DX NEWS

the magazine of the National Radio Club

VOLUME 39 SEPTEMBER 23, 1972 NUMBER 32

"I've been trying to get my comment on the front page for three years now and I've just given up trying!"
(Alan Merriman, Virginia)

IN THIS ISSUE

NEW NRC MEMBERS THIS ISSUE:

*Victor Jarr, B.P. 567, Quebec 4, P.Q.
*Wayne Forrest, 4041 Bethel Dr., Apt. 16, St. Paul, Minn. 55112
*Wm Hurd, 2107 Shannonhouse Rd., Huntsville, Ala. 35803
*Jim Poterba, 949 Queens Dr., Yardley, Pa. 19067
*Martin Vankuilenburg, 284 Perrin, Laval, P.Q.

Welcome to the NRC, guys; it looks like a great season coming up and we're looking forward to reading of your activities!

RENEWALS THIS TIME

Washburn... Brown... Gianinni... Ritayik... Wallace... Lewis... Kerfoot... Parillo... Forster... Rader... Block... Fritz... Baldwin... Jeffrey... Holbrook... Sullivan... Tremblay... Sorensen... Karchevski... Thomas... Objio... Grey... Johnson... Clark... Jacoby... Prather... Soomre... Roach. Block... Eggert... Shannon... Hoffman... Greenhill... LaMotte... Robie...

IMPORTANT NOTICE FOR CONTRIBUTORS!

The reconstruction following last spring's disast rous HQ fire is now nearing completion & we're in the process of moving back into the old building. Effective immediately all Editor's copy, incoming articles, and the like should be sent to: 48 Hardy Avenue, Watertown, Mass. 02172. !!!

SCHEDULE FOR VOLUME 40 WILL APPEAR NEXT ISSUE WHICH IS IN TWO WEEKS...

NASWA EXECUTIVE EDITOR TAKEN

NASWA Executive Editor William P. Eddings died Wednesday, August 23, after a long illness. **Bill was widely known in the DX hobby for many years. He was** instrumental in founding the North American Shortwave Association in 1962, and served as Executive Editor from the founding of the club until his death. **His** hobby efforts for many years were devoted to increasing friendship around the world. His passing is a great loss to the shortwave radio hobby, for which he devoted so much of his time, and especially to the members of the NASWA.

LAST MINUTE TEST INFORMATION... **Jim Wallace calls to report that WMWM** on 1090 in Wilmington, Ohio, will conduct tests on October 1st and 7th from midnight until 5 AM (assume this is EST, Jim?); will feature tones and music; reports to Rollen G. Roy, Chief Engineer; address as in NRC Domestic Log. This is a 1 kw directional daytimer and should be needed by many of us...

DRAKE SPR-4 RECEIVER REPORT... **Following last issue's somewhat unfavor-** able report on the SPR-4 by Ernest Behr, several members have written into HQ reporting their own experiences with this controversial receiver. **If you've** had a chance to use this particular receiver, please drop a note to HQ reporting your feelings about it; we'll run **all of the comments in one article in an issue or** two.

A SUPER BARGAIN ON MAGNETIC TAPES... Ampex professional mag tape, 1200' reels, boxed; used at most 11 times at 15 ips full track to send program material to stations; noise level is excellent for anything BCB-wise; for most home recorders this is equivalent to virgin tape. Only 60¢ a reel in lots of 2 or 12 only; postpaid. Send cash with order to: Ernest E. Lott, Back to the Bible Broadcast, Box 82808, Lincloln, Neb. 68501. Ask for free logs showing program times on 600 domestic and foreign stations. NOT FOR RESALE AS NEW TAPES! This info from Dave Fischer.

KRVN-880 VERIES... Will be sent out starting late in September, says Dave Fischer; very few have been sent so far so f/up's are not necessary.

CREDITS... Composition of last two issues: GPN & BGK; publication crew for last issue: Grace-Anne Stipe, Mark Katz, Ray Moore, BGK & GPN. Belated thanks also go to Debbie and Stu Kellogg for helping out earlier in the year.

DO OUR MEMBERS LIKE THE PATTERN BOOK?

"I would like to say that the volunteers did a terrific job on the Pattern Book. It looks like many hundreds of man-hours went into the preparation of it & it is great!" (Robert Fischer)

"Marvelled at by all of have seen it..." (Fr. Jack Pejza)

"The greatest DX aid since Captain Glotz disappeared, hi." (John Oldfield)

"Pattern Book is super..." (Phil Sullivan)

****GPN & BGK

GRAND OCTOBER ACROSS THE BIG POND SIMULTANEOUS LISTENING CONTEST

ENTRY FORM

Mail to: CONTEST HEADQUARTERS, 1733 Candlestick, Newport Beach, California., 92660 - Deadline to be received: Nov., 22, 1972.

Name: _____

Address _____

_____

Catches reported to IDXD ( ) DXWW ( ) BOTH ( )

Equipment and Antenna: _____

_____

_____

Logging Periods Claimed:

Date	Time (PST or GMT)	Station	Points Claimed

Logging Periods Not Claimed and Why:

Room for Poison Pen Letters and Sage Comments:

Additional copies available from NRC CONTROL or from TOYLAND.

TEAR HERE

1972 DX'er of the year AWARDS

CPC..... } WES BOYD
DOMESTIC.. }

INTERNATIONAL... } BENGT ERICSON

At the end of each Volume year of DX NEWS, "DX'ER OF THE YEAR AWARDS" are given by the NRC to members in three categories: the International DX'er of the Year - selected by the IDXD Editors; the Domestic DX'er of the Year - selected by the DDXD Editor; and the CPC'ER of the Year - selected by the Chairman of the Courtesy Programs Committee. **The recipient of each of these** awards has been selected on the basis of outstanding activity and support to the respective sections and activities. Award winners are announced at the annual Convention Banquet and receive handsome engraved plaques. **This year featured** a unique occurrence: Wes Boyd was chosen independently in both the Domestic and CPC areas; he was also one of the prime movers in the Pattern Book project! Congratulations to Wes and Bengt for outstanding contributions to the hobby...

**********COMING SOON IN DX NEWS**********

A full expose' of the Miami Convention, complete with pix... A remarkably fine Colombian station list supplied by the Colombian Government and updated by Ce'sar Objío... **The final installment of Captain Glotz' solution to the flying** tower mystery (soon to be made into a movie starring Frank Zappa and Big George Kelley)... **More auroral info from GPN... Several articles by Wes Boyd** and GPN to increase the usefulness of the Pattern Book even more... Another Transatlantic Simultaneous Listening Contest... Plans for several new high performance loop amplifiers... Baluns and matching Transformers for Maximum Loop Performance...

MUSINGS OF THE MEMBERS

MEMBERS' LOGGINGS AND ACTIVITIES

Ernest R. Cooper
438 EAST 21st STREET
carrier route 56
BROOKLYN NY 11226

GREG HARRISON - 17600 Orna Drive - Granada Hills, California - 91344

More news, so more Muse. Our local power station is up to its old tricks again. It was quiet from June until 8/13, a Sunday, so of course it continued all through MM, when KABC/KFWB/KMPV were all on SPs. I could hear something on 790, looping ESE/WNW (I think) which I assumed to be KULF, since they poured in every MM back when KABC was on regular SP. **I didn't even check** 710, since I knew it was covered by the power company garbage, but it was the third MM in a row that KMPC was off, so let's hope it's regular. I'd like to get WOR out here, but KETR is still NSP. Who knows what all was on 980, whose audio didn't make it through. The power company has been broadcasting continuously since then. I called their radio-interference department on 8/16 and got same-day service, as they sent someone out that afternoon. The man explained they were doing some work at the power station, but he didn't know how long the noise would be on the air. **He did say he would check it out and try to eliminate it.** You'd think that if the City of Los Angeles wanted to broadcast, they'd apply for a CP, hi. But what makes me sick is that two local radio stations are defective this week. **KGOE-850 was off the air the afternoon of 8/15, & KEZY-1190 is running on** low lower, night pattern or something right now (8/17). 850 had two or three stations on it, but nothing I could pull through the buzz. And there is something under KEZY all day, possibly XEMBC, but who knows, since the buzz is so bad. **I can't even find the KEZY null under the mess. So, I might as well give** up DXing until this mess is gone, but who knows how long that will be, since it was on continuously from March to June of this year. **Pre-noise reports off to** KLOU WCCF ZNS1. Real nice personal v/l from KELP-920 whose AN DJ, Bobby Coleman, says he is from nearby North Hollywood and wants some tapes of local stations, especially Drake's KHJ. **Good DX & 73s.**

JOHN TULL - 5539 Oak - Kansas City, Missouri - 64113

I just received my copy of the Pattern Book. What a terrific DX aid! It helped me on 620 w/WSUN for my second Florida catch. On 860, WDMG Ga. looked like a good bet. I tried it for a few minutes last night and sure enough, it was there but only over about 5° or so with my loop. **I had to try to null KOAM** and CJBC at the same time. Only verie for July, KOWA-730, Worthington, Minn. (KWOA, no? -ERC) daytime reception, a CM & v/l. Again thanks to the NRC for a job well done on the Pattern Book. 73.

RON MUSCO - 16 Chestnut Drive - Windsor, Connecticut - 06095

More SM DX (try it - you'll like it!) 8/6- WLNG, most-wanted, heard @ 6am s/on till buried by WTYM (semi-local) who s/on five minutes late. I noted someone under WPTR 7:10-7:30 & after. Nulling them, WADK R.I. came in L&C. Good CX this morning as WPTR is difficult here to **null** even slightly. **I took a day** trip 8/12 to Putney, Vt. and on the way back went through Brattleboro looking for the towers of WTSA-1450 & WKVT-1490, but didn't see them. The next night CX very good on 1450 & the following heard: **Someone with Red Sox BB 8:15pm, but I was** unable to ID (three Maine here, one N.H. & WTSA per list, carry Red Sox). WSVP R.I. w/brief ID @ 8:59 & WCTC N.J. in the clear @ 8:30. I stayed with the channel 8/14 AM & heard WMAS s/off at 12. **This left WWSC N.Y. in the clear with** their 24-hour thing. Nulling them produced CFJR Brockville Ont. excellent 1:03-1:20. This one not listed in NRC Log & I finally found it listed in a BYB. 8/17 I noted WQQW playing non-stop mx 5:35-6 when WERA-1590 s/on for #14 from N.J. Down on 1390 WFBL nowhere to be found, & WECK N.Y. battling WRIV 6:17-6:35am for #70 from N.Y. Totals now at 506/403 shooting for 600-500. V/q from WADO and [illegible], v/l from WHPA. 73.

SURE TO INCLUDE RETURN POSTAGE WITH EVERY VERIFICATION REQUEST - NRC COURTESY!

JEFF KADET - 8047 Park Overlook Drive - Bethesda, Maryland - 20034

Thanks to everybody involved with the NRC Pattern Book. It is, without a doubt, now the most useful DXing aid for the serious domestic DXer. No listening done here since mid-April as I had to graduate the University of Maryland and had a lot of exams to study for. **I got a B.A. in Psychology and I** plan to return for graduate study in a year or two. By the time you read this I will be on the road seeing the U.S. If my car & money hold out I hope to stay in Tulsa for a while and then maybe Tucson. Two new veries: v/ls from KKIM & WHLW. Of 50 stations reported this year, eight haven't responded. They are: WEYY WOAP WHIY WCON WLIZ WPRT WTCO & WTLO. Does anybody have any info on these? Domestic totals now 1,719/740. I hope everybody is enjoying his Summer. 73.

G. HARLEY DeLEURERE - Box 10 - Hendricks, West Virginia - 26271

The new WBTX-1470, Broadway/Timberville, Va. has taken to the air. WBTX can be heard here all day. The address is Box 337, Broadway, Va. 22815. For your information, on 9/3/72 a new BBC XR has been built at Crowborough, Sussex, to broadcast on 1088k. I believe that Radio 4's Droitwich, Worcestershire, (Midland) will no longer broadcast on 1088. (I hear they've moved to 1052 kc/s. -ERC) Reports are wanted and can be addressed to the Chief Engineer, BBC External Broadcasting, Box 76, Bush House, Aldwych, London, WC2B 4PH. DXing has been extremely limited, because I'm just too tired to get up in the middle of the night; however I have done a wee bit. **Veries for such incluce WXLN-950, Po**tomac/Cabin John,Md.; Rennes I-710, F-35 Thourie, Ille-et-Vilaine, France; WESC-660 Greenvillw, S.C.; WFRA-1450 Franklin, Pa.; WADD-1560, Brockport, N.Y.; WAYB-1490 Waynesboro, Va. & WAMB-1190, Donelson, Tenn. The new address (prior to 3/72) of Radio Nacional de Espana is Casa de la Radio, Prado del Rey, Madrid. Well, I had better close. Do have a good time in Miami. 73.

ROBERT E. FISCHER - Box 94 - Newark, Delaware - 19711

I just recently aquired a Sony TFM-1600. It's every bit as good as AFS & ERC say, **at least on BCB & FM.** On 8/16 between 1-2pm I got weak but readable signals on KDKA-1020 WVPO-840 WHAM-1180 WGMS-570 WMCA-570 & WCAO-600. I think the last three have nulls my way but until the mailman gives me my Pattern Book I won't know. (I think he stole it). Good readable signals on WBZ-1030 WYRE-810 WNYC-830 WHLI-1100 WLIX-540 WDMV-540 WARM-590, not bad for high noon. All loggings made using just the built-in antenna in he 1600. On 8/17 @ 9pm, Paramaribo-725 (signal S-7 on SPR-4) noted easily both on SPR-4 and TFM-1600. **using SM-2 antenna on the SPR-4 and the built-in antenna on the 1600. Sensitivi**ty & selectivity on BCB seem almost as good as SPR4 and much better than any other portable I have tested or used. To test out image rejection, I checked for the image of local WILM-1450 at various distances. Beyond four miles from the XR I heard nothing. **Between two & four miles I heard birdies on 540 & 1450 but no** image on 540. At two miles distance a weak image was noted along with the birdies on 540 but the image could be nulled out easily (not the birdie, as it mixed in with a WDMV/WLIX mixture - what an awful-sounding mess!). **Whether this is** good or bad I don't know, I'll let readers decide for themselves. A local buddy's Panasonic Harbormaster portable did worse - loud images at eight miles distance from the XR. On selectivity all I heard from 1245 to 1305k were the two locals here on 1260 & 1290, & it's sensitivity was bad as well. **The people in the a**partment over mine have a Tandberg TP41 - it was a rat's nest on BCB. Although it was "top rated" on FM by Stereo Review, the 1600 had better selectivity on FM, also the TP41 tuned up only to 107.5m. How a radio like that can be top-rated I don't know! The raters certainly are not DXers! (Or maybe DXers don't rate!)
-ERC

BERNIE DUFFY - 350 Richmond Terrace - Apt. 1P - Staten Island, New York - 10301

WBBX-1380, Portsmouth, N.H., s/on daily @ 5:30am EDT in the clear!

DAVE SCHMIDT - Wilmington, Delaware - 19802

WCHE-1520 will be on with a r/c on August 30 12:15-12:30 EDT.
Please pass the word. (Is this a r/c, last Wednesday, Dave? -E.C)

BEGIN THE NEW SEASON WITH A NEW VOW - TO MUSE REGULARLY FOR THE N.R.C. MEMBERS!

