

SHORT WAVE NEWS

Vol. 2 • No. 11

NOVEMBER, 1947

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Short Wave News

Vol 2 No 11

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November, 1947

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Editorial

Short Wave Broadcast Listening

WE include in this number a short review of Radiolympia, in which we have endeavoured to present, for those unable to visit the show, some idea of the essential features of the new equipment to be seen this year.

Perhaps the most noteworthy advance seen in this year's new receivers, is the attention given to the short wave ranges. Many new sets now cover the short waves in five or six ranges instead of the single range universally found before the war. In order to make short wave listening even easier, the tendency now is to cover the broadcast bands only, so that those—from the average listeners point of view—dead spaces between are no longer to be found. One disadvantage of this is that the amateur bands are no longer included—but maybe this is an advantage where 7 Mcs. phone is concerned!

Short wave broadcast listening has been sadly neglected in the past by the general listener. There is a wealth of good entertainment to be had from S.W. broadcast stations—as many readers well know. Now that band-spreading of the S.W. broadcast bands has been introduced it is almost as easy to tune in a short wave station as one in the medium wave band. But more than this is needed to popularise S.W. broadcasting. The man in the street still associates S.W. listening with C.W. interference, heterodyne whistles, fading and terribly sharp tuning. He is not aware of the advances made in modern receivers nor of the entertainment to be had.

We have felt for some time now that a propaganda drive to popularise the short waves is long overdue and now that the new receivers are leading the way to better short wave reception, we think the time is ripe to start such a campaign.

Our own first move in this direction has been the preparation of our latest publication, "These You Can Hear." Knowing that developments in the short wave side of broadcast receivers would be a feature of

Radiolympia, we prepared this publication in time for the show and many readers will have already seen a copy there. This publication was prepared expressly to interest the man in the street in short wave broadcasting. Preliminary announcements have already appeared in this magazine. Whilst it contains a series of reprints of the S.W. Broadcast Station descriptions which have appeared in the "S.W.N.," there is a deal of further information of value to the new S.W. broadcast listener, to be found between its covers. Printed on art paper, the illustrations are far better than their counterparts in the "S.W.N.," and the cover is sufficiently unique to arouse the interest of most prospective customers. We feel that our readers could do a great deal to popularise S.W. listening by such measures as talking to their friends about S.W. programmes they have listened to, about interesting stations they have heard, and so on. We feel that clubs and radio societies similarly could do a lot to introduce S.W. listening to others in the community. No doubt various local exhibitions and socials will be held by many clubs this winter to which members of the public will be invited. Such opportunities are excellent for 'pushing' short wave listening. We trust we will not be accused of 'pushing' our own wares too much if we say that a supply of "These You Can Hear" for sale or distribution to the public visiting these exhibitions would prove an excellent introduction to the uninitiated visitor. Similarly if you know a friend who might become a S.W. listener with a little persuasion, how about presenting him with a copy for Christmas? We are already selling numbers of copies to radio dealers who are anxious to introduce their prospective customers to the possibilities of the S.W. ranges on the sets they hope to sell them. We do feel that much more could be done to make the public "short wave conscious" and during the months to come, we are going to do all we can to popularise S.W. broadcast listening, and to bring the knowledge of its possibilities to a much wider circle of the public. We are sure our readers will join with us in this campaign.

A.C.G.

V.H.F. News

V.H.F. activity has certainly dropped off badly during recent weeks. The end of the DX season and the recent uncertainty of the future of V.H.F. allocations in this country have doubtless contributed to this decline. The latter has possibly been the primary cause. However, now that the future is more or less known, we can start to plan again. John Clarricoats of the R.S.G.B., writing in the current "Bulletin," says that the new frequency allocations are certainly not likely to come into force before 1st January, 1949. That gives us over another year of 60 Mcs. activity for certain. The past summer season has been one of the most exciting on record and next summer should see similar activity. Those old hands who have sorted out all the snags of VHF transmitters and receivers will no doubt be planning for a jump to 144 Mcs. as soon as permission to use that band is given. There are many readers however, who have so far not tried their hand at V.H.F. work and a preliminary run on 60 Mcs. would enable them to gain much valuable experience. There is still the opportunity of gaining this experience on a "not too difficult" band, so we would suggest that those who have not yet tried "five" and who are wondering what next to do, include preparations for next summer in their winter building

programme. Much of the gear built for 60 Mcs.—from a rotary beam to a convertor—can be adapted later for 144 Mcs. The recent Atlantic Conference makes it plain that the future of amateur radio is going to be on a higher frequency policy than hithertofore. So those of you who are wondering what fields to conquer next, how about making good use of the next few months, building gear for 60 Mcs. and enjoying the summer months on a band whose characteristics are quite new to you?

More DX Records

Last month in our "Quarterly DX Prediction" we said "... with the increase of M.U.F. about the middle of the month and with this increase occurring in the afternoon period it should be possible to work 'extra-G DX stations'." This prediction came true for 50 Mcs. if not for 60 Mcs. as some more 50/28 Mcs. cross-band contacts were made. From G6DH we learn that the M.U.F. went up to 38 Mcs. on October 4th, enabling ZS1P to QSO cross-band with G5BY at 1350 GMT. On the 11th, at 1145 GMT, ZS1P and ZS1T both contacted PAoUN on 50 Mcs. making the first European/African two way contact on this band. No signals were heard at G6DH, but G5BY heard VQ2PL. On the 14th, MD5KW was heard on 50 Mcs. On the 15th, VQ2PL and MD5KW worked cross-band 50/28 Mcs. and ZS1P heard MD5KW but did not work him. At 1650 GMT G5BY worked ZS1P again cross-band 28/50 Mcs. On October 16th, at 11515 GMT, VQ2PL had a QSO with MD5KW as did also ZS1P, and G5BY had still another cross-band QSO with ZS1P.



Some of the VHF gang at a recent meeting of the V.E.R.O.N. at Appeldoorn. Left to right we have PAoPN, Mrs. PAoUN, PAoUM, Mrs. G6DH, PAoUN and Mrs. PAoUM.

The Month's Conditions

Tropo conditions have generally speaking been good, though lack of activity may have made some think they were bad. G5BD's remarks that some of his regular skeds with 8JV—which have now exceeded the 400 mark—have been better than ever before. There have been no Sporadic E contacts reported.

Query Corner

We can almost take a leaf out of "CQ's" feature and introduce a Query Corner into VHF News, as we repeatedly receive reports of unusual signals heard. G5BD this month mentions hearing a number of what appeared to be FM signals on October 17th, at 1400 GMT on 46 and 47 Mcs. On 45 Mcs. he heard a station sending "CQ de WAX QRU IMI ANS 24." Some of these signals were also heard by G8JV. On the 18th, at 1325 GMT ZSU2 was heard on 47.2 Mcs. This signal was also heard by G6DH.

General Activity

The following have been heard on the band:—G2ADZ, AS, ATK, CIW, CUA, LK, MV, NH, RI, TK; G3AAT, APY, BLP, CCD, CU, NR, VK; G4KD, OU; G5BM, BY, LQ, MA, MQ, PY, WP, XB; G6DH, JJ, KB, KV, LK, LL, LT, MN, UH, VX, XM; G8GJ, GX, JV, KZ, PY (Pye Experimental Station, Cambridge), QM, QX, UZ.

Q.R.P. CLUB

by G2SO

AT the request of numerous readers, it has been decided to give each month a few lines to the genuine low power transmitting enthusiasts. It has been felt for a long time that the QRP operator has been given a raw deal as regards attention and publicity, hence the QRP Club.

To ensure efficiency it has been decided to merge the QRP Club with the I.S.W.L., so that any existing member of the League is automatically entitled to partake in the QRP Club's activities. Non-ISWL members who are interested in genuine QRP work are invited to apply for membership. (Subscription to ISWL is 1/- per annum.) Now in order to assess the definite support we can call upon in contests and the like, and in order to keep our records straight, we ask everyone interested in QRP work to write to the Secretary giving full details

of gear used, bands used, circuits of TX and any other information that may be of interest. If you are a League member, please quote your ISWL membership number; if not, then you may send your ISWL subscription in the same envelope and we will enrol you.

This section will be for real QRP, and we suggest that the maximum power be fixed at five watts. QRP is an elastic term (50 watts is considered QRP in the States). From time to time much publicity is given to many DX stations that are contacted by such and such a fellow, but in very few cases is the licensed power given, and with today's 150 watts as a general allowable power, surely DX contacts should be comparatively easy! With five watts or under, DX is certainly rare, and such contacts are worthy of much praise.

It will be obvious that this section will rely upon members sending along the "gen." All hams interested in such operating are invited to send along data and suggestions. You have long awaited such a chance of a section in the magazine all to yourselves and now you have it at your disposal it is up to you to support it—who knows, if sufficient interest is shown it may be possible to persuade the Editors to increase our space! Monthly news for inclusion should reach me by the 8th of each month.

The results of the first QRP Contest were given in the September issue and it will be seen what can be done with simple gear. In fact, in a letter received from the winner G6ZN, he mentions that in the past 12 years, with an input never exceeding 4 watts, he has worked 62 countries. Surely an incentive to the fellow with no mains!

So there we are. All enrolments, data and comments should be addressed to G2SO, QRP Club, c/o "Short Wave News." 73 and let's hear from you all.

(LAZY-H—Cont. from p.290)

A very poor ground wave signal is radiated, which is all to the good and results are not particularly impressive on short skip contacts, which is all to the good again as beams are not erected for these purposes.

Results with this aerial have been so encouraging for so little trouble that the only regret is that space is not available to put up a second Lazy-H at right angles to the present one.

Around the Broadcast Bands

Monthly survey
by "MONITOR"

All times are given in G.M.T.

(For EST subtract five hours;
for AEST add ten hours)



A YL announcer at the mike of OLR, Prague

OVER the past month your scribe has received many very interesting reports and schedules and it is good to see that more readers are laying out their reports in a much more readable order. Thanks O.M's. Any news for this column should be addressed to "Monitor," c/o "S.W.N." to reach me by the 5th of the month.

● Asia

Palestine. C. A. Wharton (Leeds) sends along a QSL he has received from The Forces Broadcasting Service in Jerusalem MELF. Freq. 7220 kcs. Schedule is as follows: Wed./Sun.

Wednesday:—2110 Personal Presentation. 2140 Evening Serenade. 2155 Transmission Schedule. 2200 Midnight Special. 2315 Close down.

Sundays:—2110 Record Round-up. 2130 Evening Serenade. 2150 Transmission Schedule also Listeners letters answered. 2200 Midnight Special. 2315 Close down.

Japan, Kure. Rex Gillett from Prospect down in Sunny Australia states in an Air Mail letter that he is hearing the B.C.O.F. station WLKS now on 6065 kcs. instead of 6105 kcs. They also remain on the air until 1330 instead of 1000 hrs. Signals were quite strong until sign off with "God save the King." Commercial and Radio Australia Features are broadcast. Tokio relaying the Home Service was also heard on 15235 kcs. at 2300. Gave call as JOAK.

Iran. Radio Tabriz, Azerbaijan in letter veri to your scribe states that they operate as follows: Freq. 11960 kcs. 1030-1215, 6090 kcs. 1500-1830. Programme opens with the "Song of Iran" March in the latter BC

and Imperial Hymn in the first. News in Russian at 1130, in French 1145 and English at 1200 on 11 Mcs. band. Although my report was for their 12180 kcs. transmission no mention is made of this freq.

Batavia. Sidney Pearce (Berkhamstead) mentions PMA "Radio Batavia" on 15345 kcs. with R6 signals giving news in English for Europe at 1645-1700. Rex Gillett has heard a station on about 7260 kcs. announcing as "Radio Sumatra" or similar call. Left the air at 1355 with "The end of a Perfect Day." Programmes are of recorded type. D. O. French of Norwich writes in to say that there is a station in Biak operating on 7200 kcs. that signs off with same tune. Jungle Network and calls Batavia at 1100. This was given in a recent Australian DXers Programme states French. R. V. Aldridge (Amersham) has logged on 15145 kcs. (?) with English news at 1435 and also an English programme on 18580 kcs. at 1715. Signals were R7 and R9. This reader like Pearce and your scribe uses a Sky Champion RX. According to PCJ Holland a new 100 kW. station is to be built in Batavia and to be in operation in about 12 months time.

Ceylon. T. B. Williamson (St. Albans) sends in another excellent log again this month and he mentions Radio SEAC Colombo on 9520 kcs. at 0030 with opening BC to Forces in Asia. He states it wipes out VLW7 (Perth). Has any other reader heard this Perth station? Aldridge has heard Radio SEAC on their 15120 kcs. channel at 0040 with R6 signals also on 17700 kcs. at 1930 R8. Your scribe has logged them with beam on the British Isles at 1730-1930 Sundays operating in the 15 and 17 Mcs. bands

in parallel. 15 Mcs. transmission is heard at a terrific QRK here . . . the strongest signal that your scribe has heard for a few years . . . as a matter of fact 20 years! R6-9 on 17 Mcs.

New Guinea. Our representative in New Zealand Arthur Cushen sends along a lengthy Air letter full of DX heard in his part of the world. He has heard a station on 7200 kcs. at Biak or Hollandia with good signals at 1000-1130 with programmes in Dutch. He states it signs off at 1130 with "The end of a Perfect Day." Heard calling Batavia at 1100 and giving location as Hollandia. Evidently this is the station reported by Rex Gillet although on 7260 kcs.

● **Africa**

Portugese East Africa. H. Westman down in South Africa reports CR7IB Beira "Radio Clube do Beira" on 7150 kcs. at 1800-2000. QRA: P.O. Box 3, Beira. CR7AA Lourenco Marques heard opening at 0455 with news cast at 0500. Announced as "Radio Clube do Mocambique" (Williamson).

