMIDT	New Castle, DE	HQ-180, SM-2, LW
W'ski	BOB WESSOLOWSKI	Milwaukee, WI	Old Philco, 4' loop
FAW	FRANK WHEELER	Erie, PA	S40B
NZ	NEIL ZANK	Lincoln, NE	HQ-180, AA loop
			HQ-160, SM-1
			R388, Inverted "L"



Seems like the "JK" faction is multiplying, hi. At this rate, we'll have five by the Ides of March. Come on you other initials; you're just not trying! I want to see at least three of everything next week, hi. Seriously, maybe a couple of you JKs could send in a middle initial with the next report, before ECR gets permanently fuddled, hi. Lots of reports this week!! "Keep up the great work.....ECR....."

GRAVEYARD DX.....
1230, 1240, 1340, 1400, 1450, 1490.....

editor: Harry J. Hayes
Star Route, Box 226c
Gouldsboro, PA. 18424

We have more than double the contributors this time for 1240 khz. accomplishments than we had for 1230, so right to it.

*denotes pre-1960 logging

1240

mi. DXer & loc.	station & loc.
2500 Stan MORSS Bradford MA	WFFF Pasadena CA*
2450 Gene ALLEN Vallejo CA	WGBM Cambridge MD*
2440 Gene ALLEN Vallejo CA	WINK Ft. Myers FL*
2440 Stan MORSS Bradford MA	KRNO San Bernardino CA*
1930 Bob KNOX Newton NJ	KEYY Pocatello ID*
1610 Bob KNOX Newton NJ	KICA Clovis NM*
1370 Don KASKEY Galva IA	KROY Sacramento CA*
1355 Don KASKEY Galva IA	KSON San Diego CA*
1160 Andy RUGG Pte. Claire PQ	WFOY St. Augustine FL
1050 Ron SCHILLER Monmouth Beach NJ	WINK Ft. Myers FL
1015 Mike SCHEEL Davenport IA	KEVA Evanston WY
1000 Jerry STARR Hubbard OH	KCCR Pierre SD
880 Jerry STARR Hubbard OH	WMMB Melbourne FL
870 Russ EDMUNDS Parsippany NJ	WFOY St. Augustine FL
860 Alan IMPRESCIA New York NY	WFOY St. Augustine FL
845 Andy RUGG Pte. Claire PQ	WBIR Knoxville TN
835 Bill LACKKEY Kingsville TX	WEKR Fayetteville TN
835 Tom SUNDSTROM Willingboro NJ	WFOY St. Augustine FL
825 Russ EDMUNDS Little Silver NJ	WTAX Springfield IL
800 Rich EDDIE St. Louis MO	WCNC Elizabeth City NC
780 Harry HAYES Thornhurst PA	WENK Union City TN
765 Jeff FALCONER Clinton OH	WWNS Statesboro GA
760 Rich EDDIE St. Louis MO	WGVA Geneva NY
725 Forest OSBORN Hooker OK	KEMY Billings MT
720 Alan IMPRESCIA New York NY	WWNS Statesboro GA
700 Bill LACKKEY Kingsville TX	KAKE Wichita KS
700 Paul MOUNT Teaneck NJ	WWNS Statesboro GA
675 Neil DICKERSON Sharptown MD	WFOY St. Augustine FL
670 Tom SUNDSTROM Stockton NJ	WWNS Statesboro GA
665 Mike SCHEEL Davenport IA	WJEJ Hagerstown MD
650 Neil DICKERSON Sharptown MD	WLAS La Grange GA
650 Dave SCHMIDT New Castle DE	WEML Macon GA
630 Martin FOLTZ Lansing MI	WCNC Elizabeth City NC
630 Forest OSBORN Hooker OK	WTAX Springfield IL
610 Dave SCHMIDT New Castle DE	WWNS Statesboro GA
585 Jeff FALCONER Clinton OH	WKDA Nashville TN
495 Brett HANAVAN Chula Vista CA	KROY Sacramento CA
475 Martin FOLTZ Lansing MI	WROV Roanoke VA
450 Paul MOUNT Teaneck NJ	CFLS Levis PQ
410 Harry HAYES Thornhurst PA	WRNC Raleigh NC
360 Bruce WINKELMAN Greensboro NC	WINN Louisville KY
355 Bruce WINKELMAN Greensboro NC	WBEW Youngstown OH
85 Brett HANAVAN Chula Vista CA	KBON San Bernardino CA

Notice how WFOY and WWNS dominate the listings. One other note of interest is that WFOY was heard on all different dates by the submitting DXers, showing perhaps how well this station gets out on tests or on Aurora CX.

DEADLINE for 1340 khz. will be April 7, 1977. Send your best two catches for each of the six graveyard frequencies. I notice a number of you using the trig.

distance formula of great circle paths and this is perfectly acceptable. Unfortunately I do not know trig. so I cannot standardize by this method. When you measure mileage please use a map of the United States and Canada if you can. Avoid world maps. If you have trouble with the mileage, send your entries in without and I will measure them.

The limitations once again. Only stations in the United States, Canada, Mexico Cuba and Bahamas will be considered for inclusion and these must not exceed 1 kw at the time of reception. Conversely contributors should send in only loggings made in the above areas to be considered for the listing. However, I am lifting the limitations to the extent of encouraging our members outside of the above areas to tell me what they are hearing on the GY channels. It is impossible for me to include you members in the actual listing and keep the original criterion for which the "competition" is based. However, I will make known your accomplishments in this part of the column since I am sure everyone is interested in TA GY reception and the likes. It looks as though I have already overextended my limits so I will get into the details of one overseas report I have received next time.

Harry

CLIPPING CORNER

From the New York Times, February 22, 1977
via Bob Foxworth

SUN ACTIVITY LINKED TO DROUGHT AND COLD

Scientists Cite Lack of Sunspots
as Clue to Unusual Weather—
Trace Patterns of the Past

By RICHARD D. LYONS
Special to The New York Times

DENVER, Feb. 21—A group of solar physicists and climatologists told a national science convention today that the "bizarre weather of the last year might have been caused in part by abnormal activity on the surface of the sun.

While stressing that positive proof is lacking, the scientists said that all available evidence pointed to another year or two of cold winters in the Eastern and Central states and drought in the Western United States.

Sunspot cycles, which occur at intervals of 22 years and over longer periods of several hundreds of years, correlate hot and cold, Earth. Dr. Arthur J. Hundhausen of the National Center for Atmospheric Research presented evidence, as did other scientists, of the longer cyclical behavior of the sun at the 143d meeting of the American Association for the Advancement of Science.

One of the scientists, Dr. John A. Eddy, an astronomer who has been seeking to connect historical events and climatological changes with variations in solar activity, is concerned with short- and medium-term effects that can be traced back several thousand years by historical observations, and up to 7,000 years by measuring the amount of the isotope carbon 14 in the rings of trees.

Stratopis Increase Solar Wind

According to Dr. Eddy, who is with the National Center for Atmospheric Research in Boulder, Colo., and currently a visiting fellow with the Center for Astrophysical Research, Cambridge, Mass., and other scientists, the theory is that stratopis increase the solar wind—that is, solar particles and radiation that fan the earth. The solar wind determines the amount of cosmic and galactic rays that strike the earth, that the carbon 14 record locked into the tree rings is evidence of unusual activity on the sun.

Tree ring studies conducted by Dr. Charles W. Stockton of the University of Arizona and interpreted by Dr. J. Murray Mitchell of the National Oceanographic and Atmospheric Administration in Washington have found abnormal conditions of cold weather and drought in North America when tree rings have high levels of carbon 14 caused by a slowing down of solar wind activity because of fewer sunspots.

Dr. Eddy said the same tree ring and weather conditions were occurring today as they were during times of drought in the Plains states in the early 1950's, and the Dust Bowl period of the 1930's.

"If you look at the record of climate there is a one-to-one correspondence that's so good I don't want to believe it," Dr. Eddy said. "Whenever the sun seems to lose its spots on a major scale, the earth goes through very cold spells and even 'little ice ages' such as occurred in the 17th century."

These longer cycles, ranging from 50 years to several hundred, again are unexplained, but historical data indicate extremely bad weather being linked with a long-term lack of sunspot activity during the reign of Louis XIV in France. Conversely, there was a warming trend during the time of the Crusades from 1100 to 1300 A.D.

Normal Weather to Return

If these scientists are correct, "normal" weather patterns should return in a year or two, but will be followed in a decade or so by another, long-term cooling trend for North America.

Dr. Eddy said that it appeared over about a century or two "that we probably are headed for somewhat cooler climates than we have enjoyed in the past 50 to 60 years."

However, despite his predictions of cooler climates, he sought to dispel any concern that the weather headed for another ice Age, the last of which ended about 15,000 years ago. Climate cycles that produce such drastic changes in weather occur over periods of thousands if not tens of thousands of years, he said, and the "most pessimistic outlook" is that an Ice Age would be several thousand years away.

But Dr. Eddy noted that even changes of as little as 1 degree Fahrenheit could have contributed to major alterations in conditions that vitally affect society, such as the amount of land that may be kept in cultivation for crops.

Sun Not Only Factor

He underscored the point that solar perturbations, while significant, were only part of a much broader pattern of atmospheric activity that, in turn, resulted in peculiar weather. Other factors that could even be more important, he said, included the amounts of dust and chemicals in the atmosphere, the degree of cloud cover over the oceans, and the degree to which sunlight was reflected back in to the atmosphere from the polar ice caps.

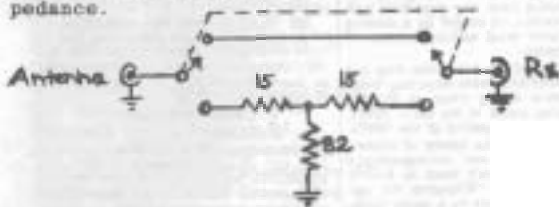
Several factors that have appeared to be even more significant in recent years, he said, were increased dust being carried into the atmosphere from winds over the Sahara, and larger quantities of pollutants such as carbon dioxide and sulfur dioxide entering the atmosphere and affecting the amount of sunlight reaching the Earth's surface.

Further Rx Hot-rodding Hints

Chuck Hutton

As most technically oriented DX'ers know, even the best DX rigs come without certain useful accessories and with certain features that can be improved upon. While some of these modifications are complicated enough to warrant a whole article, due to space limitations I will describe these to a moderate degree and list references that will provide further practical details. All of these modifications will improve rx performance to some degree; some will make your rig into a new rx while others will not have so dramatic an effect. If you perform all or most of these modifications the net effect will be to give you an rx that easily outperforms even the best commercially available rig. This article is slanted towards rx's employing tubes as most of the popular high quality units (Hammarlund, Hallicrafters, Collins) were built before the semiconductor era. Many of the subjects covered are equally applicable to solid state devices however. Each individual rx has its own problems that perhaps another make does not suffer from; since the subjects I will cover are general I suggest that if you have a particular problem or need with your rx not covered herein search thru the last 25 years of *CQ* and *QST* where many excellent articles on specific rx's have appeared. Owners of Collins R388, R390, 51J series, and 75 series rx's are invited to contact me for a list of articles relating to these rx's.

Every rx suffers from cross modulation and overloading when presented with 50 kw in the backyard. In some sets the tremendous AVC voltage generated will either completely block up the rx or cause reduced gain when trying to DX a station next to the local. A cheap and easy method for reducing overloading is the circuit shown in figure one. It requires no change to rx circuitry but does have the drawback of reducing the weak station level by the same amount as the 50 kw heavy. Generally 10 dB of attenuation will bring you back into the safe area but not affect the ability to hear a weak station. This T-pad is designed for the common 50 ohm antenna impedance.



For 20 dB of attenuation make the resistors 40, 40, and 10 ohms. Use the minimum amount of attenuation necessary to eliminate overloading in order to keep from degrading the S+N/N ratio.

A better answer to the problem of overloading and cross modulation is to do some substitution in your RF stage. The choice of RF amp tubes can be very, very important. A simple substitution of

one tube type for another (the kind of modification people like most!) can dramatically improve gain, S+N/N ratio, and cross modulation. Caution- do not substitute sharp cutoff tubes for remote cutoff (variable mu) tubes. Remote cutoff tubes have better characteristics for strong signal handling; I replaced the 6AK5 sharp cutoff tube with a 6BZ5 and was rewarded with 10 dB additional gain, reduction of overloading and cross modulation, and longer tube life. DX'ing around 750 khz is now possible even with W8B running 50 kw at 2 miles. Be careful when substituting tubes- check a tube manual and your rx manual to determine biasing requirements, cathode current, and transconductance. Many tube types were developed after many of today's popular rx's were designed; in particular some of the remote and semi-remote cutoff tubes such as the 6BZ6 and 6DC6 were late arrivals that were designed specifically to solve the problem of strong signal handling. Each makes an excellent RF tube in my experience. The 6BAG is an older and more common remote cutoff tube but it is also widely known as a noisy tube.

Diving further into strong signal handling, RF stages may or may not be helped by application of AVC. Some poorly designed rx's do not have the feature of delayed AVC- i.e. AVC is not applied until signal level exceeds a fixed value where S+N/N ratio is no longer a factor. If your rx does not have this feature the RF can be disconnected from the AVC and run wide open without any serious degradation of AVC performance. Contrary to what you may think at first this may actually help overloading characteristics. The explanation is that if the applied signal voltage on the RF grid exceeds bias, rectified grid current flows in the circuit and charges the grid capacitor, which then discharges thru the AVC buss to the IF grids. Properly designed low impedance AVC lines will help to rectify this problem; if you suspect problems in this area disconnect the RF AVC and see what happens.

Mixer tubes are a weak link in the rx chain. The old adage of minimum gain before maximum selectivity was designed to protect the mixer from cross modulation and overloading, in addition to applying reasonable signal to the typical wide skirt crystal filter. A good bit of noise is also generated in the mixer stage and this problem is compounded by the fact that most rx's have declining gain at the higher frequencies. This problem is well recognized in the amateur literature; various articles have been published on how to improve the performance of mixer stages. Some of the suggested remedies include: (1) installation of that little gem (pun intended) the 6DJ8 dual triode mixer which will provide increased S+N/N ratio with its gm of 13,000 in addition to improved cross modulation performance. A little bit of rewiring and chassis blacksmithing are needed in most cases. (2) the ultimate is probably the 7360 beam deflection mixer tube, usually thought of as a high level mixer or product detector but also a fantastic rx mixer. With reasonable design these tubes are always operated in the linear region. Also the two plates can be wired in push-pull mode and balanced to the IF, providing excellent image rejection. Installation of a 7360 mixer is a major production which I have not tried to date. If I ever have the time to design my own rx

I'll certainly use one.

