

VOLUME 38
MAY 15, 1971
NUMBER 27
"Enclosed are my dues for another wonderful year in the NRC. Keep up the great work on that bulletin; it's very much appreciated. " (Eric DiRicco, Pa.)

IN THIS ISSUE...
The Loop-Sensor Cardioid Array - Ronald F. Schatz
Pattern Controlled Loops for the Mediumwave DX'er - Gordon Nelson
Domestic Supremacy Ratings - Bob Karchevski
Verification Signers - Ernie Cooper
NEW NRC MEMBERS THIS WEEK...
*Jim Hayes, 9 Henry St., Wilkes Barre, Pa. 18702
*Wm. Blazek, 2716 Bellbrook St., Hillcrest Heights, Md. 20031
*Stuart Kantor, 38 Lawrence Dr., N. White Plains, N. Y. 10603
*Sidney Scholes, PO Box 1494, Evanston, Ill. 60204
*Richard Lauhead, 591 W. Co. Rd. B, St. Paul, Minn. 55113
*Harry Simpson, 4520 State, Box 46, Kansas City, Ka. 66102
*Doug Brandon, Box 1265, Big Springs, Texas 79720


Welcome to the NRC, gentlemen, we hope to be reading of your DX activities often here in DX NEWS. Your New Member kits are being prepared and will be mailed at the earliest possible time. Why not write into Ernie and introduce yourself in a Musing?

RENEWALS THIS ISSUE...
DeLeurere... Greenhill... DiRicco... Wood... Grubbs... Russell...

Another brave spirit bites the dust! Word has it that IDXD Editor Bob "Foxy" Foxworth will be married on May 28th to a sweet young thing by the name of Kathy... This means Foxy'll be moving out of Manhattan and may even begin to DX again, who knows? We wish Foxy and his bride the best of luck!!!

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WILL LOSE
Below is reproduced the Table of Contents for the new NRC Latin American Log - 110 pages of unique Latin American station information, articles, maps, verification signers, etc. ! Updated to include LA changes as recent as April 1st, 1971 , the NRC LA Log is now being mailed to those NRC members who have reserved copies and have sent payment to HQ. Can you get one? Well that depends... The pressrun was determined by the number of NRC members who wrote into $H Q$ some months ago to reserve a copy; if every reserved copy is purchased this leaves 234 NRC members out in the cold. The actual pressrun was considerably smaller than the NRC membership size but we do have a number of overrun copies for those who did not reserve a copy or who do not claim the copy they reserved. ON JUNE FIRST WE WILL MAKE AVAILABLE REMAINING COPIES ON A FIRST-COME-FIRST -SERVED basis. If you have reserved a copy but don't advance $\$ 2.50$ to HQ by 6/1, you'll lose your reserved status and your copy will be mailed to the general membership on a f.c.f.s. basis... If you have not reserved a copy but wish to get in line, send $\$ 2.50$ to $H Q$ and we'll put you on the standby list... The pressrun was 234 fewer than the present membership size so many will miss out. . . No second printing planned.. Same size, format, and binding as the universally acclaimed NRC Domestic Log... He who hesitates loses...

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(reprinted in part)
Dear Mr. Cooper:
"Thank you very wuch for your letter of April 19th regarding reception report for WPJD, Deisy, Tenn.
I certainly am sorry that you have been caused concern by the announcement of one of our announcers regarding the non-verification of DX reports.
The reason for the announcement was that quite a number of reports have been coming in to WPJD. As you surwised we are understaffed and losing a considerabie amount of money as we are nearly 11 non-advertising. Our engineer there is fine Chisistion brother tho drives 150 eiles round trip to work every day. He a fine chrisilen brin in the bor puts in a full shift in on the board anmacing and then does the engineering. Therefore he has no time to speak of to wite letters of verffication or to make up QSL cards. Presently we have nowe at WPJD. Frankly we never expected to have so many listeners reports Ixom a little 250 watt station. Daisy, Tenn. by the way is a suburb of Chattanooge, Femessee.
"No we did not receive any adverse letters nor falsified letters to ${ }^{2}$ knowledge. However, we have received quite a number of falsified and copled reports from a number of foreign broadcasters for PJD2 but none that I can remember from U.S.A.
"We have discussed the matter and the engineer at WPJD says he will do the best he can to verify reports as soon as possible. It would help however if as you suggested DXers would fill out a card with all the data and put a stamp on it. All the engineer would have to do then is sign it. This would help us greatiy. In fact one DXer aid this the other day to help us out after hearing reports would not be conflrmed. And this vas appreciated, and was confirmed.
"We appreciate your concern and want you to realize that the announcement was not made because of any hard feelings toward broadcasters but because it was working a haraship on our engineer who is overworked.
"Please extem 收 personal best wishes to all of your readers and fellow DXers. We have had good relations in the past and certainly want you to know no one has any hard feelings toward DXers at WPJD.
"We would appreciate very much however the considerations mentioned above from DXers and we will be happy to confirm their reports.

Sincerely in Christ, (signed) Robert A. Mayer, Managing Dir. P.S. We have just purchased a third station in Winston-Salem, N.C. ( (fithos's note: They Are, pifiliated with PJD-2-1295, in Sint Maarten.) FLASH- WWLE-1170, Cornwe11,
K.Y., MM 5/10, l-1:30\%my SPECIIALS

Monday May 17 K P IN 1260 Casa Grande, Arizona 1,000w. 3:01-4:15* I R CA This special TEST broadcast will feature middle-of-the-road music, and maty station IDs. Send return postage with your reports, to Mr. "Bud" Thomas, KPIN, Casa Grande, Arizona, 85222. Arranged by Paul Lotsof.
Thurs. May 27 K WY S 920 West Yellowstone, Mont.1,000w. 2:30-2:45 r/c-1w This is their regular quarterly frequency check. Cycle tone and announcements are used on the air. Peports should be sent, with return postage, to Mr. John Stanturf, KWYS, Box 9, West Yellowstone, Montant, 59758. This is via Jim Adams of IRCA, and both these tips PHONED us by Don Erickson! ERC *This time, 3:01-4:15, COULD be E.S.T. or E.D.T. - we're not sure. (D. Erickson) "AN" Situation.
 The neat issue is in TikEs voekn. Deadilne dete in Erooklyn for Kinings will be Thurnday, May 19th. De aure to Mase for that tssue, and atick to 30 lines of Do MEWS primt, and inelude your catchen nal tipe by date, collb, frequency, and $10-$ cstion. Yake your report help tomene elise ret mone rev logifings?

## of the Members

TOK MeCCFMACK = 275 Lttleton Itreet - West Larryette, Indiana ~ 47906
I funt got beck froe Jerry Eterr's Yap tixot and 14 uss 8 hisest to say the lesst. (The brew ren out5) Thee for an introt I'n 20 yemra old, atngle, and hrve been toxing BCB for e little over four years. I've logegi had verifled oll 50 atstes and el tht provinces as well. I buve heerd between 2,000 2, 100 stetions end have 802 verificetions. Hecent ver jell here inelude: v/1- MCht

 verie)



 620 (5th II.I. verle) KOFI-6y0 (thind Enwnitan verte here), WhIT-820 \& W0ps-940.

 soc tount tese veriel sal never Will, sithough I tape mearly all DX entches. it:


 I've never used a loop. पp unt 11 recent Iy I have been in DX fanatic Lateminc ex cessiviy on aps, ssis is after uidnidht orten. Tapesponders are veleoce here anil visitcars it all tinent. The wr ghtp hail been fantastic this past senson w/urnn
 too. T3a fron Hooaserland and 40 chowed at IAD'e Doog? \#Gill. (Helocoe to the HAC, Tot, end ve vill velcome your regulnr contributionn to Husinge! -YFC)

BOE KIME - 9842 Warvick foned - Inalsaspolis, Indinn - 46240
We11, it's about that tiae egain to Huve. Since 叫 Inst Jusing guite * Dit has been lieppentng, horcester Electronics lab sent ne their inf on their loop. So, when Terry Bleck peid be a viait, I Fesily got to work the loop well. I beclded this In whet I need, go I bought one, elthough it ham't arrived yet. Yewnutisle, stalle sill of this una going on we udded another $50^{\prime}$ of vire to iny 1 w which brings 3 meter rendingn y 5 dh. Amper bock to the nx, I rinnlly receive and r/c severnl veeks hego and got a v/ 1 for State 134 verilled. On $3 / 25$ whil1090 wes conint in atrong $0 / 1024 Y$, finnlly 180 in on $3 / 276$ L2t2lam, a good catch

 vell after loce 1 Wrak s/ort on $4 / 9$, frifly rejpalar WhLo Misa- on 580 on $4 / 8$, and good entch st kLOU-1560 $121360 \mathrm{on} 4 / 9$. Bone other atations lopged lurine the


 for the beat catch of the Spring brenk vas PJAG-900 in Aruba, WirI, Fumaing 10 kt







 $4 / 5$ saround dt30pa. I managed to mall whal vell enough, to who did I get? fo in-


Nuser for you (I think you can use s.11 the help you can get). (HEIPI -EAC) Pur those of you who are 11stening for $W B H Z=1570$, it's 250 N i mot 1,000 as in tric Log.

PAIL K. HAFI - 2105 Muse - Fort Worth, Fexes - 76112
I spent April \%-7 in Bt. Charles, III. nttending as WEL conference. IXX CX seemed to be neperally much better than when I Itved thare three yearn ngo. 111 obbervationa vere on the Hesth $0 \mathrm{R}-2 \mathrm{il}$ in the notel rook. I was eble to upend
 st111 the wane ss here - chson w/WDAP dceninant. WG9B-1480 auper-10cal advertining 24 hours, 4 moted on NeN. It might be a good lame to checik thia to see if they are REP; of thet. At $10 \mathrm{pm} 4 / 5$, KIOA ves hastal getting the wornt of it frow CMMgho. CBM not yet heard here in Sexas. At $11 \mathrm{pe} 4 / 6$, KXX-1070 noted in weally, \& KRID-1000 in, readable but fady. A11 I can asy is that the Chicago aren, especially $V$ of the efty, is ISne p X country. I aise the Cennilina here in Texas, even sone of thon were pestn up Sorth. Their progrnaning (vith gome obvicus exeepHons) in vary tasteful. f ©X here in Tlxas have held up better this Bpring than they ever have been since I noved here. Base of wy more moent aetivity will 11-
 $4 / B, 101 D-1400$ on FS $4 / 9$. KNMD/KLRK-1340 tests on 4/12. KRCB-1560 test on 4/12. cX on the svernge remain as good as ther have aver been sil year. Much of this
 This is what 區 is sil nbout. I bope it keepe up, totals are nov 616 on tape. 73.

Greetfripe fron the Steel City. Fear not NRCers for I an a-
 LAWD party, I must epologize for not being there becsune I just onn't get snywhere w/ten pounls of planter on sy lag. Tes, that 's riah falke - I hroke it. But don't Morry, it's caly a compound fracture, hi. I have been padd up in bed for two weeks, but en up haround nov. Borry for not being mble to call Jerry gterr, but I don't heve his phon muber. Well, let'e get dovn to m, which has been pretty frir for me lately. Flecent catches are: $3 / 18-\mathrm{Kn} / \mathrm{I}-610 \mathrm{Minn}$. $3 / 29$ -



 night $1 y$ a 12212 , probably a $I / c$ v/very brier Ins. I beve sent e report to ell or thoce catchast It would be great if I vould got a verie back froes all, hi. Well while I get beck up on zy erutches nond brusthe in sore of this polluted Steel cyty air - coudt-coagh-coagh, I any 733 nad Feace.

rix aince Last Muse has Indeed been aparce, with only four nev logdings aince Aprili began, of it ${ }^{1} \mathrm{~m}$ nov April 13 ! Such an it iat $4 / 2=$ INSR-1320




 could be lenrned, Hilp: Locnlly, CP of WPRs shoula be on testing beroge this is read, according to phone call, and slao mitiole in the local presis. They plan to
 In Midmest fairly esilidy. I na sttemptins to set up is IXX Specini in the menr fur ture. No aigh of new CP-1310, White Sulphur Springs, W.Vs. ns of this dete-I viast thin noren overy week ob 1 will keep my tyes and eara open. That's it for novi nore in it.





Bop LIdCal - 539 Warth Firesticene Boulevard - Nkron, Chio $=44301$
Hi pang? I haven't had a Musing in for several wonths now so I thou-ht $I^{\prime} d$ os lesst say that $I^{\prime \prime}$ a silve. First of all, I'd like to congratulate lerry sterr and the mad YaDs on a great get-together on 4/10. I really had a rest time. $\mathrm{DX}: 4 / 4-\mathrm{Sin} 0-1540$ Niles, 0 . I was shocked to hetr this one. In foct, I hed to te hauled to the hospttel ofter 14 stening to them, his. WRHD-1490










 $N$ throudA downtown Akron (50in EFP). Dxept for that and in roople of other Itees




ROMERI E. FISCHER - Box 94 - Newark, Delaware = 19711
of the worla and the Sumporbqatitime for another blurb from the Chenical Cepital (inest paint factories with in olfictory range. Who knows, Wilmington might even become the DX Capital with Dave coming back from Yadiand and with severfl other area DXers activating. fiecent acquisitions smelude an $504-1$ loop. It has a very good aignal boobt characteristios, juat how wich I don't know since my S-meter is not onlibrated in the standard 5 units. It cefinitely extends the rame of my Sory CF\% 150 portabin, which, by the way, will become the standby unit in another nooth. Dy the time you read this I'11 have my order in for a ppenking new H0-1003C. I need selectiv ity bedly! Ho luck on TAs recently, mostly L/s. My bM-1 loop has acmevelrd chan acteristica. It alitht be caused by intersction (moybe by mutual induction, per hrpsi) with the antenne built in to my portable, which eemnot be disoormected. Firat of ell I get "liend spots" (quadrents with nothing - not even beckecround noise) when the nntemn is pointed in certain directions when ( $n$ ) it in too close to the $H \mathrm{~K}_{2}$, bas (b) wen the RX is tuned to low frequencies, like below about 650 Also I have difficulty mulling out locals and also some strong out-oī-town 50 kw stations at night, like WIW, etc. On some nights some stations null out better than others. Why? Maybe GPN can explain the dead spot phenemon. Also - when a strong antenna like the $S M-1$ is close to a weak one (like the one in my RX) can the signel be transferred through free space (air) from the strons antenna to a weak one making it impossible to null out stations because there is still signal in the weak antenne coming through? That's it for this time around. 73s. Summertime activites might include building the Altazimuth Loop

TCW TULL - 5539 Gek - Kansas City, Missourt - 64110
On the night of $4 / 21 \mathrm{CX}$ must have reslly been great: I don't have ny

 could understand with our stepdeughter soting aa interpreter, Belize-634, good
 I guess I'd better net on LA Iog fant. I nlao recelved Beundor-go5 ani Coloebia
 ntritint on ore now. It vill have $137^{\prime \prime}$ cares on an $13^{\prime \prime}$ square frume. If aspone hes tried this, bow did it turn outt This in my flrnt locp, bisd I need all the help I cen eet. I hed n vialtor froe fociliurnt. College tring ay verificetiona. They vere wonderlne kow I reculval then. I abownd bim their si mnal on my FX I GC
 vincea veried. I just need a day joi now io I ean aet in on jor nXing. 73 .

 fev log changts, mostly sasili WYBN-1260 Ni SP Ia L-jam. WKCT-930, nked $6: 16 \mathrm{an}-1 \mathrm{am}$. YOC-1420 slredt $6-1: 55 \mathrm{am}$. I vould like comments an the RCA AR-88, Mnight R-195, Henth GR-54 it 64, Hillicrafters $5=150 \mathrm{~A}$, , the Fealistic $\mathrm{nX}-150 \mathrm{~A}$. They sre possible chot cot for PXes. The HRC Report Forms are WCKlespuly I fust ardered my second batch as Ita down to four. paing has been rethor poor but thin meaked by the shsence of our TV. It'a bsek bow, though. er poor bit this two mey stetes, and a nev coontry in its sbeence. $4 / 15$, Auror-
 al. TBUl- 1240 WXCL-1350 WLHK- 1360 , Lster, USPD-1370 \& $11 \mathrm{w} /$ talk nbout Soth birthday. $4 / 16-J u s t$ wUC-1420, v/Ward "s

 Extrs-venk MINX-1600; too much Q FM. T Uns MIIH-580 v/c/v 6 3:46. Then, the high 11ght of the Bight, KPAR-620 Ariz.; $43129 \mathrm{v} / \mathrm{FII}_{\text {, }}$ yech. Dolly Holiday has only one redeentng characterlatic - hes voiee is casy to recogntze! Poor log; caly two IDe. At $5: 30$ WCHO-1470 w/rr. Zerliar, HJAI- 1040 R . Tropiosi taped again. Hould someone w/access to a cassette player b who understands piense writef I houla 15 montes of 99 lousings of vould like to have then tranatinted. I oupport have 45 minutas (the yeer I pradaste). Laver, THs 4:30 4/19 CPMK, the 73 Convention aite. $73^{\circ} 8$ (the year I graduate). LaTER, IHS $4: 30$ th 19 5 I just heard a bird. Mios rtyme. Terrible CX this 2 M . I got up e $1: 55$ to the tum of good cx, but by 3 they had beccoe avful. CKI-500 \& $3: 30 \% /$ eantent con-
 ed or two. Tota of alop from - vould you belleve - Koxic? Where's the Frienily C ndy Conpeny ${ }^{2}$ Best $\log$ of the night vas an unTD on shout 655 ( 1 need a frequen-
 plete ID $0^{-} 3$ but aipoe ay 83 is nediocre est beat, 1 onn $^{1} t$ give a tranacript, but it was darinitely sop earoussel cr Jumentud. The wel had Thl hice, is algnal fairly stroag, but fady $=$ vhol 73 .