STATIONS HEARD IN CARACAS, VENEZUELA

(From August 12 to 16, 1972)

by César Objío

550	YVKE	R.Mundial, Caracas (s/off at 0500)
570	YVLX	R.Rumbos, Villa de Cura (announcing this transmitter as 200,000 watts "Gigante del Aire, cubriendo a Venezuela" but heard weak in Caracas with QRM from R.Continente-590, s/off at 0500).
570	HIMS	R.Cristal, Santo Domingo (weak and with noise only after R. Rumbos and R.Continente s/off, heard at 0517 on 8/15).
590	YVKL	R.Continente, Caracas (s/off at 0500).
630	YVKA	R.Nacional de Venezuela, Caracas (mostly classical and instrumental music, and some cultural programmes, at the identification they only announce this frequency in M. W. and one on the 49 meter band, s/off at 0400).
650	YVLH	R.Girardot, Maracay (only heard after R. Nacional s/off).
670	YVLL	R.Rumbos, Caracas (s/off at 0500).
710	YVKY	R.Capital, Caracas (24 hours)
750	YVKS	R.Caracas, Caracas (s/off at 0500)
770	HJKH	R.Tequendama, Bogotá (fair after 0400 on 8/15)
790	YVKC	"R.Dif.Venezuela YVKB Siete Noventa (7-90) Musical" (s/off at 0400)
800	PJB	T.W.R., Bonaire (as a local station)
820	HJED	La Voz del Río Cauca, Cali (good, after 0400)
830	YVLT	R.Miranda, Los Teques (announcing power as 50 kW.)
850	HJKC	Emisora Nuevo Mundo, Bogotá (good, after 0400)
860	HILR	R.Clarín, Santo Domingo (weak, after 0400)
870	YVKU	R.Libertador, Caracas.
910	YVRQ	R.Aeropuerto, Maiquetía (24 hours)
930		R.Antilles, Montserrat, Antigua (very weak).
930	HJCS	R.Continental, Bogotá (good, after 0400)
950	YVKG	"R.Punto Novecientos Cincuenta" (950), Caracas. (This seems to be a change of name for this station. s/off at 0400).
950	HJFN	La Voz del Café, Pereira (after 0400)
990	YVRT	"Rai, Radio Tropical", Caracas (I don't know the meaning of the word "Rai")
1010	YVQE	R.Bolívar, Ciudad Bolívar (weak but clear, evenings).
1010	YVPC	R.Aragua, Maracay (days)
1020		R.Mil Veinte (weak, no location mentioned, most likely Bogotá).
1030		R.Onda, (Weak, no location heard either, they also announced identification sometimes as "Onda Musical", this seems to be a new station, but I don't know where).
1040	HJFZ	La Voz del Centro, El Espinal (heard after 0400)
1040	YVLB	La Voz de Carabobo, Valencia (good)
1050	YVKZ	"R.N.Setenta" (70), Caracas. (Even though announced as R.Nacional in WRTH, they don't identify with this name, and programmes are different from 630, there doesn't seem to be any relation between them).
1060	YVOE	R.San Cristóbal, San Cristóbal (fair)
1070	YVKW	Emisora Vargas, La Guaira ("Mil Setenta Musical")
1080	YVNR	R.Universal, Maracay.
1080	YVOJ	R.Barcelona, Barcelona
1090	YVSZ	"Exitos Mil Noventa" (1090), Caracas, (the word "radio" is not mentioned in the identification).
1100	YVSW	R.Angostura, Ciudad Bolívar (weak).
1110	YVQT	R.Carúpano, Carúpano (weak).
1110	YVRX	R.Mía, Valencia (good, days).
1150	YVMV	Ondas del Caribe, Punto Fijo (weak)
1160	YVRR	R.Guarenas, Guarenas (it seems a change of name from R.Industrial, s/off at 0300).
1200	YVOZ	R.Tiempo, Caracas (24 hours).
1230		R.Unica, (new station, good).
1240	YVSF	"R.Caripito, Canal Doce-Cuarenta" (12-40), Caripito.
1260	YVRM	"YV-RM Radio", Caracas (They don't mention the old name "R. Espacial", quite probably a change of name, s/off at 0500).
1280	HJKN	R.Metropolitana, Bogotá (fair).
1290	YVPF	R.Canaima, Ciudad Guayana (fair).
1300	YVKH	R.Crono-Radar, Petare (Petare is a small place east of Caracas, now into the metropolitan area).
1310	YVSX	R.República, Maturín (weak).
1340		R.Uno, Caracas (new station).
1350	YVZZ	"R.Guanipa Trece-Cincuenta (13-50) desde San José de Guanipa" (good, relaying R. Clarín, Santo Domingo, with Serie de la Amistad baseball games).
1360	YVTZ	R.Guaicaipuro, Charavalle (this station was not heard but mentioned by R.Miranda to be operating with 10 kW)
1370	YVLO	R.La Pascua, Villa de la Pascua (good).
1380	HISC	R.Nacional, Santiago, Dominican Republic, (heard weak s/off at 0500 on 8/15).
1390	YVTT	R.Terepaima, Cabudare (good).
1390	YVZA	R.Cultural La Voz de la Patria, Caracas (not heard) only R.Terepaima is here with a very good signal, announcing also identification as Canal Catorce (14), perhaps meaning frequency as 1400).
1480	WMDD	La Voz del Oriente, Fajardo, Puerto Rico (weak).
1500	PJC7-2	R.Hoyer, Willemstadt, Curaçao, Netherlands Antilles (weak).

On other frequencies only noise was heard, but nothing readable. All these loggings were made in the hotel, never on the outside, and all on the north-south direction, if I turned the receiver in the east-west direction only local stations were heard, nothing else, it seemed as if all stations were only on the north-south direction, or as if the other way were blocked. Below 1000 kHz no station except locals were heard till 0400 when they start s/off as they conver a wide segment in the dial, even R. Rumbos-570 announced to be operating with 200 kW at Villa de Cura, 50 miles SW of Caracas was heard very weak QRMed by R. Continente. After most of them s/off at 0400 and 0500 many stations from abroad were heard, especially from Colombia.

DAYTIME DX RECORDS

DDXR

Editor:
de Fish, Ph.Dx
Lincoln, Nebraska

DDXR # 2

Since the publication of DDXR # 1 in DXN, Vol. 39, #14, 012272, considerable effort has been expended in a modest research of the classical and some of the contemporary papers discussing the propagation of BCB signals over a finite conducting surface (the case of interest: real, lossy earth). Some of these papers and publications are listed below for reference by the serious/smart DXer.

DDXR was put forth as an attempt to increase activity in this very interesting but mostly neglected period of BCB reception. From the response, there are numerous members sufficiently interested to warrant this Section in DX NEWS and to cause the editor to continue an attempt to refine the initially proposed measure of "success", viz: MPKW--miles per kilowatt (EQP) where EQP has been defined in Paul Hart's excellent series PATTERNS published in DXN. This measure was simply the number of miles the signal travelled (great circle distance) divided by the EQP (kw) radiated in the direction of the receiver.

MPKW is a poor measure as can be seen from the following typical example in the case of 740 KBOE @ 215 miles (from Lincoln) running 250 watts with an rms field of 182 mv/m/kw @ 1 mile and 650 WSM @ 630 miles running 50 kw with an rms field of 246 mv/m/kw @ 1 mile. Both stations are non-directional, KBOE is armchair copy while WSM is somewhat "muddy" but copyable. **MPKW calculations:** KBOE= 215/0.25 = 860 and WSM = 630/50 = 12.6 which completely disagrees with what one hears on the RX--the DDXR measure of success shall conform to the unfortunate Americanism "the more the better" so higher values of the measure will indicate a better daytime logging. **Hence, MPKW has been junked. Since the power (rate of** engergy in watts) is dispersed as the inverse square of the path distance, the next measure considered was M^2PKW: **KBOE = $(215)^2/0.25$ = 184900 and WSM =** $(630)^2/50$ = 7938. Thus, M^2PKW went up in smoke. Next, the E-field intensity (which is the standard engineering parameter for the BCB) varies inversely with the path diatance, so using this parameter (unattenuated) we defined MPV--miles per volt. MPV calculations gave: KBOE = 215/(0.182 x (0.25)pwr (0.5)) = 2362.6 and WSM = 630/(0.246 x (50)pwr(0.5)) = 362.2 . So, MPV went down the pipe. Similar measures were defined using some parameters expressed in dB (decibels: 10 log P, 20 log E, etc.). The differentials decreased somewhat but did not render good measure of the RX performance on daytime signals. **Too, the dB** concept, logarithmic in behavior, tends to compress the scale of the measure so that two different loggings quite contrasting on the RX gave values of the measure with relatively small differential.

It becomes clear that as a function of distance the unattenuated dispersed power of unattenuated E-field intensity are not going to render very meaningful measures of performance while at the daytime dial. **The previous measures have** all been computed on the basis of straight line paths over a sufficiently large flat plane (no losses). **The next candidate for DDXR measure is then the** attenuated ground wave E-field intensity over an infinite flat (ground) plane having finite conductivity and permittivity (dielectric constant). **The classical** papers treat this subject in some depth and the computations become tedious enough to warrant the use of a computer. **Results were not rewarding and this** approach was abandonded.

There are several known facts that DDXR must account in designing the measure of performance: (a) the ground wave is attenuated by the finite constants of the earth's surface; (b) there are skywave signal components present during DDXR hours, especially during the quiet months of the BCB season; (c) the curvature of the earth introduces additional attenuation (what may be somewhat cancelled in effect by the skywave signal components); (d) the ground constants over which the ground wave propagates vary over wide ranges for many of the paths across North America and elsewhere; (e) there is a significant variation in daytime propagation as a function of latitude--the southern areas having poor conditions than the more northern paths until one is sufficiently far north to be affected by increased adsorption due to PCA etc.

To correctly evaluate the signal arriving from a distant point has been the aim of many adroit scientific efforts and in every case ideal assumption were **forced upon the inverstigations in order to provide a realizable evaluation.** We shall do no better in DDXR. The evaluation of the DDXR measure whould not be so mathematically complex as to render it beyond hand computation with minimal effort. **This requirement further reduces the effectiveness of the measure in conforming to RX performance.** Also, RX stations vary widely from DXer to DXer and to knov the RX antenna gain and RX performance over the BCB for each DDXR participant is not plausible. Hence, we shall try to give only a measure of the signal arriving at the RX station. RX parameters which give one DXer an edge over another will not be considered.

Before the DDXR measure is presented, the editor states that he was well aware of the folly in MPKW and that many of you who wrote comments agreed also presenting constructive comments for consideration. It is in this the editor takes heart for DDXR is created not only for a list of records but also as a forum for discussion of propagatinn and subjects related to daytime BCB. **Too,** let it be clearly understood that the editor reserves the priviledge of modifying the DDXR measure at any future date to refine and improve its performance in DDXR. **Item (e) above must be considered and it may well** be that this can be accomplished by assigning poorer earth (lower ground conductivity) to the southern regions than that used for the more northern ones. **If no** successful solution to (e) is found, DDXR may be broken into several sections (latitude bands) across North America and elsewhere. For the present, however, DDXR will treat the problem ignoring (b), (d) and (e) above. For the measure to be presented, every DDXR participant is requested to evaluate it as a performance measure of daytime reception at his location and report any poor results to the editor--possibly for DDXR presentation and discussion.

----------DDXR MEASURE----------

Part 73.184 of the FCC Rules and Regulations contain twenty graphs of attenuated ground wave E-field intensity as a function of distance (great circle paths) over spherical earth of finite conductivity. These graphs are plotted on log-log paper. **The DDXR measure is based upon these curves with the thought** that they are available to members wanting to investigate the development and refinement of the DDXR rule of success. **The ordinate of these graphs is based** upon 100 mv/m/kw @ 1 mile unattenuated field. For our purposes, we divide all values along the ordinate by 100 to give the reference as 1 mv/m/kw @ 1 mile. This is done because these charts will give the (approximate) attenuation factor A (which is a function of frequency, conductance, permittivity and distance). To obtain the E field at the RX location, the radiated field intensity F (in mv/m/kw @ 1 mile) is then multiplied by the square root of the power P in kw and the factor A. We then need to construct an equation for these A-curves with the contraint that it not be unwiedly as is the case for the "exact" equation.

Each FCC graph plots E-field against distance for various values of the parameter of conductivity ranging from 5000 mmho/m for sea water to 0.5 mmho/m for horrid (rf) soil. **These charts are based upon dielectric constants of 15** and 80 for land and sea paths respectively. Sea paths are not difficult since they present a reasonably uniform conductivity to the traversing signal while land paths present varying conductivities over rather wide limits (typically 0.5 to 30 mmho/m with the smaller values having greater weighting). **Sea paths** will be based on curves for 5000 mmho/m and to simplify calculations, we define "average soil paths" to be 7 mmho/m. **This may be modified in the future with** respect to the latitude of various DXing locations (see above). Thus, FCC charts for 7 mmho/m will be used for North America. These twenty FCC charts cover the

BCB, the center frequencies for the various charts being: 550,580,610,640,670, 700,740,790,840,890,940,1000,1070,1140,1210,1290,1380,1470,1560 and 1600 kHz.

The estimated/approximated E-field attenuated ground wave arriving at a DXers RX located R miles from the transmitting antenna is given by the equation: E = (F)(A)(P pwr (0.5)) where F is the unattenuated field from the transmitting antenna measured in mv/m/kw @ 1 mile in the direction of the DXer, P is the power in kilovatts and the notation X pwr Y meaning X raised to the power Y -- (P pwr (0.5)) is the square root of P, and A is the attenuation factor.

The construction of the equation(s) for A is as follows:
From a FCC graph the 7 mmho/m curve is plotted on semi-log paper with the A values (FCC values divided by 100) along the logarithmic ordinate and distance R (miles) along the linear abaissia. **This is done for each FCC curve--twenty** semi-log graphs in all. The points follow a very close linear plot on each semi-log plot for most distances 100-150 miles or more. This implies that each graph, for sufficiently large R, has an equation of the form $A = (B)pwr(kR' + H)$ where B is any chosen positive number (we choose B = 10 to allow the use of the common logarithm). **Now let (R',A') and (R",A") be** two points in the linear portion of the semi-log plot (we chose R' = 500 and R" = 1000 miles). From the equations $\log(A') = H + kR'$ and $\log(A") = H + kR"$ the values of k and H can be found for that graph. Twenty sets of k and H values were determined in this manner. Then, k and H were plotted with respect to frequency on linear-linear graph paper. It was (happily!) noted that both k and H could be approximated quite well by straight lines implying that $k = k(f) = B'f + B"$ and $H = H(f) = D'f + D"$. **The values of B',B",D' and** D" were obtained from the k vs. f and H vs. f graphs where f is frequency. Solving for B', B", D' and D" we obtained the following equation for 7 mmho/m A-curves:

$$A = 10\ pwr\ [-(((f + 0.8)/250)R + (2.33 + 0.508f))]$$

where f is frequency (mHz) and R is distance (miles). **Note: a different** equation is obtained for each BCB frequency. Since E = (F)(A)(P pwr (0.5)), the smaller values of E represent the better daytime loggings. Hence, E itself will not follow the conformity to "the more the better". So, we shall DEFINE the DDXR measure to be the reciprocal of E, i.e., G = E pwr (-1).

Now in the dark of day, in the high hills of Botswineya, Nibi Nibi (somewhere near the XR of XERF) the Caped Avenger came over the horizon leaving a dirty black glow in his wake and made me an offer I couldn't refuse: **the** UNIT of measure for DDXR shall be the GLOTZ!!!!!!!. Hence, finally, m(DDXR) = G = E pwr (-1) = 1.0/(F)(A)(P pwr (0.5)) .... glotz.

Returning the the aforementioned example, viz: KBOE vs. WSM, we calculate:
WSM: F = 246, P = 50, f = 0.65 , A = 10pwr(-(0.0058)R - 2.66020) and for R = 630, A = 10pwr(-6.31420). Thus, G(WSM) = 10pwr(6.31420)/(246)(7.07)= =(2.0617 x 10pwr(6))/1739.22 = 1185.42 Glotz.
KBOE: F = 182, P = 0.25 , f = 0.74, A = 10pwr(-(0.00616)R - 2.70592) and for R = 215, A = 10pwr(-4.03032). Thus, G(KBOE) = 10pwr(4.03032)/(182)(0.5)= =(1.0725 x 10pwr(4))/91 = 117.86 Glotz.

A similar equation for A will be devloped for sea paths and published in DDXR. A some future date, an equation for A over lousy soil may also be developed.

