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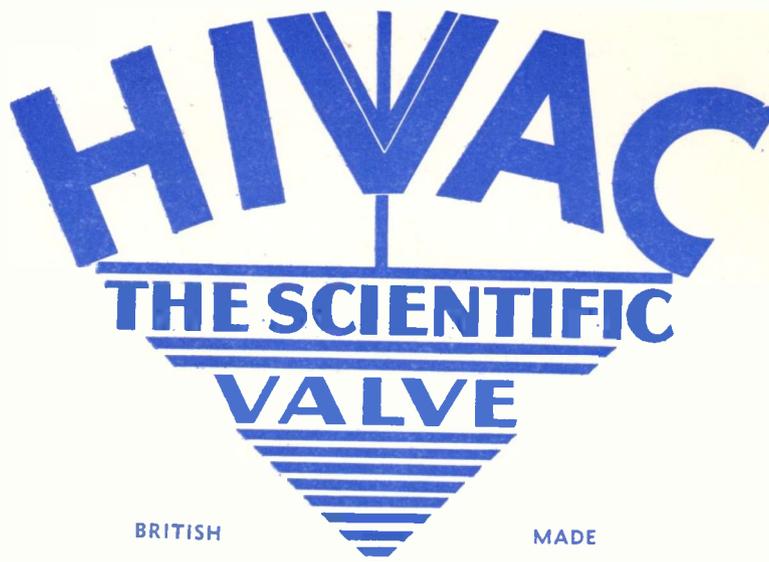
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SHORT-WAVE MAGAZINE



No. 11
JANUARY,
1938

Photo (by courtesy of General Electric Co.) shows W2XAD's exciter unit (left) and the final amplifier. More photos and story in pages 4 and 5.



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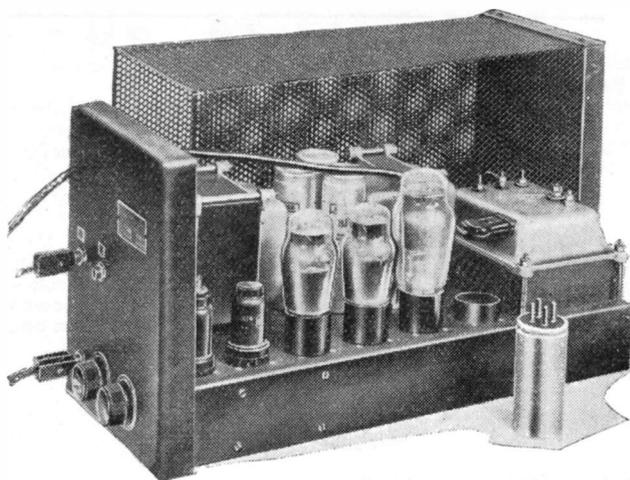
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readers' bargains on page 8. If you have gear for disposal why not make our columns a medium for the information!

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DX!

Every Short Wave Fan should join the B.S.W.L.—the leading British organisation for the DX enthusiast. We produce our own "Review": run our own QSL Distributing Bureau; issue "Heard all Continents" Certificates and can honestly boast of running one of the friendliest DX societies in the World. There are many advantages of joining such a society. For further particulars write to:—The Secretary, British Short Wave League, Ridgewell Halstead, Essex.

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THE SHORT-WAVE MAGAZINE

Vol. 1

JANUARY 1938

No. 11

Editor: BASIL WARDMAN (G5GQ)

Editorial Asst.: S. W. CLARK (2AMW)

Advertisement Manager: C. T. MILDENHALL

ONE OF THE most noticeable differences between medium and short-wave broadcasting is the almost universal use of the English language on the latter. Turning from Moscow to Rome, Berlin to Tokio, we find that a large proportion of the announcements are in our own language, directed to our own Empire. Recently the trend has been not only for the language of the originating country, and English to be used, but also a number of other languages. Propaganda is no doubt one of the main reasons

This month the British Broadcasting Corporation is starting a news service in Arabic. From the political angle it may be an excellent thing, but we are not discussing foreign politics, so we make no comment.

We suggest, however, that the B.B.C., apart from directing programmes to the Empire, considers the question of directing them to those distant countries which are our best customers. From every large export country, save England, they can receive

ADVERTISE ENGLAND

for this, but an important factor, and one which is apt to be overlooked is the reaction on the listener. Political propaganda of the normal type may not interest him, but a programme announced in a language which he does not understand bores him. He tunes in another station. It may not be broadcasting propaganda, but it is announcing in his own language. He can understand and enjoy the programmes, so he continues to listen.

Gradually the feeling develops that the country from which the programme originates is friendly to him. When he wishes to purchase foreign products, he automatically turns to those of the country which has entertained him.

Had this suggestion been put forward when Hollywood commenced film production, it would have been ridiculed; now the effect of American films on their overseas sales is well known.

programmes in their own language. We, to whom they are most valuable, ignore them.