GAX ATKIES - 2200 Heat Burnett Avenue - Loulsvilie, Kentucky - 40210
While on veontion in early March, I had a resi mace viait v/Waiter \#reville in St. Louls sal enjoyed henring scone of his taped ITn, enpecinily WDNF18i0. Also I had a long chat on the inndilae $\mathrm{v} / \mathrm{Jack}$ Hathavay in Champed en, 111. glace I visit both of these areas regularly, I'm sure we'll get together agnin. I recently pirchased s deluxe model Bpece lagnet but I haven't hed too wuch of a chamoe to oheck it out yet. Now to new DXt $2 / 20-\mathrm{MGOR}=900$ Ain. B/off e 6itipa
 1480 Tex. © $1: 20 \mathrm{man}$ v/PoP, $3 / 20-$ R. Berbsios-900 e Bpar 3/22- ISYYL-970 Ia. $1: 15$



 caase of a telephone onil. Is this one Fayettevilie, Tenn ms per PCC info? 1
 have not beard. I aid aend both wIFIC \& NED thenk you notes, though. 730 froe the Ispl of pretty borses and fabt vower.

Dr. FICTUHD E. WOOD - Dep "t of Fore1pu Lenganges - L.3.U. - Daton Roues, Le. 70003 A nev recelving bet-u $\frac{1}{2}$ is nov in ube: The Drake 3Pl-4 unt the Worcester Bpnce Hagnet DeLuxe aodel. I have siso installed g̨ut te an effective ground qyatem; o metal rod drivtn Into the Earth snd a hesvydataty osble ruming up the wail, into the second-ftobr apartinent, and to the chasis. It redacea not only static but especisily man-trate nofse inclading fluorescent lighta. CX ma of this whiting, $4 / 21$, sre rather huraral; no Eiropenns noted in the lant two weeks.
 Ing an give colum for Popular Electromics from the June issue on. I mhy not Beive it to MBC Doavention thil yoar, sib benenter vill have already started by Iabor Deyt Inca dnte is more comventent. I vill be in B.R. throughout Bumer, beaching-
 (Where heve I heard that?) Cesar's remarks lead one to believe you can connect the IB-101 to your RX and read the frequency you are tuned to. Not so! I considered building one for just this purpose, but wes told by a local ham the reasons it will not work. I was skeptical so I wrote Heath. Their Mr. V. W. Staub Tech. Consultant, enswered 'The IB-101 is not capable of being used to read the incoming frequency that the receiver is being tuped to. This type of application would require the circuitry described in the $10 / 70$ QST. We have no recommendetions for modifyins this equipment to do the job you intended with the Hammarlund He-160 receiver." It might be well to pass this info on to the members, as some might be considering this piece of equipment. The 10/70 QST can be checked out et your locel library. Now I might introduce myself as this is my first to the NRC. I have been a member eight months. I am 71, have been dial twisting since 1928 - some times out during the war \& when I was busy making a living. I am retired now and busy LIVING. Over the years I used 16 RXes. One of the later was a galaxy R-530, which turned ait to be a lemon. Back for repairs three times. I traded it down to a Drake SFR-4, which is a much better RX. I am now using the SPR-4 and a 15 year old Ha-160, three antenna, a $50^{\prime}$ wire, $30^{\circ}$ vertical, \& SHL-7 all patched through BNC connectors and 58 U cable to any RX. A $4^{\prime}$ copper rod ground, which is very important. I have an air loop, not too effective, also the ALed by Drake for the SPR-4. Real poor on nulling, not worth the $\$ 20$. I plan on an SM-1 soon. At another time I will list DX. 73s. (We look forward to that
 RM3 DAVE DOSWELJ - Naval Facility - Box 71 - F.P.O. - Seattle, Washington 9 P91 ADAK, Alaska. Spring has yet to arrive as every few days there are snow flurries here but within the last few weeks CX have sure deteriorated. Even so, I was able to hear WBZ \& KDKA one night ago. Adak's halfway between Seettle \& Tokyo so a lot of DX is Japanese, etc. which I'll leave out of Musings. Two of us are DXing here \& we're keeping what amounts to a joint 10 g - so some of these I haven't heard myself. Times areEST. 4/5-KAHU-940 e 4:08. KUAI-720 w/ Hawe ian-type mx © $4: 15$. 4/6-VOA-1140 Philippines © $3 \mathrm{w} / \mathrm{VOA}$ ID. In EE "DZCH, Bulacan, Philippines" ID on 1600 © 5:30. 4/19- KACT \#1-1520 © 2. KNUI-1310 at 2: $20 \mathrm{w} / \mathrm{Hawai}$ an Islanders' BB. KHSI-1290 © 2:45. CHOB-1280 e $3 \mathrm{~s} / \mathrm{off} \mathrm{w} / \mathrm{CSQ}$. They announcee s/on as 3, FST. KIT-1280@ $3: 45 \mathrm{w} / \mathrm{rr}$, louder than CHQB. KREX-1100 3:45. XEQR-1030 © 3:50. KDKA-1020 @ 4 . KIKI- 330 © $4: 05 \mathrm{w} / \mathrm{kIKI}$ Hitbound "ID. KJR--950 © 4:25. KHVH-1040 e 4:45 w/CBS Information Central NX. XEG-1050 was I\&C © $4: 50$. At 5 the announcer on 1030 was talking about Boston $\&$ gave the time in EST but no ectuel ID as WBZ. 1MO-1360@5:20 w/c/w. Best Eastern catch to date is one that Paul (my DXInc buddy) heard, but not I. Rats! On $3 / 27$ he caught a Sea-Joe Cotario" ID on 1290 ④:03. CJOE, Iondon, Ont. Maybe someone can clear up equestion. Quite often on 790 are the letters "KB" over \& over in Morse Code Sometimes it's "KC" instead of $K B \&$ it's not KCAM Glenallen as they've both been heprd at the same time. On 540 in CW are the lutters "NuD." What and where are these? For now, 73 .

GREG HARDISCN - 17600 Orna Drive - Granada Hills, California
4/12. Well, CX here in Southern Cal. have been beautiful lately MM $4 / 5$ was a sch:ol holidoy here, so $I$ was up at no o'clock in the morning roing over the dial several times. Actually I got up e $5: 45$ EXT to check KFI, which is supposed to be on SP 5-7am but I hed to weit for them to turn off until 6, when they went off for five whole minutes. Durine that five minutes, CMQ was blasting

 Was WIPI on their night power of 5 kw at that time, or on full 50 kw ? Also, would 'ADAR be on night 1 kw , or day 10:w? Neither one has FSA on full power as far as I $\operatorname{san}$ tell. I got my first TP (?) on $4 / 8$ on 725 k © $4: 08 \mathrm{w} /$ Oriental mx, staccato volce, etc. It turned out to be R. Pyonoyang. It faded $\epsilon 4: 25 \mathrm{u} / \mathrm{WGN}$ slop but not before I got 17 minutes of chants, etc. OMW-590 picked out of kFXM on $4 / 9 \in 4$ reveilee-tipe buple call, SS, etc. OC-880 looping E o/WCBS NX, KRNN test? 73.

STEVE KANP- 6149 Monteverde - San Jose, California - 95120
 Veries: v/1- KDXU-1450. v/q- KCBQ-1170 WAGL-1560-TEST (thenks,
Helms) JOIB-750 CJCA-930 JOKD-700 WRVA-1140. v/f- KTOK-1000. v/r-KALE-960 KTPN-990 WDXR-1560 KCLR-1530. DX here since last Musing (details in DNXD): 4/4-
 utes early@12:27-12:30am easily overriding local KEST. other catches: CKOK-300 XEIZ-1440 WRVA-1140 KIIR-990 KCAC-1010 KIXZ-940 JOUB-770 for tape report, KFMG740 KRVN- 1010 KCLR-1530 KUAD-1170 KPRa-1550 KJST-1420. 4/8-WAGL-1560 RS s/on © 6:03em w/GSQ-1ike anthem - good signal \& a good bet for those who missed TRST. SSS that day - KMYC-1410 KRON-1460 KKMY-1150. 4/11-KIZ-560. Now, I'd like to thank CAR \& the rest of the ERC for publimhing "LFITER FRCM A PIRATE". It's about time someone spoke up for pirate in a DX bulletin and told a few truths about ham radio! In my opinion, hae radio is a vaste of time, as littie is ever talked about by hams. Hams never talk about anything controversial, as politics etc. is considered taboo - I find such an attitude disgusting. Ever hear a ham brag about how many countries he hes vorked He rarely ever makes a long QSO w/a station in a rare spot - he just gives a ignal report, asks for a $\mathrm{v} / \mathrm{q}$ and gets out. Some hams in guper-rare spots have been forced to leave the air because of these IX hounds. At present, the FCC is considering opening up a "license-free amateur band". Fealiy, the FCC would do better to open up a band for free radio, rather then givea bunch of middle-aged juveniles the chance to turn another slice of the radio spectrum into much of what CB is like now 73 .

CHRIS HAMBIY - 47 Chessell Street - Bax Hill North - Victoria, Austraila - 3129 Well, here I amain after a very long absence from these pages \& I'd better give the memberghip a re-intro and a brick-bat to $H Q$ for sending my last copy of DX NEWS by ship.* Would you remind HQ that my issues com mail7 detting back to the re-irtro I've receatly aila my 4600 apd purchased the Trio 9R59 DS \& also have just got a Crystal Calibrator \#10 which would be soon in operation conce I get a power supply. The Trio is very good selectively in the 1440 range and does not have the harmful harmonics that the HA600 does. I hope to have the $100 p$ in operation soon after a year or 80 of waiting and then I shall be able to give you a report from Australia. I hope $H Q$ would be interested in this. Also I would like to remind the membership I swap IV Guides \& if anyone 'd like one just write. I also can send a green aection out of the Age newspaper (our local paper) which has the programmes of all our local radio \& TV stations, radio $3 A R \& 3 L 0$, etc. I just recently got veries from IXI-1590 and Saigon-540. Also I am hearing numercus Chinese stations at the top end of the dial but I need the calibrator before I can give you any info on these. I must end now. 73s. DAVE WHAMMOUCH - 284 Kain Street West - Hamilton 12, Ontario

Veries since last report inciude: v/1- KRGI WGGO WEBO. v/qWSAU. $v / f=W A J R$. $v / r=$ WEYY. They sure don't come in very fast any more. Only DX this month was NM 4/5-WAJR-1440 ETing 2:02-2:23 I\&C. 4/8- SSS brought WSFW1110 u/CFIJ. SM 4/18-KCBS-740 5:15-5:30 S-9 copy \& no fading. First time I've heard WC stationd when daylight is streaming through the window. KCBS gone by 5:45. Very strange morning all around. On 1340 WNCO Ashland, 0 . all alone till 6:45 when WKSN arrived on the scene. Locals CKOX/WUSJ- 1340 stili not on e 7:30. This is the first I've DXed SM for several years and I was amazed to see how many still signing on as late as 8am. Groundwave cX exceptional until about 8:30 from Eastern N.Y. \& Pa. Things like WADR-1480, WIKO-1370, WEND-1580 WIXZ-1360 WEHIH1590 and othersm all 200 miles or more, solid copy 8-8:30 w/absolutely no fading. I enjoyed the get-together in Yojngstown. One of the biggest $C M$ trades took place between Dan Myers \& wyself'. Watch out Joe Kureth, we're catching up. Now that WELW has been logged, WBKC-1560 Chardon, O. becomes my closest unheard, and with CFIS Simcce s/off © 6 every night maybe this one will be easy. 73 s .

JOiN T. TWEEDIE - vecationing in - Potosi, Missouri - 63664
I am here for two weeks' vacation visiting my son \& nis wife. Very nice around here \& I can listen to KYRO which is the local station, aiso KFMO at Flat River.