There remains one refinement to m(DDXR): Consider the case for 1030 KCTA which is weak winter daytime in Lincoln--R = 888, F = 192, f = 1.03 and G(KCTA) = 1662320. **From this huge value, we conclude the need for compression** of the m(DDXR) scale. This shall be done logarithmically by defining glotz in decibels, viz: dBG (dB-Glotz). For the purpose of DDXR, we define therefore:

$$m(DDXR)dBG = 20(\log G) = 20[((f+0.8)/250)R + (2.33 + 0.508f)] - 20(\log F) - 10(\log P) \quad \ldots\ dBG$$

From the above examples: dBG(WSM) = 61.475, dBG(KBOE) = 41.427 and dBG(KCTA) = 124.412. Note: the calculation of dBG is much less tedious than for G, only a table of common logarithms (logarithms to the base 10) need be used. (Use 5-place tables)

One point of interest: Assuming R is fixed, F is fixed, what is the power required by using m(DDXR) at, say, 1600 kHz to produce the same field as that at 540 kHz? **For the sake of instantiation, we set R = 500, F = 200 and dBG=60.** We find P(540) = 1 kw and P(1600) = 436 kw. Interesting....

For those reporting to DDXR: Values of F and P will be taken from NARBA (June 1970, updated periodically) while values of R will be ascertained from the stations geo-coordinates (also from NARBA) and those for the DXer. **The entire** DDXR will be done by computer, but any information not readily available to the editor will become the responsibility of the reporting DXer to obtain either from the FCC or the station itself. **If the station is directional, then the** bearing of the DXer as measured at the transmitting antenna is necessary and this parameter may be obtained either by PATTERNS (III), by the computer or by the algorithms for great circle bearings and distances previously published by the editor in DXN. Also, the pattern parameters at this bearing must be known to complete DDXR calculations (the determination of F), this implies FCC info, station info or the ACTUAL antenna pattern be available.

Finally, as a recap from DDXR#1, those reporting to DDXR are to supply the following: (a) name (b)address (c)latitude--degrees & minutes and longitude-- degrees & minutes (d) RX and antenna used for DDXR loggings and (e) time zone. For each logging: (1) frequency (2) call (3) location (4) date (5) time or time period of logging (6) transmitting power (7) directional or non-directional (8) details of reception (signal quality, etc., no pgm details) and (9) H,T,or V (heard only, taped or verified) for the date and time the logging is being reported to DDXR. Remember too, DDXR hours are 1000-1400 LOCAL TIME only. DDXR will list the best logging (dBG) for each frequency and may also include a States DDXR once a year--i.e., number of states logged during DDXR hours.

To end, as a reference to those participating in DDXR, here is the daytime log for the Lincoln area as monitored on a typical winter day--no frequency is vacant but those listed with *** indicate directional systems for which the value of F has not been calculated:

FREQ	CALL	R	dBG	FREQ	CALL	R	dBG	FREQ	CALL	R	dBG
540	KWMT	176	***	550	KSD	380	40.5	560	KWTO	312	33.7
570	WMAX	150	14.1	580	WIBW	128	14.0	590	WOW	53	5.7
600	KSJB	428	***	610	WDAF	167	19.0	620	KMNS	110	***
630	KHOW	443	51.2	640	WNAD	382	51.5	650	WSM	630	61.4
660	KOWH	52	***	670	WMAQ	455	42.6	680	KFEQ	120	***
690	KGGF	120	***	700	WLW	662	68.5	710	WHB	155	***
720	WGN	458	44.6	730	KLOE	284	43.4	740	KBOE	215	41.4
750	KBEO	474	72.8	760	WJR	704	77.3	770	KOB	661	72.9
780	WBBM	458	47.5	790	KXXX	246	33.4	800	KQAD	---	???
810	KCMO	153	11.9	820	WBAP	541	60.2	830	WCCO	348	35.6
840	WHAS	626	72.4	850	KOA	434	48.4	860	KNUJ	269	45.2
870	WWL	826	***	880	KRVN	143	11.8	890	WLS	465	53.9
900	KJSK	57	18.4	910	KINA	146	***	920	KLMR	365	52.9
930	WKY	363	49.7	940	KVSH	243	37.4	950	KJRG	192	40.7
960	KMA	71	12.3	970	KJLT	218	35.2	980	KMBZ	164	25.1
990	KRSL	173	42.1	1000	KTOK	378	***	1010	KIND	252	53.8
1020	WPEO	377	66.2	1030	KCTA	888	124.4	1040	WHO	185	18.0

FREQ	CALL	R	dBG	FREQ	CALL	R	dBG	FREQ	CALL	R	dBG
1050	KSIB	236	39.5	1060	KNLV	127	30.6	1070	KILR	207	***
1080	KOAK	80	30.0	1090	KEXS	165	***	1100	WKYC	783	***
1110	KFAB	44	0.2	1120	KMOX	382	51.6	1130	KLEY	247	***
1140	KBIL	163	41.3	1150	KSAL	138	27.2	1160	KSL	802	119.5
1170	KVOO	324	44.6	1180	WLDS	351	67.4	1190	KLIF	553	***
1200	WOAI	800	121.5	1210	KGYN	379	64.2	**1220**	**KOFO**	**150**	**43.7**
1230	KTNC	76	36.3	1240	KFOR	4	13.1	1250	WREN	133	28.5
1260	**KGBX**	**304**	**57.0**	**1270**	**KNWC**	**187**	**44.7**	1280	KCNI	159	41.0
1290	KOIL	46	13.9	1300	KMMO	217	48.9	1310	KGMT	51	26.5
1320	**KLWN**	**150**	**42.8**	**1330**	**KFH**	**214**	**41.3**	**1340**	**KGFW**	**124**	**36.0**
1350	**KMAN**	**109**	**36.2**	**1360**	**KSCJ**	**124**	**28.1**	**1370**	**KAWL**	**47**	**15.6**
1380	KUVR	142	42.7	1390	KNCK	98	35.2	1400	KLIN	3	15.2
1410	KLEM	143	40.5	1420	KJCK	125	37.3	1430	KRGI	81	23.6
1440	KEWI	136	***	1450	KWBE	36	22.3	1460	KRNY	128	31.7
1470	KTRI	114	***	1480	KLMS	6	***	1490	KTPO	130	39.3
1500	KSTP	346	58.5	1510	KTTT	58	28.3	1520	KSIB	122	38.6
1530	KECK	6	***	1540	KXEL	248	44.8	1550	KICS	87	36.7
1560	KRCB	51	24.4	1570	KNDY	65	43.9	1580	KESM	248	69.7
1590	KTCH	102	40.2	1600	KRPS	89	37.6				

For misc. musing: Average (R) = 254 miles and Average (dBG) = **41.8**

The best (dBG) Local (L) and Regional (R) and Clear (C) channel loggings will also be noted in DDXR thus making 110 records (to be broken!) in all. In the aobve, best: (L) 1490 KTOP @ 39.3 dBG, (R) 1260 KGBX @ 57.0 dBG and (C) 1030 KCTA @ 124.4 dBG. This measure, dBG, shall be used in DDXR until it can be demonstrated that there exists a refinement that doesn't introduce large complexity in its calculation.

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----------the list is endless, more to come in future DDXR/DXN.

BEST DAYTIME DX my Friends and do report to DDXR: D. Fish, Box 6256, ZIP: 68506

EBU TRANSATLANTIC LIST

In anticipation of what promises to be the best season for Transatlantic reception in quite a few years, we are running the entire latest EBU internal monitoring report showing every station monitored by the network of official EBU monitoring stations during the past month. This listing, which is by far the most accurate, complete, and up-to-date tabulation of European Zone stations, is essential for the active TA DX'er and is available only through the NRC. The EBU network works around the clock monitoring the European MW band and what we are here presenting is a complete record of all stations noted there during the past month - thus the occasional non-European entry.

This band status report is organized as follows. Column one gives the channel number (Copenhagen Plan), frequency in kHz, and wavelength in meters. Column two gives the city where the station is located; if there are low-powered relay stations operating on the same channel, they are indicated by "plus n st.". Column three is the country where the station is located; since this is the internal monitoring report which is not intended for outside use, the language is French. We have included a listing of the French-language country name abbreviations elsewhere in this article. Column four indicates the nature of the program transmitted on the channel; "RNE 1" is the Radio Nacional España program 1, etc. Refer to World Radio Handbook for elaboration. Column five is the operating power in kilowatts, this is the latest official power as supplied by the stations to EBU. If the column is blank the power is not known; night/day powers are shown in that format. Column six is perhaps the most important information of all; this is the exact frequency that the station was operating on, based upon EBU frequency measurements. This is the average of a number of frequency measurements and the value is shown in cycles per second (or Hertz); thus 528 980 , 8 means a frequency of 528.9808 kHz (remember that Europeans use a comma where we use a decimal point). These exact frequencies are of great use to the TA DX'er because they give the DX'er some advance information about the SAH (Subaudible Heterodyne) or "beat" frequency between the different stations on a particular channel. (See our article on the Subaudible Heterodyne, available from HQ as an NRC reprint for further information).

West German networks:

AFN	American Forces Network
BR	Bayerischer Rundfunk
DF	Deutschlandfunk
HR	Hessischer Rundfunk
NDR	Norddeutscher Rundfunk
RB	Radio Bremen
RFE	Radio Free Europe (USA)
RIAS	Radio in the American Sector
SDR	Suddeutscher Rundfunk
SFB	Sender Freies Berlin
SR	Saarlandischer Rundfunk
SWF	Sudwestfunk
WDR	Westdeutscher Rundfunk

Spanish networks:

CAM	Cadena Azul Del Movimiento
CAR	Cadena Azul de Radiodifusion
CES	Cadenas de Emisoras Sindicales
COP	Cadena de Ondas Populares Espanolas
CRI	Compania de Radiodifusion Intercontinental
RE	Radio Espana
REB	Radio Espana de Barcelona
RNE	Radio Nacional de Espana
SER	Sociedad Espanola de Radiodifusion

ONDES HECTOMETRIQUES — MEDIUM FREQUENCIES

No.1	Ain Beida	ALG	A	600	529.000.0
529 kHz	Beromuenster	SUI	3	150	529.000.0
567 m	Schwerin	D-D	D1	20	528.999.8
No.2	Budapest-Lakihegy	HNG	1	300	538.999.7
539 kHz					
557 m	Kuwait	KWT			539.000
No.3	Braunschweig + 1 st.	D	DF	400/800	548.000.0
548 kHz	Oran	ALG	A	600	547.983.2
547 m	Oviedo	E	RNE1	50	548.00.
	Leningrad	URS			548.000
No.4	Helsinki	FNL	R1	300	557.000.0
557 kHz	Cairo 3	EGY	E	50	557.000.2
539 m	Monte Ceneri	SUI	1	50	557.000.1
	Craiova 2	ROU	2	20	556.998.6
	Greifswald	D-D	D1	10	557.000.8
	Faro + 1 st.	POR	ENR1	1	557....
	Volgograd	URS		20	557.000.0
No.5					
566 kHz	Athlone	IRL		100	565.998.2
530 m	Berlin	D	SFB1	33/100	566.000.0
	Bologna + 3 st.	I	1	25	566.000.0
	Valença do Minho	POR	ENR1	1	565.999.3
No.6	Stuttgart	D	SDR1	300	575.000.0
575 kHz	Tel-Aviv	ISR	IB	200	574.986
522 m	Leipzig-Wiederau	D-D	D1	100	574.996.7
	Riga 1	URS	1	100	575.000
	Bragança	POR	ENR1	1	574.997.3
No.7	Madrid	E	RNE1	[illegible]	583.998.0
584 kHz	Wien 1 + 3 st.	AUT	1	150	584.000.0
514 m	Paris 3 + 1 st.	F	FI	10/5	584.000.0
	Teheran ?	IRN		100	580.005.5
	Riyadh	ARS		1000	587.482.4
No.8	Frankfurt + 1 st.	D	HR1	150/400	593.000.0
593 kHz	Pleven 1	BUL	1	250	593.00.
506 m	Sundsvall	S	1	150	592.998.6
	Oujda	MRC	A	100	593.209.8
No.9	Lyon 1	F	FI	[illegible]	602.000.0
602 kHz					
498 m	Bucuresti-Ghermanesti	ROU	1	3	602.001.8
	Diedrischagen + 1 st.	D-D	BR/D1	10	602.000.8
No.10	Sarajevo	YUG		300	610.996.1
611 kHz	Berlin-Koepenick	D-D	BR	250	611.000.5
491 m	Sebaa-Aioun	MRC	A	140	611.011.5
	Petrozavodsk	URS		100	611.003.6
	Grafenwoehr + 2 st.	D	AFN	10	610.992.0
	?	IRQ			610.1..
No.11	Batra 1	EGY	VA	450	620.045
620 kHz	Wavre-Overijse	BEL	F1	150	620.000.0
484 m	Vila Real Tras-os-Montes	POR	ENR1	10	619.997.8
	Santa Cruz Teneriffe	E	RNE1	100	619.996.1
No.12	Tunis-Djedeida	TUN	A	600	629.000
629 kHz					
477 m	Timisoara 1	ROU	2	135	628.994.2
	Vigra	NOR	1	100	629.000.8
	Aldrans 2 + 2 st.	AUT	R	25	629.000.0
	Erfurt	D-D	D1	20	628.999.3
	Miranda do Douro	POR		1	628.911.6
No.13	Praha	TCH	P	150	638.000.0
638 kHz	La Coruna	E	RNE1	100	638.006.4
470 m	Limassol	CYP	BBC	100	638.00.
No.14	Daventry + 4 st.	G	3/R5	150	647.000.0
647 kHz	Simferopol	UKR		100	647.00
464 m	Tovarnik 2 + 1 st.	YUG		20	647.00
	?				647.075
	Tabriz	IRN		100	646.996.7
No.15	Murmansk	URS		150	655.998
656 kHz	Napoli + 4 st.	I	1	120	656.000.0
457 m	Tel-Aviv	ISR	IB	200	656.000.5
	Potsdam	D-D	BB	20	656.001.1
No.16	Rohrdorf	D	SWF1	30/100	664.998.1
665 kHz	Lisboa 1	POR	ENR1	135	665.000.4
451 m	Damas-Sabboura	SYR	A	100	665.87
	Kaunas/Vilnius	URS		100	665.000.5
	Athinai	GRC	3	15	664.950
No.17	Marseille 1	F	FI	150	674.000.0
674 kHz	El Gawarsha	LBY		100	674.001.8
445 m	Tchernovtsy + 1 st.	UKR		100	673.991.8
	Bodoe	NOR	1	10	673.990
	Aigen + 7 st.	AUT	R	0,05	674.006
	Jerusalem	ISR	IB	20	674.001.8
No.18	Beograd	YUG	1	400	683.004.3
683 kHz	Sevilla	E	RNE1	125 250	682.998.0
439 m	Berlin	D	RIAS2	300	683.000.0
	Hof	D	RIAS2	40	683.000.2
	Meiningen ?	D-D			996
	Brouillage/Jamming				683 ...
	Rasht	IRN		100	680.005.6
No.19	Suhl-Wachenbrunn	D-D	D	250	691.999.9
692 kHz	Moorside-Edge + 1 st.	G	4N	150	692.000.0
434 m					
	Viseu	POR	ENR1	1	691.999.5
		IRQ			692.054
	Kinshasa	CGO			692.000 ...
	Oufa	URS		100	
No.20	Radio Andorra	AND		250	701.025.6
701 kHz	Istanbul ?	TUR	1	150	701.02.
428 m	Sebaa-Aioun	MRC	B	140	701.02.
	Banska-Bystr. + 4 st.	TCH	B/CR	100	701.000
	Aachen + 5 st.	D	NDR/WDR	5	701.000.0
No.21	Donetsk	UKR		150	710.000
710 kHz	Rennes 1	F	FI	[illegible]	710.000.0
423 m	Tallinn	URS		150	710.000.0
	Cairo 2	EGY	M	100	710.160
	Zagreb 2	YUG		25	710.003.1