Admittedly the service would be advertising, but it would be advertising England, not particular wares. Abroad can be seen posters advertising our country; why not boost it over our short-wave stations?

* * * * *

The Editor and staff of THE SHORT-WAVE MAGAZINE, in wishing their readers and other friends a happy and prosperous new year, also tender thanks for the encouragement proffered during the past year. So many letters of valued testimony have been received that we are encouraged to put forward still greater efforts to improve upon that standard already attained.

Contributions for publication in our editorial pages will be given consideration and payment will be made for matter used. Only manuscript accompanied by a stamped, addressed envelope will be returned. Whilst we are willing to advise on suggested articles no guarantee of acceptance can be given.

The publisher does not necessarily agree with the views expressed by all correspondents and contributors, the aim being to open the columns to every phase of opinion.

Annual subscription—Inland, 8s.; Abroad, 10s. Post paid. Published on the first Wednesday of each month at 84/86 Tabernacle Street, London, E.C.2. 'Phone: Clerkenwell 6230.

Two Favourites—

W2XAD and W2XAF

THE MOST POPULAR short-wave stations in the world, and goal of all short-wave listeners, are the twin stations W2XAD and W2XAF.

Located in Schenectady, 138 miles from New York City, they bring to British listeners the programmes of the New World, far removed from the arena of European propaganda broadcasts they put the entire resources of American entertainment at the disposal of European listeners.

Announced as "International short-wave broadcast stations," they are primarily experimental (as denoted by the "X" in their call signs) and at Schenectady their owners—the General Electric Company—develop short-wave equipment while maintaining a world-wide entertainment service.

● W2XAD

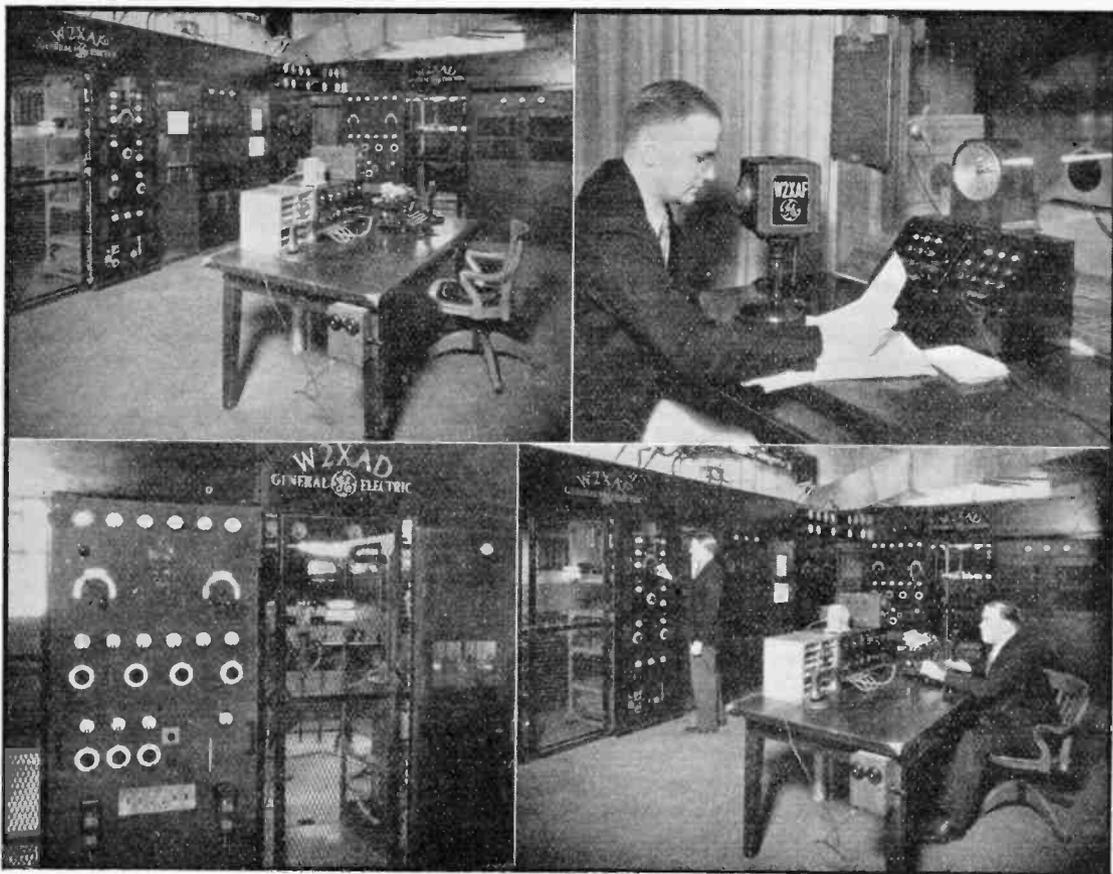
Foremost in popularity is W2XAD, which operates on 15,330 kc., or 19.56 metres, and which now puts a signal into England comparable with that of a local broadcast station.