The same thing can be said for IF tubes that was said for RF tubes: newer types have higher gain and lower noise figures. If your rx is more than 10 years old it would pay you to check CQ and QST for articles specifically on your rx and see what other people have suggested for updating the tube complement.

Many a good rx has a simple one crystal filter with the accompanying narrow nose and wide skirts. About 20 years ago it was realized that by employing several crystals differing slightly in frequency an excellent bandpass characteristic for AM reception could be produced. Simple 2 or 4 crystal lattice filters have flat tops and reasonably steep sides much like mechanical filters but do not have quite the shape factor. In addition there are a few small side lobes, but these are usually around the 70 dB attenuation level and can be tolerated. Numerous are the articles which have been written concerning the use of surplus FT-241 crystals which are designed to operate in harmonic modes of frequencies that happily fall in the frequency area of most IF's. These crystals can be had through JAN crystals, hamfests, and surplus houses for as little as a nickel each up to 75¢ each depending on where you find them. If you want to go all the way with these things a filter can be constructed using 8 crystals that will certainly be equal to the expensive Collins mechanical filters.

Mechanical filters have been thoroughly covered by GPN in his excellent article. This article is more informative than anything that has appeared in the commercial literature so if you are interested in these wonderful devices that article is required reading. A few additional comments: (1) the 6 dB insertion loss quoted is for the newer Collins filters; if you have gotten hold of a used older series filter the insertion loss will be in the 20 dB to 25 dB range. Plan on some sort of compensating amplification. (2) Collins produced a mechanical filter adaptor which plugs into the first IF tube socket and contains a filter and two stages of IF amplification. These are still around in used condition, albeit getting harder to find. If you don't trust your electronics you might want to look into these; current cost \$125 or thereabouts. (3) beware of mechanical filters that have been treated roughly or mailed. I have never heard of a filter that survived a drop on the floor. Ask for protective packaging if you must risk them in a trip thru the P.O. Many articles have appeared in the amateur press describing clever little adaptors and circuitry- see the references for a listing.

Q-Multipliers are overlooked devices these days. Admittedly they don't have the proper shape factor for AM dx but they can still be extremely useful devices. I currently have two installed on my R388; one for exalted carrier reception and the other for notching out second hets when DX'ing in tight corners. The second can prove quite valuable when fighting off a domestic and an LA split to hear a TA. If you are not up on exalted carrier reception by all means read the references. It really does wonders to make a weak signal seem clearer and cleaner. Heath Company used to make these things but they have not been available for some time. It is still easy to find them in club ads or perhaps the Ham Trader Yellow Pages. If not able to find one they are simple devices to build and can be whipped together for little cost. The Heath Q-M's

are designed to operate from 450-460 khz and perform best in this range. The slug tuned coil can be adjusted to resonate at up to 500 khz quite easily; beware however that moving the slug around will lower the Q of the coil and the Q-multiplier will cease to oscillate. Therefore it is not possible to achieve maximum selectivity. A poor remedy is to lower the value of the cathode resistor from 8.2K to 4.7K; more satisfactory is a trip to the local parts house to purchase a different set of resonating capacitors. Buy 1% tolerance high quality components and be careful to maintain the 3:1 ratio of the capacitors or the feedback operation will no longer be up to par.

Noise limiting will be of some value to most DX'ers. The most effective limiter for impulse noise is the blanker type that actually cuts off succeeding stages of the rx for the duration of the pulse. This type of limiter is not very effective for continuous QRM or QRN- lengthy bursts of energy such as sideband splash can be better handled by semiconductor diode clippers. See Ray Moore's article in the Receiver Manual for brief hints. I have found that an audio clipper is also of some help for severe bursts of slop if clipping is below the point where distortion occurs. I used an oscilloscope to set the desired audio just below the clipping point and found that this point corresponded with the point where distortion began to be audibly evident, making adjustment of the clipper quite simple if a scope is not available.

Audio filtering can be of some benefit to the serious DX'er. A simple notch filter as described by Wherry will eliminate the last of a heterodyne that a notch filter missed. Another simple device is the 300-3000 cps bandpass filter described by Wicklund. In my experience the active filters do not perform much better than the simple passive filters in listening comparisons. The SSB Crud-O-Ject popular in ham circles uses toroids and capacitors to produce sharp cutoffs at 300 and 2500 cps and would be much cheaper to build than an active filter. Even a simple R-C filter will do wonders to eliminate 60 and 120 cycle hum and the low grumble of hets on some frequencies.

No doubt there are other gimmicks and tricks that can improve performance. This group will certainly go a long way though in making any rx into a super DX rig. Please check the references for practical details on many of these; if you become stuck and need further help I will be glad to answer specific questions.

SUMMARY OF THE 1975 CONTENTS, VOLUME 43 (1975-76)

No. of issues: 30
Total Page count: 940
Projected count: 960
Variation: -20
Avg. Pages per Iss. 32

Contents

Missings: 284.5 pages
IDX: 130.5 "
DDXD: 94.5 "
HQ: 70.0 "
Lists, etc.: 111.5 "
Features: 43.0 " (articles)
Tech. Arts.: 56.0 "
Back Covers: 30.0 "

Clippings: 27.0 pages
Veris: 17.5 "
Conv. & GTG: 17.5 "
Veri-Signers: 14.0 "
Dom. DXA: 9.5 "
For. DXA: 4.0 "
DXChange: 7.5 "
"A." Graphs: 7.0 "
Filler & Misc: 12.0 "

TOTAL: 940.0 pages.

If you are among the many DX'ers who tape their DX for future listening, then the following tips will be of interest. This goes primarily for those who plan to save their tapes over a period of years as a record of their DX. The important point is that tapes have a predilection to deteriorate over a period of time. Some points to consider:

- Muddy audio when recorded will become steadily suddier with time
- Heavy audio will become bassier
- Noise will become noisier

In light of this, certain precautions should be taken in the initial recording of DX during the actual DX session, as well as in the transcription to a "master tape" of exceptions:

- Record with as much treble as possible, even under static conditions.
- Do not use an audio filter unless it is necessary to remove hiss or other noise.
- If you use the re-record process, and filter then, filter out bass more than treble except for hiss.
- Use a sufficient amount of audio to withstand deterioration, but don't "overdrive" the recorder input. This will cause muddiness.
- Try to record the master tape on the same machine you intend (barring unforeseen circumstances) to use to replay it in the future.
- Use an "Automatic Level Control" if the recorder has one. You will still have to "ride" the gain on the machine you are playing the original tape on, but it will make your final tape easier to re-hear. If you don't have "ALC", try to keep the level equal manually.

In any event, deterioration will take place. Thus, it is advisable to re-play your tapes at regular intervals, and to re-record them again as necessary to try to reduce your losses due to deterioration as much as possible. Again, you should strive to maintain as much treble and gain as you can.



NEW BROADCASTING HOUSE
P.O. BOX 90
OXFORD ROAD MANCHESTER M80 1EJ
TEL 061-228 3434. TELEX 088708

IMP/MC.

19th January 1977.

Mr. B. Vernon,

General Delivery,
Manitbridge,
Manitoba,
Canada.

Dear Brian,

Many thanks for your reception report and interesting letter. It was indeed Radio Manchester you were listening to, and I think you now hold the 'long distance record'. We would be very interested to hear your recording, and please accept with my compliments the enclosed tape.

All the best.

Yours sincerely,

Roy W. Freese,
Engineer in Charge.

musings of the members

editor: Ernest R. Cooper

6 Anthony St.

Provincetown, MA. 01957

The opinions expressed in this column are those of the individual members, and do not necessarily reflect those of the editor, the publisher, or the National Radio Club.

RAY ARRUDA - 48 Woodlawn Street - New Bedford, MA - 02744

MM 2/7, up from midnight to 3 with nothing new heard. WNCB-570, WABC-770 & WCAU-1210 were all noted off at different times ETing w/ OC/TT/IDs. On to MM 2/14: WEXO-1500-TEST heard well 12:20-12:40am with many IDs in voice and code, TT, music, & on-the-air phone calls. WIVB-850 very tentative from 1:40-2:32 with nothing but code IDs copied; tentative report sent. Sat. 2/19, 3:13-3:31am, stop 1550 was WGBR on ET w/ OC/TT & detailed ID @ 3:15. MM 2/21 was really good so here's what happened. All times are AM: TEST from WBBQ-780 was rough copy under Cuban & WBBM 1:04-1:20 with marches & voice & SIDs. WHIR-1330 alone with deep fades and pop with many "Radio 13" IDs & WX for Eric from 2:04-2:30. WAMQ-860 just ending ETAs I got there with s/off announcement, this @2:51. Last, but certainly not least, the real prize in KYMN-1080 TEST from Minn 3-3:09 w/VID at top of hour folo by violin mx for about three minutes, then 1K tons weak & way u/powerhouse WTIC. Call to station confirmed it was their signal for #6 from that state. I find it very difficult to understand that how a member of any DX club will go out of his way to send a CPC letter to a station, & the station agrees to, and does, conduct a TEST, receives reports from around the country, and then does not follow up with verifications for these reports. These stations are few in number, but it must make some of our hard working CPCers quite discouraged at times, but they still do a great job arranging TESTs. 73.

CURTIS D. ENGBERG - 80 Concord Road - Wayland, MA - 01778

Just a note to keep Eric in practice, hi! Lowband TA's fairly good on 2/1, then a couple of weeks of mostly LA's here. 2/7-WJDM s/off @ 5:30pm on top of 1530. At 8pm, R. Margarita ID blasting in on 1020. SS & mx noted on 895, unID. 818 Morocco fair. 2/8- R. St. Vincent-705 with strong EE ID @ 8pm. 2/9- Strong SS all over the dial. 2/11- 8:30-m and on, the SS still great. Quito-735 in @ 20/8-9, R. Juvenil ID on 925, a strong SS on 943. 2/12- St. Vincent even stronger than previous days, mx noted on 805. 2/14- Shortly after WTOP s/off at midnight, WEXO-1500 w/full ID & then into code. That evening @ 6, WRBX-1530 s/off leaving Vatican-1528 w/dl mx alone. A few days on church business in Atlanta kept me away from the dials, but back for MM 2/21 showed excellent highband TA's. 1502 f Walker was the best ever heard here. Strong mx very good on 1367, but unID. Then quick check this eve on arrival home from work (no holiday here) found me tuning past 1530 just after 5:30pm & a loud voice said "This is WDJZ in Bridgeport, CT conducting ETs" and nothing more heard. Only my fourth new one of the year, but worth while. 73. (Curtis'll be at ERC's on April 2nd - will YOU?)

CHARLES GEORGE - 6407 Howard - Dallas, TX - 75227

I received two new veries: WEC-600 & W W-580. On the night of 2/12 @ 1:07 I heard my first station from CA, K I-640 c/u CMQ. First I heard the announcer mention his guests, then PSA for Safe Water, #327-4141, spot for GMC Trucks, spot for CA. Federal, then the talk show started and signal was then lost. I hope I can get a verie from KFI. I have more time for DXing at night now since I lost my job with Howard Johnson's. I have been looking for a new job. I would like a job with a small station, as an announcer - that pays. Some good and/or bad news, EXVI-1600 has applied to go full time as well as KVIL-1150. I will now have to get busy and report to KATZ, KSAL, WJBO while I still have a good chance at them. 73.

AS THEY SAY IN FAIRMONT, WV, "WBBM-920". "WESTERN MEMBERS' MUSINGS NEEDED" IN FACT, ALL MUSINGS ARE WELCOME. DEADLINE IS THURSDAY IN PROVINCETOWN.

TED LANGLEY - 61 Willow Street - Pleasantville, NY - 10570

This Muse begins with questions which I think are of general interest to novice DXers. Ernie, why is Universal Coordinated Time abbreviated UTC and not UCT? (I didn't know it WAS! -ERC) What is a reggae show? Do you know why Joseph Plonka's Muse 1/31 included a caution about the Yaesso-FRG-7? If I prepared a booklet consisting of cut-outs from catalogs showing pictures and specs of surplus & new receivers, & names and addresses of dealers of surplus & new RXes, do you think the NRC would be interested in printing it? I know such a booklet would have been very helpful to me in my earliest NRC days, in addition to the NRC RX Reference Manual. Now to a new topic. On 2/7 I mailed a two-page report, single-spaced to WCCO-830, Minneapolis, for programming I heard 2/5 from 7pm to midnight. I received a reply on 2/11 and they returned my mint stamps, and asked about interference from WNYC and SSES on the frequency. I find this kind of correspondence very interesting and think many other NRCers will also. I'll end this with some of my own Mothball Memories - Fibber McGee & Molly, Gangbusters, Mystery Theatre, & finally, who knows what evil lurks in the minds of men? The Shadow Knows! Ha ha ha, or, I mean, hi, hi, hi, ho. (In NRC language, that is). Good grief, this is a Muse? Oh well, I guessthis is destined for ERC's "circular file." (Ha, fooled-ja, Ted -ERC)(A Muse is what YOU make it!)