Ethiopia. Radio Addis Ababa 15074 kcs. heard at 1730-1815 with dance recordings. QSA4 R9 with poor modulation. Logged by Reg. Masters of Portsmouth. R6 QSA3 at 1930 with call "Radio Addis Ababa" . . . programme of English dance and light music (Williamson). Also logged by J. L. Simpson of London with R5 signals at 1930-2000. Closed with "Radio Addis Ababa is now signing off." Suffers by QRM. Pearce says that they are well heard at his QRA around 1730 and that they usually sign off at 2000. Frequency varies somewhat from 15060-15074 kcs.

French Equatorial Africa. Brazzaville. FZI "Radio Brazzaville" has been logged at 0530 and 2045 on its 11970 and 9440 kcs. channels with news in English (Cushen). Williamson reports them on 7000 kcs. at 2330 in Spanish and French at 2345. Also on 9984 kcs. at 2200 with R6 signals. R. Iball of Workshop has heard them on 11970 kcs. at 1730-1810 R9 QSA5. Call "Ici Brazzaville," 9984 kcs. transmission heard R8 QSA5. 9440 kcs. R8 QSA5, 17527 kcs. 2045 news in English and call "This is Brazzaville," R6 QSA5.

Cape Verde Is. Praia. 6400 kcs. heard with good steady signals from 2100 to sign off at 2300. (Westman).

Azores. Ponta Delgada 4840 kcs. is still heard on this freq. to 2300. (Westman).

● **Australasia**

New Zealand. Arthur Cushen states that the following stations have been testing at 0900-1000: ZL2 9540 kcs., and ZL3 11780

kcs. with programmes relayed from Medium wave station 2YC in Wellington. Power of SW outlets are 10 kW.

Australia. Weak signals are now being received from VLW7 Perth and consistently heard on 9520 kcs. peaking to R4-5 on good nights from 2330-0030. Programme consists of physical jerks to dance music with instructor calling out numbers and directions. News bulletins of ABC National Programme also heard. (Williamson). VLH4 11880 kcs. R7 at 2200 with ABC news followed by Major Hatfield's Physical jerks session. (Williamson). Sidney Pearce sends in new schedule of "Radio Australias" transmissions to the British Isles as follows: 1st BC—0700-0815 over VLA6 15200 kcs., VLB10 11740 kcs. and from 0745 over VLC9 17840 kcs. 2nd BC—1400-1500 VLA6, VLG10 11760 kcs. and from 1430-1500 over VLC7 11840 kcs. 3rd BC—2000-2130 VLA8 11760 kcs., VLC11 15210 kcs. and 2000-2115 over VLB9 9615 kcs. BC to West Coast of U.S.A. now starts at 0430 instead of 0445. Aldridge has heard VL84 11810 kcs. with news at 1520 R8, VLA10 17840 kcs. at 0830 R4, VLC9 R8 at 2145 with news, VLA6 at 0830 R8, VLA8 R6 1520 News, VLG7 15160 kcs. 2045 R7 also with news. A. W. Robertson of Cranford sends in schedule of BCs to the British Isles mentioned above. He mentions that VLG7 also carries the evening BC at 2200-2215.

● **South America**

Argentina. LR1 Buenos Aires 9460 kcs. heard at 2200 with R7 signals relaying LR3 Radio Belgrano. (Pearce). R. J. S. Thomas (Milford Haven) heard LRA 9690 kcs. and LRA5 17720 kcs. with English bulletin from Department of Cultural Affairs Buenos Aires every Friday evening at 2010. LRA5 QSA4 R4 with QSB. LRA he states has QRM. Bob Iball logged LRS "Radio Splendide" Buenos Aires on 9315 kcs. Signals were R7 QSA5 at 2305-2330. LRS also heard at 2200 with call. (Robertson).

Bolivia. CP15 La Paz often heard on 5880 kcs. from 2245. Signals up to R6 QSA3 with heterodyne. Announces as "CP15 y CP20 Cadena Panamericana de la NBC." (Williamson).

Paraguay. ZPA3 Asuncion 11870 kcs. R4 at 2345 with guitar songs and call "Radio Teleco." (Williamson).

Ecuador. HC2RL Guayaquil 6635 kcs. heard closing at 0240 with Spanish/English call "Hello America this is HC2RL Quinta Piedad." Signals were R4-5 QSA3. Operates Wed. and Sats. only. (Williamson).

Chile. T. B. Williamson has logged the following Chilean stations recently: CE1180 12000 kcs. at 0000 R7-8 QSA4. "Radio

Sociedad National Agricultra." CE1174 11740 kcs. 2330 R7 QSA4 giving call as "Emisora Nueva Mundo." CE960 9590 kcs. R6 QSA3 at 2245 with call "Radio La America." Has man and woman announcers. All the above stations are located in Santiago. CE970 9730 kcs. R4 QSA3 at 2315. Has CW QRM from WEA3/WAA16. Call "La Voz de Chile." Station at Valdivia. CE8AA Santiago 5800 kcs. heard R3 around 2345 . . . another outlet of Radio Sociedad National Agricultra. Cushen mentions CE604 a new Chilian on 6040 kcs. heard with weak signals to 0400.

Peru. OAX6E Arequipa 6335 kcs. heard R5 at 0430 giving call at "Radio Continental." Suffers CW QRM. OAX4Q Lima 6010 kcs. R7 at 0245 with call "Radio Victoria en Lima." Has severe heterodyne. OAX4Z Lima 5895 kcs. R8 at 0215 "Radio Nacional del Peru." OAX4V Lima 5915 kcs. R6 at 0450 closing with call "OAX4W y OAX4V Radio America, La Voz de Nueva Mundo." All reported by Williamson.

● Central America/West Indies

Trinidad. First report of reception of VP4RD Port of Spain comes in from T. B. Williamson who has heard them at 2315 on 9630 kcs. with R6 QSA4 signals announcing call as "Radio Trinidad" by female announcer and relay of BBC programme "London calling the West Indies."

Martinique FWI. FZF6 9705 kcs. Fort-de-France heard one Sunday evening at 2315, R5 QSA3 with call "Ici Radio Martinique Poste Nationale Francaise." Reported to be on 9342 kcs. at times. (Williamson).

Guatemala. Pearce reports TGQA "La Voz de Quezaltenango" 6400 kcs. Relays TGQ 1450 kcs. Verifies by QSL card being a view of studios. Schedule: 1800-2000 and 0100-0400. Saturdays 1800-2000 and 0100-0500. TGRB Guatemala City 6860 kcs. heard with R6 signals at 0320 with call "Voz de la Guardia Civil." (Williamson).

● North America

Mexico. XEHH Mexico City 11880 kcs. R7 QSA4 at 0320 with commentary on Pelota game. XEOI also at the same location 6012 kcs. audible after OAX4Q closes. Identified at 0430-0500 with swing records and call at 0500 "Radio Mil en la Capital de Mexico." Signals were R5 QSA3. (Williamson).

U.S.A. (West Coast). Reg. Masters reports KGEI 15130 kcs. at 0630-0715 with variety and news. R7 QSA4 with flutter

QSB. Same programme carried by KNBX on 15330 kcs. with R8-9 QSA5 signals. Pearce says that the best stations heard at his QTH are: KGEI, KGEX now on 17780 kcs. from 17880 kcs., KNBX, KWID 11900 kcs., KWIX 9570 kcs., KCBF 11810 kcs. All heard at 0600.

Hawaii. KHRO Honolulu heard on a new freq. of 15250 kcs. (announced) at 1052 with selections from "Oklahoma." Signals were R6-8 QSA5 with bad flutter QSB. Programme in Japanese at 1100 after which signals faded out. (Scribe).

● QSL Section

Sidney Pearce: HCJB (9958 kcs.), XDY, HC2RL, NAVE (letter from U.S. Navy Dept., Washington), OTC2, OTC5, TGQA, KGEX, LRX1, Radio Algeria (11835 kcs., letter veri in English), Singapore (15300 and 15275 kcs.), Radio SEAC (17770 kcs.), Jaffa (2 QSL's . . . one English one Arabic for 6790 kcs.) Arthur Cushen: CR8AA, VUM2, Luxembourg, Kuala, Lumpur, Monte Carlo (to use 25 kW. on Nov. 1st, 1947, sends nice letter, booklet and 2 photos), XECC, YV5RU, LLI, LLA, LKQ, WLWR, CKCS, CKRA, HEU5, KRHO (15250 kcs.), Jerusalem. A. W. Robertson: Radio SEAC (15 Mcs.), VLA4, OTC2, PCJ, TAQ, Radio Sofia, HER5, HCJB, VQ7LO. G. S. Gilham-Dayton: VLB4, HOXA, VUD10, Radio Andorra, Radio Singapore, WLWL, WLWR. K. V. Palmer: FZI, OTC5, PCJ, SBC, Schwarzenburg, OLR2A, CKLO, CHOL, Radio Andorra, Warsaw. T. B. Williamson: KZPI, Singapore (11735 kcs.), VLR2. Reg. Masters: FZI, Radio Suisse, HCJB. Bob Iball: VLC9, VLA8, TGWA, OTC2. Your scribe from Radio Tabriz (12180 kcs.)

● Acknowledgements

Sidney Pearce BSWL336 (Berkhamsted, Herts.), T. B. Williamson M.B. ISWL/G247 (St. Albans, Herts.), Reg. Masters ISWL/G407 (Portsmouth), Arthur Cushen ISWL Representative (Invercargill, New Zealand), Bob Iball ISWL/G941 (Worksop, Notts.), C. A. Wharton (Leeds 8), Rex Gillett ISWL Representative (Prospect, S. Australia), R. V. Aldridge (Amersham, Bucks.), H. Westman ISWL/ZS993 (Upington, S. Africa), J. L. Simpson ISWL/G879 (London, N.W.6.), A. W. Robertson BSWL2550 (Cranford, Middlesex), R. J. S. Thomas ISWL/GW1069 (Milford Haven, Pem.), G. S. Gilham-Dayton ISWL/G909 (Aylesbury, Bucks.), K. V. Palmer ISWL/G449 (Tankerton, Kent).

THE LAZY - H AERIAL

By C. H. Ranft, G5RF

THIS is not an attempt to launch yet another type of aerial on the world, but is a discussion of the merits, demerits and practical details of an old and well tried friend.

For amateur purposes, having decided to use a fixed beam in preference to a rotatable one or an omnidirectional aerial, it is normally desirable to achieve the power gain by confining radiation to a low vertical angle rather than by narrowing the beam and consequently restricting the area where it is effective. It is also convenient unless space is unlimited, to make the aerial bidirectional.

Dr. O'Hagan has pointed out the desirability of low angle radiation in a recent article*, particularly on 28 Mcs. and this is true to a lesser extent on 14 Mcs. For most amateurs, arrays giving vertical directivity are impracticable for lower frequencies.

The Lazy-H fulfills the above requirements and possesses other advantages also—the credit and debit side being outlined below:—

Advantages

(1) Moderate horizontal directivity (5dB over a horizontal dipole at the same height in its favoured direction) but very useful vertical directivity.

(2) High impedance and wide spacing make adjustment easy and losses lower (in a low impedance close spaced array like the Kraus; voltages and current are very high, making insulation a serious problem whilst the selectivity due to the high Q permits operation only near the optimum frequency and renders adjustment critical).

(3) Broad frequency coverage, reasons as above.

(4) Bi-directional.

(5) Reasonably light, cheap and easy to construct—only requires wire, string, insulators and feeder spacers—no wooden spreaders, duralumin tube or other ironmongery.

Disadvantages

(1) High masts are required as the bottom half wave sections should be at least half a wavelength high. 40 ft. masts are therefore desirable at 28 Mcs.

(2) Operates on one band only, though there is a modified version called the X-H array which will work on any two adjacent harmonically related bands—this requires even more height however.

Theory of Operation

One of the more satisfactory ways of directing the radiation from an aerial system is to arrange a number of dipoles in such relative positions, and feed them in such phase relationship, that radiation adds up in the required direction and cancels out in the undesired direction.

Dipoles are in phase if the field round each builds up and collapses simultaneously and out of phase if the reverse is true.

Radiation is confined to directions at right angles to the plane of the two wires if they are in phase, whatever plane they are in with respect to the ground. Thus if the two dipoles are located parallel and are above the other, radiation will be confined to a plane parallel with the ground. In the Lazy-H four such dipoles are so arranged which explains the low angle performance.

Unfortunately if the two upper dipoles were fed by a parallel pair of wires from the feed point of the lower two the two pairs would finish up out of phase, so the centre feed section is crossed over (at A in Figure 1).

Any adjacent half wave sections of a multi half-wave wire are out of phase. If we assume that this wire is three half-wavelengths long we can clearly arrange for the end half waves to be in phase by eliminating the centre half wave by blotting out the radiation from it. This can be achieved by folding it in half so that radiation from the two parallel wires so formed

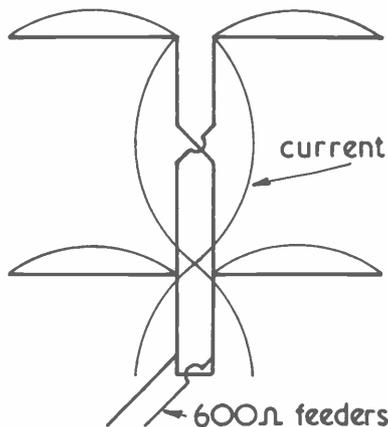


Fig. 1a: Electrical arrangement showing current distribution

* 'A Ground-Plane Aerial'—Short Wave News, June 1947

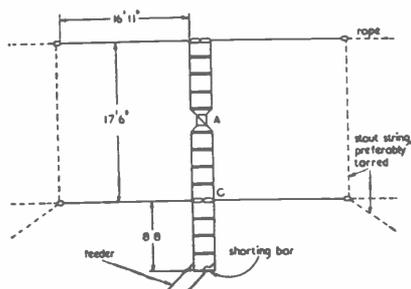


Fig. 1b: Elevation of the system

will cancel out. This is provided for us gratis in the matching section of the Lazy-H.