DANGERFIELD 3rd - 202 Governor's Drive - Wallingford, Fennsylvania - 19066 I have been listening quite a bit but haven't reported in for two months, so as usual I will fust list some of the highlights. 2/24-Did enyone hear Jean Shepherd on WOR rembling on about how he had been picked up in Anterctice and Holland ? (For what? -ERC, hi) Back to my DX. I heard a Russien on 1525 © 6:15pm - good signal. 3/4-CHRS atop 1090 most of the evening, and WMML etop 1110 © SSS. 3/8-I discov red the Frazier-Clay fight on the RAI net in Italian; of course, and noted audio on 6568458991331 1578. March generally wes on excellent TA month. 3/12- CJRB quite alone on 900 (3) 8:30pm, when looped that direction. 3/19-Arabic program on 1484 © 11:18pm turned out to be another Libyan station, $/ /-1124 \mathrm{k}$. 3/21- BBC-1457 apparently at Crowborough, was like a $10-$ CP1 © 7:30pm w/a church of England broadcest over the World Service. Skop,je-809, Yugoslavio was clear e 10:57pm. MM 3/19-Interesting morning. The SSes on 670 780 \& 860 carrying ER were HRN, HRNQ \& HRU, all heard between 3-4am. HRNQ, IDing es R. Morezen, dominated 780 though listed for 770 . Same morning, PRB9-1000 wrs very sttong e $3: 15$, \& LR3-950 wes on top e 3:40 w/WPEN off. Incidentally WPEN hes been off for several MMs. Noted on 4/1: WLIL-730 e SSS. MM 4/5-A good one. KKHI- 1550 nice © $3: 15 \mathrm{~s} / \mathrm{off}$. PRF4-940, Rio, completely dominated from 3-4em. Surprise, IRA-870 w/clear IDs was alone \& good from 4-4:30. And LRA7-750 believed // to LRA. 4/9-R. Demerara had slipped to 761 k from 8-9pm, \& had a bezutiful signel until their 9:15pm s/off. Mid-April has brought Auroral Cx, end MM 4/1e there wes no PRF4-on 94C. There was instrad, KIXZ. © 4. 4/21- Station heard throughout the evening on 1403 sounds like, and may be, Conakry, Guinea, so perhaps it is a sometimes AN station. Upper band TAB still good. And how, Ben; DAVE SCHMDT - 44 Green Lane - Green Ridge, Pennsylvania - 19014 see p. 24 ! gpn

Greetinas from the land of stations who have all modulation and no carrier! It's been a few months since last report so I figured I'd drop in a few lines. The draft board is still hot on my trail but it sdems like they don't know what to do since I started asking questions, hi! I just got the set and the loop hooked up again on $4 / 17$ (in about five minutes, hi!). The loop still has a few bugs and will have to be rewired. It's nice to hear things like local WJWL-900 $\alpha$ WFIN, WAYE-860 o/WIEL, WMID-1340 w/no WHAT, WGH-1310 at a louder level than WCAM, WAEB-790 o/WTAR, etc. Speaking of WAEB, NRCer Joe Benson was recently employed by them emd is doing the 1 H show. I told him to send in some info but I guess he won't - he don't know how to spell yet, hi! (Maybe he don't know his grammar good neither -ERC) Only DK is $4 / 19 \mathrm{w} / \mathrm{WBAY}-1360$ ( $12: 14 \mathrm{am}, \mathrm{w} / \mathrm{c} / \mathrm{w}$. In local tiabits: WEEZ is now $\mathrm{c} / \mathrm{w}$ anvmore. WFIL will be moving their studios shortly since the FM \& TV were both sold seperately and will probably be off a few morns when it's tekirg place. WCAM is getting new owners (gang that owns KUDL-1380); WPFN-950 is under new meneqement (again), their third new owners in the past six years! WAAT-1300 is due to change calls. (They already have, Dave, back to WTNJ -ERC) Sorry that didn't make the YAD thing; qy time wes spent elsewhere hif I need Ed Recis' address. And to all who are in the S.E. Pa. N.J. \& Del. area, we will all have to get together and start reporting and give Youngstown a run of it. Who knows, by doing thet we might even get a report from Joe Jones, hi! 73.
SFN FRANCTSCO GIANTS' BASEBALL NETWORK:

|  | ReNCIS | ' B | EbALI | OAKIAND | ATHLETICS' | BASEB | NETWORK |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 560 | KSFO | 570 | KCNO | 1090 | $\mathrm{KNCR} *$ | 1480 | KWUN* |
| 580 | KNJ | 1230 | KDAC | 1230 | KWG | 1490 | KBLF |
|  | KWIN | 1240 | KPLY | 1270 | KBLC* | 1510 | KIRV* |
| 600 | KVCV | 1290 | KHSL | 1340 | KBET |  | KTIM* |
| 620 | KISD | 1380 | ктом |  | KAOR | 1110 | KPOP |
| 630 760 | KOH | 1400 | KUKI | 1450 | KEST |  |  |

630 KOH
$760 \mathrm{KGU*}$
970 IBEE
980 KITIS

*     - weekends and holidays.
(These two submitted by NRC's Bob Karchevski)
Nell have semt the KEY stations only which was listed in the Sporting News of 10. We went the NETWORKS carrying the games, as in most cases, the ney for tion is a bis, coumonly heard one
publicity for the baseball teams!

CARLER SCHOLZ - 3 Somerset Road - Tenafly, New Jerbey - 07670
Iong time, no Muse. A recent camping trip to N.W. N.J. found me with a positively putrid transistor portable RX trying to $D X$ off $\&$ on. Daytime found WABC \& WNNJ 1360 to be the only listenable stations; at night the dial was filled, but dial calibration (At 1,000k per inch) made DX impossible. However one night. (I believe it was 4/14) I think I had ZNS U/WPIR-1540, and later that night I saw a spectacular Auroral display. SSS 4/15- WASA-1330 Md. s/off clear from any WPOW N.Y. QRM! Very nice. Cesar Objio, your "HGFM New York" is probabiy WGSM-740, Huntington, L.I., N.Y. (WGFM is WGY's FM calls, Carter - and Cesar ERC) Thanks to Jerry Starr for having the 1971 NRC "Convention" over Easter weekend, and regards to WHOT newsman Art Jordan who is undoubtedly scrutinizing this Musing with a dicroscope. If you put it under ultra-violet light, a dirty picture appears. (UV lamps are availeble for $\$ 20$ from Paul Barker, $\$ 25$ with a local distant switch). Jerry had a Dor pattern book: Did you know you're in WERA's major lobe, ERC? All correspondants, please write. 73s. (I can't be, Carter, for they protect WWRL's primary coverage acea, and this is it! -ERRC)

RONAID F. SCHATZ - 510 N.E. 138 Street - North Miami Beach, Florida - 33162 Greetings \& solicitations from cardioid land! First, I wish to commend GPN on his extremely tactful though foggy article entitled "Pettern Controlled Loops." However, for a clearer \& more comprehensive treatment of cardioid theory I recomend my upcoming "Loop-Sensor Cardioid Array - Part II" to appear in IRCA's builetin \& HOPEFUINY in here too, GPN permitting. Now, if I may clear up some misconeeptions: 1) Cardioid arrays are nothing new. The FCC, etc. heve been using them for decades to solve the " $1809^{9}$ mbiguity" problem inherent in the standard loop. In fact, I know of a marine RX equipped with such an array seling for about $\$ 155$ in certain marine electronics stores! 2) Technical liter ature on CA's is relatively rare, \& $99 \%$ of it treats the aubjeat only in terms of its cepacity to eliminate the 1800 ambiguity. The CA designed as a nuling instrument, therefore, is very much a pioneer field on the practical side. 3) Over the past four months I have designed \& built several LSCAs, all of which exhibit ed perfect-null cardioid reception patterns while the later models gave excellent \& surprisingly easy pattern control. Richard Clark has been DXing with one of my designs for some time now, \& several other DXers are building their own from plans which I supplied them. 4) The one big drawback of the LSCA, as compared to the standard loop, is that it's not a simple "tune \& turn" operation. Finding the nuil is a matrer of shuffiing at least three variable controls, \& since the array is extremely sensitive to even the slightest electrostatic change in its vicinity conslant retuning is mandatory. 5) As mentioned in my article 'LoopSensor Cardioid Array - part I" (submitted to HQ some time ago for offsetting) the ISCA's greatest value is the tremendous width of its aull area, a factor which makes all that delicate tuning worthwhile. 6) In the same article, please correct uy formala for a cardioid pattern to read something like 'K plus coseK, K - $L^{\prime \prime}$ - sorry bout that. Use of the sine function, however, is solely a matter of reference \& is no great sin. Well, in less dramatic news: $C M H-630$ has been off the air for weeks now, $w / C H D-890$ carrying "R. Liberacion" in its place. Why CMHP is off makes interesting speculation. $Q Q-640$ has been much stronger lately, but off frequency HJBJ still causes a buzz all daylight long. Now that I've perfected the ISCA - excelsior! Cnward to the narrow-beam array! See you all on top of Mt. Tamalpais in Sept. \& in Miami/Fort Lauderdale the following year. Recuerden: Ia Florida y vos en '72! IXXXIII y el mejor DX.

TCATY IAGATIUTA - Box 6291 - Portsmouth, Virginia - 23703
Just a few lines from Va. 4/25-Todey Va. is on DST. Nice verie in from WIXR-1510 Norwalk, $0 ., 500 \mathrm{w}$, heard $4 / 4 \mathrm{~s} / \mathrm{on} 7: 30$, 0 shows four sharp nulls to the W . 4/4-WJAX-930 atop channe 1 © 9:55pm. IAs were all over the dial but I don't speak SS, hi! WANV-G70 clear © 10:05pm. They also come in during daylight. $4 / 5=$ I copied WMCA-570 © noont ime, while looking for WLJE-570, which
 Warrent on, N.C.? (I think so -ERC) Seems I need the NRC LOg, hi! Best wishes. (And it seems I need to do the updating in mine! -ERC)
foout time for my annual report to Musinis. I'd better re-introduce m:self. I have been DXing since $1946 \&$ a member of NRC since ' 48 . From the late 40 s to early 60 s I concentrated on BCB but in recent years I have become wainlv a utility \& FM DXer w/occesional tuning on BCB. Most listening below $3 \mathrm{mc} / \mathrm{s}$ or above 30. I expect to do more BCBing next Winter as I swapped the HRO-500 (bigzest mistake I ever made in a purchase) for an older model $S$, 600 . Hammarlund mekes a sharp RX. I'm still using a $20-y$ ear-plus $H Q-129-X$ et the cottage. Recent $D X$ ancludes WHLW-1170 N.J. 12/29; HIFA-1597 D.R. 1/1E © 9: 10 pm . WYDE-850 Rle. 6pm. WRg -1000 Ky . 6:12pm 2/26. WFEP-1080 Pa. $2 / 27$ © 9:388m \& 2DK-1100 Antigue $3 / B \in 7: 43 \mathrm{pm}$ on. Underlined have QSLed. Of above, most interestinz verie wes two pager from WRaM. CE says in part "Your hobis souni quite interesting I've never heard of anyone logeing BCB stations before." come on fellows! You should hear then s:s thetr XR is on Pine Mountain some 3,000' above sea leve:. Some sine veries receiver in past couple of months from stations heafd in years prst. Oldest is from EAJ-29-953 for report of 11/64. No f/up sent since 1965: fnother surprise was Surinam-725 from $3 / 69$ report. Best oí all was from Erj-57894 Canary Is. for $12 / 69$ recention. Never zive ip! All band veries total 7,029 of which 2,281 are BCB; 97 BCP countries ZSLed. I have new hobby which is realli. competing with redio. I purchesed a Schrinn ten speed bicycle last July and so far have pedaled some 350 hours for 4,830 miles. Anyone want to jiin me the Summer of '72 for a trip across Trans-Canada Highway? (I'll sit on the handlebars! -ERC) Only 4,725 miles from St. Johns Nfla. to Victoria, B.C. and just think of ell the IrFR's you could log if you weren't too tired, hi! Anyway my welght is down from 185 to 136 \& the doc srys this 42 -year-old is in really GREAT SHAPE!

SCOTP BROCKWAY - 112 North Creseent, Drive - Rome, New York - 13440 Ever get the feeling that somoone up there doesn't lixe you? For one thing, ver: few verifications have been tricking in, and for another, as I fm typing this out, it's snowing (4/24) - hard! Yich! I'd like to know which direction the seasons are going in - backward or forward. On well, the few things thet are in since last airing of the tonsils are: v/1- WTHM-1530 written on my refort, XERB-1090 same (these are v/r!-ERC) WTOC-1290 w/a OM too, CKEY-590, WDEL$1150 \mathrm{w} / \mathrm{CM}$, WEEP-1080 WEAN-790 w/program guide, \& WXGI-950 for a report of a $\mathrm{f} / \mathrm{c}$. $\mathrm{V} / \mathrm{gs}$ in ere WILK-980 WC $f 0-600 \mathrm{R}$. Belize-834 $\mathrm{w} / \mathrm{a}$ map design on an oversized card, WCHS-580 WAIT-820 WHLI-1100 \& KOMA-1520 for state \#36, f/up. I hope WIAX responds in a smmilar way to the f/up of a few days ago. For some reason, I havent been DXing too much due to generel apathy, I guess. Friday nights are spent socializing $w /$ the weaker sex \& other ones are generally devoted to taping $m x$ off the RX. This is added to my ever-growing tape collection, and the cost of tape cassetts is driving me to the brink of bankruptcy along $\mathrm{w} /$ the $\$ \$$ spent on other -ah em - necessities of life like the first reason for not DXing. But if you've got to go, what better way, hi? T111 next accumulation of info, 73 s .
ERNEST R. COOPER - 438 East 21 Street - Carrier Route 56 - Brooklyn, N.Y. 11226 Local newsettes: WJRZ-970 goes to WWIJ in May, \& to rr formet to catch the crumbs that fall off wase table. They will drop Mist BB next sea son, too. WAIK-1370, WRIV-1390 \& WKIP- 1450 have all dropped the METS for the YANKERS, as noted by hearing same lately. METS are on WJRZ-970 WGLI-1290, WNAB1450 \& WVIP-1310; maybe others even more remote, hi. WNYC-830 \& the FM \& TV outlets owned by N.Y.C. have dropped 55 employees \& go to 11 hours on wNYC-830 start ing 511 - the golden op ortunity for NY/NJ wen to $\log$ KBOA at their SSS! And, WQXR AM \& FM have brought an offer of $\$ 10,000,000$ on the market! The N.Y.Times, owners, are mulling it over. There go all the locals I ever $1_{1}$ sten to - WJRZ for $c / w, \& W H Y C$ \& $W Q X R$ for ctassics! New Yori radio is as blah as ayywhere in the country now - e big nothing. Just run-of-the-mill stuff - endless boring SIDs on so meny stations (does the Mafia control this, perchance? Why else'd a station bore its listeners with repeated jingles, over, over, \& over?) It's like listening to someone talk who keeps repeating the same cliche over \& over, like "y know" "y know". Bostonians don't know how lucky they are, radio-wise, hi. Very little DX, nothing to write into DX NEWS about, so - C U N $1 \frac{1}{2}$ fortnights.

PATTERN CONTROLLED LOOPS
FOR THE MEDIUMWAVE DX'ER
*Gordon P. Nelson

## [Continued from the April 17th issue]

The previous table showed the effect on the basic cardioid pattern shape as the ratio of the vertical to loop signals was varied $(R=E / B)$. If there is no vertical antenna at all, $R=0$ and and we have a normal "figure eight" cosine loop pattern, with equal peaks and nulls separated by 180 degrees.

As the amount of vertical signal is increased (by using a taller vertical, for example), $R$ in the equation increases and the nulls begin to pull together. If, for example, the pickup of the vertical is adjusted to one-half of the loop signal ( $\mathrm{R}=0.5$ ); the nulls are $120^{\circ}$ apart and the two peaks are definitely no longer equal in pickup: one is about 9.5 db (about 2 S Units) more sensia tive than the other.

By the time the relative amount of signal from the vertical antenna reaches 0.9 of that from the loop, the nulls are still $52^{\circ}$ apart but the pickup of the smaller lobe is less than onetenth of the larger.

By the time we have increased the amount of vertical antenna pickup to within $1 \%$ of that from the loop ( $R=0.99$ ) the nulls are within 16 degrees of each other and the pickup from the small middle lobe is less than one-one hundredth of the main lobe.

When we adjust the signal from the vertical to a value exactly equal to that coming from the loop, the nulls merge togethe into a single null and we have the basic cardioid pattern. One of the characteristics of the basic cardioid pattern is that the pickup in the peak direction for a cardioid is twice ( 6 db ) that of either the loop or vertical antenna alone.

What does this mean to the loop builder? It means that any attempt to construct a practical pattern controlled loop will require very careful adjustment of the relative signals contributed by the loop and vertical antennas. If our loop cum vertical array does in fact perform according to Equation? (see appendix) which is the classical textbook behavior, very slight variations in the electronic parameters will produce rather major alterations in the shape and properties of the resulting pattern. A one-percent shift in relative signal pickup, for example, will cause the single cardioid null to split into two nulls more than 16 degrees apart.

In order to thoroughly null out a powerful local station (say a $50 \mathrm{kw'er}$ within a few miles) a null depth of at least 80 db is essential. Assuming a cardioid loop as described by equation 7 is adjusted to completely reduce the troublesome local station, observe that a variation in the relative pickup of only $0.1 \%$ will result in a new pattern with nulls split by about $5^{\circ}$ and only 66 db of effective null in the original direction. Holding the relative signal contributions from the loop and vertical to within the tolerances necessary for really deep nulling will require extreme care in even the best of circumstances because of the sensitivity of the cardioid pattern to very small variations in relative pickup.

THE PHASE PROBLEM. The previous discussion, yau will recall, was based on the assumption that the relative phase shift between the two slgnals (as given by the quantity of in our equations) was adjusted exactly to $90^{\circ}$, But In actual practice it has been our experience that it is even nore difficult to udjust and hold the relative phase than it is to control the relatlve pickup. What will be the offect of variations in the exact relative phase between the two signals?