ANGEL M. GARCIA - 32 Hillside Road - Hackettstown, NJ - 07840

Here's what DX has been taped since my last Muse: 8/25-C.R.L.-1165 ID @ 8:01. 11/5- I stayed on 566 from 5:48 until 6:14 listening to f announcer & cl mx, assumed Ireland; R. Cayman-1555 found accidentally @ 6:30; R. Columbia-725 ID @ 9:45pm. 11/10- WHOA-870 SIDS in the null of WW: @ 7:55. 11/13- R. Sonora de Guatemala-1188 ID @ 11:02pm. 11/16- Es Sonora-675 ID @ 11:19. 12/1- Blasting "This is Monte Carlo"-1466 @ 6:30. 12/6- R. Rumbos & XEQ fighting it out without any sign of CEM; R. Caribe-1040 ID @ 8:58; R. Margarita alone on 1020 @ 10:04; R. Fides-1025 ID @ 10:44. 12/10- Radiolandia-1160 ID @ 8:25; R. Internacional-1015 YSC ID @ 8:30. 12/13- Guinea-1403 beautiful full ID @ 9:03; they usually ID on the hour plus or minus a few minutes, it seems. 1/2- R. Corporacion-540 ID @ 11:58. 1/4- La Voz de Armenia-1081 ID @ 7:21 using 1k bandwidth on HQ-180 (I normally DX with it at the 2k position). 1/11- WKAQ-580 SIDS @ 7:02 carrying BB game - same game on WAPA-680 but no ID there. 2/2- R. Tropicana ID @ 1:25am on 540; R. Bristol-1546 ID heard but I missed taping it @ 1:44am, fortunately unnn. Mi Amigo assumed the powerful rocker on 1562 @ 1:30am. 2/10- R. Cosguina ID on 1155 @ 10:50, full ID from R. Casino--1176 @ 10:58. I have other DX taped which might yield some interesting IDs if I get an opportunity to re-listen to them. At first I thought the lack of TA's was my new location but it seems CX for TA DX have been poor overall. All times PM except where noted.

JAMES HOPKINS - 29 Grandview Avenue - Pitman, NJ - 08071

Since this is my first Muse, as intro is in order. I'm 18 & in my senior year at Pitman High School. I began in SW & switched to MW at the beginning of 1973. I've been DXing on & off since then. I first joined the IRCA, then the NRC. My current receivers are a Panasonic portable, a Realistic Astronaut 4, a Sony STR-6055 stereo, & a Sony TRM-9430W. I do 90% of my DXing w/the Panasonic though. My antennas are an LW, a 4' Wedge, & a 2' loop. My totals are 785/418, 42/41, 6/5, 22/8. I am now looking into an R-390 for an RX. On to DX: MM 1/31- WRBJ in on their TEST. I set the alarm for 3am, & found KHIL-1250 very good w/TT & a couple of IDs. I think I also heard them on lkw. Later, WTTI at it again, 4:05. 2/2 brought WBER-580 & WKKO-860 on SRS. Neither was in long enough for a report. 2/3- UnID tester on 1110 w/TT @ 1. 2/8- Cayman Is. -1555 w/good signal @ 7:45pm. 2/10- WGSB-970 w/NIS at midnight. 2/12- UnID TT on 1450 @ 12:45. 2/13- WMOO-1550 testing w/mx, then WGSB-870 for a report. 2:15, WNRI-1380 w/code IBs. Most of my DX is listening for tests. Well, I think I've said enough, so 73s till next time! (Welcome to the NRC, James! We'll be looking for many more Musings!--ERC)

LOTS OF MUSINGS MEANS LOTS OF ENJOYMENT FOR LOTS OF MEMBERS! SO, LET'S HAVE THOSE MUSINGS REGULARLY! PLEASE DOUBLE SPACE, AND PLEASE STICK TO A.M. & P.M., E.L.T. THIRTY LINES IS THE LIMIT PER MUSING. *ERC

DAVE BENNETT - 3145 176 Street - Surrey, B.C. - V3S 4N8 (VE7AZG)

Greetings. Well, my absences from these pages seem to grow longer and longer (and maybe welcome?) (But NO! -ERC) This time it took RJE to stir me up - more on that at a later date, perhaps. I'm writing specifically because of a recent trip to Hawaii, where I picked up a little information that may or may not be useful to the Mainlanders. KHVH-1040, Honolulu, is running an all-NX format, & has pickups from all the networks, which could be confusing. Also they run the CBS "Mystery Theatre" around the witching hour (local witching hour, that is!) KGMB-590 Honolulu, IDs as "The Coconut Network" or "KGM-Super-B", & has frequent song "I Love You, Hawaii" bits. One of the evening DJs calls himself Granny Goose. And unfortunately, I didn't get to do that much listening while there, so the info I did get was on the stations we listened to most. Evening reception on Maui (we stayed at Napili Bay) was sort of strange, with even the locals on Maui fading in and out. My beat up old Sony portable with its 2" loopstick couldn't hear anything outside the Islands. I was going to pick up a Realistic TRF whilst there, but the only Radio Shack on the island was out of stock. And I didn't really feel I wanted to spend \$40 for a \$30 radio here at home, hi! More from here later? Well, you never know! 73 for now.

JAMES E. CRITCHETT - 1635 Walbridge Street - Red Bluff, GA - 96080

I am still DXing at some time in each 24 hours. Nothing of interest to others from Tues. 2/8 through 2/11. Then @ 5:03 2/12 on 870 I heard a full ID of KAIM & KAIM-FM as a prelude to s/off. "Our Father" preceded the ID, & the SSB took them off the air; WWL mullied. KOIN-970 has been checked hourly on SMS & at least once nightly, and they have no Silent Period, nor had they changed calls to KYTE as requested in the 1/24 Broadcasting, as of 4:44 MM 2/14. KOOK was usually with them, too. SM 2/13, with KKIS off, @ 5:39 KTRM-990 IDed clearly. MM 2/14, KFRG-610 was not off, as reported by the Log. At 5:28 with KYXI mullied WKBW-1520 IDed as "KB", gave time as 5:28. I missed the possible s/on for f/c by KRGI-1430, but did hear a steady TT from 5:35 to 5:45, no ID. No KARM or KLO, so CKFH was heard, & WWL IDed @ 5:44. KALI SS heard, but too weak for ID. No KOSI IDed either. At 6:01 on 1000 I heard the SSB; possibly WCFL, but too weak. At 6:04 Sydney, NSW, Australia, was mentioned in the news. The WX NX was given, & it was said to be past midnight as LZD went off without ID; my first "Down Under" station here - I will try again in two weeks when KOMO is not testing. The last logging was at 7 when GHPQ-1370 IDed, mentioned CHUB, Nanaimo also; KEEN off. The first NRC Log mailed has not been received, really lost! 73s.

BOB WESSOLOWSKI - 1933 South 33rd Street - Milwaukee, WI - 53215

(the Polack with the Pabst & Philco). Another week has gone by & I still haven't seen any Muses from any of the other 15 Wisconsin members. Please write, fellas. I got state #41 2/13, WNRI TEST. I thought WMEE's usually-armchair signal would kill the frequency, but the CW IDs made it through fine. Thanks for doing the code slowly, Craig! I tried for the WKXO TEST @ 12 & 1:15, but not there; I had to work Monday, so I couldn't stay up any longer. Rats. OC on 850 must have been WIVS (2/14 approximately 1:15) but unnn. Second Sat. 2/12 again had quite a few unlisted testers, including a TT/OC mix 12:25-12:31 of 800k who looped N/S, and TT/OC & very high pitched TT mix on 900 12:55-1:01, looped WNW/ESE. The 900 was probably a PoP, but I didn't hang around to find out. Fri. 2/11 brought a couple of LA's: YNX-750 w/Managua mention very clear in WSB null 12:43am, & La Voz de Darranquilla-760 in WJR null @ 12:28. I also had some SS talk on 770 but couldn't ID. Now I wish I had taken SS back in high school! I also had WMOH-1450 in fairly clear 2/11 w/a spot for the WMOH Bridal Fair, 1:17am. I haven't done too much DXing lately, mainly due to a bad case of the "tireds". I guess I'm going to have to get my tape recorder ready to tape the WNRI TEST and have it ready to use all the time. I was amazed at how much more copyable the code was on tape than on the "original." I packed it away about nine months ago to unclutter my DX corner & almost had myself believing it really didn't help much. However the WNRI TEST & some comments on a verie I got about "Discrepancies" in my report (shame on me) convinced me I do need it. Best DX to all.

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with its single crystal filter - just to get better mechanical readout of frequency - is in this author's opinion making a mistake. It is a fact that the HQ-180's selectivity will separate signals 1 kHz apart that the R-388 cannot, even when properly aligned. Of course, if the comparison is made with the R-390A there is a better match, but of course the cost differential increases too. No hard and fast rules can be made here!

Some SW DXers have been using inexpensive Hufco counters to read the L.O. to determine the 1 and 0.1 kHz digits, using an interpolation chart to relate the digits presented to the incoming frequency. (E.g., 4.6 = 0.0 and 4.7 = 0.1 and so on). Of course this technique may be used with any frequency counter and will suffice if you are only interested in measurement of an already acquired signal. A pocket calculator will let you figure your received frequency fairly easily if you go this route but it is inconvenient when making "sweeps" looking for new signals to stop and calculate offsets all the time! The Hufcos were selected because of their low cost, and they are widely advertised in ham magazines. They also advertise a small board with a crystal that makes your counter act as a readout, for HF ham gear but it appears to operate with Linear Master Osc (IMO)-type gear, and the crystal makes it a fixed-offset device(25).

There exist other methods of achieving IF offset, such as heterodyning. A typical mixing circuit was published in QST (4) but it is frequency range limited and requires forms of "tweaking" that are unattractive, being an analog mixer device. On the plus side, the circuit is capable of measurement of incoming signals to about 1 Hz accuracy. It is known as the MacLeish circuit. As of last year, correspondence with the A.R.R.L. about readouts invariably brought mention of this circuit, with no mention of the type of circuit we describe later. However the current Radio Amateur's Handbook has a description of a receiver with a digital readout that is informative (30). It is possible to use digital mixing, as in the Heath SB-650 (17) but that particular piece of gear is intended for HF transceivers having a fixed HFO, variable VFO (or IMO) & a fixed BFO arrangement and the circuit is unnecessarily complicated for this application. With some experimentation it may be possible to wire the HFO input to zero, drive the BFO input with a small, shielded oscillator operating at 455 kHz, and drive the VFO input with the receiver, to make the SB-650 operate in this fashion. The unit currently sells for about \$160 on the used-gear market and may represent an alternative if it can be modified successfully. The author regrets he is unable to engage in correspondence concerning this topic. A couple of years ago, Heath was not helpful about prospects for such modification, apparently reflecting corporate policy in general concerning modifications to their kits, to be used with "foreign" products over which they have no control (26).

Manufacturers are coming out with LSI chips (Large Scale Integration, putting many functions on one silicon chip) that provide counter and readout functions for receiver tuning. An example are two MOS LSI chips now marketed by General Instrument Co. (22). As we mentioned, manufacturers are reportedly working on circuits using such devices, so the reader may wish to await developments here. Even the new Heathkit AM-FM tuner announced in their Christmas '76 Catalog offers a readout and may contain one of these new chips; we have not seen the specs on it as yet. The circuit may be an alternative to the counter we are using here, though perhaps accuracy may suffer. In addition, reportedly computer techniques are being adapted to this problem. Even with the dropping prices and availability of microprocessor chips such as the 8080 and Z-80 etc. while this remains a possibility, the cost of support systems and peripherals make this approach financially unattractive, unless you already happen to have your own home computer system up and running, as more and more people are. Then you could tie it into your receiver and probably take care of the IF offset in software.

There is another approach to the problem that we haven't touched on yet. One can obtain a digital readout without actually using LEDs or readout tubes. If the local oscillator is made up of a synthesizer circuit (divide by n osc. where the divide ratio is set up on thumbwheel switches) the receiver may be tuned to whatever freq. is wanted by adjusting the thumbwheel switches accordingly.

This approach is often found in VHF equipment, and 2-meter amateur gear and now even some CB gear features this kind of circuit. However, antenna and mixer peaking are broadbanded over the useful range of the equipment in most 2-meter gear, but this is not possible on a wide range HF or MF receiver such as we are interested in. This means you will have a separate "preselector" that must be peaked up whenever the receiver tuning is changed. The SPR-4 receiver is a good example of the separation of oscillator tuning from antenna/RF tuning (even though the osc. tuning remains analog.) In digital tuning, the oscillator is stepped along in intervals that may be made as small as practicable to ensure what appears to be smooth tuning. In commercial gear a 10 Hz step will often be found, and even 1 Hz synthesizer tuning may be purchased or built - for a price. While this is highly desirable in HF point-to-point circuits using single sideband, it is not necessary for DXing AM signals if a "clarifier" or "fine tune" can be added to a synthesizer that steps in increments of, say 100 Hz or 1 kHz to cover the area in between steps. This is analogous to the "delta tune" found on many CB radios. The problem as it concerns us is that a good synthesizer type commercially built radio is very expensive, often in the multi-kilodollar range, and a homemade synthesizer, unless it is carefully built, is extremely susceptible to noise pickup and frequency jitter, and either won't have the desired resolution or else it would be very expensive if it did. While 2-meter amateur transceivers cover from 400 to 1000 steps, in 10-kHz intervals (the 5 kHz shift up is added later), a synthesizer we could use on HF could have to cover 300,000 steps! This assumes coverage from DC to 30 MHz in 100 Hz intervals - a much greater octave span. Such a circuit would be a terror to homebrew, and so it is advisable to stick with analog tuning as is found in current receivers, and use an external readout. The end result performance after all, is the same. Readers who would be interested in the idea of building a simple synthesizer that covers the MF broadcast band in 10 kHz steps with the idea of perhaps, adding it to a small portable radio for field use might consult literature describing the TPT Model 760-01 AM receiver card that is used in their synthesized EBS receiver (27). In any event, the point ought to be emphasized that when "digital readout" receivers are discussed, it is instructive to examine whether the tuning is digital or analog, and just what circuitry drives the readout, as this can have a great effect on the price or cost of the entire receiver. A sensible cost compromise is found with such newer receivers as the XCR30 Barlow-Wadley, the Drake SSR1, the Yaesu FRG7 etc. which step in 500 kHz or 1 MHz intervals and tune analog in between.