This makes the lower section of the Lazy-H our old friend "two half waves in phase," which gives a gain of 3dB over a simple dipole. By "stacking" a further "two half waves in phase" above this a further 2db gain is added. Add to this the advantages of confining the radiation to a plane parallel to the ground and the picture looks distinctly rosy.

The total horizontal directivity is slightly better than two half waves in phase, but quite reasonable results are obtained at 5RF at up to 30 degrees off maximum (at right angles to the wires).

The gain due to the vertical directivity is impossible for the amateur to calculate but under certain conditions might reach very impressive figures—perhaps 18dB. This would be more noticeable under poor conditions or at times when the band is just opening up or fading out, for extreme DK. This is more especially true of 28 Mcs.

For those unfamiliar with decibel (dB), it is a unit of power gain (or loss) and not an absolute unit like a volt. 3dB gain is a power gain of 2, 6dB a power gain of 4 and 9dB a power gain of 8.

It seems to have been decided that one "S" point difference is a gain or loss of 6dB. A gain or loss of 3dB is about the smallest difference the average ear can distinguish. Thus S6/7 is 3dB up on S6.

It sounds much more technical to talk about dB's!

Feeding Methods:

Whilst approximately 150 ohm feeders can be hung on at A in Figure 1, in which case the cross over and the matching stub would not be needed, it is usually more convenient to feed at the lowest point, and the standard arrangement is to hang 600 ohm feeders on at the appropriate point towards the bottom end of the stub.

Low impedance twin feeder of high efficiency is obtainable these days however,

and is much easier to handle than open wire lines, and the losses are usually lower, especially in wet weather—this is true of the modern polythene types and twin coax. types employing rubber insulation are undesirable except for very short lengths. The writer has no experience of doing so but it could well be that single core coax. could be used—some unbalance might result but would not be too serious in view of the low impedance.

However one comes unstuck with the $\frac{1}{4}\lambda$ matching stub as the centre impedance of any of the half wave sections, and therefore the matching stub is of the order of 300 ohms. However the low impedance feeder (say 80 ohms) is attached, no point will be found in the stub to match it as the stub will gradually rise in impedance from the 300 ohm region at the bottom to about 1200 ohms at the top.

The method adopted at 5RF was to use "Q" bars or a "linear transformer." Without going too deeply into theory, if it is required to match a line impedance to a load impedance it can be done by inserting a section between the end of the line and the load, of an impedance equal to the geometric mean between the line and load impedances thus:—

$$ZT = \sqrt{ZL \times ZLo}$$

when ZT=matching transformer impedance
 ZL=Line impedance
 ZLo=Load impedance

The matching transformer or Q section usually takes the form of two spaced conductors $\frac{1}{4}\lambda$ long, the impedance being adjusted by juggling with the diameter and spacing of the conductors. There is a formula for this but it is much easier to look up the tables in any of the amateur handbooks.

In our case then, we have to match an 80 ohm line to a 1200 ohm load, the impedance at the end of each of the bottom half wave sections is 2400 ohms, therefore the total impedance shows these in parallel—or an impedance of 1200 ohms from the formula we find:—

$$ZT = \sqrt{80 \times 1200} = \text{about } 310 \text{ ohms}$$

Looking up in the tables we find that a 310 ohm section must be composed of $\frac{1}{4}$ inch tube spaced $3\frac{1}{2}$ inch centre to centre or $\frac{1}{4}$ inch tube spaced $1\frac{1}{2}$ inch or 8 swg wire spaced something under an inch. All of these are a bit nasty either for loss in wet weather due to close spacing or from the mechanical undesirability of having copper or duralumin tubes hanging from the aerial.

However, we need not despair as two higher impedance sections in parallel will give us the same result, in which case four wires of a reasonable swg are employed with ordinary feeder spacers.

The "Radio" Handbook gives a table of gauges and dimensions for four wire transformers. Unfortunately this only goes up to 261 ohms but extending it and using the same principle a four wire section was designed which approaches the required 310 ohms and a satisfactory match appears to have resulted, standing waves on the line appear to be less than 3:1 which is acceptable for amateur purposes.

The layout and dimensions are given in Figure 2.

The line is B.I. Cables Type BTF 219 Flat Twin 85Ω RF cable.

Constructional Details:

Insulators and feeder spacers can be of any reputable make, the writer uses steatite insulators and Polystyrene feeder spacers.

A spacing of 8 inches is satisfactory for the centre sections although this is not critical—at this spacing a spacer every 2 feet is adequate.

The centre crossover can be achieved with a square piece of Polystyrene as detailed in Figure 3. Losses will be low here as it is a point of low impedance (and therefore low voltage).

It is always wise to avoid soldered joints if possible so the whole array minus the matching section can be made of two pieces of wire threaded through the insulators and the crossover piece.

It is advised that the whole thing be laid out on the ground first and all the lengths and spacings achieved in this position—warning—take it easy, for the penalty for excess haste is death by strangulation!

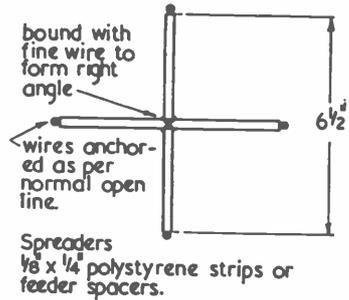


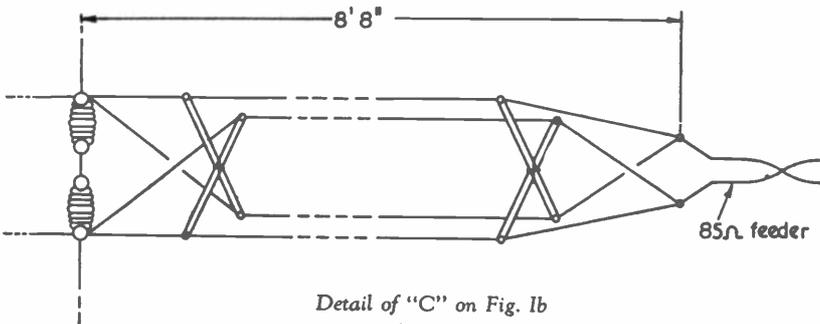
Fig. 2: Four wire Q section

Alignment:

The official method of lining up the orthodox version is to lower the aerial till the bottom of the matching stub can be reached, inserting an RF meter instead of the shorting bar and "parasitically exciting the array from a nearby dipole," the feeder having been removed. A current should then be observed in the meter—the bar is then moved up and down the stub until maximum current reading is recorded, it being advisable to cut the stub wires a foot or two longer than the formula dimensions to allow a little "come and go."

Having achieved this, shut the dipole down and feed the array direct from the feeders, this may necessitate altering the position of the bar. The feeders should then be moved up and down the stub "till standing waves are at a minimum." Replace meter with a piece of wire when all is finalised.

Which all sounds very nice on paper—the enthusiasts may proceed with this method. The writer, being a lazy type, cut all lengths to the formula figures as indicated in the handbooks, hung on the patent four wire section cut to an electrical $\frac{1}{4}\lambda$



Detail of "C" on Fig. 1b

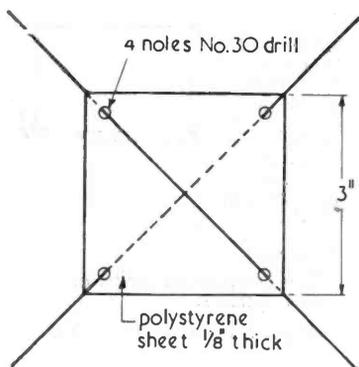


Fig. 3: Centre Cross-over

and turned the juice on. Standing waves do not appear excessive and the thing works!

A receiving-only station is pretty well tied to this method in any case.

High currents should not be expected at any point in the array due to the high impedance—about 300-400~ at $\frac{1}{2}\lambda$ centres.

Results:

These have been highly satisfactory. As it is erected on a line 30 degrees W. of N. (true) it aims at VK-ZL and South America.

Reports are entirely satisfactory particularly in bad conditions and at extreme DK. On numerous occasions reports have been received from VK to the effect that at S5 and S6, 5RF has been the only European signal audible.

Comparing it with a recently erected three element rotary of the same average height an interesting fact emerges.

Under average conditions the three element is 3-6dB better (when aimed in the same direction) up to 4000 miles, from there up to 10000 miles there is no difference, but distances from 10000 to 15000 miles (e.g. VK the long way round) the Lazy-H is 3-6dB better.

Under bad conditions and at other times when extreme low angle radiation is required, such as "troposphere bending" QSO's of over 70 miles, the Lazy-H has so far been found superior.

Data is not complete on these comparisons as yet but the writer is forming the impression that we want titltable vertical directivity every bit as much as rotatable horizontal directivity.

(Cont. on p.283)

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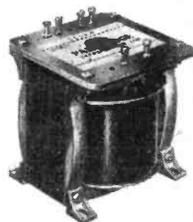
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RADIOLYMPIA 1947

THIS, the 15th National Radio Exhibition, and the first one since 1939, was held at Olympia from October 1st-11th. This review is intended to present readers with an idea of the exhibits that we considered to be the most interesting from the short wave viewpoint.

Receivers

A feature of the general coverage receivers was the prominence of bandspreading devices on the short wave bands, though we did not encounter any receiver under this category which incorporated a B.F.O. Cabinets, generally, were of a high order of workmanship though apart from a few isolated cases we did not see anything of really strikingly original design. We did note, however, that prices were still high, though, of course, purchase tax did not help in this direction.

One interesting development noted in several receivers was the arrangement whereby the broadcasting bands were given really good coverage plus bandspreading. This, of course, meant the elimination of parts of the spectrum, including the amateur bands, but for those mainly interested in the BC bands these sets are ideally designed. A good example of this type of receiver was the **Beethoven** "Connoisseur," which has nine valves and eleven wavebands. Bandspread tuning is used on the

ranges marked 11, 13, 16, 19, 25, 31, 40, 50, 60 and 90 metres. The bands are marked in megacycles and the receiver is available as a table model, console or radiogram.

Another set of interest was the **Aerodyne** Model 431 (or model 432 for AC/DC). This set has seven short wave bands, with bandspreading on six of them, in addition to the long and medium wave bands. Another point we liked about this set was the fact that it was calibrated in both metres and megacycles.

A rather more expensive model, available in console or radiogram form, was exhibited by **Dynatron**. The features of these sets are a remarkably fine dial and slow motion tuning mechanism combined with a continuous coverage from 10-85 metres on the short waves. Variable selectivity control is provided, down to 5 kcs., and the sensitivity is given as 1 μ V (which is better than some communications receivers).

Radiograms

We noticed some very fine models on show, the cabinet work in most cases being outstanding. All types, from the table-top types to the most elaborate pieces-of-furniture were to be seen. Prices were, however, very high on the whole and a good percentage of those shown must be surely out of the range of the average person's pocket. About the most outstanding

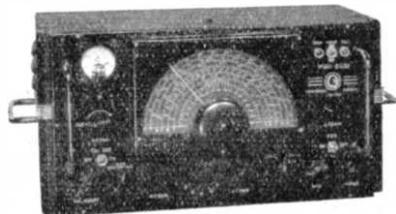


The Ultra Model T447. This set was chosen by King Feisel of Iraq as a means of reliable reception of Baghdad. We were so impressed with this receiver that a review of it will appear in a future issue.

one we saw was the H.M.V. Model 1901, which is described as 'The most remarkable Autoradiogram in the world; a three-unit, 43-valve, 12-waveband instrument for AM and FM reception'! The price of this masterpiece is £700. A novel Philco product was a radiogram operated on the "penny-in-the-slot" principle. The records are simply fed into a slot in the cabinet and the instrument does the rest!

Midgets and Unorthodox Receivers

As was to be expected, midgets were well to the fore, and in this class were some really compact and truly portable receivers. Though most of them were purely local station sets, Alba exhibited a model with a short wave band from 16-50 metres. Other remarkably small receivers were shown by Burgoyne (who claimed their personal receiver to be smaller in cubic content than any other), Vidor and Romac. Of the unusual designs we did not see as many as would have been expected. Probably the most outstanding in this field was the "Venus" marketed by Champion Radio.



The Q-Max communications receiver

Electronic gadgets that switch one's radio on and off at a predetermined time were to be seen, and the "Rota-time" programme pre-selector claimed out attention as being a particularly neat example. Goblin showed a receiver with such a device incorporated in the design.

Communications Receivers

Though there were many communications receivers to be seen, as for instance, those on the G.E.C. and Marconi stands, very few were available for the private purchaser. The Q5/10 receiver, the latest product of "Q-Max" was on show, however. It is available in two models, one covering five short wave bands (1.8-28 Mcs.) and the other for general coverage from 1-31 Mcs. The set uses 10 valves, with a sensitivity of under 2 μ V and with 2½ watts undistorted output. An unusual feature, and a praiseworthy one, is the fact that the receiver is unit-constructed. As an example, the crystal calibrator unit can be supplied separately and just plugs into the main receiver. The famous Eddystone receivers, were, of course, on view, including the new general purpose model (680). Of special interest was the new export short wave receiver, type 659, which incorporates a high quality console speaker.

Kits and Component Assemblies

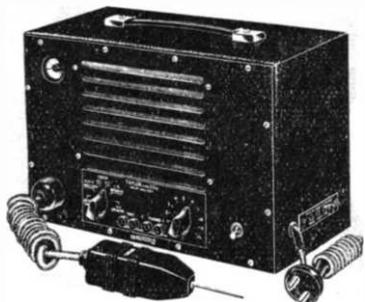
It was interesting to note that at least one firm has found it worth while to show complete kits of components, together with complete diagrams and instructions, for various type of receivers and amplifiers. This firm trades under the name of Radio Kits Co. Ltd., and their range is of really reasonable price.