Whereas variations in the relative pickup (as measured by R) have the effect of shifting the location of the nulls without affecting their depth, fluctuations in the phase adjustment will dograde the quality of tho mults as well as shifting their location, . Suppose we have been uble to adjust the relative plckup of the two antennas (R) to exactly 1.000 ; what happens if the phase differential changes by a snall anount? The following graph shows the effect of varying the phase by i 5 nall amount frou the correct setting necessary for the cardioid pattern.

Location of the sull angle $\theta_{\mathrm{N}}$ and null depth in D b for $\mathrm{R}=1.00$ and $\mathrm{R}=0.950$ as the differential phase angle ? is varied slightly.


In the first case we set the pickup ratio, $R$, exactly equal to one and let the phase drlft by i few degrees. Note that the nulls drift apart somewhat but, more significant, the mull depth is very serlously uffected - only a two degree error in setting the relative phase degrades the nulls so soverely that they are only 35 db deep. The second graph shows the effects of slight varlations in both (2) and the phase $\operatorname{tngle\& ;~a~} 51$ shift in relative pickup along with a $5^{\circ}$ phase error changes the pattern from a cardioid with a single Infinitely deep null to a rather nediocre one with two shallow nulls ( -27 db deep) separated by about $18^{\circ}$. Still a useful pattern for sone applications but useless for deep-nuliling powerful locals!

SIMMARY OF THE BASIC PATTERX CONTIOLLED ARRLYY.
A pattern cantrolled 1 oop designed around the basic equations given here and elsewhere will require vory careful adjustnent of the relative signal pickup ratio and phase differential. Very small deviations from the exact values given by the equations will bave rather nafor effects on the shape of the resultant patteril. Slight

Varlations in the pickup ratio of the $l$ oop and vertical antennas will produce significant variations in the locations of the nulls; minor fluctuations in the differential phase will serlously degrade the null depth, thus 1 initing the ability of the array to null strong stations. Taken together, slight fluctuations in both smplitude and phase ( $R$ and $\boldsymbol{F}$ ) tend to reenforce each other and readily produce significantly distorted patterns.

In the first part of this article we have atterpted to describe the basic properties of the simple pattern controlled loop. In addition to our derivation of the basic cosine and cardioid patterns, we have given the equations for the patterns produced by arbitrary values of relative amplitude and phase. In particular we have provided the equations which predict the behavior of null location and depth as we introduce slight fluctuations in the array as are likely to occur in actual practic due to component drift, maladjustment, etc. To the best of our due to component drift, maladjustment, etc. To the best of our for the arbitrary pattern have not been given before in the texts alt ough their derivation and evaluation are rather trivial.

Since we had performed this mathematical analysis prior to our first attemts to actually construct a pattern controlled loop array, we were spared a considerable amount of experimentation and head-scratching when we actually began to experience the problems produced by the slight fluctuations in amplitude and phase described above. Our first circuits (to be described next issue) provided us with patterns which, while encouraging - especially for groundwave signals - still behaved somewhat unpredictabiy on groundwave signals - still behaved somewhat unpredictably on
skyme signals even with very tight control of R and $\varnothing$. As we shall explain next issue, the basic cardioid pattern as described shall explain next issue, the basic cardioid pattern as described practice because of polarization ellipticity, wave tilt, and ground effects. In future issues we shall provide information not previously available about these complications and provide plans for what we've found to be the nost effective circuitry for practical pattern controlled loops.


P.O. Bor 1420, Melfort, 1420

WIGHES TO THANK YOU FOR jooniranang Thus station AND WE HEREDY CONFIRM YOU HECEMTON AT 1420 ke.

ON
OCTOBE』 23 1769 AT 658 7 mo 7.10 A m

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Twe Towers asi 1 f. im lime to true.

Xtmo-cGe Thiranunt ABTCASB - Effitinc IT

linearly polarized wavefront, but also assume that the effective effective wavefront at the antenna is parallel to the ground. This is untrue in the case of all real signals: skywave signals because of skip geometry, and groundwave signals because of the effective wave-tilt produced by the interaction of the wavefront with the nonideal ground beneath the antennas.
c. Deviations from the simple ideal vertical antenna pattern assumed above. In actual practice the pattern of a real vertical antenna is rarely uniform in azimuth and the transmission line from the vertical antenna almost inevitably exhibits a finite pickup of its own.

Al1 of the complications 1 isted above must be taken into account if the behavior of a real pattern controlled loop to real signal wavefronts is to be uniquely described. We'll return to these problems later.
SPECIAL CASES OF THE BASIC EQUATIONS.
NO ELECTRIC OR VERTICAL PICKUP, $\mathrm{R}=0$.
In this case the general equation given above reduces to:
$* * * \frac{V(\theta)}{V_{\max }}(\mathrm{Db})=20 \log _{10} \operatorname{Cos} \theta$
which is the COSINE LOOP PATTERN with infinitely deep nulls at $\pm 90^{\circ}$.

CASE OF $\mathrm{R}=1$ AND $=90^{\circ}$.
In this case the pickup equation reduces to
*** $\frac{V(\theta)}{V_{\text {Hax }}}(\mathrm{Db})=20 \log _{10}[1 / 2(\operatorname{Cos} \theta-1)]$
which is the BASIC CARDIOID pattern with an infinitely deep null at $\theta=0^{\circ}$. Note that if the inner term is replaced by $(\cos \theta+1)$ the pattern is replaced by its mirror image with the null at $180^{\circ}$ instead of $0^{\circ}$.

The above equations describe the patterns for all arrays produced by combining the signal from an omnidirectional vertical antenna with the output of a perfect loop antenna in any ratio and with any relative phase relationship. The generalized equations above predict the basic cosine and cardioid patterns as found in all standard textbooks (see below). These almost trivially simple equations do not however take into account the effects produced by the following physically significant complications:
a. Polarization ellipticity and rotation (the above equations apply only to linearly polarized wavefronts in general) ; this is an unrealistic assumption for skywave signals in actual practice.
b. Effective wave-tilt. The above equations not only assume a

THE LOOP-SENSOR CARDIOID ARRAY

## Port I

Ronald F. Schatz

1) Introduction. This first in at least a three-part article on the Loop-Sensor Cardioid Array will serve to familiarise the reeder with the unit, determine the need for such an array by the DX community, and to compare an ideal LSCA with the ideal standard, figure-8 loop. Part II :ill cover the technical theory of operation, assuming a knowledge of reactance and resonance by the reader (who is advised to brush up on these subjects in preparation). Part III will deal with practicel construction and operation, noting the experiences and difficulties encountered by the author. 2) Ubst it is. The LSCA consists of two separate antennae: One is any stancard figure-8 loop such as one you are likely using now. no:.: the other is, ideslly, a vertical vire running the centre of the loop plene, but a horizontal long-wire will do fine in many ceses. The signals from the two entennae are combined ith the correct ratios of voltsge and phase to form a K+sine cifferential pattern of reception known for its shape as a "cerdioid".
2) Directivity. The primary characteristic of the LSCA is its unidirectional (one peak/one null) pattern of reception. The peak and null are separated by $180^{\circ}$ in bearing, the peak having a gain 10 dB over that of the F8L uncombined with the vertical sensor.
3) The $180^{\circ}$ ambiguity, or the inability of the standard loop to distinguish supplementary bearings, does not exist for the LSCA. Core important to the average DX'er than this DF characteristic, however, is the array's capacity to null out a strong station thereby unveiling weaker stations lying in the opposite direction, stations not heard previously because of necessarily peaked ¢RH or an undesired null.
4) The null. This fact wes not appreciated by the author until 3 fter a night of DX'ing with the LSCA: The null of seme is tremendous in size, capable of reaucing not just a few degrees of bearing but, in the author's case e.g., all of the U.S.A. and Cenada! Belo: is a table comparing relative null sizes of the ISCA and the F8L. Decibels do:m are referenced to each respective peak, assuming both peaks to be equal in gain (c.f. 3 above):
SF8L: $\frac{-10 d B}{60^{\circ}} \frac{-20 \mathrm{~dB}}{29^{\circ}} \frac{-30 \mathrm{~dB}}{14^{\circ}} \frac{-40 \mathrm{~dB}}{8^{\circ}} \frac{-50 \mathrm{~dB}}{4^{\circ}} \frac{-60 \mathrm{~dB}}{2^{\circ}} \frac{-70 \mathrm{~dB}}{1^{\circ}}$

$$
\text { ISCA: } \begin{array}{lllllll}
180^{\circ} & 120^{\circ} & 82^{\circ} & 57^{\circ} & 40^{\circ} & 29^{\circ} & 18^{\circ}
\end{array}
$$

ote that these are ideal antennae being compared. Any F8L capable of a -7003 null must be considered a precision instrument! Many DX'ers are quite satisfied with but $-40 d B$ of attenuation.
6) Proof of Perfornance. Using only a crude set-up with a longire sensor the author has accomplished the following feats of DX:
a) WIPZ-940, a 50-kw Top-40 station only 4 miles from the author's location and beaning toward same with a cardioid of its own, was nulled beyond detection during evening hours, permitting clear reception of Radio Punto Fijo, lying in the opposite direction of WINZ. Interesting to note that WINZ's splast mas still prosent on adjacent channels:
b) On a londay morning 45 minutes :aere taped of $A F C N-13: 0$ Guantánamo Bay, ;ith signal averaging $30 d B$ over the background "noise". Audible traces of CMGU were present.
7) Advantages over the figure-8 loop. The cerdioid reception pattern of the LSCA has several advantages over the FSL: a) The LSCA can differentiate between stations on colinear bearing:, determining exact direction of an unknown station and eliminating one colinear station while peaking the other. b) Experiments show that the LSCA has the capacity to peak 3, even 4 , stations one at a time, oferating on the same channel (e.g., 3 stations on 1250 kHz , 120 apart - any one may be peaked 20 d 3 over the remaining two). The F8L is limited to only two stations in practical application. c) The extremely broad null of the LSCA permits the attenuation of many stations in a broad region, whereas the F8L generally nulls only one station at a time. d) Properly constructed, the LSCA's null will eliminate any interfering station, regardless of polarisation errors (The null is tuned in with a pot, coil, and capacitor, so that any null that is not perfect is considered being "detuned").
8) ... and the disadvantages. a) The null is too broad for the ISCA to be of much use in high-precision direction finding. b) Two interfering stations on opposite bearings camnot be nulled. c) Using the LSCA, especially tuning the null, is a test of patience.
2) In conclusion. The Loop-Sensor Cardioid Array far outshines the ordinary figure-8 loop in $2 l l$ respects except as a high-precision direction finder. Its addition to the DX den is highiy recommended. The author considers its nide null to be its greatest asset, useful on crovded channels such as the graveyards. As construction details come to light and DX'ers contribute to its perfection the LSCA should prove to be the greatest advance in medium-wave DX antennae since the loop itself.
-30-

## ADDENDA \& Editor's comments:

With regard to Mr. Schatz's comments elsewhere in this issue of DX NEWS, the reason that this article did not appear in the previous issue was because we had detected a number of serious technical errors in the original copy and, rather than publish a technically incorrect article here in DXN, we chose to advise the author of the suspected errors so that he might correct them before the article appeared here in DXN. Those who subscribe to the excellent ham magazine, HAM RADIO, were recently treated to the unfortunate spectacle of that magazine advising its readers to "please forget" a technically spurious article on antennas which unfortunately slipped by the editorial staff in a previous issue. Rather than repeat this unfortunate process, we chose to advise Mr. Schatz of the suspected errors in his article rather than run it immediately - thus the one issue delay in the appearance of this article. Mr. Schatz has submitted the following corrections to the above article in response
$\cos 9 \mathrm{~K}$, $(\mathrm{K}=1)^{\prime}$; here K represents the loop-sensor voltage ratio rather than the usual 'constant value'." (2) " 10 dB should be changed to 6 dB ".(3) "-10 $20,30,40,50,60,70 \mathrm{~dB}$ should be changed to the values: $-6,12,18,24,30$, $36,42 \mathrm{~dB}$. The relative angles should still be correct. The numbers 70 and 40 at the bottom of this section should read ' -42 dB ' and ' $-24 \mathrm{~dB}^{\prime}$ respectively. "

We believe that there are a number of additional major technical errors in this article but, in keeping with the wishes of the author, will append our comments to the original article here in DX NEWS rather than further delay publication. RE: Paragraph 2- the general cardioid pattern can only be obtained by combining a cosine loop pattern with a vertical pattern which is invariant to $\theta$. The equations relevant to this invariance will appear in the next issue of DX NEWS. RE: Paragraph 2, corrected by the author's comments above. Under no conditions can the "loop-sensor voltage ratio" K appear as a multiplicative constant in the argument of the cosine term in the pickup equation. This quantity is equal to the variable " $R$ " given in our equations elsewhere in this issue. RE: Paragraph 7, section d: no linear combination of electric ("E") and magnetic ("B") antennas can be independent of variations in the effective polarization figure at the receiving site as affected by polarization ellipticity, polarization angle, the imaginary component of the complex dielectric component of the ground reflectivity under the antennas, and the wave angle of the effective vector resultant wavefront in the neighborhood of the antennas. We regret the necessity for such in situ corrections to an article here in DX NEWS but we bow to the wishes of the author for undelayed publication of the original manuscript. (GPN for BPC)


## INTERNATIONAL



REPORTEDLY IN OPERATION...

CYPRUS. The brand new Cyprus relay transmitter for Radio Monte Carlo began testing on 1232 kHz on April 3rd with programming in French and Arabic; announcements were given as "This is Radio Monte Carlo, the first experimental Arabic transmission of Radio Monte Carlo at reduced power on medium wave 243 meters, 1232 kHz ." (Editor)

LIBYA. Gonfirming the suspicions of many stateside DX'ers, Beida on 1124 is using a two-tower directional antenna array for their $1,000 \mathrm{kw}$ transmitter. Benghazi on 674 also has a two-tower array. (MWN)

EGYPT. Cairo reportedly has been heard with a new station on 809 kHz in Arabic; with Abu Dhabi also on the channel be wary of presumptive ID's! (Ed)

BRAZIL. ZYK36, R. Capibaribe, noted in Sweden on 1237 kHz . (ARC)
SINGAPORE. A new 150 kw transmitter is reportedly now ope rating on 680 kHz. (MWN)

GAMBIA. Radio Syd, formerly based on the pirate ship Cheeta II, began operating from a land-based station on 5/9/70 and supposedly employs a staff of 20. The last information we had on this was that they were using 10 kw on 908 kHz . A good target for this summer and fall! (DXCLUSIVE)

CYPRUS. The BBC East Mediterranean Relay station is now on 1457 kHz and was noted signing off 2315 after World Service news; announced only 1421 and 719 channels however. Much disturbed by another testing transmitter noted often with nonstop classical music until about 2320. This second station may well be the powerful BBC transmitter, believed to be the 1295 kHz rig, which is heard testing nights around 0000 with World Service relays. A rather confused situation at the present time! (Bengt Ericson, Sweden)

URUGUAY. CX12, Radio Oriental, Montevideo is reportedly using "one of the most powerful transmitters in America" on 770 kHz according to a QSL recently received by a European DX'er. Correct address in NRC LA Log to: R. Orientaldd Oriental, Juan A. Rodriguex 1405, Montevidco. (SDXK)

PORTUGAL. San Gabricl's 971 kHz operation is 100 kw and may be the transmitter formerly operating on 1412 kHz . (ARC)

INDONESIA. A DX'er in New Zealand reports hearing a Radio Republik Indonesia station on 1334 kHz ; location given as Djakarta. This is the first RRI station reportedly operating on the MW band; the stations reported by Lars Ryden some months ago were private operations. (NZDXRA; Editor)

SPAIN. La Voz de Guipuzcoa now broadcasts in French every Sunday 0900-1100 from the station, this one is owned by Mr. Trimoulent, a majority stockholder in Radio Andorra, and expects to increase the amount of French language programming in the future. This one, which operates on 1097 kHz , has been logged in North America with RS Spanish programming. (ARC)

## PLANS, RUMORS, AND PROMISES...

JAPAN. The Japanese Minister of Posts and Telegraphs has announced that a major change in the Japanese broadcasting scene will take place soon as the result of excessive QRM from Chinese and North Korean stations. The plans call for an expansion of medium wave broadcasting in Japan, both an increase in the number and power, and for switching some Prefectures to FM at the same time. The new plans are scheduled to be implemented in September but still must be formally approved by the Government's radio wave control council. (Official Japanese'sources, via Editor) Hopefully this will put some high power stations on channels more favorable for ECNA reception... Ed.