Mechanics

We'll now take up the details of this particular counter. This is not a how-to-do-it article, but enough detail will be given to allow the experienced constructor to assemble the circuitry. It is probably fair to say that if the prospective builder cannot do his own layout, wiring and troubleshooting from the diagrams, he won't have the background or experience to troubleshoot problems that likely will arise in getting the project to work satisfactorily. If the reader paid someone to do the work, a deal would have to be made taking into account the amount of hand labor involved. We spent over 100 hours in assembly, checkout, modification and debugging of the initial unit, so it can be seen that the cost of labor would be substantial. However a great deal of that time was spent assembling modules that can be purchased, and in assembling the switches which also can be substituted (5,24). Use of these parts will save time but raise the cost of parts. Home made circuit boards for the clock section and the decade counters are assembled on "vectorboard" having 10 holes per inch, matching the IC socket pins. High quality sockets should be used for all ICs and are carefully epoxied onto the boards. If 6 hole/inch board is used, additional holes are drilled for the socket pins using a Moto-Tool drill press, or with care, a hand drill. Because of the number of overlapping wires, if etching were done it would have to be double sided with plated-thru holes and this is impractically complicated for a one-time shot like this, so we recommend point to point wiring. There is only one type of wire that is usable in this kind of job. That is untinned, solid copper #24 wire that is used in telephone work, either in 4-conductor cream colored drop cable, or preferably in the 50-conductor bundles used in office telephone installation work. An installer can likely get you a 3 or 4 foot hunk and, when opened up, will give you all you need.

There are many color coding combinations available which makes hookup and lead tracing easier. A small 25-watt soldering iron (not a gun) is needed to make the close-together connections. Alternatively, wire wrap techniques can be used by those so equipped. The descriptions of the boards are given later in the article.

The author's own unit consists of the following main sections, which will be described pictorially at the end of the text in the second part of the article.

- a) Power supply. The TTL circuitry requires 5 volts exactly (within 4.75 and 5.25 V) at about 2 amperes total. We use 2 separate supplies, each rated at 5 volts and 1 ampere. This can be done with a 6.3 volt, 1.2 A filament transformer (an easily obtainable import item). The rectifier can be a quad of 1N4002 types, or a bridge with adequate ratings. We tried the HEP R0801 but they got quite warm and were not used. The regulator can be a zener clamped series pass transistor but a type LM-309K regulator, which looks like a transistor, is recommended. Several thousand uF filtering are needed for each supply. One supply operates the logic (the ICs doing the counting) and the other supply operates the 7447 Numitron drivers and the Numitron readouts themselves. The 7447's sink about 24 ma to ground per segment in Numitron service (20) so with an average display reading of 25 segments being illuminated, about 2/3 ampere is needed here alone. Using 2 supplies keeps glitches created by the high current switching from getting back into the logic and creating false triggering. In my unit, the power transformers each rise about 10° C above ambient, and the internally contained ICs themselves generate a just noticeable mild heat. The LM309K's should be heat sunk. It is OK to use a single 5 V supply if one is available with adequate current rating. A LM-321 might be used in this application. Extensive 5V buss decoupling is necessary in such case.
- b) Clock board. This is a 100 kHz time base oscillator, with a 74121, and a series of 7490 ICs wired for divide-by-10 and a divide-by-2 to generate the 20 msec clock signal and associated gates and inverters to create the gating, preset and strobe pulses needed to step the decade counters, latches and display drivers in the proper sequence. A 1 MHz or even a 4 MHz T.B.O. can be used if available, just by adding extra dividers in the chain of 7490's, but the improvement in accuracy is not necessary, because of the counter's low resolution (100 Hz). The board must be hand wired, as no commercial equivalent is available. If a 100 kHz T.B.O. is used, there will be (1) 2N706, (1) 74121, (4) 7490 and (2) 7400 IC chips (total 7 chips).
- c) Decade board. These can be purchased (5,24) or hand wired. Either 5 or 6 can be used depending on how far up in frequency it is desired to operate. For reasons described later it is possible to use 5 boards, and 6 readouts, the 6th can be either wired to indicate a figure "1" (overflow) or can be turned on manually to indicate a "1" when operating between 10 and 20 MHz. This saves on cost and power consumption. Each decade board contains a 74192 decade counter, 7475 quad latch and 7447 decoder/driver. The 74192 and 7475 operate with what is known as "binary coded decimal" counting in which 4 parallel lines (representing 1,2,4 and 8) contain information representing the number in question, depending whether they are "off" or "on". Thus, if the "1" and "4" lines are "on" and the "2" and "8" are off, 1+4=5 which is the number being sent. The binary number equivalent of 5 is 0101. So 4 wires can carry 10 possibilities for numbers. The quad latch simply stores each of those 4 states at the same time (parallel mode). A decoder translates the BCD coding into signals that operate the 7-segment readouts. There are reference works (6) that describe this more fully; they are highly recommended reading. Each board has as many as 18 connections on it, although not all will be used at once, or in normal operation e.g. lamp test, blanking. Unless you enjoy long hours with soldering irons and tiny wire we recommend purchasing decade boards and spending the extra money.
- d) Input board. This takes a fraction of a volt signal from the local oscillator tap, amplifies and squares it so it will operate the TTL circuits in the counter. The circuit we ended up using was the one appearing in the CES literature (1) as it was the best, simple one tried so far. There are a number of other circuits that can be used. A good library of amateur radio magazines will yield many interesting circuits. For example, page 22 of the Oct. 1976 QST has an interesting input ckt.

- e) Readouts. We used the RCA type Numitrons because we got a price "break" on them (15). They are incandescent filament readouts in an upright (not slanting) format and are planar (not having one figure behind the other, as in a Nixie-(Burroughs trademark)type readout). The figures are nice and large, being 0.6 inch high and 0.35 inch wide (15.24 x 8.89 mm) which is several times the area of a LED. These tubes fit in a standard 9-pin tube socket, and today cost about \$5 each, so LEDs would be cheaper. In addition the Light Emitting Diode readouts use less current and require a less complex mounting arrangement to shield stray light behind the displays. Mounting detail is left to the reader's ingenuity. If the tubes are used, the sides have to be painted with dull black paint, a baffle is needed behind them, a window of dark red plastic should be used, and a brace has to be made for the tops of the tubes to keep the characters aligned upright in their sockets. LEDs require only the window, which can be made of acrylic plastic, though polarizing plastic is preferred. An attractive format readout can be created by substituting the Hewlett-Packard type 5082-7300 readout. These use a 4x7 dot-matrix display, giving a highly legible, precisely defined numeral which is 0.29 inch tall. They can be driven directly from the 4-line parallel BCD output of the 74192 as the latch and decoder function are carried on the same chip. Unfortunately, the cost of \$15 per chip offsets that savings. The 5082-7300 have appeared occasionally on surplus as low as \$6 per unit. Check the ads in the ham magazines. They look like an 8-pin IC and the number appears on the top surface, so they are mounted upright directly behind the viewing window. Note that LED and incandescent readouts need only 5 volts supply. Nixie readouts, being a gas-discharge type, need a 170 volt power supply and tend to radiate more hash; their use is not recommended by us. Their obsolescence is manifested by their low cost in surplus, \$2 per tube. A good way to connect the boards to the readouts is by using color coded "spectra-strip" which is a multiple conductor, flat ribbon cable, each wire being a different color, which peel apart when needed for connecting. A series of lugs have to be made up and attached to the edges of the boards for anchoring such connections.
- f) Presets. These are switches that load the preset number into the 74192's. If we use slide or toggle switches, 4 switches are needed for each decade in BCD fashion. We used a bank of slide switches as they were obtained as samples at the IEEE electronics show for cost = zero. Thumbwheel switch preset (23) is much preferred, however. These are often advertised by the same outfits referred to previously. It is essential to obtain a BCD Coded switch. If the readout is going to be used on a single band and/or a single receiver, the preset values can be determined experimentally and then permanently wired into place. This appears to be the approach taken with the Worcester MW receiver (13). In practice, all the preset does is to switch a pin on the 74192 between 5 volts (thru 1K ohm) and ground, and a SPDT switch is used. If a number greater than 10 is preset (e.g. 1 and 2 low, 4 and 8 high = 12) an "illegal" combination will be shown. This will be an illegible figure such as a backwards "C" or a "U". Refer to the numitron literature (15) for details. Note that this is impossible with a thumbwheel switch preset. Accidentally bumping a slide switch "on" when it is not wanted, can cause erroneous readings that are not always obvious, or give the impression a segment has opened.

So in this case, we have an input board and clock board on each end of the chassis, decade boards side by side in the middle, just behind the row of readouts, and the power supply and preset switches on the back of the chassis; the window the readouts show through is on the front. It may be a good idea to use as large a chassis as possible to allow access to the parts during checkout and servicing. This can make shielding easier, also. A very satisfactory format is the one the CES uses (1). We used a standard chassis 3" high x 10" wide x 5" deep (Premier ACH-401) with the power supply on a subchassis 3" x 3 1/2" wide x 2" deep (a standard minibox size) and the preset switches were on a separate extension at the rear, next to the power supply. We subsequently added the thumbwheel switch preset, on a bracket facing the front, and recommend this be done in future models of this project. The chassis size is reasonably compact but makes for problems during checkout and servicing which required repeated unsoldering and disassembly of the unit as certain parts of the boards could not be reached. (The builder may wish to add test points on his boards for this reason).

Operation

The counter connects to the receiver's local oscillator. Unlike many commercial circuits, this requires but a single coaxial lead. Inside the receiver we installed a cathode follower isolation stage yielding several hundred mv output which varies depending on the type of receiver, and the frequency to which it is tuned. Use of this stage yields negligible detuning of the oscillator itself (referred to where it would be oscillating were there no load connected to it.) The detuning, with the cathode follower, is zero throughout the MF range, several hundred hz at 4 mHz, and about 1 kHz detuning at 15 mHz with the input cable connected to the counter in the "off" mode; there is about 4 kHz detuning at 15 mHz when connecting to the counter when it is "on". This connection has to be added inside the receiver. We used the same circuit as was used for the video takeoff from the mixer when we described the operation of the Heath SB-620 Spectrum Analyzer (7). Other circuits have been written up which do as good a job (28).

When the local oscillator plate is connected directly, through about 33 pf capacitance to the counter input using about 18 inches total feedline, the local oscillator is detuned from nominal frequency due to capacitive loading and the receiver's mechanical dial calibration is seriously upset. The detuning gets progressively worse as the frequency is increased. We ran this test on three different HQ-150 Hammarlund receivers and got similar results in each case: For a received frequency of 1 mHz, detuning was about 750 Hz. At a received frequency of 5 mHz, detuning was 7 kHz. When receiving 7 mHz, detuning was 10 kHz. At 10 mHz, the detuning was 25 kHz. After that point it gets much more serious, so that at 15 mHz the detuning is around 200 kHz and at 20 mHz it is around 300 kHz. The worsening performance above 10 mHz is apparently due to a different L-C ratio in the receiver's oscillator tank circuit. A different input circuit on the counter may make this effect less noticeable. It should be recalled that serious detuning at HF will compromise mixer alignment, resulting in weakening of received signals or an increase in "images" generated in the receiver. The Mattis circuit (29) that has just been announced as this is written may or may not exhibit this problem on some receivers due to the lack of an isolation stage, on the other hand the Mattis uses a MPF102 JFET as the input device which presents a higher impedance than our circuit (the CES circuit) does, so it is hard to tell how serious the detuning will be in this case. We are looking forward to conducting bench trials with the Mattis counter to determine how well it works, and if noise and pulling problems are serious or not.

When operating with either of the Hammarlund HQ-150s in use here, stable triggering of the counter is obtained from 535 kHz to past 16 mHz (8). The 4 digits representing whole kHz humbers are stable and do not blink, when the receiver is tuned between the adjacent number "step" points (such as when tuned to 710.5 the readout will show a stable 710). The 0.1 kHz digit will fluctuate between two adjacent numbers, depending on where exactly the receiver is tuned. (The readout would jump between 710.4 and 710.5, with the 0.1 kHz digit displayed, in the example just given). This jitter in the 100 Hz digit is due to the "plus or minus one count ambiguity" problem found in asynchronous counting where the counter accepts more or less of the final cycle of energy and either counts it or not, so each successive readout of the count may be 1 more or less than its preceding readout. (31) This is the reason that original QST author Hagen opted for an undisplayed 0.1 kHz decade, as well as for cost factors; also the reason the same approach is taken in the Mattis circuit. The actual counting period, being 10 ms, makes the 0.1 kHz reading actually become the last digit counted and the +/- 1 count ambiguity directly shows up on the 0.1 decade readout. However, being tolerant, curious and analytical in nature (yes, we have faults, too, hi) we decide to include the 0.1 kHz digit and have found that by applying an integration process by eye, when watching the flickering 0.1 kHz digit it is easy to see which number it tends to display the most, and that becomes the reading sought. The problem in practice is less than this description would make it seem. This enables us to get readings to 100 Hz on received signals that we are confident lie within a 300 Hz bracket and this is as good as the much touted R-390's unless you are right up there with the mechanical corrector; such procedures are not necessary with the counter.

Incidentally care must be exercised when the count is jumping between two adjacent digits. Repeated shifting between a "6" and a "7" looks very much like an "8" and a slight mistuning of the receiver will resolve such a problem.

In a single conversion receiver such as the Hammarlund HQ-150 the local oscillator operates about 455 kHz above the incoming signal on the 4 lower ranges (540 kHz through 10 mHz inclusive). The counter is thus set for the complement of this offset. In actuality the offset depends on the center frequency of the receiver's IF passband, or the resonance frequency of the crystal filter - if the IF is aligned to match the crystal filter's response point as it should be. The crystal used in the Hammarlund HQ-129X, HQ-140 and HQ-150 series are all centered around 452 kHz (10) and IF alignment is made accordingly. This preset value was determined empirically by tuning in a known-frequency signal and adjusting the preset until the display read correctly. Then, with the input disconnected, the 6-digit display will read "99548.0" and the 5-digit will read "9548.0". (11). On the higher frequency bands, however, and this is on the 10-18 and 18-31 mHz ranges on the HQ-150, the local oscillator frequency is below the input. In this case the preset on the counter is changed to read "00452.0" which adds the IF offset to the L.O. signal, again giving the received frequency as the display (12).

The alignment of the receiver used should of course be good enough to ensure what is known as "tracking" (18). This means that the antenna and mixer alignment reasonably follow oscillator alignment (tuning the receiver) by a constant offset (the IF) as the set is tuned through its range. In practice, if the dial calibration is within, say, 50 or 100 kHz in the HF range it won't noticeably affect mixer peaking vs. received frequency; with such "error" of course, the digital readout will replace the mechanical scale as the calibration standard. On the medium wave band it is desirable to have mixer tracking as exact as possible, because of the large disparity in wanted/unwanted adjacent frequency signal levels found on MF, and small tracking errors are much more disadvantageous than they are on HF. The ideal solution is to add mixer tuning to the receiver (21).