Weymouth Radio had an interesting item in their Permeability Tuning Unit. Though these units only cover medium and long wavebands, there is no reason why something should not be produced for short wave use.

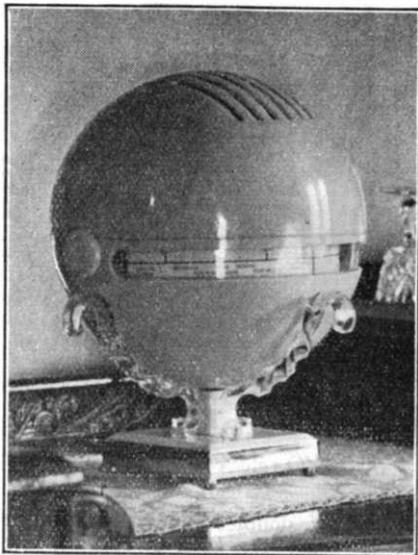
Various firms offered coil packs and similar small assemblies and **Q-Max** provided the transmitting enthusiasts with much of interest, including coil turrets, driver units, oscillator units and so forth.

Components

So many exhibitors showed a wealth of components that it would be impossible to describe them all here. Those interested particularly in components are referred to the November issue of "Radio Constructor" which carries a comprehensive review. Generally speaking we did not see anything outstandingly unusual though many components showed a great advance in design. One thing we looked for in vain was a good, inexpensive slow motion drive and dial for self calibrating. **Belling & Lee** showed some car plug suppressors and we were told that a big drive for the compulsory suppression of car ignition QRM was under way by the Radio Industries Council. We wish them luck! A range of coloured pointers and knobs, after the style of certain service ones, was on view at the **Bulgin** stand and took our fancy. **Q-Max** had on show their new insulating material "Polymax" which is claimed to retain all the electrical properties of ceramic and yet has the added advantage of being unbreakable. **G2DY**, on the **Haynes Radio** stand, showed us a fine 100 watt amateur transmitter incorporating the firms chokes and transformer. Whilst on the spot, we all recorded our keying on the undulator on show, and had some nasty shocks when we looked at our keying on the tape! **G.E.C.** had two exhibits that are worthy of mention; their 14 Mcs. glass-envelope crystal and their new 1½ in. moving coil meters, ideal for grid circuits.



The Taylor circuit analyser



The "Venus" Receiver

Valves were to be seen in their dozens, and we were particularly interested in the **Mullard** display of transmitting valves—from those of 7.5 watt rating to the massive 18 kW water cooled types.

Test Gear

Many manufacturers showed good examples of advanced test gear, examples of which were the **AVO** Electronic Test meter and the **Valve Characteristic Meter**. Of much interest to the ham is the new **G.E.C.** range of miniaturised test gear. One of this range is the **Miniscope**, which, though only measuring 8¼ in. x 6½ in. x 2¼ in., is a complete cathode ray oscilloscope. Various units are available to attach to the **Miniscope**, to increase its uses.

Aerials

Of those firms displaying aerial equipment, one we thought was rather ingenious was the **Antiference** folded dipole, the "Arnine." Two models are available, one for frequencies of 14 Mcs. and above and one for 7 Mcs. and above. Easy adjustment to any required length is a feature and the polythene web of the aerial span is conveniently calibrated for cutting to various amateur and broadcast bands. A matching transformer is available if the aerial is to be used with a receiver not



The AVO valve characteristic meter

designed for doublet input. Other firms, such as Aerialite, Belling & Lee, etc., showed a comprehensive array of short wave, television and car aerials.

Special Exhibits

Radiolympia had its own "broadcasting station," in a glass-enclosed sound proof studio, from which the radio and television programmes were distributed throughout the show. It was directly connected to Broadcasting House and Alexandra Palace.

The special exhibit "Electrons at work and play" was full of interest and the firms who contributed to this are to be highly congratulated. Here are some of the items: Kylstron tubes, showing the behaviour of the electron flow; an Infra-red Telescope; demonstration of Radar Transmission; Sound Picture Reproducer; the detection of moving objects by Micro-wave detector. The exhibition of an electronic railway showed the enormous possibilities of electronic devices and, incidentally, presented a glorious opportunity for the grown-up "children" to play trains!

Other items of note were—the Quartz Crystal Section, the demonstration of Ultrasonics and a Radio Controlled Fuse.

In Television Avenue, cubicles were set aside so that various manufacturers could place working models on show. This allowed for a good comparison to be made of all the types available. We noticed that the 9in and 12in. tubes were the most popular and we saw very few sets throughout the Avenue and the exhibition proper that used other sized tubes. The smaller

tubes seemed to be well out of favour. On the Baird stand, we were much impressed by the "Grosvenor" television receiver which had a screen of 22in. x 19in.

Scotland Yard put on an interesting show, complete with blue police telephone pillar and demonstrations of how the 999 system works.

Cable & Wireless operated a telegraph circuit with the company's station in Barbados. Visitors telegrams were transmitted and the replies came back within 70 seconds. Other transmitting gear was to be seen on the Marconi and S.T.C. stands.

Conclusions

From this brief survey, it will be seen that the exhibition provided plenty of interest. It was a good sign to see so much on show—and most of it for sale to, the general public. Although the show contained much not of direct interest to the short wave enthusiast, all will agree that the exhibition was an undoubted success. The first day broke all previous records for attendance. We look forward to an even better show next year, when we will be just as eager to descend on Olympia again like so many excited school children! One thing that did strike us as a healthy sign was the fact that practically without exception everyone on the stands knew what a "ham" was. There is no doubt about it, the ham is getting more attention than in the past and he will undoubtedly receive more in the future. The hams are now fully recognised a large potential market and not just a minority.



Samples of Polymax insulators

Radio Amateurs Examination Course

By D. Warner

Part 9: *THE TRANSMITTING LICENCE*

ASSUMING that the would-be transmitting amateur has decided that, with or without the help offered in this series of articles, he stands a good chance of qualifying for a licence, what steps should he take?

The Application

The first is to apply to the Engineer-in-Chief's Office, W5/5, Bren Buildings, North Circular Road, London, N.W.2, for form E.in.C.428, which is a summary of the conditions governing the issue of the licence, and also for a copy of the application form (E.in.C.447).

General Conditions

From these forms he will learn that an amateur must be able to satisfy the following requirements before a transmitting licence can be issued.

- (a) be able to send and to receive the morse code at a speed of, at least, 12 words per minute.
- (b) to have passed the Radio Amateurs Examination or similar examination of the same or higher standard.

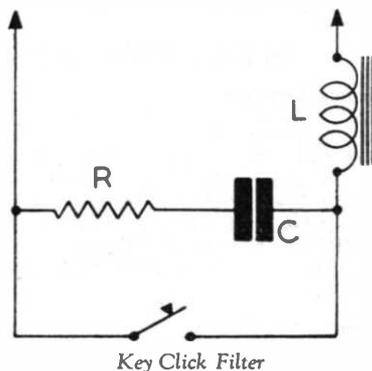
A list of exemptions for both requirements (a) and (b) are given in appendix "A" to form E.in.C.428. The technical examination is held at regular intervals by the City and Guilds of London Institute at most technical colleges throughout the country, but if any difficulty should be experienced in finding an examination centre the Superintendent of the City and Guilds Institute should be contacted.

No undue control is exercised over the type of apparatus used by the Amateur but it is essential to provide a reliable frequency meter for checking the calibration of the transmitter. Suitable instruments have been described from time to time in these pages.

Interference

Possibly one of the most important conditions of the licence is that governing the non-radiation of interference. Possibly the worst type of broadcast interference from a telegraphy transmitter is that known as "key click" produced by the sudden commencement and cessation of the signal. Any

sudden change in the radiated power produces a wide range of harmonic frequencies and is also capable of shock exciting the tuned circuits of nearby receivers. This results in the reception of annoying clicks or thumps. The cure for this type of interference is to prevent such rapid changes by the use of a key filter of the type shown in Figure 1. The filter is connected in the circuit which is to be broken by the key, the inductor limits the rate of increase in the signal power when the key is closed, and the capacitor similarly limits the rate of delay when the key is opened. The resistor is for the purpose of preventing sparking at the key contacts, an effect which in itself may cause interference. For this reason also it is always desirable that the key should control a low power stage.



Poor power supply regulation, resulting in a considerable change in the H.T. voltage between key up and key down conditions may also produce key clicks. An inductor in the H.T. feed to the stage drawing the most current should prevent this effect. Also with low power transmitters a bleeder resistor connected across the H.T. supply, and of such a value that it draws a standing current equal to about a quarter of the full load current may be used to improve the regulation of the H.T. supply.

Interference may also be mains born, that is to say interference may be carried from the transmitter to the receiver via the

mains supply wiring. The use of mains suppressors in the power leads to the transmitter will normally prove to be effective, but in severe cases similar suppressors will be required at the receiver as well.

Another form of interference which has already been considered in this series is that due to the direct generation of harmonics frequencies in the output stage of the transmitter. When a push-pull circuit is employed the even harmonics cancel out in the load leaving only the odd harmonics. Of these the strongest is the third, and this is frequently prevented from reaching the aerial by the use of a filter circuit in the aerial feeder.

Hum Modulation

In order to prevent the signal becoming modulated by mains hum care must be taken that the H.T. smoothing in the transmitter is adequate. It is a condition of the licence that the ripple voltage should not exceed 5 per cent. of the D.C. voltage. In this connection is always advisable to ensure that the filament of heated supply to the valves is adequately by-passed to earth,

e.g. by earthing one side of the heater winding and capacitively by-passing the remaining side at each valve heater pin.

Permitted Power

The power which the amateur is permitted to use depends upon the frequencies on which he elects to work. The table shows the maximum power which is permitted at the present time.

Frequency in Mcs.	Maximum power in Watts	Type of Signal
1.8 — 2.0	10	
7.15— 7.3	150	C.W.
14.1 —14.3	150	M.C.W.
28 —30	100	R.T.
58.5 —60	25	

Power is defined as the total D.C. power (watts) input to the anode circuit of the valve or valves energising the aerial, the figures quoted are not therefore the maximum permissible power output.

In conclusion the writer wishes every candidate success in the examination and trusts that this series although not covering the complete syllabus, will have served to clarify some of the problems confronting many newcomers to our hobby.

STATION LIST MODIFICATIONS

Frequency Changes

HS8PD from 5990 kcs. to 6125 kcs.; Kuala Lumpur from 6165-6045 kcs.; VQ7LO from 4950-4890 kcs.; Saigon from 4810-6190 kcs.; Macassar (YFA4) from 9265-9250 kcs.; Prahai from 6405 kcs. to 6024 kcs.; OAX4M, 6305-6315; KZPI, 9710-9500; CR7AA, 5860-6137; Saigon 6190-6165; ZEB, 3800-3700; ZQP, 3900-3914; TGQA, 6405-6900.

Call-sign Change

6250 kcs.: YSU to YSUA.

Now Testing

Wellington, New Zealand: ZL2, 9540 kcs.; ZL3, 11780 kcs. Between 0900-1000 GMT, relaying 2YC.

ETA, Addis Ababa, 15074 kcs., now testing prior to resumption of broadcasting. VP4RD will soon be testing on 6085 and 12950 kcs.

Additions:—

Freq.	Call	Location	Slogan	(Watts)
3498 ...	CR7IC	Beira, Mozambique	Radio Clube de Beira	
4840 ...	VUC2	Calcutta, India	All India Radio	10000
4920 ...	VUM2	Madras, India	All India Radio	500
4960 ...	VUD2	Delhi, India	All India Radio	10000
5800 ...	CE8AA	Santiago, Chile	Radio Sociedad Nacional de Agricultura	1000
6080 ...	ZEA	Salisbury, S. Rhodesia		
6110 ...	VUD3	Delhi, India	All India Radio	5000
7140 ...	CR6RE	Melanje, Angola	Radio Clube de Melanje	
7146 ...	—	Dalat, Indo China		
7155 ...	CR7IB	Beira, Mozambique	Radio Clube de Beira	
7175 ...	CR6RB	Luanda, Angola	Radio Clube de Angola	250
7299 ...	CR6RL	Benguella, Angola	Radio Clube de Benguella	1000
7530 ...	—	Dalat, Indo China		
9465 ...	—	Hanoi, Indo China		
9500 ...	CR6RL	Benguella, Angola	Radio Clube de Benguella	1000
9563 ...	—	Vienna, Austria	Sendergruppe Rot-Weiss-Rot	
9590 ...	VUM2	Madras, India	All India Radio	500

On the Ham Bands

Conducted by "CQ"

● Top Band Notes

ON a number of occasions recently, we have heard stations sending "Testing de G-..." and finally signing VA. Several times, stations have called obviously anxious to co-operate and give reports—but no replies. It makes one feel that the tests could not have been so very important! If it is really necessary to use a radiating aerial for such tests, then why not listen afterwards for the co-operation which is probably there for the asking?

We hear that G8LZ (Gravesend) is trying to ascertain how far his signals travel in daylight. Understand that Bedford and Ipswich are the furthest so far. Here is a chance for the SWL's to prove their worth—so why not give the top band a few minutes occasionally?

First of the alternating portables has been heard—G2nj/A/P, the operating district being Peterborough.

Sun-spot activity has coincided with very fluttery signals, which have sounded for all the world like transatlantic DX. Which reminds us that in a couple of months it may be worth while to keep a watch out for W signals on the band.

With activity being rather low, one can enjoy 100 per cent. QSO's on very low power these days. One of the best QRP merchants to be heard in London is G3acr (Burton-on-Trent) who pushes in a nice signal for his 2 watts.

● 3.5 Mcs.

It's good to hear the voice of G3ACC on the band. We have often heard the excellent CW signals but we got an extra thrill when 3ACC came up on 'phone for the first time. Carry on the good work, Meg! Just why does everyone crowd on to the edge of the LF end of the band? What about the 3600-3635 kcs. part, fellas? Heard one old-timer, who operates on 3630 kcs., thanking others for looking!