No.22	Muenchen	D	FE	150	718.999.1
719 kHz	Oestersund	S	1	150	718.998.2
417 m	Norte I	POR	ENR1	100	718.998.1
	Sfax	TUN	A	100	719.031.5
	Lodz	POL	2		718.999.3
	?				719.337
	Brouillage/Jamming				719 ...
No.23	Schwerin-Wöbbelin	D-D	D	250	727.999.7
728 kHz	Athinai	GRC	1	150	728.001.3
412 m	Klagenfurt 2	AUT	R	25	728.000.2
	Campo de Gibraltar	E	RNE	10	727.973.1
	Mirandela	POR	ENR1	10	727.994.0
No.24	Poznan	POL		300	737.000.0
737 kHz	Barcelona	E	RNE1	[illegible]	737.000.4
407 m	Tel-Aviv	ISR	IB	600	737...
	Hof-Saale	D	RIAS2	40	737.000.1
	Brouillage/Jamming				737 ...
	Asyut	EGY	AV	100	736.830
No.25	Lopik	HOL	1	120	746.000.0
746 kHz	Aleppo-Sarabek	SYR	A	100	745.987.0
402 m	Plovdiv	BUL	2	30	746.040
	Cottbus-Hoyerswerda	D-D	D1	20	746.000.0
	Otocac ?	YUG		0,05	746.010.4
No.26	Lugoj	ROU	1	400	754.999.9
755 kHz	Braunschweig + 1 st.	D	DF	200	755.000.0
397 m	Lisboa 2	POR	ENR2	135	755.002.7
	Kuopio	FNL	R1	20	754.999.1
No.27	Kerkuk	IRQ	A	100	760.110
764 kHz	Sottens	SUI	F	150	764.000.0
393 m	Odessa	UKR		10	763.995.6
	Dakar	SEN		200	763.996
No.28	Cairo 1	EGY	CP	500	773.003.4
773 kHz	Stockholm + 1 st.	S	1	150	772.999.2
388 m	Sofia-Stolnik + 1 st.	BUL	1	30	773.000.8
	San Sebastian	E	RNE	20	772.998.7
	Voronej	URS		20	773.000.0
	Ucka + 4 st. ?	YUG		20	772.953
	Salzburg 2 + 14 st.	AUT	R	1	772.998.9
	Zahedan	IRN		200	774.438
No.29	Tartus	SYR	A	600	781.889.0
782 kHz	Burg	D-D	D	250	781.997.4
384 m	Kiev 2	UKR		100	782.000
	Miramar	POR	RCP	100	781.996.8
	Rijeka + 1 st.?	YUG		2	782 0...
No.30	Limoges 1	F	FI	[illegible]	791.000.0
791 kHz	Thessaloniki	GRC		100	790.998.2
379 m	Bakar ?	YUG		10	790.969
	Astrakhan	URS		50	790.996
No.31	Amman	JOR		100	800.01.
800 kHz	Leningrad 2	URS	2	100	800.000
375 m	Nürnberg-Dillberg	D	BR1	50/100	800.000.0
	Madrid EAJ.7	E	SER	20	800.000.0
	?				800.047.9
	Bonaire	ATN		500	799.993.9
No.32	Skopje + 1 st.	YUG		1000	809.001.1
809 kHz	Crowborough + 3 st.	G	ES/41	500	809.000.0
371 m	Sevilla EAJ.5	E	SER	5	808.992.1
	[illegible]	URS	2	10	809.000
No.33	Batra 2	EGY	A	450	(818.028)
818 kHz	Sud Radio	AND	SR	900	818.002.1
367 m	Warszawa-Mokotov	POL		300	818.000.4
	Trieste	I	1	25	818.000.0
	Rabat	MRC	A		818.(036)
No.34	Oujda ?	MRC	B	300	827.020.3
827 kHz	Sofia-Vakarel	BUL	2	100	827.005.5
363 m	Freiburg + 4 st.	D	SWF1	40	826.993.2
	Barcelona EAJ.1	E	SER	20	827.000.3
	Castelo Branco	POR	ENR1	1	827.001.1
	Kiel	D	NDR1	0,5	827.000.0
	Gorkii	URS		20	827.002.1
No.35	Nancy 1	F	FI	150	836.000.0
836 kHz	Beyrouth	LBN	1	200	836.006.6
359 m	Kharkov + 1 st.	UKR	2	20	835.999.3
	Kiuruvesi	FNL	R1	20	835.998.8
	Huelva	E			(836.008)
	Granada ECS.5	E	SIN	2	(836.016)
	Palencia EFE.4	E	RCN	2	(836.021)
	Valencia EFE.17	E	REM	2	(836.220)
	Las Palmas EAK.35	E	COPE	10	(836.0..)
No.36	Roma	I	2	540	845.000.0
845 kHz					
355	?	TRK			840.611
	Elista ?	URS			845.00
No. 37	Bucuresti-Tincabesti	ROU	2	150	854.000.6
854 kHz	Murcia	E	RNE5	125	853.991.8
351 m	Berlin-Britz	D	RIAS1	300	854.000.2
	?				854.720
	?				853.335
	Brouillage/Jamming				854 ...
No.38	Paris 1	F	FC	[illegible]	863.000.0
863 kHz	Blagoevgrad	BUL	1	30	(862.974)
348 m	Sibenik + 1 st.	YUG		1	862.975
No.39	Frankfurt	D	AFN	150	872.000.0
872 kHz	Leningrad ?	URS			872.000.0
344 m	Cairo 2	EGY	AC	50	872.395
	Budapest + 1 st.	HNG	2/B2	20	872.00.
	Zaragoza EAJ.101	E	SER	20	870.2612
No.40	Berlin-Koenigsw.	D-D	R1	100	880.993.5
881 kHz	Titograd + 4 st.	YUG		100	880.99.
341 m	Washford + 3 st.	G	4W	100	881.000.0
	Dammam	ARS		100	881.000.2
	Stavropol	URS	2	20	881...
No.41	Alger 3	ALG	F	300	889.980
890 kHz	Dushanbe	URS		500	889.999.3
337 m	Linz	AUT	R	20	890.000.1
	Bergen + 2 st.	NOR	1	10	889.999.8
No.42	Milano	I	1	600	899.000.0
899 kHz	?	YUG			898.986
334 m	?	TCH			899.00.
No.43	Burg	D-D			908.137.4
908 kHz	Kirkuk	IRQ	AR	200	908.040.4
330 m	London-Brookmans Park	G	4L	140	908.000.0
	Cluj 1	ROU	2	50	907.999.1

No.44	Lj bljana	YUG		135	916 999.1
917 kH	Ma rid EAJ.	E	RE	20	917 009.1
327 m	Te uan 2	MRC	C	5	917 1...
	Re chenbach	D-D	BR	3,5	917 002.9
	Cc·al Bay Paphos	CYP	1	7	917 083
	Makhatch-Kala	URS		50	917 01.
No.45	Wavre-Overijse	BEL	R1	150	926 000.0
926 kHz	Izmir	TUR	1	100	925 987
324 m	Zakynthos	GRC	1R	50	926 016
	Nis + 3 st.	YUG		20	926 02.
	Ivanovo	URS		10	926 ...
No.46	Lvov	URS		100	934 997.3
935 kHz	Burg	D-D	B	250	934 996.6
321 m	Agadir	MRC	A	100	935 085.0
	Berlin	D	AFN	10	935.001.4
	Cairo 4 ?	EGY	M	10	935/936
	Rezaiyeh	IRN			935 112
No.47	Toulouse 1	F	FI	100	944 000.0
944 kHz	Rostov/Don	URS	2	20	943 996.7
318 m	Larissa	GRC	FAG	5	943 958.9
	Pleven 2	BUL		30	943 503.1
	?	ROU			944 ...
	Rio de Janeiro	B		50	940 001
	Luanda	AGL		10	944 034.0
No.48	Brno + 1 st.	TCH	F	100	953 000.0
953 kHz	Madrid EAJ.29	E	CR1	20	952 998.3
315 m	Badalona EAJ.39	E	P	2	952 969.2
	Sydney	CAN		10	969 999.0
	Las Palmas EAJ.50	E	SER	10	953 002.0
No.49	Korça	ALB			958 3..
962 kHz	Deir-el-Zor	SYR	A	60	962 150
312 m	Turku	FNL	R1	100	962 000.3
	Tunis-Djedeida	TUN	F	100	962 007
	Paris 4	F	RP	4/8	962 000
	Kragujevac + 3 st	YUG		10	961 952
	?				965 027
	?				961 997
No.50	Hambourg + 4 st	D	NDR/WDR	300	971 000.0
971 kH	Smolensk	URS	1	150	970 999.7
309 m	Istanbul	TUR	3	2	967 8..
	Marrakech 1 ?	MRC	A	1	970 952
	Asyut	EGY		5	972 403
No.51	Alger 1	ALG	A	200	990 ...
980 kH	Göteborg	S	1	150	980 000.0
306 m	Trieste	I	A	10	980 000.0
	aklion	GRC	FAG		980 119.4
	ma-Ata	URS			980 008
No.52	Berlin	D	RBI	500	989 000.1
989 kHz	Madrid	E	RNE	50	988 999.0
303 m	Beyrouth	LBN	2	10	988 965
	Kukes	ALB		8	992 ...
	?				988 161
	Brouillag /Jammi g				989 ...
	?				989 650
	Kermanshah	IRN		100	986 969.6
No.53	Kichinev	URS		100	998 000.3
998 kHz	Bilbao	E	RNE	20	998 016.0
301 m	Heidelberg + 1 st	D	SDR1	10	998 000.1
	Nigret	NIG		20	998 003
No.54	Beograd	YUG		200	1007 005.1
1007 kHz	Lopik	HOL	2	120	1007 000.1
298 m	Kerkyra	GRC	1R	30	1006 99.
	Malaga	E	RNE	10	1006 991.1
No.55	Mainz-Wolfsheim	D	SWF1	300	1016 002.2
1016 kHz	Venezia + 1 st.	I	R	25	1016 000
295 m	Tripolis	GRC	FAG	10	1016 014.8
	Tanger 3	MRC	R	1	1016 002
No.56	Dobl + 13 st.	AUT	1	100	1025 000.0
1025 kHz	Jerusalem	ISR	1R	50	1025 009
293 m	Barcelona EFJ.13	E	CAR	5	1025 007.4
	San Sebastian EAJ.8	E	SER	5	1025 999.2
	Rabat 2 + 1 st.	MRC	A/R	1	1025 030
	Hannover	D	NDR1	0,4	1025 001.8
	Badajoz ECS.2	E	SIN	2	1025 008
No.57	Porto Alto	POR	RCP	50/100	1034 003.2
1034 kHz	Tallinn 1	URS	1	100	1033 998.8
290 m	Milano + 6 st.	I	2	50	1034 000.0
	Karlsruhe + 2 st.	D	AFN	1	1033 993
	?	BUL			1038 160
No.58	Dresden-Wilsdruff	D-D	D1	20/250	1042 997.6
1043 kHz	Sebaa-Aioun 3	MRC	C	25	(1043 043)
288 m	Aye-Marche	BEL	F2	10	1042 998
	Thessaloniki	GRC	1R	5	1043 00.
No.59	Iasi	ROU	2	1000	1052 000.1
1052 kHz	Start Point + 1 st.	G	RW	100	1052 000.0
285 m	Tripoli	LBY		50	1052 ...
	Tetuan 1	MRC	A	20	1056 698
	Cottbus + 1 st.	D-D	D1	10	1051 999.3
No.60	Diyabakir	TUR	1	300	1060 999.8
1061 kHz	Norte 2	POR	RDP2	100	1061 002.8
283 m	Kalundborg	DNK	2	60	1061 003.1
	Cagliari + 3 st.	I	1	10	1061 000.0
	Joannina	GRC	FAG	10	1061 013.0
	Cairo 6	EGY	M		1060 865.4
	Zagreb + 4 st.	YUG		7	1061 026
	Saransk	URS	2	50	1061 005.4
No.61	Paris 2	F	FI	100	1070 000.0
1070 kHz	Tartus	SYR	F	60	1069 080
280 m	Banja Luka + 1 st.	YUG		25	1070 002
	Dnepropetrovsk	UKR		20	1070 00.
	Mesolongion	GRC	F	0,25	1070 015
	Bissau ?	GNP			1070 002.1
	Sackville	CAN		50	1070 002.0
	Buenos Aires	ARG		110	1069 999.4
No.62	Bremen	D	RB1	100	1079 000.4
1079 kHz	Katowice	POL		60	1079 000.6
278 m	Valencia	E	RNE	25	1079 001.3
	Grevenas	GRC	FAG	10	1079 016
	Koper-Beli Krizi Sat.	YUG		6	1079 002
	Plauen	D-D	BR	2	1079 002.0
	Casablanca	MRC	A	1	1078 958.7
No.63	Droitwich + 1 st.	G	GR	150	1088 000.0
1088 kHz	Tirana	ALB		50	1088 005.8
276 m	Grossarl 1 + 1 st.	AUT	1	0,05	1088 002
	Novi Sad ?	YUG		20	1088 00.
	Brouillage/Jamming				1088/1089
	Luanda	AGL		100	1088 ...
	Perm	URS		20	1088 005.6