In use as a tuning indicator, it is good practice to misalign the preset by 100 or 200 Hz from the exact center of the receiver's passband (13). Thus when a signal at say, 1400 kHz is tuned in, the count will jitter between 1400.1 and 1400.2 as indicated on the readout. If the preset were set so that the counter read out 1400.0 under the same circumstances, the jitter would make the count change between 1399.9 and 1400.0 which is visually unattractive. If desired, the 0.1 kHz digit can be extinguished by grounding the "blanking out" pin # 4 on the 7447 IC through a small SPST switch. This is a pin you can tie right to ground. The decade board behind it is left in operation of course as it is the first counting stage. This eliminates the flicker and gives a stable "whole kHz readout". In actuality, a readout to 100 Hz is not really necessary when used on the MF band as a tuning aid (13). It can at times be more useful on the HF SWBC bands and the Ute bands where frequencies don't fall into exactly defined channels, and on the Ham bands when tuning 3SB signals. When measuring signals, we turn on the BFO and tune in a nearby crystal calibrator checkpoint, tune the receiver to indicate say 3900.0 on the readout and trim the BFO the last couple hundred Hz (if necessary) to get a zero pitch beat note. The preset on the readout normally is left alone. Then, when any signal is tuned in to give a zero beat with the BFO on, the counter directly reads it's frequency, ideally to about 100 Hz. Checks with known nearby broadcast carriers verify the BFO calibration. A regenerative Q-multiplier can substitute for the BFO in this application.

It does not really pay to resolve frequency closer than 100 Hz because of the wide bandwidth of the receiver's IF that is needed for satisfactory reception of AM signals. Limitations in the audio response of the receiver make resolution to the next greater order of magnitude i.e. 10 Hz very difficult, and there is no corresponding benefit in so doing. In normal use, readout to the even whole kHz has proven to be very adequate and optimal when scanning the bands, looking for new signals. There is a "no mans land" between 100 Hz resolution described here, and the 1 Hz resolution that PFM techniques

imply, and a different procedure (using a transfer oscillator with a high accuracy direct counter) is needed to secure such results (14). In any event, PFM techniques are based on a different set of needs and available data, and are not of concern here. Other circuits such as the MacLeish (4) can be employed that can serve both goals, although the disadvantages were touched on earlier. So, we point out that this is not a "precision" measuring device, it is just an indicator - although when used with a receiver with 100 kHz of range in a half inch of dial, it can seem like precision!

It may be noted here that, unlike mechanical dial scales that crowd together as the frequency is increased, the error bracket of measurement remains constant (at 300 Hz at the outside) throughout the entire tuning range. We should also point out that, as long as the IF passband (center frequency) of the receiver is undisturbed, this device is "self-aligning". Whenever the receiver is tuned, the change in frequency of the L.O. is what brings the signal into the IF where it is subsequently turned into audio. This same change is what is indicated on the counter. Thus the counter must, by definition, indicate where the receiver is tuned. Any slippage in the dial or other mechanical malfunction makes the desired signal jump past as the receiver is tuned, but the readout jumps past the wanted frequency in the same fashion. In normal operation the set may be tuned to a wanted frequency with the RF gain all the way down. Upon bringing it up, there is the desired station, perfectly tuned in. (So far..this technique has failed to work with 4QD-1550, Falklands-2370 and a few others...) At any rate, this can be beneficial in recording DX tests etc. when the DXer is working or is away. Someone else in the house has to merely tune the set until the wanted frequency appears on the readout, start the recorder and adjust volume to suit. This eliminates problems with tuning errors associated with initial warmup drift when recording "blind" as the untrained operator can set the tuning properly without having to know what to "listen for".

Use of an outboard IF adapter with mechanical filters is no problem, if you find, as is often the case, that the mech. filters have a different center frequency than the crystal filter. All that is necessary is to adjust the preset by a few kc, or how much is needed to make the tuning accurate again. In addition, if coverage of the longwave band is desired, a converter such as the Hagan unit (32) can be employed to upconvert LF signals to HF. A simple adjustment of the preset is all that is needed to give accurate readout on the LF band. In our case, a 4000 kHz conversion frequency is employed, and by adjusting the preset from "9548" to "5548" we can tune in 4000 with a "000" indication on the readout, the thousands digit automatically blanks out when a zero is indicated. In this case, Allouis-164 is heard at 4164 on the HQ-150 and the readout indicates "164" and we have the full HQ-150 selectivity available on LF to separate LWBC stations from beacons. This is much easier than with regenerative sets such as the RAK, RBL, Radiomarine etc. and gives coverage below that provided by the BC453, that is, below 190 kHz. In our opinion, the converter way is the best way to go to get on LW assuming a good antenna and fairly noise free location are available, otherwise nothing will work for you. We might mention, the Hagan converter is an excellent circuit. We get full coverage of the MF Broadcast band between 4550 and 5600 kHz HF with as good results as on direct reception, except for the more crowded tuning range, and occasional weak feedthrough of a powerful utility being heard directly inside the receiver.

Another nice thing to bear in mind is that in a disk rim-drive dial receiver, which so many are (others are string and pulley drive, or direct LMO readout e.g. SPR4) even if the dial plate becomes split, warped, chipped or otherwise unusable, the receiver itself can still be kept in operation! Just fabricate a sheet of BLANK Plastic, or even use a gear reduction drive directly on the tuning condenser shaft, and you can still use the set. Without this capability, the set would be valueless.

The counter generates a slight amount of interference, detectable as a weak, muddying hum on occasional frequencies in the lower HF range. No interference has ever been noted on the MF range. The counter generates some weak birdies when it is being fed a signal that appear in VHF and tune as the receiver is tuned, and have been noted in the 2-meter gear and on a nearby TV set as a very weak herringbone.

This interference is due to inadequate shielding and bypassing and probably hum modulation effects coming from ripple in the power supply. The noise, what little of it has been noticed here, is not considered a serious enough problem here to warrant extensive modification and reworking of the layout and design. Better shielding and use of ferrite beads would solve a lot of the problem, it seems. We have noticed that below about 7 MHz, use of an unshielded single wire between the L.O. output jack on the receiver front panel and the counter input eliminated some of the noise problem. We can do this thanks to the low impedance output from the cathode follower driving the line; this won't work with a direct tap type hookup. In any event if there is any question about interference, and when doing extended weak signal work it is advisable to switch off the counter to eliminate any possibility of QRM (19). The counter comes on instantly when powered up and does not need any warm up time, as drift in the time base osc. is negligible. So it can be left off when a desired frequency is located if the receiver will be left there for a while, in the event there is a noise problem. The displays are not multiplexed. This eliminates a substantial cause of RF hash that other solid state devices (such as digital clocks) exhibit. Individual layout and shielding as well as the type of receiver and antenna in use can all make a noticeable difference in the likelihood of interference. A small transistor hand held portable picks up moderate digital "hash" when held right against the display window, but the hash cannot be heard several inches away. It is strongly suggested that a counter of this type not be included inside the cabinet of a receiver unless extraordinary shielding is employed. This would indicate use of a completely enclosed metal case.

The 100 kHz time base employs a J-K H17T crystal in a CR-42/U holder which was borrowed from a calibrator in the Hammarlund receiver. The output was brought to a jack on the front to aid in alignment. As long as the oscillator itself is within several Hz of being on frequency (a very loose tolerance) the accuracy of the display will not be affected, and precision alignment is not absolutely necessary. Just the same it is advisable to get it as close as possible. The trimmer in the circuit cannot be grounded so a variable with isolated rotor and stator, or a compression trimmer must be used, and the alignment made with a nonmetallic tool. Unless you use another circuit in which the trimmer rotor can be grounded. The 2N706 osc. transistor may be substituted with RCA type SK-3039 or HEP S-0011. The oscillator cannot be heard in the receiver by radiation from the unit. If the counter were built inside the receiver cabinet, there might be a small amount of pickup. The signal from the 100 kHz test jack can be coupled directly into the receiver's antenna circuit as a check on the T.B.O. calibration by zero beating it against a broadcast carrier on an even-hundreds frequency such as 800, 1000 etc. or WWV. The harmonics are strong enough to allow this.

The counter may be used as an ordinary frequency counter by setting all presets to "zero". In such a case, observe resolution limits and max. frequency. See also the remarks about zero blanking (12). Note that the type 74192 is rated to toggle up to 32 MHz but some chips do not reliably go this high, and need clean input signals. The use of type 74LS192 chip in the first stage (or in all decades) may help with high-end reliability. Readers interested in good accuracy in ordinary direct frequency measurement at MF, HF and higher frequencies are advised to obtain a counter intended for such work. 50 MHz counters (with external prescalers extending the range to 500 MHz) that read to 1 Hz can be bought in kit form for around \$250. A wide selection of such devices is regularly advertised in the amateur radio press.

If reception coverage down to, say 520 kHz is desired in your present receiver, a padder can be added across the oscillator tank to pull the frequency down the last few kHz that your set won't ordinarily cover. The counter will indicate how much extra tuning range is obtained in this way. This may be a quick and easy way for many DXers to log stations such as Radio Rumbo, Costa Rica who were recently heard on 527.3 at 0502Z signoff, or the powerhouse Algerian on 529 who blast in when conditions are good. The additional range that can be had by padding the low end of the oscillator won't be much more than about 10 or 15 kHz before sensitivity drops off a lot, so this technique can be considered only a temporary "gimmick" to see what happens. All that is necessary is to clip a variable across the osc. tank coil and tune it while watching the readout indication.

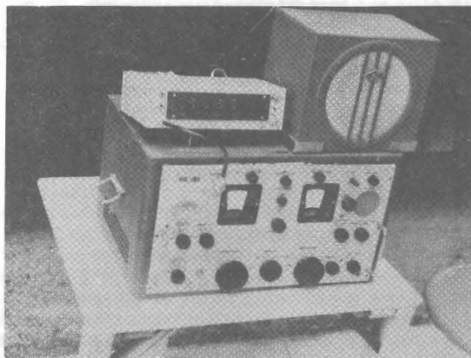


Illustration of author's 6-digit readout, with 4 digits illuminated. (May not indicate in offset print). To left of window, power switch and 10K digit "on" switch; input jack at bottom. To right are 100 kHz trimmer with 0.1 kHz digit blanking switch; 100 kHz test sample jack at bottom.

* * * *
This unit is 100% home constructed. Kits and/or boards are not available.

Index of Footnotes, References and Supplemental Material.

- 1) Digidex review, DX News 23 Feb 1976, and CES review (Model 100), DX News, 19 July, 1976. Heath SB-650 produced by Heath Co., Benton Harbor, MI 49022; possibly a discontinued item at this time. In addition to the Digidex and CES products, a German firm is marketing a device known as the DCR-30 intended to give a 3-digit readout with Wadley-loop circuit, and other receivers (depending on suffix letters N, S and U). This item may or may not be available in the U.S.; indefinite at present.
- 2) Two frequency counters with offset as an option are the Fluke Model 1941A, which cost \$350 new and is no longer in production (see Application Bulletins AN-12, AN-13 and AN-15 dated 1974) and the Ballantine Model 5700A (see review in Electronics, page 133, 25 Sept. 1972) which cost nearly \$900 dollars.
- 3) Technical Topics, SPEEDX, page 6, April 1976.
- 4) "Frequency Counter..", MacLeish, QST, p. 15, October 1970, page 11, May 1971 and page 31, June 1972.
- 5) A good mail order house for many of the parts required is Solid State Systems, Inc., P.O. Box 617, Columbia, MO 65201. Ask for their catalog. There are many others, too.
- 6) Two very good references that should be widely available are "Transistor-Transistor Logic" published in 1973 by Howard W. Sams Co. # 20967 (\$5.50) and "TTL Cookbook" published in 1974 by Howard W. Sams Co. # 21035 (\$8.95). These books are 176 and 335 pages respectively and will answer most questions the reader might have.
- 7) "Use of the SB-620 Spectrum Analyzer", DX News, 9 December 1974 (part 2).
- 8) Erratic triggering past 16 MHz in the author's unit is apparently due to decreasing L.O. output from the receiver at higher frequencies being unable to reliably trigger the counter's input circuit. More sensitivity and use of a 74LS192 in the first stage would be suggested. Oscillator injection is demonstrably weak on the 18-31 MHz range in this receiver series resulting in relatively poor sensitivity even after RF and mixer alignment is verified. Other receivers may have more drive at higher frequencies. Tom Sundstrom's HQ-150 operated the same counter to 24 MHz without using a cathode follower stage.
- 9) "A simple Frequency Counter for Receivers", Jon Hagen W7URZ, QST, Page 11, December 1972. See also, Feedback, QST, Page September, 1973 under the Technical Correspondence section. Also, Jenkins, private correspondence.
- 10) This agrees well with other checks made during alignment of several receivers in the HQ-129 through HQ-150 series and with experiments made using a well-calibrated EC-453 receiver as a tunable IF with the HQ-150. Over 6 similar rx's all show this.