● 14 Mcs. News

Al Slater had a weeks holiday, which enabled him to keep a close watch on the band during the afternoons. The result was hordes of J's, including 8AAA and 8AAM in Korea, 9AAD and 9ANT on Okinawa and 9CRP in the Marshalls. KG6's were also predominant with KG6AG and W6VRF on Guam and W6WCN on Saipan. VU, VS1, VS2, KA, PK and W6/7 the long way round were also entered in the log book. After this effort, the band seemed to

deteriorate with mornings and late evenings almost blank. In the log we see, amongst others, HI8AN, KA1AI, 7GC; KH6AW, CT, JQ; OQ5CA, PK1MH, 2RK, 3PH; ST2AM, VK5XJ, 6FL, 6HL, 6RU; VS2CD, 7AC, IT; XZ2AG, YN1HT, ZL1CD, HY, 3AW, 4AO, AT.

D. L. McLean would like to know of any stations operating on phone in Zone 39. Any offers? D.L.M. has heard 36 Zones and 120 countries post war with 36 Zones and 131 countries "all time." 99 countries have been verified. Whilst on the subject, we see no sense in listing post war and "all time" ratings separately. After all, if a SWL takes a couple of years off from his hobby he is not expected to start all over again in his scoring! It may be said that some were able to listen during the war whilst others were in the Forces. This argument is stupid because at any given time many listeners are able to devote more time to the hobby than others. Anyway, D.L.M. has some nice catches this month, including: C1JC, FT4AI, KH6KA, M1A (says he is in San Marino), MD1A, 2B, C, 5AP; OX3GE, GG, MC; VK7TR, 9NK; VP2AT, 3LF, 4TJ, 9F; VS7IT, VU2RV, ZC6JL, JV; ZL2BE, 2GX; ZS1DO, 2BJ, 6FN.

A. H. Onslow is feeling pleased with life as he has had one of the best months for DX since he started up, hearing 8 new countries and bringing the total to 133. Good going, O.M. He heard a station signig EDC who said he is in Rio de Oro. Maybe! A.H.O. says the QSL Bureau for PK1/2/3 is Box 190, Batavia.

J. H. Endersby remarks that conditions have been below average, particularly after sundown, with evening W's almost non-existent. South Americans were heard very strongly but with an unusual flutter effect usually associated with the W6's. In his interesting log, James includes: C1YT (1725), CR7VP (2155), J9CRP, KA1AB, AI; PK3EJ (1530), VS1AN, 2VC, 7IT; VU2DG, DY (2000); XZ2AG, ZC6AR, JL and JV.

M. Hardaker sends along his first contribution to this section and says that September was the best month for DX since he started last year. Maurice has now logged 82 countries, and all on a one-valver! Here is the pick from his log: EL3a, J9ant, KH6db/KG6, KL711, um; MD1d, 5kw; OQ5av, OX3mg, VE7zm, VK2am, zc, 3nc, 5fl; VP8ad, VU2bg, YL2am, ZC1al, ZD4ab, ZL2bv, ZS1cz, 6lr.

Refg. Vincent has some nice ones and we pick out as the best PK1MH, MD2B, C,

5RH, JH, 6GS; ST2AM, OX3GC, GG, MC; J9ANT, VP4TJ, VS1BA, 7IT; VU2BQ, EC, WW, XZ2AG, ZD6JY (surely ZC6JY?), ZL4AO and VQ2EC (is this VU2EC?). Also a nice list of VK, PY, LU, etc. Reg. mentions that VP4TJ is ex-J9ANA and he will be on 28 Mcs. as soon as gear arrives.

R. W. Ainge now has a 132 ft. aerial up and judging by the log it is doing its stuff. We see in the log such items as HI8WF, J2AJA, OX7B, PK3BJ, ST2AM, UB5AC, UR2KAA, VP4TU, TX, TAE, 9F, T; VU2RV, BV, DY, BQ, DG; XZ2AA, AG; YN3CL, ZD1AA.

● Ten

G5RF reports: September exhibited signs of a succession of disturbed periods and one had the impression that conditions never succeeded in getting really "going." Not that conditions have been bad—at times they have been very good.

However, the most optimistic of us will be a little disappointed at the performance so far of the equinox period of this "maximum" year.

On some occasions the MUF has risen to the 42 Mcs. region chiefly over paths between East and South.

Disturbed conditions must be expected at this time of year when we depart from the mediocre consistency of summer and alternate between summer and winter conditions.

A review of conditions over various DX paths follows, extending to early October:

Europe

No Sporadic E noticed. Many G and near European signals have been heard by "DX scatter," causing confusion since they frequently sound like "super-DX."

Asia

Good on many mornings with the Near East on the some of the "summer-type" afternoons.

As evidence of the return to winter. UA9 and CR9 have been heard at very good strength in the mornings, frequently very early, around 0700-0800 after the ZL's.

Africa

Pretty consistent, peaking in late afternoons. The broad average of strengths has fallen from the high summer level at the times when they have been heard here.

N. America

Very good signals some evenings. It is understood that W6 were very good during the week end 27th-28th September. Saturday evening October 4th produced a good crop of W7's—a little more rare than W6 on "ten." When they come on keep a crafty eye open for KH6 and KL7, VE7 and 8.

This path is still erratic and more liable to the effects of ionosphere disturbances

than the others due to its proximity to the Polar regions.

S. America and "Long Route" Oceania

South Americans have been very good on many late evenings and on good mid-day and morning periods. Central Americans such as KP4, VP4, VP6, CM, KZ5 have been heard well some evenings also. VP6CD1 was heard at S7 on 9th September. This is ex-G2CD1 who did so well with QRP from Stokenchurch, Oxon.

An odd effect has been noticed. On many evenings South Americans, including the LSA commercial group, have faded out quite quickly about 2000, the band remaining virtually dead for a while—nearly an hour sometimes—then the S. Americans start to build up again about 2100, and LSA goes up to a terrific QRK. Sometimes, when this occurs VK or ZL will come in with the S. Americans. VK/ZL signals over the "long route" have been heard or worked September 10th, 11th.

Oceania "Short" Route

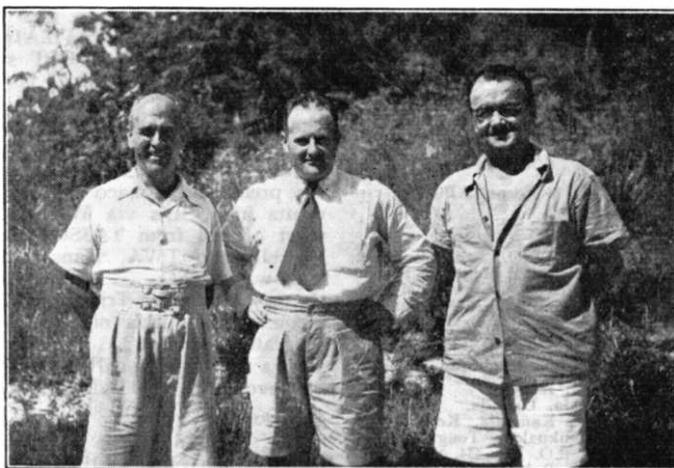
Has been very good on many mornings. The mid-day periods have frequently been very good also particularly September 10th-19th, at latter end of which time the Brisbane boys VK4AP, VK4RC were outstanding. A sign of the return to winter conditions has been the appearance of ZL stations early in the mornings, sometimes 0730.

VR5AB Tonga 28045 cw was worked at 1030 October 5th (we hope he is genuine!)

Owing to the lack of time spent on the air no analysis of "good" and "bad" days will be given.

D. L. McLean sends in the best log this month with dozens of real DX calls. The best ones are C8KY (Zone 23-1000), CR9AG, AM, AN (1250), J8AAA, ACS; KG6AAF (1130), NY4CM, LM; ST2FT (another new one), VE7AIE, EL; VP3HL (2100), 4TAX, 6HR; VS2BU (1020), 9AB, AN; VU7AB, BR, JU; XZ2KM (1050), ZC6JL, JP, RG; ZD2KC, 4AB, AL; ZE2JA. There are 12 VK's (heard between 0930-1230), 6 VU's, 11 ZL's (between 0830-1030), 22 ZS's and many rare W districts.

Al Slater says that "ten" claimed the honours for DX last month. He heard a whole batch of R8/9 KG6's, including 6AE, W6WCN and W7IOR/KG6. Tops for rarity was W2WMV/C9 in Moukden and J8AAA in Seoul, Korea. Two new countries were added during the month in the form of Bahrein and the Marshall Isles, making the score 137 now with 78 verified. Others of note were C1CH, J9AAS, KG6AE, VP4TAX, VS9AB, ZD2KC and many ZL, J and Latins.



Some of the gang from Bermuda. Reading left to right, VP9K, VP9D and VP9E

James Endersby records almost daily reception of ZS1P, ZS1T, EL5A and OQ5BA. James did not have much luck with the W's but the Asiatics had a few good days and the Near East stations were quite reliable. Interesting ones were HI8WF (1430), VU2TM (1120), ZD2KC, ZS1AX, 2DY, 6FC, W6WCN/KG6, W6YOT/C6 and some /MM calls.

Bert Teeter (New Jersey) reports the following, amongst others, from six hours of listening: HI8FA, J8AAM, AAS, AFK, 9AAO, AAS, HMP; KH6MI, KG6BE, KL7FC, PK2RK, VP3HL, 6HO, VU2GB, YN4BC, KZ5SW.

Suez Canal Zone: MD5PC-MD5ad; Tangier: EK1AS; Tunisia: FT4AI-FT4an; Uganda: VQ5JTW.

● **Consistency Poll**

Here are the results of our Poll No. 1 (Africa). Phone stations are given in caps and CW stations with suffixes in lower case as is our usual style. These are the stations voted as the most consistent from the countries indicated:

14 Mcs.: Algeria: FA8CF-FA8ih; Belgian Congo: OQ5BR-OQ5av; Cape Verde: CR4HT; Ethiopia: W6VKV/I6-I6usa; Gold Coast: ZD4AH-ZD4al; Kenya: VQ4ERR-VQ4kth; Libya: TR1P-MD1e; Liberia: EL5B; Morocco (Sp.): EA9AI; Morocco (Fr.): CN8BA-CN8bq; Nigeria: ZD1KR-ZD1kr; Rhodesia (N.): VQ2HC-VQ2hc; Rhodesia (S.): ZE1JX-ZE1jo; South Africa: ZS2AL-ZS1cz; Suez Canal: MD5PC-MD5ad; Tangier: EK1AS; Tanganyika: VQ3TOM-VQ3hjp; Tunisia: FT4AI-FT4an; Uganda: VQ5JTW.

28 Mcs.: Egypt: SU1HF; Eritrea: W6VKV/I6; Liberia: EL5A; Kenya:

VQ4ERR; Nigeria: ZD2KC; Rhodesia (N.): VQ2WP; Rhodesia (S.): ZE1JU; Sudan: ST2MP; Tanganyika: VQ3EDD; South Africa: ZS1T.

Date for closing the next Poll (South America) is November 15th. A new system for future polls will be announced next issue and will be of special interest to those who like the competitive element in their DX'ing.

● **G Calls heard Overseas**

Readers overseas are invited to submit logs of G stations on any bands for inclusion in this section. Here is this month's selection:

Frank Barrett (Brooklyn, New York), RX, HQ 129X with 30 ft. single wire aerial. Average signals QSA5 R8. On 28 Mcs.: G2ANJ, BOZ, FB, FLC, FMT, FZG, HFR, HIO, IS, 3ABN, ABZ, AKF, BMF, CJK, HM, LB, LV, SN, ST, SV, WH, YJ, 4JZ, LW, MH, PV, 5DV, HB, IW, KS, YU, ZG, 6AY, BQ, CB, JL, MB, WF, WU, 8AN, SN, GW3AX, GM6UC.

Bert Teeter (Rumson, N.J.), 14 Mcs.: G2MA, MF.

From "Universalite" (U.S.A.) Members' logs: 14 Mcs.: G2XV, 3BM, HZ, 5JO, PP, 6PD, XP, GI8UW, GM8MN, OG, GW2UH, 3AX. These have been reported as the most consistent signals for the period.

Peter Sommsich, HA8S (Budapest), 14 Mcs.: G2aan, 3asx, buu, cih.

● **Query Corner**

The greatest query this month is that of M1A, who gives his QRA as Experimental Radio Station M1A, Republic of San Marino. A. H. Onslow says the op. does not speak English, only French and German. If anyone can throw any light on the

● Topical DX QRA's

CR9AM: Box 504, Macao, via Hong Kong.
 EA7A: Box 101, Cabo Jubi, Rio de Oro.
 ET3A.J: Grosse, Poste Restante, Addis Ababa, Ethiopia.
 I6ZJ: G. R. Chiffey, The Government Press, B.M.A., Eritrea.
 FT4AN: George Solet, Box 72, Tunis.
 H18MAF.J: Max Fiallo, c/o P.A.A., Ciudad Trujillo, Dominican Rep.
 J8AAA: Sigs. Section, HQ 24 Corps, APO 235, c/o P.M., San Francisco.
 J8AAM: APO 235, c/o P.M., S.F.
 J8ACS: AACs, APO 712, c/o P.M., S.F.
 J9CRP: Box 18, Navy 824, F.P.O., San Francisco.
 MD5AB: 18 Air Formation Signal Regt., M.E.L.F.
 MD7RH: R.A.F. Station, Nicosia, Cyprus, M.E.F.
 PK2ML: c/o Max R. Rommel, R.N.N., Semarang, Java.
 SV0AB: c/o Salonika Area Signals Troop, British Forces in Greece.
 VQ9BI: Port Moresby Post Office, Papua.
 VQ4ASC: Box 667, Nairobi, Kenya.
 VQ5DES: Box 355, Kampala, Uganda.
 VQ5ELD: c/o Postmaster, Kampala, Kenya.
 VR5AL/VR5IP: Box 25, Nukualofa, Tonga Isles.
 VS1CE: G. R. A. Wright, P.O. Box 434, Singapore.
 VS2BU: Sgt. Morgan, R.A.F., Butterworth, Panang, Malaya.
 VU2FK: L/Cpl Ryland, 22 Coy., GHQ Signals, New Delhi.
 VU2FS: E. Dawson, Suite 8, 9 Dacres Lane, Calcutta.
 XAMC: Signal Service Coy., A.P.O. 209, U.S. Army, Trieste.
 ZD3B: B.O.A.C., Bathurst, Gambia.
 ZD4L: c/o G.P.O., Accra, Gold Coast.
 ZD4AL: D. J. Robinson, Wireless Engineer, Accra.
 ZD4AL: West African Signals Regt., Accra.
 (Acknowledgements to A. J. Slater, A. H. Onslow, D. L. McLean and John Clarke for several of those listed).

authenticity of this station, we would be much obliged. Another one queried by friend Onslow is YA2TL. We have yet to hear of a genuine one from Afghanistan, but maybe this time . . .