No.64	Bratislava	TCH	B	150	1097 000.1
1097 kHz	Madrid EFE.14	E	REM	20	(1097 083)
273 m	San Sebastian EFE.23	E	REM	2	(1097 257)
	Bologna	I	R	60	1097 000
	Sama de Langreo EFJ.57	E	CAR	2	1097 085
	Las Palmas ECS.4	E	SIN	20	(1097 087)
	Esfahan	IRN		10	1099 988.0
No.65	Vilnius 2	URS	2	100	1106 000.0
1106 kHz	München	D	AFN	40	1106 002.0
271 m	?	EGY	A		1115 971
	Leon EAJ.63 ?	E	SER	2	1106 021
	Manresa EAJ.51 ?	E	SER	2	1106 138
	Huesca EAJ.22	E	SER	2	1106 085
	Vitoria EAJ.62 ?	E	SER	2	1105 906
	Linares EAJ.37 ?	E	P	2	1105 959
	?	E			1106 306
	La Coruna EAJ.41 ?	E	SER	2	1106 082
	?				1106 010
No.66	Bari + 6 st.	I	2	50	1115 000.0
1115 kHz	Kaliningrad	URS	1	20	1115 000.0
269 m	Boe Vesteraalen +7st.	NOR	1	1	1115 009
	Ouarzazate + 1 st.	MRC	A	15	1114 986.5
No.67	Bayda	LBY		1000	1124 000.1
1124 kHz	Banke Osterija + 1 st.	YUG		20	1124 009
267 m	Leningrad 3	URS	3	20	1123 999
	Barcelona EAJ.15	E	SER	10	1123 995.0
	Houdeng	BEL	F2	10	1123 999.8
	Varna 2	BUL	2	10	1124 00.
	Muerzzuschlag + 11 st.	AUT	R	0,1	1124 000
	?	YUG			1126 7..
	Salvador	B		10	1120 010
No.68	Tovarnik 1 + 3 st.	YUG		300	1133 000.0
1133 kHz	Zaragoza EFJ.46 ?	E	CAR	2	1132 988
265 m	?				1132 998.8
	?	E			1132 926
	Malaga EFJ.56 ?	E	CAR	2	1132 987
	?	E			1133 065
	Jaen ECS.9 ?	E	SIN	2	1133 060
	Murcia EFJ.19	E	CAR	2	(1132 995)
	Sevilla ECS.8	E	SIN	2	(1132 896)
	Bilbao EFJ.43	E	CAR	2	(1132 989)
	Oviedo EFE.22 ?	E	REM	2	1132 762
	?				1133 095
	?				1133 016
	?				1133 030
	?	E			1132 961
	?				1132 995
No.69	Riga	URS	2	50	1142 000.0
1142 kHz	Constantine 1 + 1 st.	ALG	A	40	1142 070
263 m	Arkhoudi	GRC	FAG	20	1142 016.9
	Stuttgart + 7 st.	D	AFN	10	1142 999.2
	Pula + 1 st.	YUG		2	1142 028.9
	Altenau 1 + 11 st.	AUT	1	0,05	1142 000
No.70	Cluj 2	ROU	2	950	1150 999.3
1151 kHz	Stagshaw + 2 st.	G	4M	100	1151 000.0
261 m	Marrakech	MRC	B	1	1151 333
	Mar del Plata	ARG		25	1150 005
	Beni Sueif 2	EGY	E	50	1154 930
No.71	Kardzali 1	BUL	1	150	1150 99.
1160 kHz	Strasbourg 1	F	FI	20/200	1160 000.0
259 m	?	URS			1161 8...
No.72	Odessa	URS		50	1168 999.9
1169 kHz	Beli Kriz-Koper + 2st.	YUG		20	1169 005.3
257 m	Heilbronn + 1 st.	D	SDR1	10	1168 999.9
	Porto	POR	RNE	10	1168 886.1
No.73	Hörby	S	1	100	1177 998.7
1178 kHz	Thessaloniki	GRC	FAG	50	1177 991.8
255 m	Barcelona	E	RNE2	20	1172 998.6
	Marathon	USA		50	1180 000
	Rio de Janeiro	B		50	1179 8.
No.74	Szolnok + 1 st.	HNG	B2/3	135	1186 999.8
1187 kHz	Cuenca	E	RNE	5	1187 001.0
253 m	Sevilla	E	RNE2	5	1186 988.5
	Casablanca 2	MRC	B	1	1187 167.8
	Riyadh	ARS			1182 999.9
No.75	München	D	VOA	300	1196 000.9
1196 kHz	Agadir	MRC	C	20	1193 959.4
251 m	Alexandria 1	EGY	R	10	1196/1199
	Portalegre	POR	RDP1	1	1196 001.4
	?	URS			1195 800
No.76	Bordeaux 1	F	F1	100	1205 000.0
1205 kHz	Krakow + 1 st.	POL		60	1205 000.0
249 m	Akko	ISR	IB	10	1205 010
	Subotica + 2 st. ?	YUG		7,5	1205 014.2
	?				1206 991
No.77	Tallinn 2 - Tartu	URS	2	200	1214 000.0
1214 kHz	Washford + 15 st.	G	1	60	1214 000.0
247 m	?	TUR			1211 449
	Tirana	ALB			1214 06.
No.78	Falun	S	1	300	1223 003.1
1223 kHz	Madrid	E	RNE3	50	1223 005.2
245 m	Stara Zagora	BUL	2	30	1223 053
	Rimini	I	2		1222 999.9
No.79	Kosice + 2 st.	TCH	S/CR	100	1232 000.0
1232 kHz	Tanger 1	MRC	VH	200	1231 998.9
244 m					
No.80	Kiev + 1 st.	UKR	2	150	1241 000.0
1241 kHz	Vasa	FNL	R3	25	1241 000.0
242 m	Nancy 2 + 6 st.	F	FC	100	1241 000.0
	Crnomelj + 2 st.	YUG		0,05	1241 00.
	Luanda	AGL			1243 611
No.81	Tripoli	LBY		1000	1249 986.3
1250 kHz	Balatonszabadi + 1 st.	HNG	B2/2	135	1250 000.0
240 m	Cork + 2 st.	IRL		10	1250 005.5
	Lopik	HOL	3	10	1250 000.0
	Chaves	POR	RDP1	1	1249 996.3
No.82	Rhodes	GRC	VOA	150	1259 000
1259 kHz	Wroclaw + 1 st.	POL		200	1259 000.0
238 m	Valencia EAJ.3	E	SER	5	1258 990.0
	Bilbao EAJ.28	E	SER	5	1259 062.7
No.83	Neumünster	D	DF	600	1268 000.0
1268 kHz	Novi-Sad	YUG		150	1268 001.3
236 m	Madrid EAK.1	E	COP	20	1267 988
	Mallorca EAK.18 ?	E	COP	2	1267 996

	Station	Country	Net	kW	Freq
No.84	Strasbourg 2	F	FC	30/300	1277 000.0
1277 kHz	Moskva 3	URS		20	1277 000.3
235 m	Florina	GRC	FAG	10	1276 976.4
	Gevgelija + 2 st.	YUG		2	1276 980
	Rio de Janeiro	B		50	1280 005.9
	Kabul	AFG		100	1279 981.1
No.85	Praha-Melnik	TCH	C	100	1286 000.0
1286 kHz	Tel-Aviv	ISR	GT	7,5	1286 007
233 m	Lisboa	POR	RRE	2,5	1286 005.7
	?				1285 997.3
	?				1286 000.0
	Brcko	YUG		2	1286 004
	?	YUG			1285 009
	Rimavska Sobota	TCH			1285 997
No.86	Crowborough	G	ES	600	1295 000.0
1295 kHz	Shumen	BUL	2	30	(1294 720)
232 m	Vranje + 1 st.	YUG		10	1294 996.9
	Foxdale	G	MAN	2	1295 005.0
	Rabat 3	MRC			1295 160
	Gjirokaster	ALB		0,2	1293 845
	Brouillage/Jamming				1295 ...
	?				1297 8..
	St. Martin	ATN		0,2	1295 012.8
	Baku	URS	2	150	1294 999.9
No.87	Szczecin + 1 st.	POL		160	1304 000.0
1304 kHz	Constantine 2 + 1 st.	ALG		40	1304 ...
230 m					...
	Heidelberg + 5 st.	D	SW	1	1304 005.0
	Krapina + 1 st.	YUG		1	1304 051
	Antalya	TUR	1	2	1299 5..
	Kozani	GRC	FAG	0,5	1304 512
No.88	Simferopol + 1 st.	URS		100	1313 000.2
1313 kHz	Stavanger	NOR	1	500	1312 999.1
228 m	Timisoara 2 + 3 st.	ROU	1/2	30	1312 881.8
	Zaragoza	E	RNE1	10	1312 991.1
	Ancona	I	2	6	1313 000.0
	[illegible] 2 + 14 st.	AUT	R	0,1	1313 00.
	?				1316 070
	Fort de France ?	MRT		50	1310 002.5
No.89	Leipzig-Wiederau	D-D	R	150	1321 998.3
1322 kHz	Safi	MRC	R	1	1321 963.7
227 m	Santarem	POR	RRI	0,5	1322 005.3
	Murmansk	URS			1321 998
	Bac + 1 st.	YUG		0,05	1322 001.5
	?	ARG			1319 965
	Téheran	IRN		100	1323 ...
	Enugu	NIG		10	1318 635
No.90	Roma + 3 st.	I	1	150	1331 000.0
1331 kHz	Kothla-Jarve + 1 st.	URS		20	1331 000.0
225 m	Elvas	POR	ENR1	1	1330 991.7
	Sombor + 1 st.	YUG		10	1332 000
	Funchal	MDR		1	1330 989
					1336 810
No.91	Baghdad-Thawrah	IRQ		20	1336 730
1340 kHz	Lisnagarvey + 1 st.	G	4I	100	1340 000.0
224 m	Budapest-Lakihegy	HNG	3	80	1339 999.1
	?	URS			1340 000
	Loznica	YUG		1	1340 009
No.92	Bordeaux 2 + 4 st.	F	FC	30	1349 000.0
1349 kHz	Pyrgos	GRC	FAG	4	1349 023.4
222 m	Riga	URS			1349 000.0
	Gols + 2 st.	YUG		0,05	1348 998.6
	Kavalla	GRC		1	1351/1334
		IRQ			1349 002.4
	Kuwait	KWT		1	1345 007.7
No.93	Berlin-Koepenick	D-D	BW	250	1358 000.5
1358 kHz	Bremerhaven	D	RB1	2	1358 000.0
221 m	Tirana	ALB			1358 012.9
	?	URS			1358 000
No.94	Bialystok + 2 st.	POL		60	1367 000.0
1367 kHz	Venezia + 13 st.	I	3	25	1367 000.0
219 m	Porto	POR	RNR1	10	1366 996.1
	[illegible]	SUI	F	0,5	1367 000.5
	R. Nordsee Intern.	s/mer			1366 999.3
No.95	Lille 1	F	FI	300/100	1376 000.0
1376 kHz	Vinnitsa + 1 st.	URS	1	50	1375 991.9
218 m	Kardzhali 2	BUL	2	30	1376 567
		ETH		4	1373 00.
No.96		URS	3	150	1385 001.3
1385 kHz	Athinai	GRC	3	50	1385 000.4
217 m	Madrid ECS.11	E	SER	20	1385 000.4
	Tuzla + 4 st.	YUG		1	1384 99.
	Inca EFJ.45 ?	E	CAR	2	1385 00.
	Gerona ECS.14	E	SER	2	(1385 0981)
	La Coruna EFJ.11 ?	E	CAR	2	1385 000
No.97	Graz + 8 st.	AUT	R	25	1394 000.3
1394 kHz	Augsburg + 2 st.	D	AFN	1	1393 998.8
215 m	Göteborg + 15 st.	S	3	0,75	1394 000.1
	Tirana	ALB			1393 997.9
	?	URS			1394 00.
	Reus EAK.53 ?	E	COP	2	1394 126
	Vigo EAK.33	E	COP	2	1394 00.
	Zamora EAK.26 ?	E	COP	2	1393 891
	Santander EAK.68	E	COP	2	1394 00.
	San Sebastian EAK.44?	E	COP	2	1394 111
	?				1394 992
	?				1393 973
	Zaragoza EAK.6	E	COP	2	1394 0031
	Jerez EAK.17	E	COP	2	1394 0101
	Ahvaz	IRN		100	1389 881.1
No.98	Brest 2 + 5 st.	F	FI	20	1403 000.0
1403 kHz	Tiraspol ? + 1 st	URS		10	1403 000.0
214 m	Komotini	GRC	IR	5	1402 996
	Granada EAJ.16	E	SER	2	1402 966
	Conakry	GUI		100	1402 697
No.99	Pristina + 3 st.	YUG		100	1412 000.4
1412 kHz	Turku + 1 st.	FNL	R3	4	1412 000.0
212 m	Bad Mergentheim	D	SDR1	3	1411 999.5
	Tarrasa EAJ.25	E	SER	2	(1412 272)
	Murcia EAJ.17 ?	E	SER	2	1412 145
	Pamplona EAJ.6	E	SER	2	1414 590
	(Granada EAJ.16)	E	SER	2	(1411 973)
	Castellon EAJ.14 ?	E	SER	2	1412 012
					1412 225
					1412 172
					1411 9..
					1412 064
	?				1412 106
	Burgos EAJ.27	E	SER	2	(1411 893)
	Ile Maurice	[illegible]		[illegible]	1410 004.8

	Station	Country	Net	kW	Freq
No.100	Saarbrücken	D	SR1	400	1421 000.9
1421 kHz	Alger 3	ALG	K	40	1421 013.3
211 m	Riga	URS	2	10	1421 000.1
	Tampere	FNL	R1	1	1421 000
No.101	Skive + 1 st.	DNK	2	70	1430 000.0
1430 kHz	Bacau + 1 st.	ROU	2	50	1429 493
210 m	Uzhgorod + 1 st.	URS		50	1430 000.2
	Pesaro + 2 st.	I	2	2	1430 000.0
	Valencia EAK.5	E	COP	2	(1430 0081)
	Malaga EAK.11	E	COP	2	(1430 0012)
	Ciudadela EAK.63 ?	E	COP	2	1430 084
	Lerida EAK.15	E	COP	2	1429 999
	Jaen EAK.40	E	COP	2	1430 002
	?				1429 842
	Lugo EAK.18	E	COP	2	(1430 0061)
	Valladolid EAK.9	E	COP	2	(1430 0081)
	Caceres EAK.57	E	COP	2	1430 ...
	Gorgan	IRN		10	1426 5..
No.102	Luxembourg-Marnach	LUX	2	1200	1438 999.6
1439 kHz	?	URS			1438 998.5
208 m					
No.103	Squinzano + 29 st.	I	2	50	1448 000.0
1448 kHz	Joenkoping + ? st.	S	1	2	1447 998.0
207 m	Coimbra	POR	ENR1	1	1447 998.1
	?	URS			1448 00.
No.104	Benghazi	LBY		3	1453 953.8
1457 kHz	Constantza 2	ROU	2	50	1456 9971
206 m	Clevedon + 3 st.	G	AW	20	1457 000.0
	Bihac + 1 st.	YUG		2	1457 015.3
	Judenburg + 7 st.	AUT	R	0,1	1457 00.
	?	ALB			1456 998.1
No.105	Monte-Carlo	MCO	2	200	1466 000.1
1466 kHz	Simferopol	URS		25	1465 991.4
205 m	Kautokeino + 3 st.	NOR	1	5	1466 008.9
	?				1465 994
No.106	Wien 2 + 4 st.	AUT	R	150	1475 000.0
1475 kHz	Cordoba EAJ.24 ?	E	P	2	1475 011
203 m	Lerida EAJ.42 ?	E	SER	2	1475 165
	Logrono EAJ.18	E	SER	2	(1475 0381)
	Sabadell EAJ.20	E	P	2	(1475 0001)
	?				1476 885
	Zamora EAJ.72 ?	E	SER	2	1476 990
	Santander EAJ.33	E	SER	2	(1476 9112)
	Oviedo EAJ.19	E	SER	2	(1476 9983)
No.107	Berlin	D	SFB1	5	1484 000.0
1484 kHz	Liège	BEL	FT	5	1484 001.2
202 m	Riga 3	URS	3	5	1484 000.0
	Barrow + 7 st.	G	4/NW/NT	2	1484 000.0
	Bolzano + 11 st.	I	2	2	1484 000
	Oostende-Bredene	BEL	W1	2	1483 995.5
	Baia Mare + 4 st. ?	ROU		2	1484 475
	?				1484 161
	Dijon + 3 st.	F	FI	1	1484 021.0
	Pietarsaari + 1 st.	FNL	R2/R1	1	1483 997.3
	?				1484 172
	?				1483 ...
No.108	Leningrad + 1 st.	URS	3	50	1492 999.1
1493 kHz	Ajaccio + 7 st.	F	FI/FC	10	1492 999.4
201 m	Svetozarevo + 8 st.	YUG		10	1493 ...
	Kitzbuehel 2 + 3 st.	AUT	R	0,05	1492 997
	Guarda	POR	RA	0,02	1493 007.3
No.109	Warszawa-Mokotow	POL		300	1502 000.6
1502 kHz	Beograd + 3 st.	YUG		6	1501 99.
200 m	Münster	D	WDR1	0,8	1502 000.0
	Garmisch + 4 st.	D	AFN	0,25	1502 018
	Burgos EAK.3 ?	E	COP	2	1502 185
	Bilbao EAK.13	E	COP	2	(1502 0081)
	?	GRC			1506 320
	Sevilla EAK.2 ?	E	COP	2	1502 004
No.110	Berlin-Koepenick	D-D	RI	250	1510 999.5
1511 kHz	Veltem	BEL	RO	20	1511 000.2
199 m	Delimara Point	MLT	BBC	20	1511 00.
	Skopje 2 + 2 st.	YUG	2	20	1511 ...
	Chania + 1 st.	GRC	IR	5	1511 00.
	Tallinn	URS			1511 000
No.111	Ostrava + 5 st.	TCH	C	30	1520 000.0
1520 kHz	Alicante EAJ.31 ?	E	SER	2	1519 905
197 m	Albacete EAJ.44 ?	E	SER	2	1520 261
	Gerona EAJ.38 ?	E	SER	2	1520 179
	Jaen EAJ.61 ?	E	SER	2	1519 854
	?				1520 051
	?				1520 440
	?				1520 150
	?				1520 288
	Reus EAJ.11	E	SER	2	(1520 019)
	Alcira EAJ.54 ?	E	SER	2	1519 854
No.112	?	URS			1525 000
1529 kHz	?	URS			1524/1529
196 m	Citta del Vaticano	CVA		50-150	1529 000.0
	Peking	CHN		2000	1524 996.2
No.113	Mainflingen	D	DF	20/70	1537 998.7
1538 kHz	?	URS			1538 000
195 m					
No.114	Vinnitsa	URS		50	1546 000.4
1546 kHz	Seelow	D-D	DI	5	1546 000.5
194 m	Brighton + 50 st.	G	3	1	1546 000.0
	Abtenau 2 + 4 st.	AUT	R	0,05	1546 000