- 11) When receiving a signal at 1400 kHz, the receiver's local oscillator operates at $1400 + 452 = 1852$ kHz. If the counter is set up initially at 9548.0, when counting the 1852 it will end up at $9548 + 1852 = 11400.0$ and the lefthand "1" will overflow and not be seen, with the "1400.0" appearing on the readout. For this reason, in a 6-digit display the two lefthand digits must be preset to "9". In that event, $99548 + 1852 = 101400.0$ and again, the left hand "1" overflows and the reading of "01400.0" is obtained. Over 10 MHz, the "1" for ten-thousands kHz will then indicate. E.g., when reading 10200 kHz, $99548.0 + (10200 + 452) = 110200.0$ and the 10200.0 is displayed.
- 12) If the counter is going to be used below 20 MHz only, a slight but worthwhile savings in parts cost and current load may be achieved by installing 6 readouts (00000.0) and 5 decade boards (0000.0) and the "1" in ten-thousands will have no decade board driving the digit. On the lower bands, when presetting, the "thousands" digit is always preset to "9". On upperbands, the thousands is always preset to "0". This change between 9 and 0 is accomplished by either grounding, or connecting to +5 V thru a 1K ohm resistor, the two appropriate pins on the 74192. The +5 V introduces the desired preset number, and grounding introduces the zero. By handling this task through one half of a DPDT toggle switch, the other half of the switch can be used to turn on the two segments in the 10,000's readout tube that illuminate the figure "1" by directly applying voltage to the readout pins. (In a Numitron, pin 2 goes to the common +5 V supply and pins 5 and 8 are grounded, recalling that segments are turned on by grounding them through the 7447 driver which is a process known as "active low" operation). This, then, gives a complete readout without a separate decade board needed only to indicate when the count has passed 10 MHz. The disadvantage is that if you tune below 10 MHz in the high band range the displayed "1" stays lit, so that tuning down to 9950 would indicate "19950" until the "1" was turned off. This is not a serious problem in the HQ-150 and similar receivers as the break point where preset must be inverted happens to fall at 10 MHz. We emphasize that users who wish operation above 20 MHz, or attach a readout to a double-conversion receiver with fixed first oscillator on high bands (depending on the signal takeoff point) will want to include all 6 decade boards, and in addition, an adjustable preset on all 6 decades, not just a 9/0 choice. A thumbwheel switch preset is advised in such cases, and in that event the switch scheme just mentioned would not be used.
- 13) Worcester recognized the problem with 0.1 kHz readout in his description of the MW DX receiver he sells, in DX News for 17 November 1975. However, due to the limited range of spectrum his readout operates over, he was able to achieve his goal by offsetting his time base oscillator, a 16 kHz crystal, by a small percentage rather than offsetting the preset by a fixed amount as done here. This means that accurate tuning is achieved, when in 1 kHz resolution, by tuning just above the point where the units digit changes value from the next lower figure.
- 14) PFM (Precision Frequency Measurement) is discussed in an article by C.A. Taylor in Naswa's FRENDX beginning in March, 1976 and running in installments. SAH work (Sub-Audible Hetrodyne) was first described in DX News in 1965 and refers to the low frequency (typically < 25 Hz) beat note between 2 or more broadcast carriers on nominally identical frequencies. Inferential identification of stations can at times be made by precisely measuring these carrier frequencies and comparing the results to previously obtained data, or published figures such as are provided by groups such as the European Broadcast Union. An unpublished paper, "Frequency Signature Analysis" by Nelson will provide more detail if it is made available.
- 15) RCA Publication NUM-421 describes operating characteristics and applications of Numitron incandescent readouts. For information on LEDs the reader is referred to catalogs of such firms as Hewlett-Packard Optoelectronics, Monsanto, Opcoa and Litronix, for examples. Many such devices are widely available in "surplus".
- 16) Digital Station Accessory, Conklin, Ham Radio, Feb., March and April, 1972.
- 17) A review of the Heath SB-650 may be found in the New Products Section of QST, page 56, August, 1972.
- 18) For information on tracking of superhetrodynes, see Radiotron Designer's Handbook, 4th edition, section 25.3 (p. 1002). Also, "Graphical Solution of Superhet Tuning Design", QST, page 52, May, 1950.

- 19) This would also be a useful feature in the Worcester receiver to provide the possibility of battery operation. However, use of high voltage semiconductors in the mixer gives the impression that battery operation would not be feasible in any event with this particular receiver, unfortunately.
- 20) The type 7447 draws 43 mA. per package (plus readout drain). The 7475 draws 32 mA. The type 7490 and the 74192 draws 65 mA. The reader can approximate expected total power consumption based on the number of chips employed.
- 21) Mixer tracking was discussed in DX News, 6 January 1968 and a description of the addition of a mechanical linkage mixer trimmer in the HQ-150 is covered in the NRC Receiver Manual (first edition). This job can be done either with a mechanical linkage to a small capacitor replacing the mixer trimmer or with a variable capacitance diode, pot and bias supply. No commercial receiver literature we have ever seen has acknowledged the advisability of ensuring mixer alignment, much less dealt with it. This procedure is of importance usually only on the MF Broadcast band.
- 22) General Instrument Corp. has developed two MOS LSI chips for use as readouts for receiver tuning but either have a fixed (mask programmed when the chip is etched) IF offset, not enough range, or inadequate freq. resolution. Data we have on hand unfortunately indicates neither chip is suitable for DXing applications. Mostek Co. has developed a multi-digit programmable counting chip but no data is on hand.
- 23) If a thumbwheel switch is used to program offsets, it can be interfaced to the 74192 by putting a 1N914 type switching diode in each lead between the switch out and the preset pin with cathode on the pin side; anode on the switch side. Each IC pin then has a 270 or 330 ohm pull-up resistor attached to ground. The "common" on the BCD coded thumbwheel switch is then fed directly with +5 V and the 1K ohm is no longer needed. See QST, page 36, July 1973 for a description of interfacing procedure. See Solid State Systems catalog number 69-21021 for rear-mount 10-position BCD switch that will work well. Cost \$2.50 per decade.
- 24) A suggested source of decade readouts is the ESE Company's ES-900 series Modular Display Units. Each module includes a printed circuit card, 7-segment incandescent readout tube, and 7447 decoder-driver. If the module that also includes the 74192 and 7475 (both are options) is selected, the number to order is ES-955 for a 5 digit readout and ES-956 for 6 digits. Cost for the -955 is \$81.50 and for the -956 is \$94.00, and the card connector is another \$5.00. Information may be obtained from ESE, 505½ Centinela Ave., Inglewood, California. (Prices as of April 1976). In addition, Solid State Systems, P.O. Box 617, Columbia, MO 65201 markets Universal Decade Counting Units. See page 16 of their Spring 1976 Catalog. A DCU with the catalog number 11-X9251 uses 74192-7475-7447-Filament Readout, and 11-X9252 uses the same logic with a LED Readout. X = the number of decades. An 11-69251 cost \$91.50 and an 11-69252 cost \$103.50.
- 25) The Hufco "Digidual" advertisement can be found on page 90, Ham Radio, November 1976.
- 26) The reason that kit manufacturers have not come out with a digital readout kit is likely due in large part to the difficulties and uncertainties of interfacing the readout with differing local oscillator circuits and mixer conversion schemes as found in various receivers. This requires some background in receiver theory and problem-solving ability and conflicts with the philosophy of at least one major kit manufacturer concerning background in electronics needed to make kits work when assembled from the manual provided with the kit.
- 27) The AM receiver card in the Time and Frequency Technology EBS receiver, part no. 760-01, which is marketed for broadcast stations, has a synthesized local oscillator that is programmed with 3 thumbwheel switches and steps in 10 kHz increments, and works with a 460 kHz IF. The card contains 15 digital ICs, a 5 MHz crystal and other parts; dividers are type 74176. It uses a separately tuned preselector.
- 28) "A Panadapter Converter", WB2CCM Forney, 73, page 64, March, 1967. Uses a 6AB4.
- 29) After this article was substantially prepared, an article titled, "Digital Frequency Readout for Shortwave Receivers" by David L. Mattis appeared in the February, 1977 issue of Popular Electronics. The attractive feature of this article is the availability of a kit with boards and all parts, from Mattis Electronics, Box 162, Morton Grove, Illinois 60053. A complete kit costs \$109.95 (kit SW-5).

- While we have not tried out the kit - we hope to do so soon and report the results here - we think the circuit looks good and that readers who are not interested in constructing their own unit from scratch obtain a copy of the magazine, or write the firm directly. The kit uses LED readout with 5 decades and reads to 1 kHz accuracy.
- 30) See chapter "Receiving Systems" part, "A Communications Receiver", the 1976 Radio Amateur's Handbook, page 281-288. This is a 3-input counter circuit, similar in philosophy to the SB-650. However it may yield worthwhile hints.
- 31) Suggested reading includes, "Time Interval Averaging", Hewlett-Packard Application Note 162-1, and "Frequency and Frequency Measurement", Willrodt, Electronics World, page 25, October, 1966.
- 32) The Hagan Longwave converter uses a double balanced mixer to convert signals in the 0-2000 kHz range up into HF where they can be received on a HF receiver. It is available from James V. Hagan, 896 Port Malabar Blvd., Palm Bay, FL 32905. See DX News 10 January 1977 for details.

* * * *

Other recommended reading material includes the following:

"Build a Counter for your Receiver", Regula, 73, page 28, October 1976. This is a very worthwhile article, however the circuit is fairly complex.

"Frequency Counter Input Circuit", Powell, 73, page 89, February 1973. See also page 125 of 73 for January 1974.

Leading Zero suppression for Digital Displays" (Nixie tubes), Jackson, 73, page 107, January 1974.

For more information on adapting the SB-650 to your own system, see "Using the Heath SB-650 Frequency Display with Other Receivers", Ham Radio, page 40, June, 1973.

This only touches on the amount of information available. If at all possible, obtain a copy of the Ham Radio Cumulative Index (which has appeared in December issues each year for the past several years) and check articles appearing under topics such as Integrated Circuits, Measurements etc. Also check back issues of 73 Magazine, which runs an annual index each yearend. These two magazines provide the greatest concentration of readily available information on counters and IC circuits and techniques.

In the second part of this article we will provide wiring details of the particular counter in use here. This will appear in a subsequent issue of DX News soon.



CALLE MATASIETE No. 19 - LA ASUNCION - ESTADO NUEVA ESPARTA
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Q. S. L.

ONDA LARGA: Frecuencia 1.020 KHZ, Potencia 10.000 watos
antena monopolo. Altura 98 mts.

HORARIO DE TRANSMISION: 05:55 a 01:00 hora local

Reportado por: Brian Vernon

quien sintonizó nuestra Emisora a las 1006-1028 GMT el día 25-8-75
en su estación radio monitora.

Sinceramente agradecidos

RADIO MARGARITA

EZEQUIEL JOSE BELLORIN
DIRECTOR

Verie from Brian Vernon,
Manitoba

BOB FOXWORTH - Box 2111 - GPO - New York, NY - 10001

2/21

Time for a few words from me I suppose. This has not been as satisfying a season as I had last year although some interesting things are heard from time to time. Probably the best loggings are the supposed megawatt on 1169 back in October just around LSS & first definite audio on DLF Donebach on LW 151k. I have to comment on ERG's remarks about having never used a tape recorder. That is a shame, I can think of a number of loggings you have come up with, per your Musings, that were unID. If you had a tape, it could solve a lot of problems. Your tentative Haiti-1280 a while back sticks in my mind. With decent cassette recorders costing \$30 I don't see who anyone has to do without this invaluable aid. Also I have to comment on your letter urging a local station in your hometown on 1580 that was reprinted in DX NEWS. I thought you went up there partly to escape local QRM. Why you would want that source of QRM in your own backyard escapes me. (Civic pride? -ERG) Anyway, a station like that probably could not afford the consulting fees (they would probably have to be directional) so you wouldn't have to worry too much. Ernie'll do anything for a new logging, hi. If you like you can have WTHG instead. Just come and get 'em. I am still looking for those pictures of the 610 NBS tower Tom Farmerie promised. An interesting item on the SW "DX Jukebox" on R. Nederland, Holland, on 12/23. Oliver Goonewardena in Sri Lanka reports hearing a station IDing as "R. Centro de Mil" Honduras, on 1380 @ 7:15pm EST. He also reports "in South Asia we've been hearing Peruvian, Brazilian & some Caribbean stations at this time on MW. We hear very well R. Maldives on 1500 @ 8am EST w/NX in EE." Congrats to Oliver for getting a v/q from Brazil on 1100. (This via Victor Coonettilleke, also of Sri Lanka). Well there is a R. Primero de Mayo listed on 1380 in San Pedro Sula, so maybe that's what Oliver heard. He reported definite reception of a Honduran here. Very interesting. The path goes over the central North Atlantic & would be the ultimate "SSS skip". I wonder what else is possible from over there? We are using the Hagan LW converter here with very nice results. It's a good circuit. 73.

WALT BREVILLE 9127 Coral Drive - St. Louis, MO - 63123

It's time for me to send in another Musing. I don't have much to report this time. CX have been poor this season, at least when I hit the dials. I recently saw a complaint in Musings that while there are far more NRC members than say 12 or 15 years ago, there are fewer Musings. To me the answer is simple - there are so many interfering ANers nowadays that DX is extremely hard to come by to Muse about. It's very difficult to even catch the ID of a new station for the log, much less get a verie, unless CX are exotic enough to somehow let an unusual signal through the QRM or one of the very few remaining open channels. Oh well, we older ones can still remember the good times with nostalgia, whether it was in the early '60s (for me) or the early 20's or 30's for others. Mothball Memories in DX NEWS is really interesting and entertaining, I hope it keep appearing! I am happy to report two new veries in my shack: v/q from KTWO -1030 and v/1 etc. from KOKO-1450 TEST (thanks, Bruce!) I just got back from spending a week's vacation in the Honolulu area. I brought the TRF portable with me and did some evening listening. This time the only non-WC stations caught with ID were KERF, WOAI, WLS & WWVE (again the farthest one heard, like last year's trip). I didn't pick as good a location on Oahu this time, the thing to do is to get ever close to the wall of a mountain that's between you and downtown Honolulu where the local area XRs are (ten are ANers) so that they don't slip over on target frequencies like 660 & 750 (for Alaska) from their adjacent channels. In Waikiki, spurs & images really mess up the dial. The best island location (for reception from NA) is Kahana Bay on the windward (NE) side of Oahu, where I had my better results last year. I spent a lot of time trying to pull in WCBS & KMOX from under KPNW, apparent faint traces of them really kept teasing me, but they never came. Oh well, it was still a fine vacation. I hope to make a better & more successful DX assault next time I get there. Thanks to Norm Maguire for his wonderful hospitality when I was in Waikiki. I am looking forward to another NRC Convention, just six months away by the time you read this. Threes.

AS THEY SAY IN EASTON, PA, "WEST-1400" - Remember the "WEEK END OF SEPTEMBER TWO!" - for the big upcoming N.R.C. CONVENTION in LINCOLN! 9/2-5!