Maurice Hardaker wonders whether the numeral bears any significance in the FA calls. No, O.M., FA3, 8, 9 are all the same.

Reg. Vincent has a teaser:—ER8J. He says this is definitely the call given, so we cannot suggest the obvious solution, namely E18J! (Could it be that O.M.?)

Brian Attwood asks about TR2C and HZ1BI. If the calls are OK, then we know nought about 'em. Perhaps some reader may be able to help?

W. S. Savage is worried about EP2xz, M1A and MZ9q. He also says "who or what is KUFRA?" Well, EP2xz says QSL to Comm. Radio Station, Isfaham, Iran, but whether he is on the level we would not like to say. KUFRA can be reached via: Oasis Kufra, Cpl. Oliver, No. 8 R.A.F. Met. Unit., MELF.

● Odds and Ends

It may surprise readers to know that there are now over 80 KZ5's operating . . . FA8DX can be QSL'd via W5KPI . . . and TA1DB via HB9U . . . "Universalite" says HH2CA will not answer SWL reports . . .

Nice 'uns heard on 14 Mcs. recently include ZK1ak, ZM6af and ZAlrp, the latter may be genuine . . . QST says that the only station in the Faroes is OY3IGO, all others, like 5GS, 3G, 3PL, etc., being phoneys. How about 7NL? 5GS, by the way, gives his QRA as Box 55, Post Office, Arsuk, Greenland! . . . We hear that CZ is the prefix for Monaco . . . HP4q says he wants his QSL's via W1DX . . . If you want a card from TA3SO, the QRA is P. Morrell, c/o TWA, Kansas City, Kansas. (op. was WoSO) . . . Rumour has it that the new prefix for Trieste is I5, which seems inconsistent if this city is to count as a separate "country" . . . next month we start a new feature called "Nice Types." To be devoted to the Lids Brigade.

● Gossip

The position of the ZC6 stations has at last become clear. All stations authorised by the Military to operate are now carrying the calls in the series of ZC6JA-JZ and ZC6NA-NZ. These are called "Palestine Experimental Stations," the present list reading ZC6JB. JC, JH, JO, JL, JP, JT, JV, JY, NC and NL. QSL's for these stations, and any others, subsequently issued in the series, are to be addressed to: The Secretary, Palestine Communications Committee, HQ Palestine, British Forces in Palestine.

Other ZC6 stations are unlicensed and QSL's should be sent UNDER COVER to P.O. Box 4150, Tel-Aviv. The following calls are genuinely from Palestine and any other calls heard are definitely not in the country: ZC6AA-AZ, ZC6BA-BZ, ZC6CA-CZ. Civilians are not issued with transmitting licences.

The Amateur Radio Society of Palestine is now known as The Radio Club of Palestine, with Reuben Sokolovsky re-elected as President. There are 25 members in Tel-Aviv, 15 in Jerusalem and 10 in Haifa. Many of the members are particularly keen on 60 Mcs. and are conducting experiments. We are grateful to Reuben Sokolovsky and to G. A. Cuppleditch for the above information.

VQ4ERR writes that he gets dozens of SWL reports with each mail. Very few of the reports received are of any use, especially those from this country. It must be remembered that 4ERR works dozens of stations in G and therefore a few listener reports mean nothing to him. Robby says that he gets a lot of "try-ons" for various stations under his QSL Bureau coverage. Sometimes these "reports" are for stations that have been off the air for months, but whose names are in the Call Book! The SWL side is so busy that Robby

has a junior to answer them all. Well, there you are SWL's—forget the powerful stations and concentrate on the weaker ones if you want a good percentage of replies.

Alfred Muller, secretary of the new German society DARC, writes about the D5's. He says that the prefix D5 has been issued to French Occupation Forces in Germany, with D5aa as the first one to appear fully licensed. The station signing D5ff, giving QRA as Stettin, is a phoney. The various German societies are anxious to stop this type of pirating as it will hinder the commencement of licensing to German nationals. Apparently, the British and American authorities have stated that there are no more principal objections to the issuing of licences, once the German societies are sufficiently organised to handle the legislative side of things.

Geoff. Hutson, G6GH, is still knocking off the good DX. On 14 Mcs. recently he has worked UH8aa (14060 kcs. at 1845) in Ashkabad; VP9e (14032 kcs. at 2150); J4aak (14130 kcs. at 1805) and a juicy one by the name of AR1yl (14010 kcs. at 2135) who says QSL via W2QPv.

Had a nice letter from ISWL/G339, better known as Miss Patricia Wright (of Leicester), the daughter of G3CCA. Pat is something of a CW addict and, though she is only 12½ years old, can read at 15-16 w.p.m., having worked up to 10 w.p.m. by the time she was 10. It would be interesting to hear a QSO between Pat and some of the so-called Old Timers we hear dithering about the bands! Aside from ham band activities, including doing the logging at 3CCA, Pat acts as English Hostess for the "Radio Australia" children's overseas club. She will be going to Australia herself next year and will be making a broadcast from "Radio Australia" and the A.B.C. stations. We look forward to hearing you at the mike, Pat. Good luck.

● DX QSL's Received

D. L. McLean: CX4CT, EK1AD, HI2L, KL7ED, KP4CD (by airmail), MD2C, 5AF, 5PC; OA4BA, OQ5BW, VK2AKF, VO2T, VP2LA, VQ3EDD, XE1BC, YN3DG, ZE1JB, ZS6U, ZL4AO, T1NS.

Conrad Tilly: LI2BO, OQ5BW, LU7FN, PY4MG, SU1CX, VK4KH, VS1BA, ZC6FF, ZS6LF.

D. Garrard: CN8AB, OX1Z, EK1MD, VP5EM, VS7ES, CX2AX, 2CC, CO6BD, VK4GE, 2AIK, C1CH, OI2KAF.

D. Hayes: KP4CO, MB9AD, SV1AH, YV5AB, VK2FG.

L. H. Waine: HK3AB, OQ5AE, VK4KH, YS3PL, ZC1AL.

A. J. Slater: AR8AB, C1SM, CR9AG, EL5A, MD5PC, ZL1KJ, 4FO.

DX PREDICTION FOR
MID-OCTOBER TO MID-NOVEMBER

(7 and 14 Mcs. through courtesy of Geoff. Hutson, G6GH. 28 Mcs. with acknowledgement to Denis Heightman, G6DH).
Times:—G.M.T.

7 Mcs. Conditions

0700—W.1.
0800—ZL.
1700-1800—ZL.
2000-2100—ZS.
2300-2400—LU, PY.

14 Mcs. Conditions

0800—VK, ZL.
1300—VK, ZL.
1400—VK, W1.
1500—VK, ZL, W6.
1600—W6.
1700—W6, W7.
1800-1900—W1, Africans.
2000-2400—W1, PY, LU.

28 Mcs. Conditions

This period will give good DX with increasing regularity, especially for N. American signals. Only the further distant Europeans, i.e., SV, YR, etc., will be audible, peaking around mid-day. Mornings and early afternoon should prove good for Asia and Oceania. African and S. American signals will be audible from 0800 to 1700 tending to drop in strength towards the end of this period.

60 Mcs. Conditions

As in the last period, there may be some days when the F2 peak M.U.F. reaches 50 Mcs. or higher for distances of 2000 to 4000 miles in directions from E. round to N.W., with a peak time occurring when it is mid-day at a point halfway along the path being checked. These frequencies should be carefully watched for openings particularly from Middle East and East Coast, U.S.A. (50 Mcs. band) with a slight possibility also to S. Africa.

On 60 Mcs. tropospheric contacts will still be possible up to 150 miles or so when the weather is settled. Daytime will provide better conditions than night, but lack of activity will probably not make this apparent.



AROUND THE SHACKS No. 11

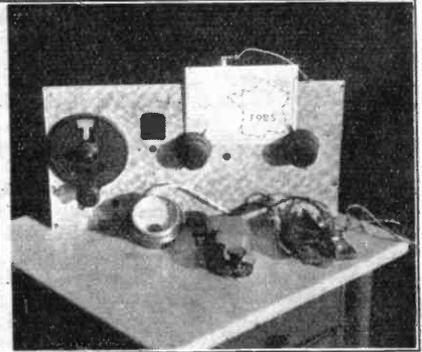
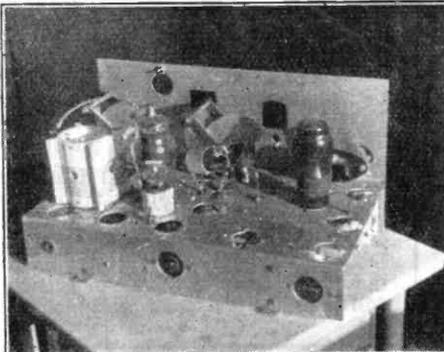
HENRI DISCAUX, F9BS

PRIOR to the war, Henri had no experience of radio and so he is typical of very many amateurs today. In 1940, he started working for the French Government at Nimes, on D.F. work, and continued in that capacity until he was called by Germany on the forced labour campaign. Henri decamped and joined the French Resistance Movement, starting up as an operator for F.F.C. (French Forces Combatant) during which time he had many hectic experiences not commonly met with in the usual radio shack! After the liberation, he decided that he might as well continue to transmit, this time on his own account and in December, 1946, applied for his ticket and acquired the call F9BS.

The original transmitter, which is still in use, is a CO (6K6) and PA (807) and operates in the 7 Mcs. band on CW. Extensive rebuilding is now taking place, due

partly to his recent visit to England when he visited several G stations and was impressed by the neatness and efficiency of the average British amateur station. Whilst over here, Henri also visited 57 Maida Vale and is now the French representative of the I.S.W.L. The new transmitter will be of greater power and will be grid modulated for phone work on the 28, 14 and 7 Mcs. bands.

The aerial is a simple 14 Mcs. Hertz, running N./S., and is not likely to be replaced by a rotary beam or any other equally complex system. Listener reports, particularly on our report pad forms, are welcomed if they are properly made out and will be QSL'd 100 per cent. Please do not forget the reply coupon, though! F9BS may be QSL'd through the ISWL Bureau or direct to F9BS, 12 rue Crebillon, Vincennes (Seine).





International Short Wave League

—Monthly Notes

RADIOLYMPIA

OCTOBER 11th, 1947 will be remembered by many members for a long time. The League parties that visited the show proved to be a perfect example of organised chaos! The whole trouble was that no party could hold together its members for more than about five minutes at a time—some got deflected from their group by the crowds, some dropped voluntarily by the wayside and others tacked on to different groups. In the end we gave it up as a bad job and let things take their course! In actual fact this proved to be rather better and it was interesting to note the constant changes in personnel! It can be said that we all had a good time, even the Uxbridge Chapter, who were very pathetically searching for a missing member for quite a time! They should have taken a tip from the Portsmouth gang, who were wandering around in at least two groups all day—hope you all caught your train OK! Another erratic body was that from the N.W. London Chapter, particularly the section lead by John Lewis about whose activities the least said the better! Eventually, however, we did not worry about whose group we came from and just formed and reformed according to the urge of the moment. Judging from the comments of representatives on the stands, the I.S.W.L. left a decided mark on the exhibition, and the B.B.C. certainly felt the impact when we peppered their "phone your queries" service with technical queries. We thought the most embarrassing question of "why does the Light Programme sometimes over-modulate?" was answered very slickly!

Many thanks to all those members who came along to the show and joined in the fun and we look forward to an even better turn-out next year.

ASTRO-PHYSICAL SECTION REPORT

This section of the I.S.W.L., under the secretaryship of P. J. Jooste, will make occasional reports on unusual solar and ionospheric phenomena and effects. Co-operation from members interested in this aspect of the hobby are invited to contact the section at 171 Ribblesdale Road, Streatham, London, S.W.16.

On the night of August 15th/16th, aurora reached the stage of a fine corona, centred, at midnight, at RA 326, Dec. 37 N. With a fine display of crimson streamers and bright flashings from between 005-0015, the

duration of the display was from 2115 August 15th to 0015 August 16th. The aurora was also observed at the Jodrell bank Experimental Station of the University of Manchester: Lat. 53 degrees 15 ft. N., Long. 2 degrees 15 ft. 11 in. W.

Radar echoes were observed on the 46 Mcs. equipment and to some extent on 72 Mcs. They started at 0010 on August 16th simultaneously with the appearance of a blue-grey auroral cloud near the zenith at the upper tip of one of the streamers which were at the time covering the northern sky. The streamers receded from the zenith, at the same time the cloud was growing in intensity till, at 0035, it broke into nine striations and rapidly faded. The radio echoes vanished at the same time as the striations appeared.

The measured range of the echoes was 480 kilometres. In order to produce the observed echoes, the electron density in the auroral cloud must have been some 100 times greater than the normal electron density during the night at these altitudes.