COMORO ISLANDS. According to La Monde, ORTF will set up a high power station sometine this year to counteract propaganda from Tanzania; this is expected to be a 200 kw medium wave station also to be used for beaming to Tanzania itself. These islands are located North of Madagascar. (ARC)

GABON. On April 16th President Bongo signed an agreement with a representative of the European Development Fund for 247, 000, 000 CFA francs for the construction of the Franceville radio center which will include a 20 kw medium wave transmitter. (Editor)

IRAN. Radio Ahwaz on 1390 plans 400 kw ; Radio Mashad on 725 plans 400 kw ; Radio Shiraz on 1050 is using 125 kw . (BDXC)

FRANCE. ORTF plans the following changes: Nancy-1241 to 100 kw ; Nice1241 to 100 kw (and the frequency changed); Strassbourg-1277 to 300 kw . Limoges-791 has already increased power from 100 kw to $150 / 250 \mathrm{kw}$. (ARC)

AUSTRALIA. The University of Adelaide has been granted a license tooperate operate a 300 watt station on 1630 kHz ; no music allowed. (NZDXRL)

ANTIGUA. ZDK on 1100 kHz plans to increase power to 50 kw . (SXDK)
DENMARK. Radio Denmark will replace the 22 year old 50 kw Copenhagen transmitter with two 500 kw ones in Jylland. (CDXN via SCDX)

GILBERT \& ELLICE IS. The new 10 kw transmitter on 844 will be moved to Naribai and it is hoped to provide a directional antenna for better coverage in the Line Islands. (NZDXRL) GET THEM WHLLE THEY LAST!!!!!

IRELAND. The Irish Press says there will be new MW stations in the Gaeltacht area, Donegal, Connemara, and Kerry (or at least one new station to cover these areas); Athlone on 566 kHz is to up power to 400 kw . (MWN/ARC/Ed.)

SWAZILAND. I'ransworld Radio has received permission to build a missionary station near Mbabane; transmitter on MW to be as much as 100 kw . (SCDX)

CHEJU ISLAND. This island South of Korea has been mentioned as the site of the replacement for the VOA Okinawa station in the event the latter is forced out of Okinawa (see elsewhere for further information on the VOA affair). Far East Broadcasting is also takling about setting up a 250 kw transmitter on the same island for beams to China. (Lars Ryden, Japan)

PAPUA AND NEW GUINEA. The ABC is planning the following relay stations which will carry the Port Moresby program (no local studios):

| Location | Callsign | Frequency | Power (kw) | Possible opening date |
| :---: | :---: | :---: | :---: | :---: |
| Madang | 9 MD | 860 | 2 | March 1971 |
| Lao | 9LA | 670 | 2 | June 1971 |
| Goroka | 9 GR | 900 | 2 | June 1971 |
| Wewak | 9 WK | 1520 | 2 | Not determined (ARC) |

INDONESIA. The RRI stations in Djakarta, Jogjakarta, Surabaya, Surakarta, Malang, Den Pasar (Bali), and Medan have been visited by Japanese radio experts to investigate the possibility of installing medium wave stations. (ARC)

FIJI ISLANDS. Heard an interview over 4VEF with someone from FEBC who mentioned a new station several times and seemed to say it would be in Fiji; not certain, though, audio was not the best. (Sullivan, Mass.) More info?

CLANDESTINES, BOOTLEGS, AND PIRATES...
NET HERLANDS. Radio Nordsee International is currently anchored near Radio Veronica's ship. RNI is still operating on 1367 with 100 kw . (ARC)

ENGLAND. Capital Radio will resume transmissions soon. (ARC) Britain is currently caught in the grip of the radio equivalent of Prohibition, with bootleg land-based operations all over the band. Most are low-powered but some, such as Radio Caroline (only a namesake to the former marine pirate)' on 1332 V kHz are powerful enough to reach Sweden and Finland. The following stations belong to the Independent Radio Association, 91 Park St., Horsham, Sussex: Radio London on 1125 KHz and FM; Britain Radio on 1180 and 1385; Radio Malvern on 1000; Galazy Radio on 1136; Radio Horsham on 1115 ; plus Radio Ajax and Radio Reigate, channels unknown. In addition, Radio England operates on 1299 kHz with 300 watts; address is 50 Hempstead Road, Watford, Herfordshire. The most powerful station is Radio 240 on 1250; reportedly using 5 kw . 240 operates with Radio Jackie on 1325, and Radio Free Caroline on 1430; address is Jackie Porey, 62 Kenilworth Ave., Wimbledon Park, London SW 19. (ARC) Come next fall, if they're not all in London Tower, one of these bootleg stations might make it to North America? !

## THE NAME GAME...

CEYLON is now officially The Socialist Republic of Sri Lanka.
CAMBODIA is now the Khmer Republic.
MUSCAT is now the official name of Muscat and Oman.

ROBERT L: FOXWORTH
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Heceptions: (All times are GMT)
(Bartels, Wisc.)
529 Algeria. Chanting on at 0603, 3/9: not nearly as good as last year.
548 Algeria. Oran fair with chanting thru loud het $2352-0000 \mathrm{~s} / 0 \mathrm{ff} 4 / 7$ and weaker at $0000 \mathrm{~s} /$ off $4 / 8$. (DeLorenzo, Mass)
Morocco. Oujda was in with clear signal and Arabic music around 0200 on $3 / 10$ so must be going most of the night. (Dangerfield, Penna.)
650 Alaska. KYAK Anchorage was all alone on the channel at $12003 / 24$ : has been seldom heard this season. (Millar, Everett, Wa.)
656 Italy. RAI carried the Clay (Ali)-Frazier fight eve of $3 / 8$ here, so was AN then, with a readable signal, assuming one knew Italian, I don't really. The fight was also on other RAI stns, of which 845 was by far the strongest. (Dangerfield, Pa.)
** 65 Haiti. This is Radio Lumidre drifting from 660. (Objlo) (This is likely Gene Martin's unID, can someone tell him? ed) unID LA. WNBC too strong to ID, hrd $04304 / 3$. Unable to DF. (Edmunds, NJ)
670 Honduras. HRN Tegucigalpa hrd MM $3 / 29$ before and after 0800 with ER. They were topped by the Cuban. Was // to other freqs in Hond. (Dangerfeild) unID. Who has The World Tomorrow at 0510 on MM's? Noted under WLW $3 / 22$ and $3 / 29$ looping South. Seems awfully late for Jamaica. (DeLorenzo, Ma Venezuela. Radio Capital, YVKY, Caracas; a new name for la Voz de la Patria. Re item in 3/20 IDXD. (Obj10)
750 Argentina. I think I had LRA-7, Cordoba, at 0925 on $4 / 5$ with what sounded like the same pgm definitely logged on 870; see item there. (Dangerf ${ }^{\prime d}$ ) Guyana. Radio Demerara was the one causing the severe het here the evening of $4 / 9$ here ( $0100-0245 \mathrm{~s} / 0 \mathrm{ff}^{\prime} 4 / 10 \mathrm{GMT}$ ). Was a very strong and clear sig with WJR and the Cuban no problem. They kept the carrier on long after the $0245 \mathrm{~s} /$ off, apparently to correct the problem. (Dangerfield)
*N 780 Honduras. Another one with returns from the recent Honduran election all alone with a good signal. None listed here, but I believe the ID was Radio Morazan, which would be HRNQ. Hrd MM 3/29 0800-0900. (Dangerf'd) Honduras. None listed here in WRTVH, but Radio Norte heard. This slogan appears as HRBT-960, San Pedro Sula, so maybe a move, or a relay. Noted MM 3/22 1048 with Honduran ad, ranchera mx; 1055 ad for a Refresca Tropical", more ads, 1059 ID as Radio Norte. WBBN Carrier intermittent after 1102 but ID again after 1103 as "Radio Norte, la emisora con programacion para seis mil watts." (Watts and not watios? ed). ID later as "Radio Norie, la emisora de todos los hondureños", an obey-the-law PSA. Was very strong at times, and seemed on the high side of 780 hets. This may be LMA's unID in the $12 / 12$ DXWW. (Hauser, Texas)
(3) Likely this one the one reported: stn hrd IDing as "Emisoras Unidas" with ER on $3 / 29$ at 0505. Consejo Nacional de Elecciones through "Emisoras Unidas" a network comprising all stns in the country, directiy from the central office. Other // stns were hrd also. (Objío, D.Rep.) (Bartels
TBO New Zealand. 4YA with what sounded like a play or discussion $0913 \mathrm{3} / 15$
780 Puerto Rico. AFRTS Ramey AFB with rock pgm $08563 / 22$ "Down in the Boondocks" to 0920. Fairly weak but no real intf. exc weak $4 Y A$ which had to be looped out, hi. (Bartels, Wisc.)
evenings. (Dangerfield) last week. Otherwise; they s/off in the early

Yugoslavia. Skopje must have been the very strong signal hrd before and after 0400 on $3 / 22$ in a Slavic lang. At first I thought it might have been the BBC European Service, but I don't think BBCES is on the air at such an hour. (Dangerfield, Pa )
818 Andorta. Sud Radio $3 / 202305$ to 2340 . Sig s-5 but good audio, all in French, girl ancr with guitar and pop singing; man with news at 2331, also on $3 / 21$. (Kocsan, NJ)
820 unID. Chanting 0835 3/22. (Bartels) (Must be Apintie, Surinam. ed)
640 St. Lucia. Castries believed to be the stn with an English religious pgm 3/15 between 0951 and 0958 when WHAS signed on. Also had the same pgm on $3 / 1$, at that time WHAS went off the air and I hrd French, between 1016 and 1028. (Bartels, W1sc)
851 Spain. Murcia assumed the one here $3 / 21$ at 2342 with an $s-7$ signal and fair audio, very relaxed male speech with brief piano interlude at 2345, sideband splash QRM. (Kocsan)
BT0 Puerto Rico. WHOA at $00544 / 1$ with WWL looped, good with singing in Eng and anmts, and "Sing the Nickle Song" (Kocsan)
67D Argentina. Assumed the one here $3 / 29$ at 0900 "the hard way" under the Cuban and WWL OC; WWL mostly looped (700); their s/on coincided with the Cuban bells ID and IS; hrd a series of "pips" which sounded like trumpet tones, voice followed but only "onda corta" and "radio nacional" were understood. News for 10 minutes; at 0913 a folksy male ancr with accordion mx and 2 singers. 0916 had 2 singers on a jingle in a long drawn-out conmercial. 2 girl singers at 0922 and signal gradually dropped under the Cuban. Logged again MM 4/12 at 0859 under the Cuban. In the clear at 0913 with man in Spanish, "L R A Radio Nacional, Buenos Aires" folo by a man singing with guitar. (Kocsan, NJ)
8 IRA was strong and inthe clear on $4 / 5$ from 0905 to 0930. Was easy, and gave a nice, clear ID as ellay-erray-ah, Radio Nacional de Argentina. Tried again $4 / 12$ but Cuhan was dominant. (Dangerfield) (What happened to you on 4/5, ESK? hi-ed)
880 unId SS. Hrd MM 3/22 0705-0800, a varying signal with a bad het, LA mx with several male voices in anmts and cmcls. IS of 2 short and 1 long on a police whistle or a horn during station ID which is difficult to follow but includes mention of "Radio Union" and seeringly, "Buenos Aires". I assume this is Lima, Peru but it lacks the sharp pgng and IDing associated with OBZ4N. (Kocsan, NJ)
880 Peru. Radio Mil (?-ed) MM 3/22 0831 EST TC, ID, andean-influenced rusic, a later $T C$ as "las tres de la mañana y 38 minutos en todo el Perd", indicating daylight time is over. (Hauser, San Antonio Tx )
8 Lima very clear with Radio Union ID by YL and man 0800 3/29, hrd 0640 0800 with shrill police whistle repeated twice, usually after every alternate song. (DeLorenzo, Ma)
(8) Radio Union hrd $0630-08303 / 22$ with MoR mx, many IDs. There was a het from BBC-881 until almost 0700 then generally was on the clear except for an occasional low freq het but no other audio. Cty\#39. (Sullivan, Ma )
B81 Wales. BBC4 hrd 0608 to $0657 \mathrm{f} / \mathrm{out} 3 / 22$, news to 0610 then talk. QRM from WCBS testing and het from Lima. Iogged Wiles as \#38. (Sullivan)
885 Montserrat. Good signal $3 / 18$ with BBC World Svee at 0200. (Bartels)
Q90 Australia. 5AN Adelaide believed to be the stn with Opera on $3 / 8$ at 1014 with WLS silent. (Bartels)
25 Morocco. Agadir clear with chanting 2330 4/8. (DeLorenzo)
940 Brazil. PRF-4, Rio in with a fairly good signal atop the freq on MM 3/29 at 0845. Was all alone and quite dominant on $4 / 5$ from 0830-0900. This was a good morning for lower So America. (Dangerfield, Pa)
950 Argentina. LR3, Radio Belgrano was on top of several domestics at 0840 on $3 / 29$ with local, WPEN silent. (Dangerfield)

60 Colombia. Radio Sutatenza exclnt at $0858 \mathrm{MM} 3 / 22$ at $\mathrm{s} / \mathrm{on}$ giving out lets; for a few minutes there was a distorted spur on appx 955 but was soon cle ered up. Then into a pgm, network linked by FM, lasted 90 mins. Outlets listed conflict with WRTVH, including this freq:
HJCY 250 kw 810 Bogotá (WRTVH says 300 kw )

HJOP 10 kw 1010 Barranquilla (WRTVH says HJHN)
HJCX 120 kw 700 Cali (WRTVH says HJGU)
HJIT 120 kw 960 Magangué (WRTVH says Barranquilla)
HJCR 10 kw 590 Medellín (WRTVH in agreement)
A couple of other outlets shown in WRIVH were not mentioned. (Hauser)
970 Hawaii. KPUA was copied weakly from 0800 to $08103 / 22$. I hrd a newscast beginning at 0800 and the call KGMB was mentioned twice. At 0805, tide conditions were given for Hilo, and a time check at 0805 for "10:05" Copy was very weak under KAKC QRM but am absolutely certain. Although I did not catch the KPUA call at anytime, I am counting as Hawaii \# 2. Replay of tape leaves no doubt. Was hard to believe; phonetics of KCHV are so similar, and KGBB not on this freq itself. (Faul Hart, Ft Worth, Tx ) (I recall hearing that this station does re-broadcast KGMB news in order to serve Hilo; I too feel it is certainly KFUA -ed)
975 Ecuador. Ondas del Facifico, Guayaquil. Hrd 2355 3/18 with a better signal than 995 and $100 \%$ readable. At 0000 they carried paid messages for the people in rural areas without phone or telegraph service. This is a characteristic of many Ecuadorian stations. (Gleason, Puerto Rico)
985 Peru. Lima logged 2335 3/18 with ID as "Radio Frogramas del Feru, nua sola voz para todo el país". Signal was $30 \%$ readable. This time is barely sunset in Lima this time of year. The same ID was hrd several times clearly, in a pgm of English and Spanish rock, plus spots. They were gone by 2350. By 0100 the carrier could not even be detected with BFOing. This appears to be a change of name. (Gleason, P.R.)
989 Spain. RNE-Peninsular was clearly hrd in spite of local WIBG at 0015 3/22. I had bandwidth at .5 kc and slot tuning at +2 on the 180 . (Dgfld)
995 Ecuador. Radio Suceso, Guayaquil came in just as the 985 signal faded out with an excellent signal. Far better than ever noted on late night reception. 3/18 at 2350. (Gleason, P.R.)
1000 Brazil. PRB-9, São Paulo was very strong at 0811 on 3/19. They wer the best Brazilian signal in many a moon. (Dangerfield)
1017 unID SS. 0300-0345 3/24, looped slightly north of YSC-1015 taking a null reading. Doubt if it was CMAC-1019 as strong het against KDKA disappears with null toward Cuba. Music with anmts were hrd around 0330, but the low modulation was impossible to read. YSC and CMAC (?) were distinctly separate. This one peaked at a good level at times. (Sundstrom, N.J.)
onga. ZCO was quite good at closedown at $10003 / 17$ and all pgmg was in Eng. on this occasion. (Millar, Wash.)
1030 Argentina. IS-10, Buenos Aires was hrd below XEQR around 0800 on 3/29 with ant pointing SE; not good enough to report. (Dangerfield)
1043 E. Germany. Good signal on $3 / 12$ from $0130-0200$ with rock mx and again at 0345 on $3 / 24$. Still seems to be weaker than in previous years but then, all the low and middle band Germans have been that way for awhile. (Dgfld) Cuba. Item in $3 / 20$ IDXD here is Radio Caribe, CMBN. (Objío)
1055 $\frac{1}{2}$ Colombia. $3 / 20$ IDXD itemis HJBB, Radio Valledupar. (Objío)
1061 Italy. Cagliari + hrd 0445 3/22 with good signals; man in Italian(RjE)
1120 Colombia. HJJC Cartago, R. Cartago s/off at 0530 to s/on at $10003 / 21$. Anned freq as 1130. (Objio, D.R.)