No.115 1554 kHz 193 m	Nice 2	F	FI	300/300	1554 000,0
	Vilnius + 1 st.	URS		20	1554 000
No.116 1562 kHz 192 m	Beromunster + 1 st.	SUI	D	160	1562 020,4
	Radio Veronica	s/mer		10	1562 013
	Boraas + 11 st.	S	1	2	1561 998,0
	Covilha	POR	[illegible]	1	1562 056
	Bosanska Krupa + 2 st.	YUG		0,2	1562 001
No.117 1570 kHz 191 m	Bernburg-Halle	D-D	D1	20	1570 002
	Leningrad	URS		10	1570 003,5
	Osnabrück	D	NDR1	5	1570 000,0
	Santander EFE.25	E	REM	2	(1570 320)
	Alicante EFE.8 ?	E	REM	2	1569 908
	Iraklion	GRC	AFN	0,25	1570 002
	Socuellamos ECS.10	E	SIN	2	1570 007
	Cabra ECS.12 ?	E	SIN	2	1570 110
					1570 148
	?				1569 988
	?				1570 083
	[illegible]	MLT		20	1570 ...
No.118 1578 kHz 190 m	Genova + 17 st.	I	1	50	1578 000,0
	Fredrikstad + 1 st.	NOR	1	10	1577 999,1
	Porto	POR	[illegible]	10	1578 001,7
No.119 1586 kHz 189 m	Langenberg	D	WDR1	800/300	1586 000,0
	Tartu	URS	2	15	1585 [illegible]
No.120 1594 kHz 188 m	Lisboa	POR	[illegible]	10	1594 001,5
	Hengelo + 2 st.	HOL	2	2,5	1594 000,0
	Bolzano + 8 st.	I	3	2	1593 999,7
	Kortrijk-Kuurne	BEL	[illegible]	2	1593 [illegible]
	Koszalin + 2 st.	POL	[illegible]	2	1594 [illegible]
	Olomouc + 1 st.	TCH	[illegible]	2	1593 [illegible]
	Nîmes + 3 st.	F	FI	2	1593 999,1
	Joenkoeping + 5 st.	S	3	0,2	1594 [illegible]
	?				1594 [illegible]
	?				1594 [illegible]
No.121 1602 kHz 187 m	München-Ismaning	D	BR1	[illegible]	1602 000,0

STATIONS HORS-BANDE

	Amfissa	GRC			1611 [illegible]

COUNTRY NAME ABBREVIATIONS

AFG Afghanistan
AGL Angola
ALB Albania
AND Andorra
ARG Argentina
ARS Saudi Arabia
ATN Neth. Antilles
AUT Austria
B Brazil
BEL Belgium
BUL Bulgaria
CAN Canada
CGO Congo
CHN China
CVA Vatican City
CYP Cyprus
D West Germany
D-D East Germany
DNK Denmark
E Spain
EGY Egypt
F France
FNL Finland
G Great Britain
GLP Persian Gulf
GRC Greece
GUI Guinea
HNG Hungary
HOL Holland
HVO Upper Volta
I Italy
IRL Ireland
IRN Iran
IRQ Iraq
ISL Iceland
ISR Israel
JOR Jordan
KWT Kuwait
LBN Lebanon
LBY Libya
LUX Luxembourg
MCO Monte Carlo
MDR Madeira Is.
MLI Mali
MLT Malta
MLT Malta
MRC Morocco
MRT Martinique
NIG Nigeria
NOR Norway
POL Poland
POR Portugal
ROU Romania
S Sweden
SDN Sudan
SEN Senegal
s/mer International Waters
SPM St. Pierre & Miquelon I.
SUI Switzerland
SYR Syria
TCH Czechoslovakia
TUN Tunisia
TUR Turkey
UKR Ukraine
URS USSR
USA United States of America
YUG Yugoslavia

RADIO INTERCONTINENTAL MADRID
EAJ-29 953 kHz

RADIO CASTELLON
EAJ 14
SOCIEDAD ESPAÑOLA DE RADIODIFUSION

Patterns, Part III fish<>hart

There are two basic methods for obtaining the bearing of a DXer's location as measured at the transmitting site of a broadcast band station, viz.: (a) to calculate the bearing by solving the necessary trigonometric equations based on spherical earth and (b) to measure the angle directly from a map correct for this purpose. Method (a) has been written to at some length in previous issues of DX NEWS and the interested reader is refferred to these Reprints and Monographs.** Method (b) will be discussed here.

The local azimuth bearing of the DXer as measured at the station transmitting antenna site will be henceforth termed the "back bearing" (BB) and is measured on the local azimuth compass at the station's antenna with the following (standard) conventions consistant with the plot of antenna patterns: 0^o is True (Geographic) North and is the direction of the North Geographic Pole as measured along the great circle of longitude passing through the antenna site; 90^o denotes East; 180^o denotes South; 270^o denotes West and 360^o denotes North (also 0^o) etc.

Accuracy is of paramount importance as has been indicated herefore in this series of articles. Specifically, accuracy within 3^o of the true value of BB has been called for. However, Method (a) will give exact values of BB provided geographical coordinates are completely specified and correctly accurate trigonometric tables are employed. **Method (b) must be somewhat less** accurate because of the graphical techniques used and because of the very interesting and formally difficult problem of cartography in projecting a region of the surface area of a sphere onto a plane (a map). **Accuracy for** the USA using Method (b) can consistantly achieve values within 1^o of the true value of BB if the correct graphical constructions are used with a proper map.

To obtain the BB from a map of the USA requires that the map have certain properties which relate to the measurement of azimuth angles. The type of projection, i.e., the manner in which the USA, as it appears on the globe, is projected onto another surface which is eventually converted into a plane (a map), should have the property that no matter which two points on it are selected, the bearing of one as measured at the other by correct graphical procedures will render an azimuth angle sufficinetly accurate for the purpose at hand.

There are several projections which are well suited for BB determination between any two points: viz., Gnomonic, Azimuthal Conformal, Lambert Conformal Conic with two Standard Parallels and the Albers Equal Area Conic with two Standard Parallels. **Others less suitable are the Polyconic and Lambert** Zenithal. Others which are inappropriate (the errors increase rapidly with increasing distance in most directions) are of the cylindrical class to which the popular Mercator types belong. **The specific problem at hand is that of** obtaining a map presently published which will be readily available and at reasonable cost. **The two projections which are most correct for BB** determination and which areavailable with reasonable cost are the Lambert Conformal Conic with two Standard Parallels (best) and the Albers Equal Area Conic with two Standard Parallels(next best). **With these projections used,** BB values within 1^o of the true value can be obtained. Ther errors in these projections are effectively restricted to the expansion and contraction of the paper on which they are printed. The largest errors will occur along the East and West Coasts of the USA so that when determining BB to or from these areas care should be taken to reduce the error inherent in the process of reading angles to as small a value as possible. There are several sources for such maps to be used in conjunction with the graphical prodecures described below to determine azimuth BB required for our objectives. ***

It is necessary that the map have longitude parallels spaced at leaset every two degrees. A map without these parallels is effectively worthless for BB evaluation. A protractor and straightedge are needed to effect the BB measurement. The straightedge should be at most as long as the longest diagonal of the map used and the protractor size is related to the area of the map. It is suggested that no map smaller than 2' x 3' or so be used for accuracy of the graphical technique diminishes with decreasing map size (area). For maps, say, 2' x 3' or larger, the following protractors are reccommended: Keuffel & Esser #1274-8 (8" diameter) or #1274-10 (10" diameter). Each of these instruments is constructed of transparant plastic and scaled 0-180° in 0.5° increments. To determine the BB of point A (the DXer location) as measured at point B (the location of the antenna for the station of interest), follow this procedure:

(a) lay or mount the map absolutely flat so that measurements will not be distorted;
(b) using the straightedge draw a line between point A and point B;
(c) center the protractor on point B and place the base line of the protractor (determined by markings for 0° and 180° and the protractor center) PARALLEL to the nearest line of longitude on the map; (This alignment with the longitude parallel is MOST important!!)
(d) read the angle at which the line form A to B crosses the protractor scale as follows--
  (i) all angles are measured clockwise from True North or True South (determined by the base line of the protractor being parallel with the nearest longitude parallel on the map!!!);
  (ii) if A has longitude East of B, then BB equals the value of the angle as measured from True North;
  (iii) if A has longitude West of B, then read the angle clockwise from True South at B, call this angle D. Then BB equals D plus 180°.

A few notes are appropriate: In item(a), the entire line between A and B need not be drawn unless a determination of distance (separation between A and B) is desired. Maps of the Lambert Conformal or Albers Equal Area type are also well suited for the determination of great circle distances--just scale off the line from A to B using the scale of distance provided on the map. If the distance from A to B is not desired, then only a portion of the line from A to B need be drawn--a line segment ("mark") long enough in length to allow the angle to be read from the protractor.

Figures (I) and (II) depict the general procedure. After the value of BB has been determined, it is then a relatively simple matter to obtain the EQP radiated in the direction of the DXer provided a plot of the appropriate antenna pattern is on hand. The value of BB is located on the antenna pattern plot and the field value in mv/m @ 1 mile is then scaled or read from that graph and EQP calculations follow directly. -------de Fish, Ph. Dx ©

**--"On the Derivation of those Spherical Trigonometric Relationships Required for the Computation of Great Circle Distances (GCD) and Great Circle Bearings (GCB) with several Algorithms in FFORTRAN IV for Execution on a Digital Computer" --de Fish (NRC Monograph)

--"An Algorithm for Great Circle Computations of Bearings and Distances Between Two Points on the Earth's Surface" --de Fish, DX NEWS, Vol. 39,#8 November 27, 1971 (NRC Reprint)

***--a map which will suffice is obtainable from Rand McNally, Box 7600, Chicago, Ill., 60680 for approximately $4: Stanford's General Map of the USA, 1971. Albers Equal Area Conic Projection with two Standard Parallels, approx., 2' x 3', 2° coordinate increments with 1" equal to 80 miles.

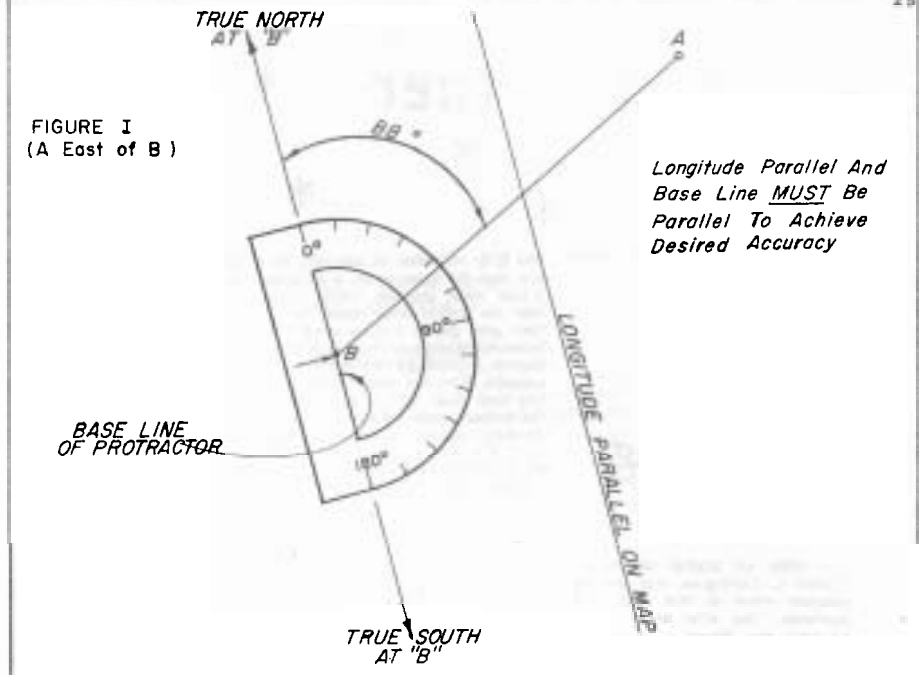

FIGURE I
(A East of B)

Longitude Parallel And Base Line MUST Be Parallel To Achieve Desired Accuracy

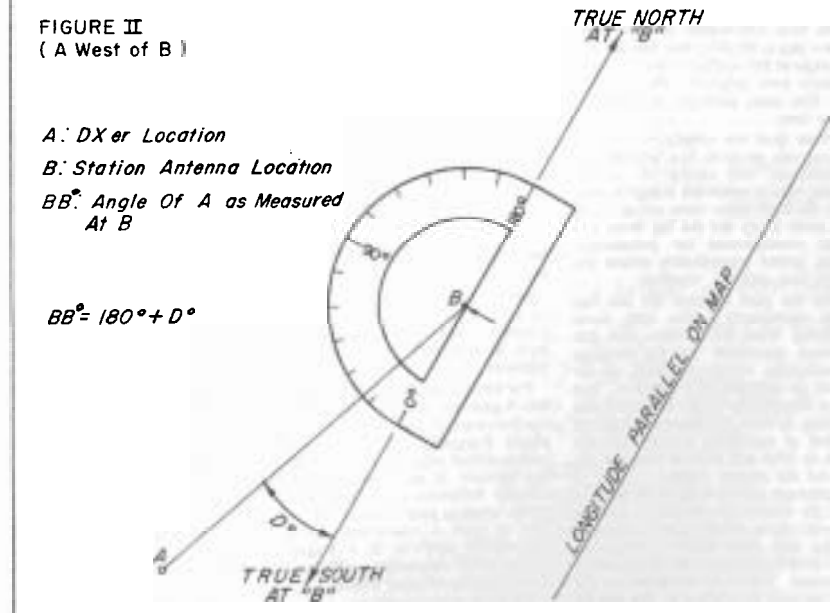

FIGURE II
(A West of B)

A: DXer Location

B: Station Antenna Location

BB°: Angle Of A as Measured At B

$BB^\circ = 180^\circ + D^\circ$

Clipping Corner

Solar Flares:

The Sun Puts on A Dazzling Show

In 1859, an English astronomer, Richard C. Carrington, was charting sunspots which in that year were numerous. The solar image in his telescope was filtered to reduce its blinding brightness, but suddenly in one sunspot group two brilliant spots of light appeared.

At first Carrington thought there was a gap in his filter that had allowed passage of full sunlight. But the spots became even brighter. He had been the first man, perhaps, to witness a solar flare.

Since then the correlation of such flares with sunspots has become well established. The number of spots is cyclic, with a maximum every 10 years and the more spots there are as a rule the more likely are the big flares and their consequences for communications, power transmission across the earth and, perhaps, weather.

For the past 10 days the sun has been particularly active, with flares erupting from its surface and the auroras generated by the activity occasionally visible at least as far south as northern New England. But most remarkable is the fact that this activity is "out of season." The last period of maximum sunspot activity was in 1968 and another was not expected for several years.

Although scientists have studied the sun for centuries, remarkably little is known about what causes sunspots, flares, and their cyclic (though, as last week's exhibition showed, erratic) behavior. The spots are areas on the sun so cool in relation to the nearby surface that they seem black. They are related to strong magnetic fields and it is at points of magnetic tension that the flares occur. A flare develops when magnetic fields, which hold the ionized solar atmosphere in their grip, give it a sharp pinch. The temperature soars to many millions of degrees, generating a flash at visible, ultraviolet, X-ray and radio wavelengths. The flash itself may penetrate below the ordinary raido reflecting layers of the earth's atmosphere, creating a lower layer of ionized air that absorbs radio waves and impedes communications.

Then, days later, particles ejected by the flare reach the earth, diverted by our planet's own magnetism toward the magnetic poles. These particles may also upset the radio-reflecting layers. They can distort the earth's magnetic field causing a "magnetic storm" in which the compass needle behaves erratically and the particles plunge into the atmosphere further from the poles than normally. It was such an effect that brought the aurora from its normal habitat near the poles to within sight of New England a few days ago.

Among the clues that may ultimately be deciphered to explain the eruptions is the cyclic pattern of sunspot polarity. The spots tend to occur in pairs and during one 11-year cycle the eastern spot in each pair will carry a positive or "northern" polarity and the trailing spot will carry a negative or "southern" polarity. The sun at such a time will also display a weak over-all field with its north magnetic pole on top.