POINTERS FOR THE S.W. REPORTER (2: The Broadcast Station)

THE reporting of broadcasting stations differs in many respects to that of amateur stations. Certain general "golden rules" already mentioned in part one of this series should be adhered to, and should be studied carefully by the broadcast station reporter. Various minor complications, however, come into the picture where the BC station is concerned.

Whereas it is usually a waste of time to report R9 local amateurs, this does not apply to broadcasters, necessarily. Many "local" stations will confirm any report merely to be able to enclose literature of a propaganda nature and station schedules, etc. We know quite definitely that a certain minority of stations often forego the formalities of checking the report for accuracy! This is, however, the exception rather than the rule, and so the reporter is urged to compile a report as comprehensive as possible.

The broadcaster is mainly interested in the "entertainment value" of the signals, that is to say they aim at "local station" reception. They want to know whether you just listen because the programmes originate from their particular part of the world, irrespective of readability, purely from the

novelty point of view, or because the signal is such that you can sit back and really enjoy the programmes in the manner that one does to the medium wave stations. Another factor of prime importance to the broadcaster is QRM. A perfectly modulated and strong signal can be rendered unreadable due to some heterodyne on the carrier. If QRM is experienced the reporter should state the station causing the QRM, the strength of the offending station, and at what times the QRM is experienced. The writer knows at least two instances whereby SWL's reports have induced powerful international broadcasters to shift frequency from a hot-bed of QRM into a clearer channel.

With the reception report some means of establishing identification must be given. It is by far more satisfactory to keep the actual report and the station check on separate sheets of paper. Also, any letter accompanying reports should be on separate paper. Nothing can be more annoying to a station than to receive a letter, check, and reception report all jumbled up on one sheet of paper! The actual check to allow for verification will depend upon the type of programme emitted. "Radio Australia" and "All India Radio" will not verify any report unless at least 15 minutes of programme is quoted. In very many cases this time must be suitably extended, especially when dealing with Oriental and Latin American stations. For instance, if the station is radiating a news bulletin in some foreign language, or a straight talk, there is nothing tangible that will provide a check. Musical items, also, may not be recognised and here again it is difficult to supply proof of reception. Again, if a station features one or two popular or classical tunes that are easily recognised, then this is ideal for proving reception. In brief try to imagine that you are at the other end and must check the station log against the report submitted.

Some Latin American stations will only verify reports submitted in their mother tongue. To non-linguists this presents a real problem, but luckily the instances are comparatively rare. We have in hand an idea that will materially assist reporters when sending to Latin stations, and this will be published in due course.

A factor often overlooked is that very many short wave stations are designed for local coverage only and are not particularly interested in long distance reports. A.F.N. for instance is solely for the American forces in Germany and will not verify reception reports. Some of the Australian short wave outlets are relays of

the ABC Home Service and are only intended for local listeners. The same applies to many of the Russian stations, Latin Americans, etc. However, if the listener concentrates on the weaker stations most of them will appreciate a good reception report and will oblige with a QSL.

To conclude, we urge all BC fans to make use of the League QSL Bureau. This is the only one in the world to cater for the BC listener, and its advantages are too obvious to mention here. In most cases there is no point in rushing off report by air mail, though in isolated cases this does give advantages. Normally, the broadcaster will answer reports in batches. In the past some stations seem to have replied to reporters approximately once a year! The writer has had to wait nearly 2½ years before now for a verie. Some stations appear to verify for a time and then suddenly cease, only to start issuing QSL's again. The reason for this is that when the station passes into new owner's hands (this is quite frequent in Latin America) a different policy may be set down. It is one of those things that makes the hobby so interesting!

I.S.W.L. CHAPTERS

Here is a complete list of all League Chapters already formed and those in the process of formation, together with the appropriate QRA's to write to for information. We urge all members in the districts mentioned to do their utmost to support their local groups.

Birmingham: G. Moore, 42 Fern Road, Erdington.

Chelmsford and Romford: W. C. Mills, 3 Elm Cottages, School Lane, Broomfield, Chelmsford.

Darlington: M. Harrison, 36 Southend Avenue, Darlington.

London (S.): W. A. Martin, 21 Brixton Hill, London, S.W.2.

London (N.W.): J. Lewis, 484 Finchley Road, London, N.W.11.

London (W.): c/o H.Q.

Manchester: E. D. Hebron, 9 Argyle Road, Manchester, 14.

Malvern and Worcester: R. G. Barrell, 4 Bromyard Road, Tenbury Wells.

Oldham: G2FAY, 62 Chestnut Street, Chadderton.

Portsmouth: R. Masters, 62 Battenburg Avenue, North End.

Preston and Southport: C. Aspinall, "The Willows," Fernor Road, Tarleton.

Plymouth: G. J. W. Harvey, 5 Garfield Terrace, Stoke.

Rochdale: J. W. Hughes, 40 King Street South, Rochdale.

Uxbridge: L. M. Harris, 93 Long Lane, Hillingdon.

Walsall (affiliated club): C. G. Morrison, 61b Raleigh Street, Walsall.

York: S. Beharrell, 13 Ash Street, Poppleton Road.

If there is no Chapter in your district, please contact your local representative.

Component Review

The Solariscope

●

An interesting and extremely useful radio accessory—the Fisk Solariscope, invention of Sir Ernest Fisk, Managing Director of Electric and Musical Industries Limited—was shown at Radiolympia for the first time.

●

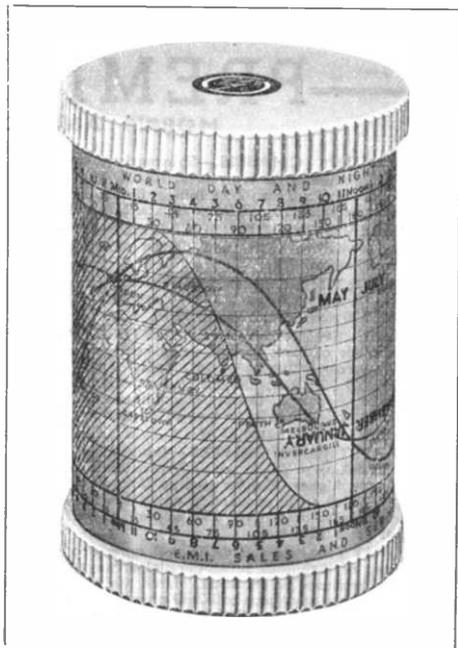
Of interest to all users of Short Wave Communications, the Fisk Solariscope is a novel instrument designed to show clearly and easily the areas of daylight and darkness over the earth at all hours in each month of the year.

It is particularly useful for short wave radio communication because it shows at a glance whether daylight or darkness waves should be used for direct communication between any two points.

As an aid to the short wave enthusiast, the Fisk Solariscope can make all the difference between complete success and indifferent results. The varying conditions of short wave reception are due primarily to solar influences and, by using the Solariscope, hours of unnecessary searching on unsuitable frequencies at a given time and for any particular country it is desired to hear, can be avoided.

The Solariscope is also useful for teaching solar and geographical relationships throughout the year and it gives at a glance the relative times, or hourly time differences between any two places on earth. It can also be used to ascertain distance,

The instrument consists essentially of a double Mercator projection map, on which the land boundaries are repeated, wound in cylindrical form round a rigid former. Over this is fitted one of a series of four transparent shadow charts—depending upon the month of the year—supplied with the instrument. The three not in use may be kept inside the instrument, which is fitted with cream bakelite caps one of which is removable. By rotating the transparent shadow graph until the appropriate time-line is over the receiver location, the areas of daylight and darkness may be instantly ascertained, together with the relative Mean Times of places throughout the world.



The Fisk Solariscope is supplied with a comprehensive instruction book which includes a gazetteer of the principal short wave broadcasting stations in the world and a table of waveband allocations with notes as to suitability for different times of day.

The price is one guinea, post free, from the Amateur Radio Division, E.M.I. Sales & Service Ltd., Hayes, Middlesex, or through local dealers.

I.S.W.L. RENEWALS

Subscription reminders to I.S.W.L. members are being sent out and many are renewing promptly. Apart from those who have already renewed their subscription, members with numbers between 1 and 395 are due for renewal this month, whilst those with numbers between 396 and 442 are due next month.

Will the above mentioned members please do their best to send along their subscriptions promptly. Renewals are at the enrolment rate of one shilling. We have been much gratified by the good wishes and encouraging remarks and comments made by members when sending along their subs. and the unanimous opinion is that everyone is well pleased with the progress to date.

PREMIER RADIO

MORRIS AND CO. (RADIO), LTD.

ALUMINIUM CHASSIS.—Substantially made of bright aluminium, with four sides, 10in. x 8in. x 2½in., 7/-; 12in. x 9in. x 2½in., 7/9; 16in. x 8in. x 2½in., 8/6; 20in. x 8in. x 2½in., 10/6; 22in. x 10in. x 2½in., 13/6.

SUPERSENSITIVE DOUBLE HEADPHONES.—Balanced armature with reed driven aluminium diaphragm. 60 ohms, 8/6.

ELECTROLYTIC CONDENSERS.—Miniature meta can type, 8 mfd. 500 v.v., 3/-; 16 mfd. 500 v.v., 4/-; 8x8 mfd. 500 v.v., 6/6; 50 mfd. 12 v., 1/9.

2-VALVE, SHORT WAVE BATTERY KIT.—A complete Kit of Parts for a 2-valve receiver, covering 15-600 metres, including valves, coils, drilled chassis, H.T. and L.T. dry batteries, to last approximately 6 to 12 months. A pair of Double Headphones and full instructions. Price £3/10/-. An Extra Coil can be supplied, covering 600-1900 metres at 4/-.

ROTARY TRANSFORMERS.—Input 12 v., output 180 v. 30 mA., 4 v. 2-3 A. with 19 volts input, output is 50 per cent. higher. May be used on D.C. mains as L.T. Charger. With small conversion coil operate as D.C. Motor. Original cost over £5. Employ powerful ring magnet. Price 10/- each.

OUTPUT TRANSFORMERS.—A super production. By means of ingenious series-parallel arrangement, all windings are used at all times. Match any tube, single or push-pull to any voice coil 2-30 ohms. 7 watts, 22/6; 15 watts, 30/-; 30 watts, 49/6; 60 watts, 59/6.

BATTERY CHARGER KITS.—All incorporate metal rectifiers, input 200-250 v. A.C. 40/100 cycles.

To charge 2 v. accumulator at ½ amp. ...	15/-
.. 6 v. .. 1 amp. ...	17/6
.. 12 v. .. 1 amp. ...	22/6
.. 6 or 12 v. .. 4 amp.

Complete with Variable resistance and meter £3/15/-
To charge 6 or 12 v. Accumulator at 6 amps.
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H.T. ELIMINATOR AND TRICKLE CHARGER KIT.—Consists of a complete kit of parts to construct an H.T. Eliminator with an output of 120 v. at 20 mA. and provision for trickle charging a 2 v. accumulator. Two metal rectifiers are employed. With circuit, price 30/-.

RADIOGRAM CABINETS.—Dignified appearance and good workmanship. Size 34½in. high, 19 in. deep, 36in. wide. Send for illustration. Cabinet only, £26. With Electric Motor and Pick-up, £32/16/-.

ROTARY TRANSFORMERS.—Size only 7in. by 4½in. diameter. With 6 v. input; output 200 v. 50 mA. With 12 v. input; output 400 v. 80 mA. Price 20/-

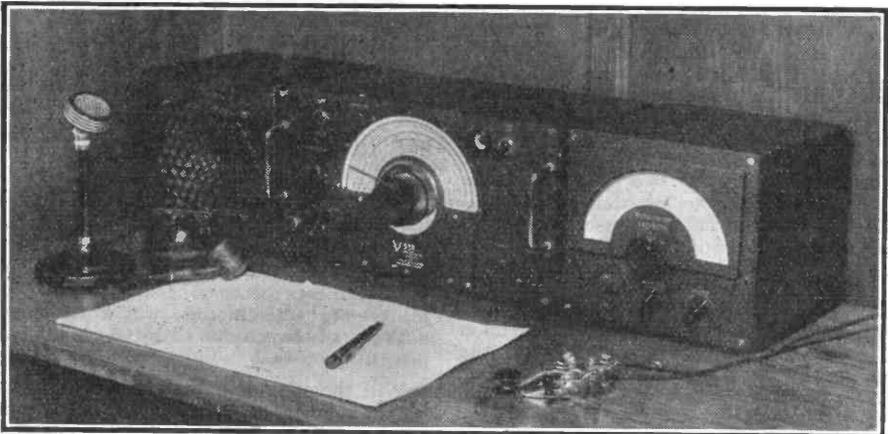
ROTARY TRANSFORMERS.—With 12 v. input; output 600 v. 250 mA. With 6 v. input; output 280 v. 250 mA., Price £3.

OUR 1947 LIST IS NOW AVAILABLE. All enquiries must be accompanied by a 2½d. stamp.

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COMMUNICATIONS RECEIVERS

The famous ex-Govt. 3/11 built for the resistance movements. 4 valve superhet covering 3-16 Mcs. in 3 bands. Complete with valves, headphones, circuit details and cushioned steel transit case. Less power supply (100v H.T., 6v L.T. 4½v G.B.) **BRAND NEW 79/6** (carriage, etc. 3/).

T1154 TRANSMITTER KITS

As advertised last month. The complete replacement **RIGHT HAND** and **LEFT HAND** panels of the T1154 Tx. Only requires the addition of the valve section to complete the Transmitter, and as we supply full circuit details this can be easily done. Build your own transmitter covering 10-5.5 Mcs., 5.5-3 Mcs., 500-200 kcs. These units are **BRAND NEW IN MAKERS' CARTONS AS SUPPLIED TO THE R.A.F. THE PAIR ONLY 49/-** (carriage 6/6) or either unit at **24/6** (carriage 3/6).