* 1121 Dom. Rep. Radio Antillas, HICN Santo Domingo hrd here on $4 / 2$. (Objío)

1137 Colombia. Rio-Mar hrd here 0405-0418 3/17; a good signal. (Bartels, Wisc) @ Unusually strong, on $1138,04504 / 3$. (Edmunds, NJ)

65 unID. Weak signal, TA. (If so, would be a split -ed). Faded often, lang seemed to be accented English. Pgm was old rock, hrd "Light my Fire" by the Doors. Hrd 0634 to $0659 \mathrm{f} /$ out 3/1. (Bartels)
Venezuela. YVQV, Radio Acarigua probably the Venezuelan topping WWVA on $4 / 16$ at 0005, an auroral night. (Dangerfield, Pa )
Venezuela? SS in AST, TC, mx at $1035 \mathrm{MM} 3 / 22$ assumed to be the YV listed active, YNNU, R. Petrolera, Ci. Ojeda; upon reflection however, it could have bean Chile. (Hauser, Tex)
1180 Brazil. PRE3, Rio de Janeiro s/on at $08003 / 14$; only the 4 th Brazil logging in better than 30 years of DXing, and my first Rio station. (Roy Millar, Wash state) (Nice, Roy. ed)
unID. Am hearing a Latin American stn on this freq anncg as "el Mundo" and hrd "Guatemala" but can't get anything else as my Spanish is poor. I have 2 fine logs on him, a 45 minute one on $3 / 18$ and 72 minutes on 3/29. Find nothing in any up-to-date reference. (Wilkinson, Hlywd, Cal) Dom. Rep. Radio Merengue, HTCJ San Francisco de Macoris is back here ex-1190. (Obj1́o)
1235 Bermuda. ZBM-1 hrd with news on $3 / 21$, ID at 0610 and s/off with GSQ.
$1237 \frac{1}{2}$ Colombia. HJIL LV de las Américas the one here $3 / 20$ IDXD. (ObjÍo)
1245 Ecuador. Radio Metropolitana, Quito hrd with dozens of definite IDs 3/19 0100 with a basketball match. Plenty of ads, local references. Rptd this one. Not a bad signal for this station, which uses about 500 watts operating into a poorly tuned tower. This station fades out about 10 miles out of Quito, on groundwave. (Gleason, Hato Rey, P.R.)
Colombia. (see also next item-ed). This is "La Voz del Cesar", Valledupar, (the name and the city are not the same, but both sound the same at the end.) reported in the $3 / 20 \mathrm{IDXD}$. (Objí, D.R.)
lombia. Definitely IDed as La Voz de Corozal in Corozal, with exclnt signals most evenings. (Gleason) (obviously further research is in
1259 Polen 0345 on 412 priter de Dangerfld auroral storm. That day was a nice opening to parts of Central Europe.
** $1267 \frac{1}{2}$ Haiti. Gleason's unID is quite likely the new Radio Metropale drifting from 1280 kc ,-re $3 / 20 \mathrm{mx1}$, ( 00 j10)
1290 Cuba. Radio Guant ${ }^{2}$ namo, CMKS, Guantanamo hrd with pop mx on $3 / 29$ at s/off with NA at 0500, Wo Eng lard; was sil In Spanish. (Objio) religion, IDing as, "this is PJD2, Sint Maarten, Neth. Antilles" (Sullivan)
** 1310 Dom. Rep. Radio Boyá, HIHZ, Address: Calle 21 esq. 9, Sabana Grande de Boya. Power is 500 watts, operates 1000-0300. Owner is Juan Aquiles Gonzalez. This is the former Radio Difusora Popular, San Cristobal, which operated on 4980 kHz . (Oj龴io)
1345 Ecuador. Radio Paz y Bien, Ambato. Hrd 3/19 0005 with a mass or rosary. Station is owned by a religious order. Later on, noted a pgm of typical Ecuadorian mx with ads. Was about $50 \%$ readable. This one uses a 3 kw rig on MW which is identical to the widely hrd 3 kw unit of Radio Quito on 4923 kHz SW. (Gleason, P.R.)
1353 Colombia. Stn in 3/20 IDXD is Ecos del Río, Puerto Boyacá, HJHW. (Objío)
1353 Colombia. Stn in $3 / 20$ IDXD is Ecos del Rio, Puerto Boyaca, HJHW. (Objia
1358 East Germany. Stn hrd with fair signal on $4 / 9$ at 0355 with unID signal East Germany. Stn hrd with
behind. (Dangerfield, Pa )
1367 Int. Waters. Radio Nordsee in at 2355 on $3 / 21$. (Dangerfield)
(a) Radio Noordzee finally hrd here, best TA on band $3 / 230535$ with downbeat rock and what sounded like German deejay (Dutch? ed) (Edmunds, NJ) unID. Spanish 3/22 at 0018, faded at wrong times. Good with guitar mxa and rock group at 0022, girl singing typically Latin song at 0028 , news at olol. Signals on practically every TA channel were hrd this Sunday evening. (Kocsan, Morris Plains NJ)

1410 Dominican Rep. Re item in $3 / 20$ IDXD for HTAE Radio Tricolor. Your pgm hrd on $2 / 21$ is not live sports, as you say, but old baseball games being broadcast again as if it were a new one; not even a reccrding
** 1420 Dom. Rep. Radio Unica, HIRD Castillo has moved here (Objio) ex-600 kHz. (Objio)
** 1423 Mexico. XEF nominally 1420 has varied to here with a slightly distorted signal; is in Ci. Juarez. At 0428 3/17 with 2 minute fast TCs and ID, "Siga escuchando lo mejor de la música de Mexico, en X EF, 14-20 en su radio, Mexicorama!" (Hauser, Texas)
1457 Gr. Britain. Hrd 0459 3/22 with good audio in European svce with a German spkr; carrier cut 1459:30 after "auf wiedersehen". (Kocsan)
© Noted frequently evenings 1 thru 5 and 8 thru 13 in March with 6 pips, short part of an anthem, then Eng news but no real ID 0200-0215, off, then back with same 0300-0315, then in Eng to 0330, then German to 0400, then a slavic tongue to an abrupt carrier cut at 0500. Then, back with s/on and regional pgms, 0630 with others, as usual. Hrd more recently with BBC World Svce IDs, etc. $3 / 22$, 23 , 25 at 0400 . (Edm.)
1484 Libya. A fine signal from what must be Benghazi 3/20 0418-0432 atop the channel and // to 1124 kHz . (Dangerfield)
1505 Anguilla. Very weak with mx 0130 to $0204 \mathrm{~s} /$ off $4 / 4$ but quite loud during brief Aurora with religious pgm 0000-0100 4/5; into pgm on various musical instruments 0100, has chimes and ID every half hour. Country \# 61 hrd . (DeLorenzo, Mass)
** 1525 China Comnst. (NOTE: Recent reports from Europe indicate this has MOVED to 1529 kHz . -ed) Pretty sure this was Sinkiang with wailing female "vocal", flut, talk folo by anthem 2340-2355 3/27; also apparently a jammer here. Hrd what might have been an IS on a stringed instrument, seemingly 4 notes: A-G-A-G. Was hrd again on $3 / 28$ but was almost totally covered by WKBW splash. (Edmunds, NJ) *
1527 unID. Hrad $0015-0019$ 4/5; carrier faded in, very weak, thought I hrd some audio. Varied and wavered in level before fading out. (Kocsan, NJ) (This may be the above. Russ says that they seemed slightly off freq, (This may be the above. Russ says that they seemed slightiy off freq, and if they were on at that time, were moving up the dial. ed)
1537 Colombia. Stn here, $3 / 20$ IDXD, is H.JHD, L. V. de Petroleo. (Objío)
1538 W. Germany. D.L.F., Mainflingen a very good signal with girl spkg German at 0433 on $4 / 4$, then lively mx . (Objío, D. .R.)
1550 Mexico. XEBG Tijuana hrd well under CBE and after s/off AM 3/29. Also under CBE 0045 4/3. (Edmunds, NJ)
1550 Australia. $4 Q D$ was in with a weak signal, first time hrd on $3 / 1$ with music off and on 0838, then mostly talking after 0853 in English, faded and talking again 0909 with pgm, "England Today". Has not been hrd since then. (Bartels, Wisc.)
1597 Dom. Rep. HIFA appears here nightly very strong to 0500 taps, anthem and s/off. I think this has to be more like 10 kw as it is consistently hrd here regardless of cx. (Edmunds, N.J.)

* The latest EBU listing, dated April 15 th, shows the Chinese transmitter to be on 1524.994 kHz ; we hope for more information next issue. We have an NRC member on his way to Novosibirsk as part of a tour of the USSR; hopefully he'll bring us some word about this one... (GPN)

725 Surinam. SRS sent folder-type $\mathrm{v} / \mathrm{q}$ after 14 months; apparently are clearing out backlog again. No $f / u p$ but had sent another report in the interim. Veri statement is specific and complete; I was under impression that previous QSL's were not. Gives call letters as PZX-26. $\mathrm{V} / \mathrm{s}$ is unreadable but is the Director, S.R.S. (Mohr, N.Y.)
780 Br . Virgin Is. Verie in from ZBVI, logged $3 / 1$ and veri rcvd 3/15. This is country \#62 on BCB; v/s Leopold N. Mills, Mgr. (Wilkinson, Cal.)
870 Hawaii. KATM veried $2 / 15$ report. Loren F. Bridges, G.Mgr. is signer. Back in about 10 days. (Bartels, Wisc.)
880 New Zealand. For $2 / 15$ report; signer Arch Crabb says pgmg 0600 to 1100 is of classical and operatic mx. Auckland P.O. Box 2209. If you want to call them, telephone 78-850. (Bartels, Wisc.)
890 Colombia. Verie in from La Voz de Bogota, no call letters on the letter or pennant. V/s: Emiro Enjardo Ramos, Director. Adöress; Apto Aéreo 13018. Member of the Todelar network. HJ Number 29 verified.(Wilkinson)

1075 Costa Rica. Faro del Caribe sent specific V/q in I month for TIFC, San Jose and signed by both Asst. Gerencia and Gerente, both unreadable, but letterhead on enclosed info sheet lists Don Federico Picado 0. as the Gerente. Addr. is Apt. 2710, San José. (MOhr, N.Y.)
1100 Antigua. ZDK, St. John's sent nice, large yellow V/q in 1 month with a "thank you for your reception report of .." statement. Last name of signer looks like Matthews but wouldn't hazard a guess on the first name. Address is Grenville Radio Ltd., P.O. Box lloo, St. John's. They are also on 99.0 mHz FM . (Mohr, NY) Verie for report of $1 / 25$. Signer Mickey Mathews. Owned by Greenville Radio Ltd. (is it Greenville or Grenville?-ed) Power 10 kw . (Alster, NJ) Verie for $1 / 25$ and $2 / 1$ reports. Addr as above. (Bartels who spells it Grenville)
1210 Colombia. Verie in from La voz Amiga, Pereira for rpt of $3 / 19$ and was in the mail $3 / 20$. Verie revd 3/29. Itr states stn is on air 24 h daily and gives call letters as HJFF, 1210 kc and $10 \mathrm{kw} . \mathrm{V} / \mathrm{s}$ is Daniel Alfonso Benitez R., Director, Calle 10 N $10-19$. HJ\#30. (Wilkinson) Anguilla. Nice letter by Roy Dunlop, Director for $1 / 22$ rpt. (Bartels, Wi)
ons, final action. Broadcast Bureau grtd CP Alaska. Existing AM stations, final action. Broadcast Bureau grta
for KBYR, Anchorage to change from 1270 to 700 kHz and decrease night power to 500 watts; conditions (BP-18918); action 3/5. (de Brdestg)
1370 Puerto Rico. Broadcast Bureau grtd change of license covering change in corporate name to the Calvary Evangelistic Mission Inc. for WIVV, Vieques. Action $3 / 10$. (Brosadcasting) $3 / 22$
Realize your concern is MW only (a misconception, we welcome LW info-ed) but must tell you that after the local light dimmer QRN dies down after 0600, I can read the following on my Grundig TR-6001, using only built-in antenna: 164 France. In French with varied pgms, including deejay with some good jam session discs. Good signal.
180 W. Germany. Europa one, also in French, much speech, only fair.
For the past 2 years I have sent all my reports to Spanish-speaking stations in the Spanish language, by registered air mail, return signature card and enclose sufficient uncancelled stamps for that particular country. Stamps are purchased from DX Stamp Service. (NRC ran the price list for this a few months ago in DX News-ed). This has resulted in only one failure to reply, and that was from a station in Peru! --Henry (Hank) Wilkinson Jr, Hywd, Cal.

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$3 / 11$ was an interesting evening here in P.R. Almost no $\mathbb{N}-5$ reception. YV and W stns were either weak or totally dead. Cubans, usually infrequentiy hra, and HI's were all over the dial. A number of Africans were hrd well. Tripoli on (cont'd)

Tripoli on 1250 was doing a good job with chanting. The best TA this evening was 1457. Northerm Europe was not hrd. Even Monte Carlo was in weaker than normal and Luxembourg-1439 was hardly readable. Middle Europe, though, was excellent and 1502 had beautiful signals. Receptions in this issue of IDXD represent conditions that I have never seen in Quito, or in San Juan, for that matter. It appears that there exists a type of long-distance sunset skip here. I will certainly continue to check on it, and report findings. Apparently, the signals will stay in for no more than 1 hour or 90 minutes, with good signals, after local sunset, and then start to fade.-Dave Gleason.
"I definitely think it would be good to conduct another poll (regarding whether EST or CMT would be used in the IDXD section), this time without the heavy bias that was in the last one. If you will recall, the announcement that contained the bailot for the poll included a big plug for GMT and not one word in opposition, and by the time the issue reached the members, there was no time for anyone to write an opposition view and have it appear before the results were announced (let alone with the ballot as it should have been in the interest of faimess.) Now that GMT has been in use for almost a year, perhaps you should run another poll, this time with both the pro's and con's stated along with the ballot. The main thing the results of the last poll showed is that the majority didn't express any opinion - either because they didn't realize how it would work on GMT, whether there would be confusion or not, or because, reading the ballot and the announcement that came with it, they got the distinct impression that the decision to switch had already been made and that it wasn't worth the bother to express an opinion. In short, I don't know whether the majority WANTS GMT or whether they are merely going along with it because they think everyone else wants it. I doubt if anyone wants the present situation where in the summer we have Musings on EST, DDXD on EDT and IDKD on GMT.