For the next cycle, however, this is reversed. The polarity of the sun's magnetic field thus flips back and forth in step with the tempo of the sunspots.

For several years scientists, notably Dr. Walter Orr Roberts, president of the University Corporation for Atmospheric Research, has been studying evidence that suggests an increase in the intensity of low-pressure weather systems following a magnetic storm. Some weather men have resisted the idea of such a relationship because the energy involved in a magnetic storm is so miniscule compared to the energy in weather events.

To an ever-increasing extent, earth satellites have extended solar observations and by next year it is hoped an astronaut-operated coronagraph aboard the first Skylab in earth orbit will provide photographs of the solar corona from above the earth's atmosphere. The corona is an ever-changing halo of glowing gas that surrounds the sun and becomes visible in an eclipse. A coronagraph is made by adapting a telescope's optics to block out the center of the sun—as in an eclipse—and then photographing the halo.

One unmanned satellite, OSO-7, carries a coronagraph that, last Dec. 13 and again on Feb. 8, detected massive eruptions within the outer corona. These ejected immense gas clouds at speeds well in excess of two million miles an hour—phenomena never before seen, since that part of the corona is normally invisible from earth.

One of these explosions apparently marked the disintegration of a flare extending out from the sun some eight or nine times the sun's radius. However, images transmitted to earth by OSO-7 are inferior to those it is hoped astronauts will bring back from Skylab.

Another type of eruption that can now be traced by special radio telescopes on earth, including one at Culgoora in Australia, is called the flare spray. In such events clouds of material are ejected from close to the sun and can be followed far out into space by their radio emissions.

In any case the eruptions of recent days have reminded solar physicists of what they have long known, namely that the solar cycle is only an approximation. Its 11-year periodicity is no more than an average and some of the biggest eruptions, described as "Class 4," occur when the cycle is not at its peak. The largest of the recent series were graded Class 3 but they were probably the most intense ever recorded close to the period when the sun is "quietest."

This undependable behavior would bear on the safety of astronauts exploring Mars. They are likely to be sent on such a voyage, lasting more than a year, at a time of sunspot minimum. But if they were outside their craft when a major flare occurred, they might be exposed to a severe dose of radiation.

—WALTER SULLIVAN

DOMESTIC DX DIGEST

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Greetings and salutations, folk of the NRC. I'm just back from the Convention as I type this thing, not knowing at the moment when it'll reach print, as we've got no set sked yet for the next two issues.

call applications

680	KBAT-TX	req. KKYX	1310	KKGF-MT	req. KEIN
1150	WGHM-ME	req. WSKW	1450	KFLW-OR	req. KFLS
1220	WLTO-FL	req. WCMQ	1480	KHAT-AZ	req. KPHX

Application for CP for Boynton Beach, Fla., 1510 kHz. req. WKAO

changes

+	620	KJW -OR	CP: U2 (8/7)
+	900	CP -ON	Geraldton, 40 40 U1, F
+	1060	WBMB-MI	CP is on
+		KBUD-CO	CP is on
+		KAMA-TX	CP is on
+	1170	WMVI-NY	CP is on
+	1220	WBUL-AL	ex-WAQY (listed last issue incorrectly as Fla.)
+	1240	KPRB-OR	ANT: U (ex- SH)
+	1400	KVOY-AZ	CP: 1000/250 U1 (8/2)
+	1430	CP -NB	Bathurst, 10000 U4 (7/20)
+	1490	WJNL-PA	ex-WARD
+		WESL-MO	CP is on
+	1500	KROQ-CA	ex-KBBQ
+	1510	WBLB-VA	new call (Pulaski CP)
+	1530	KCGO-WY	CP is on.
+	1550	WOKI-TN	new call (Oak Ridge CP)
+	1570	WGLX-OH	CP is on.

sunset & evening

	790 WTAR-VA	8/20, 2230 ID into CBS "Face The Nation" w/ WAEB looped. (Tom Sundstrom, Willingboro, N.J.)
	850 WJW -OH	Good signal 8/13 2350 w/ relig., ID, nx 0000, no sign of usual WKIX. (Richard Frcho, Washington, D.C.)
	920 WMOH-WV	8/20 nx,wx,sx hrd ending 2305, ID w/ WTTM off (TRS)
	WKRT-KY	Hrd 8/20 w/ s/off 2315, hard to follow w/so many on freq., but this also probably the one w/Yanks BB ending 2310 (TRS)
	930 WBBM-NY	Hrd 8/13 2330 o/u WFMD (RF)
	950 WLOF-FL	Hrd 8/13 2322 w/rr o/WPEN,WKAZ (RF)
	1050 WCSP-WV	Hrd 8/13 2026 o/WHN & CHUM w/ 2030 s/off. (RF)
**	1100 unID	Hrd 8/17, 18 2150-2203 u/WKYC 'rr w/ "Be Still & Know" relig. pgm 2201, ID, 2203 then f/out. Only hrd "X" as last letter of call both times. KREX & Patt. Chg. ?? (RF) **Possibly - RjE
	1220 WLSD-VA	Hrd 8/12 2025 w/fantastic sig. s/off 2030. (RF)
	1250 WAME-MA	Hrd 8/11 2130 ID in BB w/ no sign of normal WTAE even w/out loop (TRS)
	1260 WWDC-DC	Hrd 8/19 w/ phone-call put-on about tourist trip down Potomac on a converted garbage scow w/2330 ID after. WBUD looped, hrd o/WNDR for first time here. (TRS)

1320 WGET-PA A surprise 8/18 w/ 2305 ID ending MBS nx into local nx o/WKAP looped & WATR, first time here (TRS)
1350 WKLX-VA Hrd 8/18 w/nx,wx ending 2245, SID into rr o/WHWH,WORK (TRS)
1370 WELV-NY Hrd 8/18 w/mx to abrupt s/off 1959 w/ FM promo, good sig. (TRS)
WMHI-MD Hrd 8/18 s/off 2000 no SSB w/ FM promo in clr after above off(TRS)
1420 WDDY-VA 8/20 w/ furniture store ad 1925, ID 1930, Ford dealer ad 1935 w/ WCOJ looped & o/several others/ (TRS)
1430 WENE-NY Hrd 8/20 w/promo abt rr stage show, ID, TC 1951 w/ WNJR looped. New here (TRS)
1440 WAJR-WV Hrd 8/18 w/clr ID 2330 thru WHHH which ID'ed right after. No sign of normal pest WAAB (TRS)
1450 WSVP-RI W/ WMAS nulled 8/13 this one heard faint w/ID 2059.(Ron Musco, Windsor, Ct.)
WCTC-NJ Definite ID w/ cl mx 2330 8/13 w/ nx, wx b4 mx. (RM)
1460 WKAM-IN Hrd w/ nx, c&w 2105 8/15 (Gary Shea, Milwaukee, Wi)
WTMB-WI In thru WKAM w/ mention of nx contest 2111 8/15 (GS)
1510 CJRS-PQ Hrd 8/13 2126 u/WLAC,WMEX,WTOP-slop. (RF)
1580 WSRF-FL Hrd 8/13 2046 thru mucho static. QRM de unID rr presumed to be WCLS. (RF)
1600 WINX-MD Hrd w/ sx 2145 8/10 w/ pop mx following thru WWRL whilest trying to get a decent null on the latter (TRS)

midnight to sunrise

* 570 WFAA-TX Sked is NSP. (Paul K. Hart, Ft. Worth, Tx.)
580 WIBW-KS Think off MM 8/21, on 8/28, can anyone confirm?? (Hart)
680 CFTR-ON Hrd 8/13 0113 among "clear channel" mess (RF)
920 WGST-GA Hrd 8/12 0138 while trying for WMNI (RF)
930 unID Hrd TT good 8/12 0120-30, no sign of WFMD. (RF)
WBCK-MI Hrd 8/12 0135 o/u WJAX (RF)
950 WPET-NC Hrd TT 8/13 0001 o/u heap; ID 0020 (RF)
970 WFLA-FL Can anyone confirm sked ?? Think on MM 8/21, off 8/28 (Hart)
980 WSIX-TN Is sked still NSP?? Think off MM 8/21 (Hart)
WTRY-NY Hrd w/ ID 0005 8/20 into rr o/usual din. Wx 0009, surprisingly no WRC. (TRS)
1060 CJRP-PQ W/FF in v. gd 0150 8/21 (GS)
1080 WKLO-KY Hrd w/rr alone on freq. 0510 8/7 (GS)
WLVN-AL In well w/ two-tone test 0230-0252 8/28, strong. Dunno if a regular TEST. (Hart)
1100 WKYC-OH Hrd ET 8/14 MM 0315 w/ taped mx. ID 0325 w/ "testing aux. XR", then off (RF)
1220 CKSM-PQ Fair SM 8/6 0312 o/u WGAR (RF)
WSME-ME Hrd 0605-30 w/MoR, few spots, jingles, battling WGAR. WCDQ s/on 0700 8/20 killed it. (RM)
WGNY-NY Off PSA at this time?? Rode over WGAR,WSME. Jingle 0630 8/20 (RM)
1230 WENY-NY ID 0557 thru mess of WERI & an unID 8/20 (RM)
1250 WTAE-PA W/rr, jackpot plug o/WREN 0327 8/21. (GS)
1280 WKST-PA Good 8/14 0347 w/ report of "a giant furry beast in the area" - could it be Capt. Glotz in disguise ?? (RF) ** Mebbeso yes, and the again, mebbeso no - RjE
1290 WHIO-OH 8/19 w/ ID, TC 0110 o/WICE w/rr; good sig. (TRS)
1300 WRBC-MS Hrd fair 8/6 0322 w/WFBR off in solarflare cx (RF)
KVOR-CO Testing most of AM 8/28 w/ vy strong sigs, flattening KVET. Mostly OC, some tone,few ID's. Strength indicates 5 kw day (Hart)
WFTO-FL Copied 0500 s/on 8/21 for first time as result of new loop angles made possible by WRR-1310 SP (Hart)
* WIBR-LA MM s/on copied 0545 8/21, add to log. (Hart)
* 1310 WRR -TX Sked 24 hrs, SP MM 0200-0600 . A big break here. (Hart)
WDOD-TN Hrd 0520 8/7 w/ a great sig. (GS)

1380 KJET-TX Testing ard 0530 8/28, vy strong w/ AM & FM ID's (Hart)
1390 WFBL-NY Hrd 0130 u/WNUS 8/21 (GS) (RM)
WEOK-NY Hrd 8/17 0617-35 o WRIV, usual WFBL not hrd. Numerous ads & MoR
1410 KQV-PA Tremendous 8/14 0230 w/ talk show (RF)
1430 WIRE-IN Good 8/13 0250 o/WNJR & WVAM (RF)
1450 WWSC-NY Battling WCTC after WMAS s/off 0000 8/14 w/ teletalk (RM)
** CFJR-ON Brockville. NOT LISTED IN LOG. (** Don't have one here, but I would presume it was listed in a corrector or updater. More on this at end of column - RjE) Hrd 8/14 w/ WWSC nulled 0103-0130 w/ spot for Gordon Lightfoot concert & All Night House Party(RM)
1460 WMBR-FL Good 8/13 0240 o/ WOKO (RF)
1470 WTKO-NY Hrd 8/14 w/ ID, TC in jumble 0150 w/ WBIG. (TRS)
WBIG-NC Hrd w/ID & TC 0151 u/o WTKO. Surprise, no WSAN! (TRS)
1490 WDXL-TN W/SID 0205 8/20 momentarily above normal din w/WBCB looped.(TRS)
WFAR-PA Good 8/14 0250 w/rr o/u traffic (RF)
1530 KFBK-CA Hrd 8/28 0200-0258 vy wk w/ typical easy-listening format(RF)
1540 WADK-RI W/WPTR nulled a surprise in itself, hrd this one L&C w/ many IDs, ads. 8/6 (RM) ** Waht time, Ron ?? -RjE
1590 WERA-NJ Hrd 8/17 u/WQQW's non-stop mx 0600-0603 f/out (RM)
WISZ-MD 8/14 w/nx,wx,ID 0130 ending just ahead of WAKR ID (TRS)
WETT-MD 8/14 w/ MBS nx to 0138, wx incl. beach & marine fcsts into mx 0140, fair-to-good sig. (TRS)
1600 WLNG-NY Much-wanted finally 8/6 0600 s/on 'til covered 0605 w/ late WTYM s/on (RM)

*****Editor's note: Please try to keep usual or routine loggings out of your reports to DDXD, and try to have as much detail as possible in what you do send. The purpose of DDXD is to pass on info valuable to other DX'ers to help them log new stations. Info on 50 kw. 1a or 1b clears is not very useful nor are logs w/ naught but date & time.

F/C's

JUNE: 4th THU: WHIY-1530 JULY: 3rd TU: WGUS-1380
AUGUST: 3rd MM: WORV-1580 ; 4th MM: KLWW-1450

Guess that does it for this time around. 73, RjE RjE

* *

The Annual New York Area Thanksgiving DX Fanork Lives!!! Start planning your time off and saving you money for it. It will be Friday, Saturday, Sunday, Nov. 24-25-26 in Northern N.J. -- a time for DX (yes, we'll have a place to do so) to talk tech, to talk DX, hear tapes, consume wine and cheese (or, if you really prefer, beer) and meet some of the people you read about here in DX News . We expect DX'ers from as far as Ohio, Maryland, Virginia, Massachusetts to be there. It will be held in a motel , so you'll have to arrange for sleeping yourself, but a good time should be had by all. More details later.

Russ Edmunds Page Taylor Steve Bohac Ed Kocsan
Bill Alisauskas Joe Fela

That list includes just some of the N.J. DX'ers who were present last year, when ERC, GPN, BGK, Foxy and others came. This one will be bigger yet!!!

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

I wonder if many NRC members have any problems logging a station that would seem to be relatively an easy catch. My such problem is my closest unheard: WOKW-1410, Brockton, Mass. at a distance of 28 miles NNE of here. They seemingly should be received between locals WALE-1400 & WBSM-1420, since I've been able to null WALE sufficiently. I've tried daytime & SSS, but results so far are fruitless. Perhaps they are directional E/W, and maybe HQ has logged them. New DX here: WBEC-1420 heard way o/WBSM w/rr on 8/13, 10:45pm. MM 8/14-12:25, WBZ-1030 noted ETing AXR until 12;30; 12:34 saw HJAH-1070 w/ID as "Emisoras Atlantico" o/CRM & quite strong for a bit w/fast SS vocals; 12:39, HJCN-1100 w/WKYC off, ID as "R. Reloj w/upbeat SS vocals very much in the clear; 12:55, WABY-1400 w/soul mx & a soul DJ, heard s/off @ 1 after repeating call & location very slowly. 1:07, apparently an FFC s/off on 1340 w/"Oh Canada", I can't really be sure who this was. WNBH is NSP, I believe, as they were still on & not //-FM as I incorrectly reported in my last Musing. 1:46, CKOC-1150 heard weakly w/rr during WCOP SP; 2:11, WSUN-620 w/an obvious Florida commercial & easy listening vocals w/WLBZ/WVNJ/WVMT all off, & perhaps WHEN as no rr was noted on frequency. 2:23, CHNS-960 good & all alone w/old rr (this is not a new logging); WCOP was testing w/mx c/w until 2:30; WPOP-1410 likewise w/rr, SID, then off @ 2:45. At 2:54, a good catch for me in WABB-1480, during a rather surprising WSAR SP. I heard an SID & some rr from WABB, then there was some competition on the frequency. Capitalizing on the WSAR SP, I tuned to 1490, where @ 3:03 I heard WOLF ID, then back into jumble. WTXL deemed to have the slight edge over all others. Last but not least, 3:15 a new state(Delaware) #1, WILM-1450 heard w/commercial for Wilmington, then gone. Unfortunately, WPRO-630 is now NSP; they are generally rr but a bit MoR-ish MMs. Evidently dhey have stiff competition from WGHG-550, which is upbeat MoR. One verie, in six days, v/q, WNEW. I note that I've logged 115 new stations since joining NRC early this year, which illustratrs how much help one gets from joining NRC. 73 for now & good DX.