PAUL R. MOUNT - 471 Emerson Avenue - Teaneck, NJ - 07666

Hi gang. First I'd like to say you're all invited to a get-together here in Teaneck on Sun. March 20 from noon till whenever you want. The program includes a buffet-style, cold cuts lunch and some laughing, I hope. There should be a more detailed announcement elsewhere in DX NEWS. If not, please contact me at the above address for directions or at 201-836-1137 till 11:30pm EST any night, for directions and info. Please let me know if you're coming, even if anonymously, hi. It'll be interesting to see how I fit all 700 of you in the house. To some recent (?) DX: 11/8 - WMVG, Millidgeville GA heard 12:12-12:39 tuneont on TEST, with sweep tones, code IDs 12:14 o/WOL & WNSC pests. UUP beacon noted 1:10. Country u/local WMCA, weak of course, 1:14 to 1:30. WEED-1390, testing from Rocky Mount NC w/lotsa IS & rr 1:40-2. 11/11- Someone sending Morse code T-E-S-T on 860 u/GJBC, 12:22. 11/20- I heard WCAW-680 in car in Englewood NJ on the way to Westbury LI. 11/21 I heard WCAW again, pretty loud, w/c/w, WCAW Sporting News @ :13, local spots, o/WRKO/WPTF 5:03-5:15pm. Funny that it had been elusive for several years up here, then heard so loud. I don't know how I missed it last year. WGTO-540 loud 5:25 to 5:30 s/off, never tried for before. 11/22- WYNN on TEST 3:11 to 3:25-plus with weak IDs, SS u/o. CKTS w/Radio Bishops 3:43. 12/13- WINS s/off @ 1, thank you WINS, talk about five miles North of "1-mira u/WOFL's Rev. Ike. When 1:06 a WIQT JX, & 1:07 WINS put on TT. WIQT was still audible, mention of Jay Florian (thanks Jay), WOFL s/off 1:30, said WJI-33 and WJI-28 use. SS QRM, they at WIQT said it was XEOY. No ID heard here, no count. Many locations mentioned - I didn't hear Teaneck, though. 12/15- Funny thing happened while listening to CKLW At 2:05 the DJ called his station "X-Rock-80". How could he make such an error, hi. So I sat down with tape and log for next half hour, but now all he said was CKLW. Such is DX. Will we CU? 73.

02139

MICHAEL GOOD - 522B Burton House - 410 Memorial Drive - Cambridge, MA / Sorry that I haven't Mused for so long but I was almost totally inactive until a month ago. School has this way of taking up too much time, hi. I really enjoyed the Convention. Thanks, LADS, and best of luck in publishing this thing! Now, for DX: 1/24- CKAP-580 Kapuskasing, Ont. like Curtis Engberg described in #14, except that they disappeared here @ 2:07am. ID was @ 1:50, and the first song afterwards was Neil Diamond's "If You Know What I Mean." I hope that helps. 1/31- WATR -1320 CT w/ET 12:55-1am; WABY-1400 NY 2:45-3 w/NIS & local NX was poor until it faded up for its ID! Amazing! WSRF-1580 FL 4:45-5am w/progressive rock & "Surf-15" spots; WKEN-1600 Del. 5-5:25 w/farm program, local ads. 2/7 & 2/14 were washouts. 2/21- Nights like this get the DX blood flowing - signals popping all over the band. Might be due in part to a change of room here - I'm now on the top floor instead of the fourth. Anyway, tentative report sent on WBBO-780 TEST. No ID, but two or three Sousa marches, including "The Liberty Bell", from 1:19 to 1:28am. Thanks, Ernie! WBBM & the Cuban were doing their best to stop it, though. R. Margarita-1020 w/ID @ 2:25am for Venezuela #3 (finally); WBCB-1490 PA dominating 2:36-2:43 w/WX & mx. WOR-716 off, so WGBB-710 FL w/ID only @ 3:10 & CJRN Ont. w/mx, ID @ 3:15 added to log. WDVA-1250 VA 4:46-4:48 w/c/w, local ad, lost & found; CBI-1140 N.S. 5:14-5:15 w/AST TCs, hockey scores, rough w/local WCOF-1150 QRM. Also noted has been pirate radio Radio Bishops-900, appearing every other MM since 1/10 around 1-4am. Boston area progressive rocker, but never announces a specific location. Anyone else hear it? Boston area DXers feel free to call (pre-paid, natch) at 617-494-0042. And welcome to Detroit area member David Feldman. As a Detroit area native, I know that NRC participation from there has been spotty. I'm glad to see a sign of change in that. I'm going to be back home on 4/2; sorry, Ernie. NE is the correct abbreviation for Nebraska. To quote the computer, 1001001.

JOHN D. HATHWAY - 2109 Tamarack Court - Champaign, IL - 61820

1/2- 3:06am WTMJ-620 s/off MM w/SSB @ 3:07. 3:31, WNBC-660; 4:04 WKIS-740; 4:13 WMC-790; 4:24 WBAP-820; 4:30 KOA-850; 4:51 CHML-900; 5:19 WSPA-950. 1/3- 1:52am, WAPI-1070; 2:02 WFLI-1070; 2:05 WIBB-107 2:39 WSOY-1340; 2:50 WHG-790; 3:05 WJBC-1230; 3:30 WAAV-1550; 4:09 WAAV-570; 4:20 WDAF-610; 4:20 WRJZ-620. 1/8- 12:41pm KATZ-1600; 1 WSHY-1560;

(Hathaway) 1:09 WRIN-1560 report #47 of the season. 1/8- 2:10pm KOMA-1520; 2:45 CFRW-1470 log #810; 3:08 KSO-1460; 11:46am WIL-1430 report #48; 12:10pm WTIM-1410; 2:37 WPRC-1370; 2:35 WGFA-1360; 2:42 WXCL-1350; 3 WJBD-1350 #811, report #49. 1/11- 11:23am WIFE-1310. 1/12- 7:17pm WIRL-1290; 7:35 WHBF-1270; 7:36 KFJZ-1270; 7:45 WIBV-1260; 7:59 WGAR-1220. 1/13- 6:08pm WOWO-1190; 6:16 KLIF-1190; 6:21 WJJD-1160; 11:27 WJBO-1150. 1/14- 12:10am WRVA-1140; 12:11 KWKH-1130; 12:17 WBT-1110; 12:33 WIBC-1070 12:35 KYW-1060; 1:22 WITY-980. 1/15- 1:30am KIRA-1010, 2:02 GHML-900; 2:08 CJBC-860 s/off w/Oh Canada; 3:06 WMAQ-670. 1/22- 1:22am, KRGO-1550 #812, 2 WDAF-610; 2:19 WRJZ-620; 2:26 KXOK-630; 2:30 WPTF-680; 2:45 WLW-700; 3:15 WCBS-880; 4:12 CKFH-1430; 2:58pm WAAQ-1300. 1/23- 2:01am WMAK-1300; 2:04 WIRL-1290; 2:10 WGBF-1280; 2:17 WXYZ-1270; 2:21 WNDE-1260 2/7- 12:17am WXVI-1600 #813. 2/10- 12:16am WAKR-1590; 1:02 WOKJ-1550; 1:06 CBE-1550 10k day & night, CBC, s/off w/"Oh Canada" to return @ 5; 6:33pm KOMA-1520; WLAC-1510; 7:34 WMBD-1470. 2/11- 11am WGFA-1360; 11:15 WJBD-1350; 11:20 WXCL-1350; 11:30 WSOY-1340; 11:39 WJPS-1330; 11:57 WKAN-1320; 12 WIFE-1310; 12:06pm WAAQ-1300; 12:22 WIRL-1290; 12:23 WGBF-1280; 12:25 WEIG-1270; 12:51 WNDE-1260; 12:52 WIZZ-1250; 12:59 WRAY-1250 #814; 2/12- 11:28am WMAX-970; 11:30 WITY-980; 12:02pm WITZ-990; 12:37 WGAZ-990; 2:11 WPEO-1020. Best 73 & DX.

ALAN IMPRESCIA - 201 East 17 Street - New York, NY - 10003

Greetings & Salutations. I must say this past week has been one of the worst I have ever had in all my years of DXing. No veries and not one new logging, and this is not from a lack of enthusiasm, just a lack of DX. I had to be content with logs on some stations that never veried - not that I expect a verie now, but what the heck? They were namely: 2/13, WALY-1420 s/on, NX, WX, & mx @ 6am. WBIS-1420 @ 6:20 w/religion announcements & IDs, & on 2/14, WRDW-1480 w/BRR RS (Black rock ? -ERC) @ 12:20am. Plenty of unID TT on 2/14, but nothing new. I guess we all know the feeling of staying up till 5am on a MM with no new loggings, and having to put toothpicks in the old eyelids the next day at work, huh? Hi. Has anyone received veries from the following: WCRJ, WRJZ, WEIG, WBUK or WSDL? If so please notify me. I have a rough idea and with a little polish, maybe it would be worth something - How about if a station with a notorious "non-verie" policy, or I should say with a "hold-out" policy (ALL stations will verie, it just takes a certain "knack"). Anyway, on these "roughies" maybe a bunch of us could send f/ups all at the same time - let's say 90 days after reception - maybe we could set up some kind of sked, etc. and in our f/ups, explain the importance of verifications to us etc., and explain a bit about the NRC. Any comments or suggestions on this idea? Let me clarify that I don't mean a "blacklist" of any kind intended. Example: WSDL ran a TEST for us a few years back, and to my knowledge, never verified. Well, if ten of us would get together, write f/ups with the explanations, etc. all with the same date. and mail them all at the same time, well, it might be worth a try. Well, now that I've added my 2¢ (and with inflation it's worth one cent) I'll back out of here. So keep the bugs off your glass and the bears off your tail and I'll catch you on the flip-flop.

ERIC FADER - 23-35 Bell Boulevard - Bayside, NY - 11360

First some AT-40 stuff. These new the week of 2/12- KFYZ-550 ND, WWGO-1450 PA, KFLD-1400 AR. KFOK-1000 was new 2/19. Some DX: SM 2/13- CFLS-1240 destroying WGBB 1:11. KRMG-740, change log, topping 1:38-1:45. CKCY-920 regular pest noted w/disc programming 1:50. Newie CHYM-1490 atop w/TC, 1:58. UNID-1450 w/SSB 2:02, not in log. UNID w/800 Hz TT-1340 2:08-2:16 break, 2:16-2:20 break. ZBM2-1340 2:32 gave ID after light rr "--and Zed-B-M-2, 1340, Hamilton, Bermuda," although location sounded more like "Brooklyn" hi. Still, ID was perfectly clear and really floored me. I had to look it up & make sure they did exist. New country, #31. It may have been they w/the automated "Hit Parade" garbage, topping the channel w/a terrific signal around 2:25, & heard in mess as early as 2:16. If they weren't the one w/"Hit Parade" who does carry it? As you read this, local WBAI-FM-99.5 may be back on from the strike b the staff. As I type this, though, WJBR-DL is coming in (?? -ERC) It may interest the Long Island crew (Glenn Small etc.) to know that WKWZ-88.5 comes in here well days on 10w. 73.

DAVE SCHMIDT - 42 Chelwynne Road - Castle Hills - New Castle, DE - 19720
A few more items have been heard to warrant another report to the Muse Master! 2/7- WEAT-850 12:31-12:43am ending NX, then c/w. 2/14- WKXO-1500-TEST 12:20-12:32am w/TT, mx, JX & Voice IDs, just about there. WIVS-850-TEST 1:08-1:21am w/cl mx, code IDs, little talk noted. WRKB-1590 1:58-2:14am w/ET w/soul mx, WQIQ off, and another welcome PA catch, WMPA-1340 3:02-3:16am w/MoR & Jack Frost Show, evidently AN MMs. 2/15- WKDE-1000 5:57-6pm w/very long s/off, mentioning WTTX, WCRE, WRNB as stations in the chain. 2/16- WJJJ-1260 5:58-6pm w/a couple of spots, & s/off, way atop WWDG for a most welcomed one. 2/17- KVSH-940 1:16-1:20 am ending f/c-TT, weak ID caught at end, WGSM-740 1:44-1:56am w/ET & rr. 2/19- To keep Delaware at 100%, WSFD-1280 taken for a report, 4:42-5pm w/little local WTUX splash. Delaware can be heard 100% here during the day, odd ain't it, hi! That's all ten stations, no doubt! 2/21- CKOC-1150 1:14-1:25am w/rr, I still needed 'em, hi! KYMN-1080-TEST about 50% 2:33-2:49am, w/mx & long IDs; nothing noted when they dropped to 250w. WGTW-1580 2:56-3:13am w/schmaltz mx ET, odd to have something other than WSRF from FL here on MMs, hi! WOR was off again this MM, nice of 'em to let us know. I would be very willing to bet that we would have a few less ANers on MM if stations weren't required to carry so much Public Affairs programming. Many have made MMs their dumping grounds for such nothingness programs (i.e. WFIL "Crossfire", WABC's yak show MMS, WNDE's idiots deluxe). If anyone in the Philly area notices any type of carrier on 928 and 972, it's Geoff Fox' employer, audible here with an S-7 carrier days, weaker at night. They, WPEN, were also off MM 2/21, and WLOF was loud enough to make one think they were still on anyway, hi! Veries: v/q- WEAT-850, WYNS-1150 w/CM. v/l- WCLN-1170, WLSH-1410, KHIL-1250 w/CM v/f, sticker, and list of reporters. Total: 858. I'll be working 11pm-7am Mon-Fri at Chrysler yard in Newark starting 2/21 for a while, so that willleave just SSS DX & MMs open for a while. Dat's it for now, zo 73s.