- That was a letter we received a few weeks ago ago from an IDXD contributor. I believe it has raised some valid points, and of course if there should in fact exist a sentiment in favor of returning to use of EST in the IDXD section of DX News, I want to be so appraised. Unfortunately, polls have a habit of being relatively minute samplings of sentiment. The respondents to last year's time switch poll were just a handful out of a membership of something near 500, and I don't think that is very good sampling. Now, with the summer coming on, and DX cx becoming worse, this would be a good way to fill up space in DX News, if you will cooperate. I am soliciting statements, to mun here in this section, on a pro and con basis, for the retention of GMT (acceptance of EST). Iet's hear from you. your IDXD Monitor Reports Editor.


Legisfative Scrutiny Due None of these items, taken separately, constitutes an insuperable obstacie to reaching an acceptable agreement. But
both sides-the Japanese under Foreign Minister Kiichi Aichi, the Americans under Ambassador Armin H . Meyer-are acutely aware that the finished with meticulous care by legisiators in both countries. The scruttny will take place in an atinosphere of accumulating ir-
ritations and frictions over matters unrelated to Okinawa, particularly the textile issue. The Americans do not ex-
pect Southern Senators, pect Southern Senators, angry textile exports as rigidly as they desired, to defeat the Okinawn treaty. But when irri-
tations over other issues are added up, the agreement could face rough sledding on the Senate floor this summer. transmitter in Okinawa, a relay
station beamed toward the Ch nese mainland. It occupies 134 acres at Okuma, 50 miles north
of Naha, the Okinowan capital of Naha, the Okinowan capital,
and has a strength of 1,000 kilowatts medium wave, plus four short-wave transmitters. The station is one of a netWork operated by the United
States Information Service around the world, situated in countries such as Britain, Morocco, Greece, the Philip-
pines and even in left-leaning pines and even in
Ceylon. Moving the station out of Okinawa would be expen-sive- $\$ 15-$ to $\$ 20$-million-and
the State Department sees no the State Department sees no
reason to do so since it says reason to do so since tit says
there is nothing cloak-and-dagger or subversive about the
broadcasts.

## Japanese Reluctant to Lat

 'Voice' Transmitter Stay
## by TAKASHI OKA

TOKYO, April 3-A Voice of America radio transmitter near a lonely beach in northern its huge American base complex, from American to Japan ese rule.
Nesotiating teams from the two countries are in the final suges of drating a forma treaty giving effect to Pres dith Premier Eisaku seement return the Ryulisyus in 1972 The treaty must be passed up on by the United States Senate and the Japanese Diet, or adequate time for deliberation beforo the date set for the transfer, Which is expected to be in whe first hall of the year. are hoping to sign the treaty by eary next month and to legislatures as soon as possible tegislatures
Essentially what the two wides are talking about now for the transfer-the status of the American bases in the is. lands, how much Japan should pay for the United States's over-and what should be considered civil assets-how to protect the rights of American men, inwyers andtoctors hess. in short, to worts out the myrid defnills involved in shiftiog administritive authority over approzimately million people

Revision Of Law Needed The Japanese, however The Japanese, however,
have a law, denying foreign
goveminets the right to have a law. denying foreign
govenimehts the right to
broadcast or rebroadcast from broadcast or rebroadcast from
Japanese territory. This dapanese territory. This law
will have to be amended will have to be amended
the Voice of America station is to stay. The Ministry of Communications, whictry con trols broadcasting in Japan
has announced its firm opposition to such a change. in The major Japancese principle in conducting the Okinawa negotiations is to keey depar
tures from the nemm to 2 min imum. Premier Sato has promised the Okinawans tha when they come under Japanes
rule their status will be ex actly the same as that of Japanese in the home islandsthat they will not be discrim. inated against or made to fee
different in any way. This is impowy the Okinawans restant because a quarter-century of alien military rulc, but the half-century
of semicolonial rule that Japanese imposed on them be fore World War II. Any ex ceptions made in favor of the represents, in the Japanese mind, a departure from the Premier's pledge.
On the
On the American side, neem to feel that Japan has taken a "free ride" on defense matters at American expense: that is, that she has prospere
economically without having to underwrite heavy military costs, because she shelters thenaval defense shield. A Jap anese refusal to allow a purely civilian broadcasting operation to continue on Okinawa, which tion to ask Congress for reloca tion funds, would not sit weil with the Senate, Washington
feels.

B, FOXWORTH

r.j.edmunds box 946
wayne, $n \cdot 5$.
PH.: (201)-335-6397
Greetings, folk -
Please pardon the above substitute mastheads, and the subsequent substitute section subheaders, but an unfortunate auto accident $4 / 17$ has resulted in a badly injured car, and a rather painful neck and back for me. (The other guy was at fault, tho', hi). Likewise, this is done on a totally alien typewriter, a newly-acquired war-surplus Remington electric, circa 1958-60, so we can't expect too much, although if I leave my current job (from which I'm on a two-week doctor/lawyer-enforced "vacation"), this may become the official DDXD typer, after a bit more cleaning.... One thing's for sure, it's got the best ribbon transfer ever seen in DDXD... Due to previous mixups here re publication dates, this issue will be a bit monsterous, nay even humongous as it contains come $3-4$ weeks of materials. Only good thing to come out of the accident is that the pain frequently keeps me awake, and thue, if ex are good, it means lotsa DX. Now on to business --

## charnges

+910 KPOF-CO SCH: 0800-0200 as of 4/1 (Blake Lawrence, Canan City, CO)
+1410 WOTT-NY CP: $5000 / 1000 \mathrm{U3}$
+1490 KCUZ-AZ CP. 1000/250 U1
unID Strong low-freq, het ( $50-100 \mathrm{~Hz}$ ) here day and nite for past several months, hrd thruout NE Ohio \& W. Pa. Euspect either WOHI or WMGW is off freq. Also noted in Pgh., so it gets out. Anyone else hear it? (Jerry Starr, YADland, Ohio) ** not noted here, but why not get somebody to check it, or contact the stns.... -RjE
**Thassit for changes, as the $4 / 19$ issue of Brosdcasting never arrived, so I've had to order a replacement -RjE

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r / C^{\prime} s
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NEW CHECKS: 2MM: 0130-45 *KHUB-1340-Nb T (NHC) 2FM: 0045-0100 WWML-1470-Pa T (PT) $\begin{array}{lll}0230-0245 & \text { WNSL-1260-AL } & D \text { (NNRC) } \\ 0215-0230 & \text { WLI }-1360-V S & D \text { (NNEC) }\end{array}$
 0245-0300 *NRJD-1550-7N VE (JNO) 0040-0050 *WTON-1240-VA T (RJE)
(change) 4 FM: 0216-0230 KPOS-1370-TX $T$ is Quarterly 3,6,9,12 (Hart) 4MM: 0130-0145 WYNS-1150-PA T is Quarterly 3,6,9,12 (RJE) Last MM: 0115-0130 KRNY-1460-Ni T (Starr) DELETE: 4SA: 0230-0245 KSVP-990-NM (Hart, per stn.)
Checks Hrd:
Checks Hrd: $\quad$ KNOX-1310; WGHN-1370; WRMG-1430 (0100); KGHL-790;
1MM: WEVA-860; KNOX-1310; WGHN-1370; WRMG-1430 (0100); KGRL-90;
2MM: WGMF-1500; WATS-960; WELI-960; WCAZ-990; WAGN-1340; KKGF-1310; KXRA-1490;
2MM: WGMF-1500; WATS-960; WELI-960; WCAZ-990; WAGN-1340; KKGF-1310; KXRA-1490
2TH: WIDG-940; 2FM: WNJH-1580; WHBG-1360; WWBZ-1360; $2 S A:$ WCCR-1580;
3MM: WAAO-1530; WORV-1580; KWLA-1530;WTHB-1550; WBTS-1480; WKSK-1600; WBBQ1340; WDXY-1240; WTON-1240; KWKY-1150; WDIC-1430; WJPF-1340;

4MM: WCBG-1590; WTOP-1500; WDXY-1240; WTON-1240; KSYL-970; WBCB-1490; WGOE-1590; WFEC-1400 (,Make change for WHSC to this date $4 / 17 \mathrm{DXN} \mathrm{a}$ )

REDS-13 Weak w/Tr w/TETRA off 2355-2359, w/XETRA when back 2359 on Weak W/IT W/Litic off 2355-2359, u
(Steve Kamp, San Jose, Cai)
 W/SID 1802 3/24 (Jerry Starr, Foungstown, Ohio)
S/off w/ inetr. $88 B 17443 / 24$ (Starr)
W/ clan 1810-25t 3/24 (Starr)
Good $w / r r 2150$ to 2000 d/off $4 / B$ (Kamp)
"Followed" signal back up from shore, though I'd lost it abt. 20 ni . out, but popped back in for ID at 1810 4/13 just down the atreot. (RJE)
1250 UFBL-PA Hrd w/ relige than a/aff 1844 4/9 (RJE)
 v/ID $18404 / 15$ (RjE)
unid Hrd at $1845 \mathrm{~m} /$ ofs $4 / 14 \mathrm{w} / \mathrm{call}$ a for AM \& FM ops. same, looping W or $\mathrm{SN}, \mathrm{call}$ taped as WAUM or possibly $\mathrm{N}-\mathrm{F}, \mathrm{N}, \mathrm{orM},-$ UM, Call change? Belp? PT hrd tape, gets same thing...(RJE) Good $4 / 8 \mathrm{w} / \mathrm{mx} 2127$ (Kamp)
1460 KRON-OR Good $4 / 8 \mathrm{w} / 20-20 \mathrm{mx} 2139$ into rr after (Kamp)
1470 Whin-CT End uk w/ ad for Fioriden \& temp. then later ID 1820 \& 1826 $4 / 9$ (RJII)
1560 WPTS-PL Hrd sk. w/D w/CHIN/WRCP mess 4/7 1831, enother closest unheard gone. (RJE)
midnight to sunfisc
540 WDAK-GA
Fair w/slop Prom KOT/KSD w/rr $02203 / 28$ (Laurence)
0 KTSA-IX
Llone 0020-45 4/14, no aign of usual WKRC-WCR-EFFIR, otc.
(Wen Boyd, IADIand, Ohio) (Wee Boyd, IDland, Ohio)
$560 \mathrm{KLZ}-\mathrm{CO}$
600 WSOM-OH 610 KDAL-ME

ET-TT \& $\propto 4 / 21$ 0205-0220+ (Boyd)
Good 3/18 $0105 \mathrm{w} / \mathrm{rr}$ (Rich Bartos, Campbell, Ohio) t* ie. cuburban IAD-land, hi - veloome to DDXD, Rich - RjE

680 CHFI-0N
** 710 WOR -My
730 GHIR-ON eched. r/c didn't go, (RjE)

740 KRHG-OK Good w/MaR 4/5 0703-10 when KCBS $O$ on (Kamp) Tx)
KBIG-CA ET-w $V$ Etrong thru hYy QRN $05004 / 19$ (Paw Hart, Ft. Worth
KCMC-TX R/on of FM outlet(KTAL) and SSB $06004 / 19$, NSP status holds, though (Hart)
800 CKOK-BC Fairw/ \&/Off $4 / 50305$ for CKOK,CKOO \& CKGF (Kamp)
900 WLMD-ND Hoted ueing tine-second tone system MM $4 / 19 \mathrm{w}$ bad signal 0025, tone cut 0032, couldn't got ID. (Schmidt) "\# Quite

940 WITE-CT frequantly, they don't ID, Dave, but format is them - RjE poted $02453 / 29$, ended 0304 (Starr) **ee, Rich, if you'd only held out to 0245, it wouldn't'a been weak....hi-RjE
WIDD-LA Caught w/last part of ID on ET 3/29 0332 (BL)
KIXZ-IX Good $4 / 5 \mathrm{w} /$ oran 0546-53 (Kamp)

* 950 WFPN-PA Noted off $0200+$ an $4 / 12$. First time noted off in abt. 5 yr . 960 WELI-CT Had ET/TT 0020-30+ $4 / 9$ ( RjE )

WBRC-AL Fair w/ry \& inx $02554 / 3$ (Bartoa)
** 970 WFLA-FL On AN 4/4. NOU NSP?? or MM SP??, didn't note then MM 3/22.. ( Paul K. Hart, Ft. Worth, Ix)
$\begin{array}{rlll}990 & \mathrm{KLIR}=\mathrm{CO} & \text { Good on ET w/MoR } 4 / 50549 \text { (Kamp) } \\ 1010 & \text { KCAC=AZ } & \text { Good on ET } 4 / 50555 \mathrm{v} / \mathrm{ID} \text { (Kamp) } & \text { Good on ET w/TT } 0433 \mathrm{~L} / 5 \text {, }\end{array}$ This one ET's often per DXM (BL)

1010 KAWA-TX ET-mx \& wise-cracking DJ's noted from $02004 / 12$, clobbering
1060 KYW -PA all else (Hart)
1060 KYW -PA Was on $303104 / 12 \mathrm{w} / \mathrm{nx}$, also copied $02202 / 1$. If testing, sure sound s like RS (Hert) ** Paul, I'lltry to remember to check them a few MM's -RJE
+1070 KNX -CA Did s/off $04004 / 5 \mathrm{~W} /$ annet of $0700 \mathrm{~s} / \mathrm{on}$. Mast be 1st MM SP (Hart) off agzin $4 / 5$, 4th straight 1st MM, but did ET 10 kw. AXR that AM (BL)
unID Who s/ons 0500 MM w/ orchestral SSB AFTER s/on annct., (or else no annct. at all) hrd second time $4 / 5 \ldots$... (BL)
WDIA-TN S/on ard. $05004 / 5$, anybody know if regulard SP or if NSP still holds (Hart) ** BL, maybe this - check w/PKH on format
+1110 WBT -NC still hold 1 st MM's - RjE
1140 KSOOOSD WRVA-VA Good w/CKXL nulled $4 / 50512 \mathrm{w} /$ relig. to 0530 , then $I D$, nx. (Kamp)
1170 KUAD-CO Good 04/5 0745-0755 w/ cdw; KLOK OC on 0755 (Kamp)

- 1190 KLIF-TX Off MM's $3 / 29 \& 4 / 5$, TT much of time leaving KTDS \& unTD(BL)

1230 KVOC-kT Fair u/KDZA w/ID on ET-TT 0237 3/27 (BL)
1220 WIST-NC Hrd w/locrl nx \& wx $4 / 30300$ (Bartos)
KWAK-AR Hrd w/ Cards BB 0125-52 4/14 (Boyd)
KXOX-TX Sounded like PoP from b4 0230 to ard 0430, TT's, mx , potent, but few ID's. (Hart)
KAKE-KS
ID noted in ET 0230 4/12, vy nice signal. This one gets out, and they test a lot. (Hart)
1250 WTAE-Pa ET from 0300 4/4/ to ard 0330 (Hart)
WTMA-SC Copied nice ID (3) $06004 / 4$ pattern/power change.
1260 WIXY-OH Almost never hrd here, but popped in w/SID 0207 4/12 w/ no ing of usual WNDR-pest. (RJE)
1290 WANS-SC Hrd 4/14 w/Braves BB all o/WKST $\approx$ WADO 2250-2300 (BOYD) *** By my own mistake, I'm running a bunch of 2200-0000 stuff of Wes's in here this time... -RjE
1290 WTOC-GA AM/FM simuleast ID up \& over unid TT 0130 4/12 (RjE)
CJOE-ON Finaliy hrd thru the mess 0105 4/19 (RjE)
1300 WBRC-MS All o/WERE-WOOD 2300-10 4/14. (BOyd) ** Who notes that the sun freaked out about $22004 / 14 \ldots$. RjE
WHZN-PA Three ID's hrd 0330 3/26 (Bartos)
1310 WISE-NC