WAVEMETERS CLASS D No. 1 Mk. 11

Covers 1.9-8 Mcs. with check frequencies up to 25 Mcs. Incorporates dual crystal 100/1000 kcs. ensuring 2 kcs. accuracy. Designed for 6v battery operation, but is easily convertible for 6v A.C., details being supplied on request. Complete with 2 valves, 2 vibrators, clips, etc., in padded teak carrying case. **BRAND NEW. ONLY £6 15s.**, or a few only without spares at **85/-** (carriage 3/6).

10 VALVE EX-R.A.F. Tx/Rx UNITS

Used by the R.A.F. in conjunction with radar, and complete with 10 valves, Rotary Transformer, smoothing, etc. **ONLY 39/6** (carriage 3/). C.W.O. please. S.A.E. brings current lists

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**SHORT WAVE (HULL)
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G5GX.**

RECEIVER KITS

2 Valve O.V.I. Bandsread tuning, plug in coils, 9-200 metres, Pentode output. Price, less cabinet and batteries **£5 10s.**

4 Valve 1. (Tuned) V2 Bandsread tuning 9-200 metres, Black crackle steel cabinet. Price, less batteries and speaker **£12 12s.**

TRANSMITTER KITS

10 watt C.W. Tx with Xtal and coils for 160-80-40-20, **£11 0s.**

25/50 watt C.W. Tx with standard panel, meter, drilled chassis, Xtal and coil for one band, all components and valves, **£19 10s.**

Further details supplied on request.

**SHORT WAVE (HULL)
RADIO**

30/32, PRINCE'S AVENUE

'Phone 7168

**SENSITIVITY
10,000 OHMS
PER VOLT**

Designed to meet the demands of Service and Plant Engineers, also Radio Amateurs. **21 Ranges:—Volts: A.C./D.C. 10, 25, 100, 250, 500 & 1,000.**

Microamps:— A.C./D.C. 0 — 100.

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Ohms: 0/10,000 and 0/1 Meg.

All voltage measurements A.C. and D.C. are at **10,000 ohms per volt**, to comply with the requirements of modern radio and electronic equipment, where tests have often to be made across high impedance circuits. **Price: £10. 10s.**

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Address all enquiries to Dept. K Electric Works, Winchester St., Acton, W.3. Telephone: Acorn 4651/4



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PRIVATE

SALE. Radiovision 5 and 10 metre Converter, New. 415 or offers. G. Bird, 118 Woodpecker Rd., New Cross, S.E.14.

MCR1 with power pack, phones, less 2 valves, battery lead. 45. —Box 1024.

WANTED HRO Coils 3.5-30 Mcs. Perfect condition only. BM/XBX, London, W.C.1.

SALE—Q Max. 104. S.W. "All dry" 4 valve, 11-250 metres. Owner QRT, Bargain, 48 or offers. A. Seymour, 16 Violet Rd., London, E.17.

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H. FRANKS, 58, New Oxford Street, W.C.1. Tel.: Mus. 9594. Sangamo synchronous motors, self-starting, 200-250v AC 50 cy. consumption 2 1/2 watts, size 2 1/2 in. x 2 in., geared 1 rev 60 mins., can be reset to zero by friction drive from front or back shaft, 1/2 in. x 1/10 in. to run clockwise, ideal movements for making electric clocks, time switches, etc., nickel-plated finish, price 22/6 ea.; 12 to 1 dial trains to fit above spindle, 2/6 per set extra; Chamberlain and Hookham synchronous motors with enclosed rotor, similar specification as Sangamo, consumption 3 watts, price 27/6 ea., complete with 12 to 1 dial train. F/3.5 lenses, 2 inch focus, by well-known makers, ex-Govt. stock, as new, fitted in oxidised mount, flange, etc., ideal for 35mm enlargers, cameras, etc.; price 27/6 each, postage 6d. To callers only, AC main-driven oscillators, type 37, 22 to 70 Mcs., complete with 6 valves, 807 valve in output stage and milliammeter in output circuit; receiving units, type 69; C.R. power units, type 526; performance meters, type 53874; AC mains wavemeters, type W1252; battery wavemeters, type W1095; receivers, type 1147; AC mains power packs for 1147; receivers 3132; indicator modulators, auto transformers; receivers, type 76A; battery driven amplifiers, large assortments of volt. amp and milliammeters, neutralizing units with RF meters, metal rectifiers, relays, vibrator packs, inter-com sets, signal generators DC to AC converters; Brown's A type headphones; E.M.I. cathode-ray tubes; 6-valve receivers incorporating Glayton unit; AC power units suitable for 1155 receiver; a quantity of Lorenz transmitting gear, etc.

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IMPORTANT. Many radio bargains of interest to constructors, etc. Send S.A.E. for list. Kemp, 18 Penrith Road, Ilford, Essex.

QSL's and G.P.O. approved log books, samples free, from Atkinson Bros., Printers, Elland.

AMATEUR Radio Specialists. Send 2d. stamp for our Monthly Bulletin. Hallcrafters. National, Eddystone, Labgear, Berrys, Q.Max, Radiomart, RX, TX parts, meters, etc. Johnsons (Radio), Macclesfield. Dept. C.

S.W. TUNING, 100, 120, 160 pFs. ceramic 3/- each. Air Trimmers with lock nut 35 pF 1/-. New Valves EF50 7/6, EF54 10/-. EC52 10/-. others from 3/6. Ceramic EF50 valveholders 6d., 5/- doz. Complete list 2d. Carters, 67 Bell Lane, Marston Green, Birmingham.

"These You Can Hear." A quality production, on art paper throughout, and lavishly illustrated, for the beginner to Broadcast Station listening. Price 2/3 post-paid, or 2/- from local booksellers. Amalgamated Short Wave Press Ltd., 57 Maida Vale, London, W.9.

DON'T MISS this Bargain Offer of R.A.F. MORSE OSCILLATORS Valve Buzzers, Type 2

A 2 valve battery-operated morse oscillator, ready for instant use without adaption. 15/- only. (Carriage and packing 2/6). Incorporates note selector control, volume control, phone, key and interference jacks. Size 9 in. x 8 in. x 8 1/2 in. Power supply required, HT 60v., GB 4v., LT 2v. (Provision for internal fitting). Price complete with 2 valves (PM11F and PM2A) 27/-. (Carriage and packing 2/6).

Government Surplus Stock, in brand new condition. Complete kit consisting of oscillator, valves, heavy duty morse key and pair of S. G. Brown phones for 32/-. plus carriage and packing. Wooden transit cases 2/6 extra.

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One Valve Kit, Model "C" - Price 20/-
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These kits are complete with all components, accessories, and full instructions. Before ordering send stamped addressed envelope for descriptive catalogue.

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These Transformers are the direct outcome of many years' experience in the design and building of this type of component. Specifications are extremely accurate, being measured and not calculated. Tropicalized finish, terminal panels.

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All primaries wound 0.210-230-250v 50 cycles

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| R.106 Secondary 250-0-250v. 60 mA.
0.4-5v. 2.5 amps.
0.4-6.3v. 4 amps. | 41/3 | R.125 Secondary 350-0-350v. 180 mA.
0.4-5v. 3 amps.
0.4-6.3v. 3 amps.
0.4-6.3v. 4 amps. | 82/6 |
| R.107 Secondary 250-0-250v. 80 mA.
0.4-5v. 2.5 amps.
0.4-6.3v. 5 amps. | 43/6 | R.127 Secondary 325-0-325v. 100 mA.
0.4-5v. 3 amps.
0.4-6.3v. 3 amps.
2.0-2v. 2 amps. | 69/4 |
| R.108 Secondary 250-0-250v. 100 mA.
0.4-5v. 2.5 amps.
0.4-6.3v. 4 amps. | 47/10 | R.130 Secondary 400-350-0-350-400v. 180 mA.
0.4-5v. 3 amps.
0.4-6.3v. 4 amps.
0.4-6.3v. 3 amps. | 90/9 |
| R.109 Secondary 250-0-250v. 120 mA.
0.4-5v. 2.5 mA.
0.4-6.3v. 5 amps. | 54/6 | R.132 Secondary 400-350-0-350-400v. 180 mA.
0.4-5v. 3 amps.
0.4-6.3v. 3 amps.
2.0-2v. 1 amp.
2.0-2v. 1 amp. | 93/6 |
| R.111 Secondary 350-0-350v. 60 mA.
0.4-6.3v. 4 amps.
0.4-5v. 2.5 amps.
Secondary 350-0-350v. 80 mA.
0.4-5v. 2.5 amps.
0.4-6.3v. 4 amps. | 46/9
49/- | R.133 Secondary 400-300-0-300-400v. 180 mA.
0.4-5v. 3 amps.
0.4-5v. 3 amps.
3.15-2.0-2-3.15v. 3 amps.
3.15-2.0-2-3.15v. 3 amps. | 97/5 |
| R.116 Secondary 350-0-350v. 100mA.
0.4-5v. 2.5 amps.
0.4-6.3v. 5 amps. | 57/9 | R.135 Secondary 400-350-0-350-400v. 250 mA.
0.4-5v. 3.5 amps.
0.4-6.3v. 4 amps.
0.4-6.3v. 2 amps. | 115/6 |
| R.121 Secondary 350-0-350v. 120 mA.
0.4-5v. 2.5 amps.
0.4-6.3v. 3 amps.
0.4-6.3v. 3 amps. | 67/8 | R.137 Secondary 450-400-0-400-450v. 180 mA.
0.4-6.3v. 3 amps.
2.0-2v. 2 amps.
2.0-2v. 2 amps. | 101/9 |
| R.121A Secondary 350-0-350v. 120 mA.
0.4-5v. 2.5 amps.
3.15-2.0-2-3.15v. 3 amps.
3.15-2.0-2-3.15v. 3 amps. | 69/10 | | |
| R.123 Secondary 350-0-350v. 180 mA.
0.4-5v. 3 amps.
3.15-2.0-2-3.15v. 3 amps.
3.15-2.0-2-3.15v. 3 amps. | 84/2 | | |

HIGH FIDELITY OUTPUT TRANSFORMERS

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| OP.702 Eight watt transformer for single triode or pentode valve. Maximum primary DC current 55 mA.
Primary 0-2500-3750-5500-8000 ohms
Secondary 0-2.5-5-7.5-15 ohms | 41/3 | OP.724 Sixty watt Universal push-pull transformer. Maximum continuous primary current 250 mA. each side.
Primary 6000-4500-3500-2500 ohms
Centre Tapped
Secondary 0-2.5-5-7.5-15-30 ohms | 86/4 |
| OP.705 Ten watt Universal push-pull transformer
Maximum continuous primary current 70 mA. each side.
Primary 10000-8000-6000-4000 ohms.
Centre tapped
Secondary 0-2.5-5-7.5-15-30 ohms | 49/6 | OP.750 Special High Fidelity Transformer for single PX4 or PX25 Class Valve
Primary 3800 ohms
Secondary 0-2.5-5-7.5-15 ohms. | 40/2 |
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Primary 8000-6000-4000 ohms
Centre tapped
Secondary 0-2.5-5-7.5-15-30 ohms | 64/4 | OP.754 Special High Fidelity Transformer for two PX4 Class Valve in push-pull
Primary 6000 ohms
Secondary 0-2.5-5-7.5-15 ohms | 46/9 |
| | | OP.756 Special High Fidelity Transformer for two PX25 Class Valves in push-pull
Primary 6000 ohms
Secondary 0-2.5-5-7.5-15 ohms | 49/6 |

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| AUT. 610 Voltage change (step-up or step-down) 50 cycles. 0-110-115v 30 watts | 32/6 | AUT. 627 450 watts | 77/- |
| AUT. 613 60 watts | 38/6 | AUT. 631 600 watts | 104/6 |
| AUT. 617 100 watts | 42/11 | AUT. 638 1,200 watts | 170/6 |
| AUT. 621 250 watts | 57/9 | AUT. 673 600 watts | 102/4 |
| AUT. 662 Voltage change (step-up or step-down) 50 cycles. 0-170-190-210-230-250v. 100 watts | 45/2 | AUT. 677 1,200 watts | 162/10 |
| AUT. 666 250 watts | 59/5 | | |

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Type WA10771 Resistance and Continuity Test Set

An exact Instrument, ready for immediate use, circuit supplied. 20-0-20 M.C. Galvanometer, decade switches, precision resistances, etc. Range of 210~ in 1~ steps, can be extended data provided. In Hardwood case 16in. x 7½in. x 6½in. as illustrated.

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BATTERY AMPLIFIER

2 Valve

2 Stage

A1134 to work with T1154 and R1155 or T1082 and R1083 or TR9H as preamp or intercom unit. Valves QP21 and 210LF, Mic.Q.P.P. output and input Trans. resistors, condensers, switches, etc., complete with Battery plugs and Circuit, in metal cabinet 7in. x 5in. x 4½in. approx.

OUR PRICE ONLY **13/6** each

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MOVING COIL METERS

2in. Scale, 2½in. flange.

Type 10/A13012, 2 reading scale, 5 mA. f.s.d. res. 10 ohms Battery/Lines.

Our Price Only **5/6** each, post free

Type 10A/8481, Thermo-ammeter, 0-0.5 Amps. Res. 650 ohms.

Our Price Only **7/6** each, post free

CIRCUITS for: MCR1 Rx, 2/9; R1116 Rx, 2/3; T.1154 Tx, 2/3; R1124 Rx, R1125 Rx, and Power Unit, 2/3; R.1224 Rx, 1/3; R.1155 Rx, 1/3; T.1134 Amp., 1/-; R.1155 AC Power Unit 6d. All available post free.

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CATHODE RAY INDICATOR and REPEATER AMPLIFIER UNIT

CRT Indicator AN/APA1 Aircraft Radar Equipment, 3 B.P.1 in adjustable case, with calibrated glare-proof screen. Overall length 24in., base 12in. black crackle finish.

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