ERNIE COOPER - The Cape Tip Dixer - 5 Anthony St. - Provincetown, MA -2657

First, we acknowledge several swell phone chats with NRCers Dr. Tom Williamson, Michael O'Shea, Clayton Adamson, Joseph Fela, Bob Selleck, & Stan Morris! Thanks, men! A "wowzy" day was Tuesday 2/22 as three v/ls arrived in one mail: WKXO-TEST, WEYI-1580 & St.Lucia-660, to bring the count to 4,026, in 44 years of DXing, an average of 92 a year, all WITHOUT TAPING. Can you match me, Bob Foxworth, hi! Don't forget 4/2/, 11am-6pm, a DX GTG here - please lemme know you're coming! DX: 2/19- I take back what I said a couple issues ago in an aside - R. Visbn-950 is indeed AN, noted this morning. Popper on 900 2:13-2:56, the same one Bob Wessolowski heard earlier, I'm sure, WLSI, KY, unn. SM 2/20, very noisy, TTer on 1590 1:13-1:21, and the noise drove me back to bed, to try on next wake-up, around 4:45, and even noisier then, so more sleep. MM 2/21- After diddling with my knobs for about seven minutes, I found a way to pull in WBBO-780-TEST - I detuned about 1/2k to the low side, and I heard their band music very nicely, and enjoyed it, one of my favorite types of mx, and a new catch too. Several VIDs & SIDs. Unn WHP-580 on top @ 1:45. WOR Tting then (710). An unID TTer-740 in/out w/WKIS & Mara-caibo, anybody figure him out? (I know - get a tape recorder! -hi!) Unn WWOK-1260 ET @ 2:30. No sign here of KYMN-1080-TEST, u/WTIC. On 1090, a station w/much U.S.A. rock turned out to be needed R. Amistad, Santiago, Dominican Republic, for a report. They topped the channel all AM. 2/22- Toot-twenny-toot and "toot-toot" all over the dial, but not on 1300, alas, as I looked in vain for WKRL-TEST. One on 1220 1:13-1:22 o/u WGAR/GKCW, and several others. 2/23- TTer on 1470 12:30-12:55 w/WSAN/CHOW/WLAM ANs. TTer on 1490 1:03-2:05 and on, no IDs heard, looping N/S. Tentative on WGOV-1290 r/c-TT 1:16-1:31, breaks every five minutes, but the voice did not get through the ANs. TT on 740 again, noted 1:37-1:47, and lastly, one on 1330, 2:06-2:16 when I gave up and went snoozie-bye. There's lots of PoPs on mornings other than Mondays - try DXing through the week! CUN7.

WE ARE GRATIFIED THAT SO MANY OF YOU EXPRESSED YOUR ENJOYMENT OF "MOTH-BALL MEMORIES." THERE ARE QUITE A FEW NRCers OUT THERE WHO COULD WRITE SOME VERY INTERESTING MEMORY COLUMNS FOR THE NEWER MEMBERS' ENJOYMENT! WHEN YOU VETERAN NRCers WERE NEW DXers, YOU READ AVIDLY THE WORDS OF THE THEN OLDER DXers - HOW ABOUT RECIPROCATING NOW AND PLEASING US ALL?

MOTHBALL MEMORIES-S

CHAPTER XLV - SOME UNUSUAL OLD STATIONS WITH ODD CALLS - by JOE BRAUNER

(note: last week's chapter number should have been "XLIV".)

Mothball Memories have done such an interesting job of "telling it like it was" but have not covered two unusual CX common to our northern neighbor, yet seldom used in U.S. - Amateur Broadcasters, and "Phantom" call letters. The former were few in number and used a call beginning with 10 (ten) followed by two letters, were of limited power (10, 15, 25, & 40 watts) and were ideal targets for CPCers, ready to test at the drop of a request. Most later became regular commercial broadcasters. 10AT, Trill, B.C. later became CJAT; 10BP, Wingham, Ont. grew into the CKNX complex, including Canada's first privately owned TV station. 10BQ Brantford Ont. and 10AK, Stratford, Ont. were two more, while the Maritimes were represented by 9EK, Montmagny, P.Q., 1185 kc/s., 10 watts. Saskatchewan had its 10AB, later CHAB, and 10BI, later CKBI. This was in the early 30's. Phantom calls were used by program sponsors, during their time on the air. Several churches had their own call, some used only during services. One Toronto station used at least eight calls. The most extensive was by the National Railway System, which during its programs used calls starting with CNR-, ending mostly with the first letter of the transmitter city. Beginning with CNRH, Halifax, and ending with CNRV, Victoria. My log lists 13 of these: CNRA Moncton; CNRQ, CNRM, P.Q.; CNRO, CNRT, CNRL, Ontario (Toronto had a second call, CNRX), CNRS Saskatoon, CNRW, Manitoba, CNRE, Alberta, CNRC, also Alta., and CNRH, N.S. and CNRV, B.C. All this was a great help in "padding" the old logbook and is one reason why my Ontario log total is 138 calls. Phantoms were few in the U.S. One I recall was WJR-WCX, Detroit. There were many "time sharers" but in most cases each had its own transmitter.

Next week: Since Joe Brauner gave me the idea, more on U.S.A. phantom calls, in "Mothball Memories."

HQ COMMENTS RE MISINGS: (RJE)

Ted Langley: See Harry Helms' Musing last issue re FRG-7; Contact me about the surplus receiver idea. I have some info for you on it.

Philip Boersma: WTRB-1570's Feb. #/off is 1845 EST.

K. Rychalsky: Don't believe either WPE or WDX numbers are available any more. Maybe someone else knows. That whole thing has declined in popularity the past few yrs.

Paul Mount: WCAW came on w/ a new power increase over the summer. Now they're a pest, but before, I'd never hrd them either.

Alan Imposcia: Did you stop to think that that plan might backfire, and convince them that they shouldn't verify at all? Might they also not figure that if there was collaboration on the f/ups, mightn't there also have been originally ?? One or two people with very kind, tactful letters of explanation about the unverified test would be much more likely of success, I would think.

Re Mothball Memories, probably the most famous one of those in the US was right in the Big Apple - WZXR, experimentally, now WQXR..... - AND, speaking of that, Ken Brownless of Britain's Medium Wave Circle reports such a station in operation thru February over there w/ the call G9BOS, testing a transmitter built for export on 953 kHz, from the Marconi Works at Chelmsford, Essex by special license from the Government. Says this is the first time he's heard of such in modern times.....RJE

VERIE SIGNERS

Table with columns for call letters, names, and locations. Includes entries like 'A - M. Whelan H - R. Arruda', 'B - J. Kay I - W. Heinen', etc., up to '1190 K P A R D Davis, CE C'.

Thank you for your enthusiastic support of this column! All verifiers, please send in your v/s, with frequencies, & type of verie. Please double space! Weed out those in recently.

545	R.Jumbo	Patrick Meyer, DGen	G 1280	W G T X	JH Bass, CE	H
550	K F Y R	u/u	E	C JfJ D	B Dingwall, E	D
560	W I N D	WR Ryan, EM	E 1290	W A T O	D Brown	H
610	W TqV N	u/u	E	K H S L	GO Wussow, CE	I
640	H L K C	Lee Ylsung, E	G	K OmW B	P Gabriel, PubSrvI	I
660	BED-34	Tu Tung Chou, DoE	G	K RhG V	T Perryman, CE	I
	StLucia	Linford Fevrier, Tehn	J	K S N N	D Libeg, GM	I
680	K NqB R	J Cameron, M, Tech Op	E	K S R C	RR Sparks	I
730	XvEnX	RA Paez, D	B	KhU Oma	H Lineback	I
740	WqK ImS	u/u	B	W CmB L	PL Whitney, CE	I
850	K E Y H	D Armstrong, CE	A	W HqG R	N Pike, M	I
	W Rca P	CR Mills Jr., CE	D	W NqI L	G Ewald, DoE	I
	W I V S	A Reis, CE	E 1300	K B R L	JW Nittler, NxD	I
854	O A X4A	Edna Almandez, M, S	A	K GqL O	DR Sappenfield, CEI	I
900	K CmL W	Betty McCord, GM	A	K Hra C	LJ Harper	I
910	W H S M	M Anthony, M	E	K X X O	RE Cauthen, CE	I
920	W T C W	C Johnson, A	F	C JmM E	D Senft, DoE	I
	W BqB B	WW Blackburn, CE	D 1320	W H I E	RE Gaskins, CE	H
	W OqK Y	W Grevlaw, CE	E	W O I C	P Bryant, CE	H
940	WfI NmE	P Carlone, CE	B	WmI LqS	FR Maynard, CE	I
950	K TmM X	RD Almer, CE	I	W FmH R	JR Gennaro	I
	W KqA Z	LW Lovejoy, CE	I 1330	W DpA L	L Edwards, OpM	A
960	W DqL M	u/u	E 1340	K OhL E	R Richter, CE	H
970	W W D J	JR Galbreath, CE	B 1350	W XqC L	u/u	H
	W MqA Y	J Dunn, CE	A	W SqM B	u/u	E
1010	K DmJ W	C West, ACE	I	W Y L S	D Crawford	E
1020	W C I L	PH Roy, M	F 1360	K R U X	C Adams	C
	K GpB S	u/u, CE	A	K FmF A	W Atchison, GM	I
1050	K CmA S	Amy H. Smith, VP	I	K ImC X	MS Manker, E	I
1060	W HqF B	M Robnson, TD	E	W L I Q	JH Abercrombie	I
1070	W H Y Z	R Slatton, CE	F 1370	C J W W	Heather Triffo	I
	C H O K	KE Monk, GM	I	W RmG S	JM Waller	H
1110	W K D Z	W Wilson, GM	H	W L O P	R Bilbrey, CE	H
	W T I S	S Shute, Acct Exec	H 1380	K SrW O	J Lockerd, TD	H
	K D R Y	E Palmer	H 1410	C FfU N	Cindy Zacon	A
1120	W WfO L	W Williams, CE	H 1440	W N C R	MJ Marcy, CE	B
1130	W IqS M	RP Johnson	H 1450	K GuF R	RC Mullinax, CE	A
	W A M G	RW Watson, CE	H	W I L M	EB Bosylan, CE	E
	W D T M	B Hosford, OpM	H 1460	KqSuO	J Roskos, CE	A
	K B M R	AL Andersoh, M	E	W VfO X	S Sinuk, CE	B
	W NqE W	P Champion, CE	E 1490	W K B V	C Yount, E	D
1140	K S O O	R Marty, CE	E	W O P I	T Tolar	D
	W A W K	R Bassett, CE	I 1500	W ZrB N	C King, CE	E
1165	C.R.L.	Curtis L. Waite, CE	G	W K X O	C Bobbitt (NRC)	J
1170	H JnN W	Victor E. Morelos, D	H 1530	W K D C	F Blotter, P	E
	K S T T	PE Blair, CE	H 1540	W PqM E	R Engler, CE	F
1190	K EqX	EG Nalsey, PD	E 1550	W N T N	R Wolf, CE	F
	K A D E	R Greenlee, O, M	I	K RqG O	Glenda GuthrieTrfM	A
	W H M T	Juanita Wallace, S	HI	W BuX T	JG Eppler, CE	BF
1200	Y V O Z	Bob Rangel, Rel Int '1	G	W OqK J	u/u	E
1210	W K N X	u/u	E 1560	W C N W	DM Sites, CE	E
1220	WqC DhQ	R Solomon, ACE	B 1570	W RuC N	D Brink, PD	B
	K ZmE E	(DB Musgrave, OpM	H 1580	W EmY H	O'Neal, E	J
		(D Solomonson, GM	I		C R E D I T S	
1230	C F P A	RH Parker	I A - R. Schiller	F - J. Falconer		
	W K L K	KJ Abram	I B - K. Rychalsky	G - H. Wilkinson		
1240	W B M L	J Howard	D C - A. Lobel *	H - P. Barton		
	W LqA G	JH Davis, CE	H D - D. Schmidt	I - R. Lindblade		
1250	W E M P	AG Hajny, CE	E E - G. Parrish	J - E. Cooper		
	K C U E	GL Brooks	I * Didn't specify type of verie.			
	W L C K	WE Harson	H One more, no frequency given:			
1260	K S N O	DJ Wright, CE	I ???? X E N U	Miguel Villarreal		
1270	K DmJ I	WV Lowe, CE	I	I. C		
1280	WqB GuF	T Greiger	A Let's have your recent v/s, with			
	K C N I	H Hromas, CE	F frequency given, double-spaced!			

BBC Urges 3-Language Common Market Radio

LONDON (UPI) — British Broadcasting Corp. officials are discreetly sounding out European Common Market nations about setting up a communal radio service aimed at developing a "Common Market public opinion," according to British Broadcasting sources.

One goal of such a service would be to prepare voters in the nine European Economic Community countries for the European Parliament elections scheduled in 1978.

The sources said an "EEC service" could lean heavily on the respected BBC's experience and broadcast over common wavelengths to cover the maximum area of the Common Market.

It could draw on the resources of all Common Market countries for news and opinion and start in at least three languages—English, French and German.

High-level BBC officials have been privately discussing the possibilities of a Common Market-oriented radio service with counterparts in several major EEC countries, the sources said.

The initial reaction on the continent has been favorable, the sources indicated. No governmental objections have arisen thus far, although the proposal is still only in the talking stage.

The sources noted that Sir Charles Curran, who leaves as BBC director general in October, will continue to be president of the European Broadcasting Union. The 55-year-old Curran's expertise could make him a

logical choice after October to oversee development of such Common Market-directed radio service, they said.

In late 1975 the BBC laid the groundwork for the current effort by telling a committee studying the future of British broadcasting after 1979, when the current BBC charter comes up for renewal, that:

"The external services (the BEC unit that broadcasts outside Britain) have long felt that with the increased involvement of the United Kingdom in the EEC, the national interest would be served, as well as the common interest of the EEC, by creation of a new service of news and information directed specifically to listeners in the community and conceived in a European dimension.

"Such a service would be broadcast in French, German and English, the three main community languages, with the possible inclusion of Italian, and would largely replace the existing non-English services."

A Common Market radio service could help sort out questions of political interests within the European Parliament and of the relationship between such a Parliament and the EEC institutions, particularly the Common Market's Council of Ministers.

Creation of a community consciousness within the EEC would be important to the success of the European Parliament, the sources said, because it must be able to count on an understanding by the electorate of the issues at stake and the continuing arguments about decisions that should be taken on them.

from AL Merriman

CLIPPING CORNER

AM stereo demonstrated at Washington hi-fi show

WMAL(AM) Washington demonstrated AM stereo at the Washington Hi-Fi Stereo Show in what J. B. McPherson, chief engineer of WMAL, believes is the first public display of AM stereo.

The system was built by Mr. McPherson and Assistant Chief Engineer Don Culp for the demonstration to spark public interest in the concept. The small-scale model consisted of a miniature transmitter located in the exhibit suite, transmitting an AM stereo signal to a standard component receiver with an AM stereo adapter.

People attending the exhibit were asked to comment on what they heard, and more than 1,500 favorable comments were submitted. Mr. McPherson said that the station plans to advise the FCC of the public's comments of the display. AM stereo systems are presently under study by the National AM Stereophonic Radio Committee which will report to the FCC soon.

Broadcasting Feb 21 1977