WRR -IX
1340 CKOX-ON
happening was the TT -RjE
Carrying hi now from 0100 nightly, ugh (Hart) ** Now maybe I cen $\log$ this one, hi -RjE

KRMD-IA this extended sked?? (Starr)
IN ID noted 0259 4/12 in ET, TT bottling next one (Hart)
KLBK-TX $0330 \mathrm{~s} / \mathrm{off}$ of ET w/ continuous TT after s/on ID for 2 hrs only s/off ID hrd, but didn't monitor constantly (Hart)
WKSN-NY
WHAP-VA
At $1 D$ behind 2 IT's 4/12 0114 (RjE)
Atop channel $01054 / 19$, seemed scared to use call, as only type of ID hrd in $\frac{1}{2} \mathrm{hr}$ was "...in Hopewell, Va." after each TC or temp check or wx. (RjE)
1350 WGAD-AL Smashing insipid Ohio c\&w w/ underground hour 0025-45 4/13, and again almost alone 2215-35 4/14 (Boyd)
1360 WBAY-WI Rpta. MM 4/19 0014 w/ c\&w (DS)
WIXZ=PA ET-TT-OC w/ ID noted 0242 4/12 ( RjE )
1370 WFEA-NH Fair o/WSPD 0040 4/6 (Bartos)
KREL-CA Good o/WSPD w/rr, up-tempo MoR on TEST; ID 0308 3/29. (BL)
1390 WNUS-IL Hrd 0255 o/WFBL w/ local WFMJ off $4 / 6$ (Bartos)

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    1400
        WRIG-*IWAIT-II
```

```WVT-PI
In faint \(w /\) local ma \(03503 / 20\) (Bartos) \(w / r r \& u r 03553 / 20\) (Bartos)
Cood w/ux, 8ID, rr \(04183 / 29\), o/u KFRU (BL)
Only one wk ID hrd in one hr TEST, Starr and others hrd even less (BOID) \(-4 / 120000-0100\) ( ( TEST arranged at IAD-1and get-together )) Hrd 0005-0015 w/ march mx, ID's, CW ID's (afterny call) wk o/u the mess, gone after 0015 4/12 (RJE)
```

watictic

``` D copied 0302 in RS 4/12, atop all nite (Hart)
Copied 0600 a/on \(\$ / 12\) for 1 ot time (Hart)
Pulled ID out of mess \(04304 / 9, w / H I-s o u n d i n g ~ s h o w, ~ b u t ~\) local origin, entitled "Music While Others Sleep". Annor. soond origin, Dolly... (Hart)
Audio proof from ard 0230-0300+4/12 (Hart)
S/on 8SB \(4 / 50815\) (Kamp)
सह下-CA
WIEV-V
```


W/ ux, a/off 88B of seni-local in

$$
\text { Frd w/c\&u RS } 0155 \text { d/19 o/u WHSC r/co (RJE) }
$$

$$
\text { ID noted in ET } 4 / 120230 \text {, y nice sig; (Hart) }
$$

$$
\text { What sounded } 11 \text { ke RS } 0320-35 \mathrm{w} / \text { Top } 40 \text {, } \mathrm{AN} \text { ? (Boyd) }
$$

$$
\text { So strong, splashing o/wसाम } 2350-58 \text { ह/off } 4 / 14 \text { (Boyd) }
$$

$$
\text { Well atop freq here } 4 / 190010 \mathrm{w} / \mathrm{rr} \text {. New aked? Shades of } 1966
$$

AN ?? (DS)
DRLETE my listed log bere last issue. While GM said on phone It wen then, CB's card later eaid no. (RjE)
Has not been noted HI for several wks; (Boyd)
W/Cards BB all o/WFAR 2240-50 $4 / 14$ (Boyd)
The FF rr here all nite, hrd 4/19 0040. (DS) ** Dave listed as unID, but this is the PEST!!!-RjE

$$
\text { ET-TT, think PoP ard } 0200 / 4 / 16 \text { (Hart) }
$$

Fair w/ 20-20 mx 0142 3/27 (BL)
Whilest tuning by, noted etn. atop freq., \& caught SID 0104 4/8 (RJE)
WISI-ITI Popped in $w / D 0147 / 4 / 12 u / 2 T T 1 s$, then back again atop all w/ Big Band mi 0200 ( RJE ) all $y /$ Big Band $\operatorname{lox} 0200$ (RJE)
Whay-XA Frd $w /$ anncd. $1 / \mathrm{c}$ (dunno if reg.) $00244 / 19 \mathrm{o} / \mathrm{u}$ the mans Hrd on ET's MM's $3 / 29 \& 4 / 5$ ard 0400 , then on RS ( 5 kw ) slso both AM's after 0500. (BL)
BCLA-TI Good w/ cosw (uggh - SK) $4 / 5$ 0722-32 (Kamp)
1540 UPTR-II RGGO-णI $\nabla_{5}$ good $4 / 5$ 0802-10 w/ nx, wx, Fi unID Vy good $4 / 5$ 0802-10 w/nx, wx, Fish \& Came rpt. (Kamp) S/ on SSB $4 / 50830$, right into c\&w, quickly faded to Mexican, maybe KGART? (Kamp)
1560 vinTD What-ac Booming s/on 0603 on RS $4 / 5 \mathrm{w} /$ GSQ-Iike anthem, easy shot for SC for thoee WC'ers who missed TEST (Kamp) (Hart)
$\begin{array}{llll}\text { KPMC-CA } & 5 / o f f & 0505 \text { must be weekdays, as no sign of them } 0315,4 / 12 \\ \text { KRCB-IA } & \text { ID } Q & \text { s/off of } \mathrm{ET}-\infty \text { ard } 04154 / 12 \text {. Believe only ID (Hart) }\end{array}$
WTRQ-NC Copied e/on in cir $06004 / 3$, new stn, should be good bet for WC'ers, fine bige. (Hart)
WTOD-0H Copied s/on 0615 4/3 in the bedlam (Hart) Good on clear channel $w / \mathrm{jx}$, ir $03153 / 29$ (BL)

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Well, that does it for this time, however, eeveral notes on several topics follow on next page.

1600 WWRL-NY Had ET-OC-TT 4/19 0130-0200+ (R3E) - fergot this one, hi.
WITH the next issue, we go to the semi-cnnual EST-DST confusion. For that issue only, we'll denote items hrd b4 \(4 / 26 \mathrm{w} / \mathrm{an}\) "S" and those after w/a "D" follow ing the time listed. And dan't forget that Michigan doesn't recognize daylight time, so all stns. there will be on EST, which is equivalent to MDT. Thus, too, all \(\mathrm{r} / \mathrm{c}^{\prime} \mathrm{s}\) from Michigan will be on an hour later than listed per ELT (EDT).
DEADLINES for \(\operatorname{DDXD}\) will be as follows: \(5 / 12 ; 6 / 2 ; 6 / 30 ; 7 / 28 ; 8 / 25\).
On the WDLC-1490 test listed in the \(4 / 17\) issue, the name listed for the CE is wrong. I don't happen to have the correct one handy, but this should reach most of you b4 you write reports. (test \(5 / 10\) ).

ADD one more r/c to the fold: 4th THU: 0000-0015, WIKI-1430-VA w/TT, hrd March.
WHO will be Domestic DX'er of the YEAR??? Well, the inside story is that it's so tight between the top two people that we may have to declare a tie, and give away two awards!!! Be at the Convention to find out!!

With no more information to impart, we'll close this now, so until next time, UPDATER NEXT ISSUE!

73, RJE REO

\section*{Pop pirates plague the Kremlin}

\author{
By Gabriel Ronay
}

A VIGOROUS official crack-down on Russia's youthful radio pirates. who put out programmes of
Western beat music, "politically Inspired beat mussic, and decadent tittle-tattle, on their unlicensed
transmitters, has met with a surtransmitters, has met with a sur-
prising amount of open opposition prinn many
fromally silent.
usual
usually silen
"Radio Hooliganism." the
official description of the pirate official description of the pirate
radio stations, began in the mid-
19tios 19605 when an educational hand-
book on do-it-yourself rartio buak on introding inced youngsters
buith too much free time on their with to much free time on their
hands to a new hobby. One-man hands to a new hobby.
pirate radio stations began spring ing up all over the country, even
invadin Moscows sacrosanct airinvading Moscows sacrosanct air-
wave length with politically sick jokes and beat music.
ln one industrial area 115
illegal broadcasts were recorded illegal broadcasts were recorded
within a five-hour listening period. within a five-hour the Soviet Press
For some time the and State-controlled radio have
been condemning the radio been condemning
pirates. In the volga region, it
has been asserted by the Baku
Prity Party newspaper, Bakhchinsky
Rabochy, the pirate broadcasts


From the
London Times

DOMESTIC DX SUPREMACY RATINGS FOR 10 APRIL 1971 ( \(\$ 5\)


THIS COLUMN IS FILLING A FULL PAGE NOW, LET'S TRY FOR TWO. NEXT LIST WILL BE COMPUTED ON 5 JUNE. MY APOLIGIES TO STAN MORSS WHO DIDNOT BELONG AT THE BOTTOM OF THE LIST LAST TIME (AS WAS PROPERLY POINTED OUT TO MEJ.

THIS TIME WE ARE LISTING BY TOTAL STATIONS TAPED. THOSE WHO ARE STILL COUNTING THEIR TAPES (-) ARE LISTED ABOVE THOSE WHO HAVE NO TAPES (O). FOR THOSE STILL COUNTING TAPES, HAVE YOU TRIED TAKING TAPES (O). FOR THOSE STIV
N.R.C. DOMESTIC DX SUPREMACY RATINGS - C/O BOB KARCHEUSKI PO BOX 3151 , DALY CITY, CALIFORNIA 94015


A-S. Kampett
B B. Bennet
B. Bennet

C - I. Kerfoot
D - R. Eamunds
D - R. Famunds
\(E\) - f. Merrimen \(J\) - C. Debelstein
\(\mathrm{F}=\mathrm{W}\). Boyd \(\mathrm{L}=\mathrm{E}\). Cooper
\(540 \mathrm{wDgA} K\) u/u, CE
W GqT O D. R. Schick, CE
C BonK K. J. Lemb
550 K Sq
K FoY R D. Brennon
580 C K P R G. Bustow, DOE
590 K GgM B A. Roycroft \(\mathrm{KHgO} \quad \mathrm{a} / \mathrm{a}\)
600 K Com S M. Shepherd, \(C E\)
610 W IqO D E. Rider, CE
620 W SqU N A. Brel, PD
660 W NaB C J. Hughes, StE
680 W DCB C D. Manley, CE
W CqT T C. Sulfridge
690 K GfG F B. McBride, PD
\(710 \mathrm{WHqB} \quad\) C. R. Nonewaler, StuS K
720 W GqN W. R. Crane, CE
730 K SmV N Thornbush Ripple W AqC E u/L
740 K V F C Dorothy Weyt, MM
770 W AqB C W. Iova, CE
790 K USL F N. Sartain, CE
\(K \operatorname{BmR} V\) J. Hul.se, SM
KrJ RmB V. I. Lowpert, CE
CM T. Ptak, CE
K C M O K. Troesien, TD
830 J CqB B (SW v/q, u/u)
\(850 \mathrm{~K} \operatorname{Tm} \mathrm{C}\) (S. West, PD
r (R. Etherton, CE
u/u
STO Mill R. Lawson, PD
910 W Dho R A. Roucroft
W DMO R L. Henry, CE
K M. Parker, CE
WRNL S. Straus, CE
920 K AgR K D. Winn, CE
930 W CNR R. Fultion, CE
940 W F N C J. L. Sprouse, CE
VESA S. Garofalo, \(:\)
\(950 \mathrm{~K} / \mathrm{mT} \mathrm{N}\) S. Fisher, PD
K IqM N G. Vogel, CE
C FAC S. Gilbert, Tech'n C KqW S L. Todds
970 K RqE M J. Feldhausen, TSu
1000 WRAR Ann M. Gledding, Trid
1020 WPEO N. Ricce, OpD
1050 K YON
1050 WD \(Z \quad\) S. Bellinger, GM
1080 F K L O B. Clark, CE
K WqJ \(J\) Jeannine Bedgley, Trfa 0
0
0
\begin{tabular}{|c|c|}
\hline 1090 & K AqA Y F. Mcdonald, CE \\
\hline 1109 & WqK YmC H. Spiller, CE \\
\hline 1110 & WHY T H. Kelly, DOE \\
\hline 1130 & W Fhe O J. M. Hartzler \\
\hline 1140 & W A W K J. Riddle, CE \\
\hline & K RqA K R. E. St.Jan, CE \\
\hline 1150 & WK P A T. Monahan, CE \\
\hline 1170 & WW LE T. Schober, CE \\
\hline & WV LC G. D. Benoit, CE \\
\hline 1190 & K H A D J. Shane, \(N \times D\) \\
\hline 1220 & K ZrEE C. Sinzer, SM \\
\hline 1230 & W S OK W. Kinsey, CE \\
\hline 1840 & W IfN N M. C. Scarsdale, CE \\
\hline 1250 & W Tff E I. Greenwood, CE \\
\hline 1260 & W FgZ E B. Licn, CE \\
\hline & K W Y R B. Viedt, PD \\
\hline 1210 & \begin{tabular}{l}
WrU OmK (R. King, PD \\
(G. Kirtley, MxD
\end{tabular} \\
\hline & K FqJ 2 J. R. Green, E \\
\hline 1290 & W FqB G R. Kline, CE \\
\hline & K OqI L J. Weist, CE \\
\hline 1300 & W RqB C W. Fulgan, CE \\
\hline 1310 & C FcG M B. Cornegie, CE \\
\hline 1320 & K CqP X W. Wright, R-dio M \\
\hline 1340 & W EFM L. Gollidey, \(0, \mathrm{GM}\) \\
\hline & W JqM A A. Harrison, CE \\
\hline 1360 & W KqM I u/u \\
\hline 1370 & W G H N G. Kleis, CE \\
\hline 1300 & KUDL R. Keeney, IRCA \\
\hline & W TqO B R. Beaver \\
\hline 1390 & W FqM J F. A. Dieringer, \(C E\) \\
\hline 1410 & \(W \mathrm{~L} A Q \mathrm{P}\). Baker, CE \\
\hline & KRIG J, F. Bagwe Il, DJ \\
\hline 1430 & CKFH G. A. Wilson, CE \\
\hline & W HiI L K. Atkins, CE \\
\hline 1460 & K SqO G. Mrers, Esu \\
\hline 1480 & W YrD K J. Smith. CE \\
\hline & KfL MsS u/u \\
\hline 1490 & Kro Wul B. Aartoli, CE \\
\hline 1500 & K T X O J. Sherp, PD \\
\hline 1510 & KCAW J. Love, FD \\
\hline 1520 & K OsM A C. Merm, DJ, E \\
\hline 1530 & K WcL A T. Wayne, PD \\
\hline & KFqBK R. Bernett, CE \\
\hline & W A A O D. Ingram, E \\
\hline 1540 & W PqM E R. J. Drimmond, CE \\
\hline 1560 & W AcG L Harry Helms, NRC/IRCA \\
\hline & H D X J . Beritlett, CE \\
\hline 1580 & \(W \mathrm{CqO}\) Y D. E. Shal, CE \\
\hline & W KcU N D. Morris, GM \\
\hline 1590 & K U DU M. Taber, DJ \\
\hline
\end{tabular}


We have some more on hand and please yeep them coming. They apjear at imefular in tervals, we admit, and please don't mind our "system". Please weed out those that have recently been listed, and please use our abbreviations, and elso, please douide```