CESAR OBJIO - c/o Ronald F. Schatz - Box 2814 A.M.F. - Miami, Florida - 33159

Hi, everybody, it is now 2100 GMT on 8/12 & I am on my way to Caracas, Venezuela, on board of an Aerovias Quisqueyana plane on a tour. This is in order to take advantage of this tour before my moving to Miami. Everything is given in the plane; beers, whisky and cokes, several times, and also meals, all you can drink. It is a propeller airplane and the trip lasts two hours and 45 minutes. I have with me my new Sony rx TFM 1000 WA, the same model bought by Ernie Cooper, and with it I intend to make a list of all of Caracas stations during my loggings. When I left home about 1700 GMT (12 noon) I met my mail carrier and he gave me my issue #20 of DX NEWS & I read it completely on the air. Wonderful the information about the Convention. I hope to be there early enough to start working. There was a free travel ticket sorted out among the travellers or money refunded to the lucky person I did not get it, my number was 66 and the winner was 83. Transportation to Caracas from the airport was in two air-conditioned buses and through a highway made at a cost of $6 million dollars a mile. The first view of Caracas is the "ranchos" made on the mountainside by the poor people as there is no place in the small valley where the city is built. Climate is good not so hot as Santo Domingo or Miami. No station was visited as I did not have any friend to guide me. Some towers can be seen on the mountains around but I could not identify any. Streets are crowded with people walking and cars. Time was easily checked with Senales Honrarias delObservatorio Cajigal clearly heard on 6100k every minute. Very exciting the trip from the city to Monte Avila on the Teleferico, you can see all of Caracas on the south side of the mountain and the Caribbean Sea on the north. It is cold up there, there is even an ice skating ring. Sorry this is too long - see you all in Miami.

JOHN OLDFIELD - passing through Mount Cheam, British Columbia, on vacation

I've been out of DX for a while so maybe this is old nes. CKSP-1450 Summerland, B.C. is on, relaying CKOK-800. CJNL-1-1400 is on at Princeton, B.C. relaying CHNL-610, Kamloops. 73. (Nice to hear from this old friend again! -ERC)

DAVE SCHMIDT - 8 Valley Terrace - Apt. 9 - Wilmingtonm Delaware - 19802

Not a whole lot has been going on in these parts, it seems, so I had a chance to visit a friend of mine who works as a DJ at WNRK-1260 in Newark, Del. While on a fast tour of the place, im between records, we stumbled upon a pile of reception reports. Most of them were good ones, but they were all local from Wilmington, except one that came from ------. After reading it, I could see why this guy never received a WNRK v/l. It was for a report he had written while in New Castle, Del, about ten miles from Newark, and the major lobe goes right over it) and that this was his fourth try for a verie, which was going to be fruitless. There was return postage pn the report, which was nice, but there was no detail, plus the fact he never heard the station from his own den. It was an NRC member. Shame, shame on you sir. If any NRCer has any verie from a station he heard while on a trip or vacation, it should not be counted, since you have not taken up permanent residence there. Believe me, little things can put a person in some very blushing moments, the very same happening to me once when I was still a DXer who was wet behind the ears. Now some good news and some bad. Naturally, first, the good. Both WVAM-1430 and WFBG-1290 in Altoona have quit ANing it. WVAM goes off with the Porky Pig bit "That's all, folks" at 1am, returns at 5. WFBG is off @ 1:05 w/SSB, also to return at 5am. FM was fairly good here this year. I'm hoping that AM will be better, though. Now the bad news. Local WILM-1450 has gone NSP AN-7 with a Soul mx show. It's nice to have a loop. Even though they're less that a 20 minute ride away, they're still very nullable. WAMS has finally (after years) brought their modulation up but the signal is still very poor here. Let's start a drive to make Joe Jones sign WDEL off at 4:30 in the afternoon! I hope he gives me a call sometime. That'll do it so 73s and all that!

BOB SHAW - 235 Columbus Street - Elyria, Ohio - 44035

The new Pattern Book is here and it's truly what we hack writers can only term a "must." It's occurred to me that when the day patrerns have been distributed, NRCers will have at their disposal the means to implement a much more realistic way to "count" their domestic catches than they've ever had before. E.g., KOMA-1520 is a fairly easy catch from here, especially during Auroral SSS. But they're rarely heard on their night pattern. Why shouldn't the guy who logs KOMA at night receive credit for a better catch than one who hears their day pattern? With the Pattern Books one can itemize accurately the dirrerent patterns being heard, rather than just calls - accurately and with virtual elimination of guesswork. Such a s stem would raise totals numerically, but the rise would be relative if the system were used widely. The question of whether or not to "count" call changes would be eliminated. When WRCV became KYW, for instance, their patterns remain the same. With night, day, CH, PSA and AXR powers and patterns, a wh le slew of different targets becomes available. I plan to use the system myself whenever (and it may be years, hi) I settle downto my next more-or-less "permanent" home. H'mm - I guess I'll need another Musing to recap my meager Summer DX. 73. (I'll still count call letters verified, hi -ERC)

ERNEST J. WESOLOWSKI - 1416 Pasadena Avenue - Omaha, Nebraska - 68107

Sorry I missed Miami. I know you all had a great time in the sun. Summer DX was something else. In my 13 years never have I DXed this time of year. All kinds of stuff - even two new ones from Florida. All new catches: WHIC-1430 r/c, KDDD-800 r/c & s/on on 8/1; KTTS-1400 RS during Aurora on 8/4; WAMI-860 r/c on 8/9; KROS-1340 s/off @ 1:05 on MMs. KMRS-1230 on late with Minn. Twins BB, s/off 1:37 on 8/16; KOLY-1300 ET 8/16 1:42-1:48, not a f/c. WHII-1570 r/c on 8/17; KEYJ-1400 N.D. r/c on 8/19 1:30-1:35. WJFC-1480 r/c-DT on 8/24. WHIY-1530 r/c 8/24. KPOS-1370 r/c 8/25 little later than list, 2:18-2:36; WJBA-1580 on 8/28 1:15-1:40 w/ET. Finally KIKN-1590 r/c on 8/28. All checks per list, unless special mention. Verie total: 1,205 in 47 states, nine provinces & 20 countries. Needed Iowa stations down to five; S.D. only six; 14 in Kansas, 11 in N.D., 29 in Colo. Skip D. & I took a weekend 800-mile drive through Kansas in July. We visited KRVN-880 KXXX-790 KAYS-1400 KANS-1510 KVGB-1590, KNEX-1540, KVOE-1400 KOFO-1220 & KARE-1470. I finally got a verie out of KXXX & inside & outside pictures. Very hard to get in their door. All old bulletins sent to club HQ. Pattern book is the best in NRC since 1934. Great job by all who helped. 73s.

MORRIS SORENSEN - God's Narrows, Manitoba - ROB CHC (vacationing in Bala, Ont.)
I have no DX to report this time as I've been away on holidays. I attended the ANARC Convention in Boston last month and enjoyed meeting the NRC-ers and others in attendance. I did wish however that more of the Boston members had attended. I would like to give special thanks to Steve Feinstein for helping me with transporation, etc. Gordon Nelson's address should inspire me to try some more Auroral DXing up in God's Narrows this Season. (What's inspiring about 48 Hardy Avenue, hi -ERC) I recently purchased an HQ-150 RX but may have some difficulty with transporting it Up North. On a recent trip to New Liskeard, Ont., I was able to tune in many LPRTs and other interesting stations. In Temagami, Ont. (61 miles N of North Bay) I saw the XR site of CBEV-1340, sonsisting of a long-wire antenna stretched between two brightly-painted poles beside the Ontario Northland Railsay Station. I believe this is a typical LPRT installation. Well, I guess that's it for now. I enjoyed a phone call from Wayne Plunkett after his trip to Alaska and the Yukon and also a visit with Tim Kerfoot on my way to the ANARC Convention. 73.

STAN MORSS - Route 3 - Broadford, Massachusetts - 01830
Well, I'm still waiting for HQ - no veries returned as yet - or my copy of "When Pirates Ruled the Waves." Gordon promised an NRC member's wife as security - I haven't as yet seen her either! One new log in WQQW-1590 Waterbury Conn. reported, & one verie, WEVM Utica on f/up. I also had WMNB-1230 s/on 5:30 for first time heard since ETc. I am working on getting a copy of "The Veronica [illegible]" - I don't know if Dutch or English version will be forthcoming - but as first correct U.S. reporter to R. Veronica will match it with the verie. WTCP-1410 sold - let's hope a MM silent period at least. (All three're waiting for you here at HQ, Stan; if you can't make it to fall publication give us a call...)

RICHARD FRCHC - Malcom Grow Box 2054 - Andrews AFB, D. C. - 20331
Hi there, fellow insomniac dial twisters. DX CX seem to be improving here, except for thunderstorms. I got my copy of the Night Pattern Book. What a fantastic reference peice! Best of new DX is HIJB-830, Dominican Republic, 8/14 @ 12:20am w/super signal that zonked WCCO. Totals are 247 stations, 28 states, three provinces, and eight countries heard. My Sony TFN-1600 has a terminal for an external MW antenna, but I get better reception if I attach my long-wire to the telescopic FM antenna. Figure that one out! On 8/17 & 18 I heard unID-1100 @ 9:50-10:03pm u/WKYC, w/rr, "Be Still and Know" religious message at 10:01, ID @ 10:03, then fade out. I could only catch "X" at end of ID both times, so KREX or KFMX. Not heard since. Could this be KREX w/pattern change @ 10:03? (More likely ZDK at their s/off -ERC) I wish Capt. Glotz would dynamite WPGC WWRL WBNL WWSW & WNCX! I'm in a steel frame building with lots of stell wall lockers, so my SM-2 loop is useless againxt those pests. Does NRC ever publishLW DX articles? Rarely - take it up with HQ -ERC) Also, how can I get a hold of an NRC Domestic Log, and how much? I hope I'll catch some TA DX this season; I'm tired of hearing LA DX alla time. all for now. 1001001 (73).

ERNEST R. COOPER - 438 East 21 St. - Carrier Route 56 - Brooklyn, N.Y. - 11226
Two v/ls in, both w/CMs - WAXC-1460 & WBRW-1170. WBRW's verie is my third for those call letters, the previous ones being WBRW-1340 Welch, W. Va. anc WBRW-1510, Brewster, N.Y. A little DX. I got up 8/17 to look for the r/c of WHIL-1570 - not heard, but I did spot a rocker on 1460 where c/w WOKO usually rules the roost, and found it to be needed WAXC, Rochester, N.Y. ex-WHEC, which I verified in 1933. I logged them from 2:08 to 2:34, when a carrier came atop the frequency, and whamma, WOKO resumed broadcasting - a lucky break for a change. On my birthday, MM 8/28, about 90° in the DX room, so I put on my birthday suit and twirled the dials, but to no avail as far as new loggings. Unn WGCE-1590 was on ET-rr most of AM & on top, the Colombian with the dreamy old U.S. mx was doing fine @ 2:29am. A TTer on 1340 held my attention 2:49-3:02, when the IDed, could have been WHAR, Clarksburg, W.Va., unn, but not sure. They interspresed occasionally w/rr. I heard WCAR-1220 s/off @ 3:03 to return @ 5. WCAU-1210 was off today. Locals WABC-770 & WWDJ-970 were on. Was that FF on 800, & who? It wasn't loud enough to be CJBC, so who was this one, anybody? See you - when, next issue!

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

REPORTEDLY IN OPERATION

GREAT BRITAIN. **The long-planned major overhaul of the BBC system went into effect on September 2nd.** The most important new feature is the creation of a new class of stations carrying local programming and ID's. These stations will be very interesting DX targets from this side of the Atlantic and the first info on actual receptions will appear in IDXD next issue. **Most BBC stations of the new** local network are of relatively low power and we've already begun to receive conflicing info about the allocations so it would appear the network is not yet finalized. **As of 9/12/72 the situation was as follows:**

*RADIO 1 - 1214 and 1484 (Bournemouth)
*RADIO 2 - 200 kHz (LW) and 1484 (Dundee, Edinburgh, Glascow & Aberdeen)
*RADIO 3 - 647 and 1594 (Bournemouth and Dundee)
*RADIO 4 -

Stn	Old freq	New freq	Power
Barrow	1484	1052	2 kw
Whitehaven	1151	692	1.5 kw
Droitwich	1088	1052	150 kw
Postwick	1088	1052	7.5 kw
Cromer	1484	692	2 kw
Brighton	1457	692	2 kw
Bartley	**1457**	**692**	**10 kw**
Clevedon	1457	908	20 kw
Bexhill	1457	1052	**2 kw**
Redruth	1457	908	2 kw
Barnstaple	1052	692	2 kw
Swindon	-	692	(new station)
Ramsgate	1484	692	kw
Folkestone	1457	1052	kw

*LOCAL STATIONS -
(All sources agree about the following:)

Station	Freq	Power (kw)
R. London	**1457**	**50**
R. Medway	1034	1/2
R. Brighton	**1484**	**1/2**
R. Solent	998	1
R. Bristol	1546	5
R. Birmingham	1457	**10**
R. Stoke-on-Kent	1502	1
R. Leeds	1106	1
R. Sheffield	1034	1
R. Blackhurn	854	1
R. Newcastle	1457	2

(Info conflicts about the remaining:)

R. Leicester	**1594**	(Brownless lists this one)
R. Humberside	1484	1/2 (ARC gives channel as 1457)
R. Teesside	1546	(Not listed by ARC)

(Following stations listed by ARC but not by Ken Brownless:)

R. Manchester	1457	10
R. Oxford	1484	1
R. Nottingham	1484	1
R. Merseyside	1484	2
R. Carlisle	1484	1
R. Carlisle	1457	1/2
R. Derby	1115	1/2

*OVERSEAS SERVICE: 1088 will be used by the European Service in French and German; transmissions to Eastern Europe on 1295 will be extended.

FLASH FLASH FLASH FLASH FLASH

The following information just in a press-time updates the EBU listing appearing in this issue of DX NEWS: Morocco: Ksar-es-Souk now operates with 15 kw on 863 kHz; Tunesia: Tunis has been operating on 952 recently but is back on the regular channel of 962 at the moment; Spain: RNE's new station at Santander is now testing on 971 kHz; Yugoslavia: a new station, believed to be located at the Kreka Banovici mines, is heard in Sweden on 962; a new Russian station carrying the Myak program, is audible in Europe on 1475, direction finding suggests the Caspian Sea area.

USSR (SIBERIA). According to recent information from Finland, there is indeed a powerful Russian station on 1525 in Vladavostok (see Edmunds/Taylor reports in past IDXD); it is reportedly running the Russian language Mayak program however.

UNIDENTIFIED AFRICAN. Richard Ginbey in South Africa reports an unid station on 989 in French; he suspects a fairly high powered Gabon station but is not parallel to 1554 or shortwave. **Anybody over here notice this during the summer?**

TAIWAN. AFNT Taipei has moved to 1550 and increased power to 10 kw; formerly 5 kw on 1560; dominates the frequency in Japan at nights now. V/1 recently received from Bill Moate, CE. The 1 kw relays on 1570 and 1590 are still in operation. (Lars Ryden, Japan)

SOUTH VIETNAM. According to a recent QSL, the following stations are still operative in the AFVN network: Saigon, 50 kw on 540 kHz; Pleiku with 50 watts on 560; Da Nang with 1 kw on 850; and Nha Trang with 50 watts on 900. (Ryden)

PLANS AND RUMORS...

BANGLADESH. The USSR is to supply a 1,000 kw transmitter to Dacca; freq will probably be 690. (Editor)

TRUCIAL AMIRATES. A new station is due to go on from Ras al Khaima soon; freq is reportedly 1133. (SCDX)

SPAIN. According to RNE on August 23rd, a considerable amount of money has been granted to further develop broadcasting in Spain, including further expansion of the MW station network. **(SCDX) Wonderful, that's all we need... (Editor)**