This station was placed in service eleven years ago, in July 1926, and using a vertical doublet aerial soon became one of the most prominent short-wave broadcasters in the world.

The addition of a beam aerial to the station increased its strength enormously, until now it is one of the best received stations in the world.

Judging from photographs of European stations it might be expected that W2XAD and W2XAF would be impressive looking, housed in large buildings. But, as can be seen from the photographs we publish, the two transmitters are installed in a room little larger than many of our studios!

The transmitter used for W2XAD is of the crystal-controlled type, using low-level class B modulation on one of the sub-amplifiers, and ending up with a class B linear r.f. amplifier which, with an input of 55 kilowatts, puts 18 kilowatts into the aerial, an efficiency of 33 per cent, very high for this type of amplifier. Three separate aeriels are used, one omni-directional (the vertical doublet) and the other two being beams of the Alexanderson type, focussed



on London and Buenos Aires respectively. Use of these beam aerials gives an effective increase of power from 18 kw. to 180 kw.

With the European beam, the station is on daily from 4 p.m. to 11 p.m., when it changes over to the South American beam until closing down at 2 a.m.

● W2XAF

W2XAF, the elder of the two stations, has been in constant operation since June, 1925. The transmitter is similar to that of W2XAD, but an output of 25 kilowatts with 80 kilowatts input is obtained on 9,530 kc. (31.48 metres).

Two aerials are in use; an omni-directional horizontal doublet, used from 9 p.m. to 11 p.m., and a beam centred on Buenos Aires, from 11 p.m. to 5 a.m. This beam also gives an effective increase of aerial power from 25 to 250 kw.

Amateurs will be interested in the photo of the "works" of W2XAD. In the exciter unit (on the left in our cover photo) can be seen the plug-in type coils of the exciter output. This is coupled to the final amplifier via a concentric tube feeder. At the top of the exciter stage can be seen the series condensers in the feeder line, while the inter-stage screening is a lesson to us all.

On the right, in the final amplifier stage, are two water-cooled "bottles" in push-pull, the cooling water leads being visible in the centre right.

In the general view the cathode ray tube monitor can be seen on the operating desk, while every meter can be seen from the operating control position.

Seated in front of a condenser microphone is E. S. Darlington, best known voice in the world, in charge at Schenectady; he is always glad to receive reports from European listeners, which should be addressed to: E. S. Darlington, General Electric Company, 1, River Road, Schenectady, N.Y.

LEAGUE OF NATIONS

January Broadcasts

The Information Section of the League Secretariat will in the near future make use of extended broadcasts and transmission times will be changed. The present schedule (each Friday) will continue, that for January being:

Time G.M.T.	Wavelength	Language	Area served
	HBO		
19.00	26.31 metres	English	British Isles
19.15	11.40 mcs.	"	South Africa
	HBL		
19.30	32.10 metres	French	Omni-directional
19.45	9.34 mcs.	"	"
	HBL		
24.30	32.10 metres	English	Canada
24.45	9.34 mcs.	"	United States
	HBL		
01.00	32.10 metres	Spanish	South America
01.15	9.34 mcs.	"	Central America

An additional transmission is given each Monday morning for Australia and New Zealand at hours which vary according to the time of year. During

January these transmissions will be given at 08.00 G.M.T. on HBO, 26.32 metres, and at 08.30 G.M.T. on HBJ, 20.64 metres.

The subjects of the talks each week are chosen by the Information Section of the League Secretariat, and they cover the activities of the League from day to day as well as the outstanding political events which concern the League of Nations. From time to time the statesmen or delegates taking part in the League's work come themselves to the microphone to talk about their tasks.

Reports and comments on the broadcasts from Radio-Nations are always welcomed by the Secretariat.

One Sunday Afternoon

Short Story

"THIS IS G5XW—xylophone Washington—calling test." Quite an ordinary call, to be heard any Sunday. The usual two or three answers were anticipated with perhaps a feeling of tiredness after a day on "forty"—it can make one so! Especially if the XYL calls TEA—likely, as the time is 17.10.

"GM6LS calling G5XW" comes back and XW intends to work him short and QRT. The London station is given QSA5 R8—the usual preliminary. Without further technical dope LS tells of his efforts to contact a London station and now wished to pass a message which he had received from G2RF of Liverpool.

That tired feeling soon disappeared when the story was told of land line breakdown between Liverpool and London, and that an urgent message must be delivered to Finchley. The ship *Annagher* had sunk off Belfast and all but one life saved. "Important that son of a member of the crew communicate with — at Liverpool, telephone —."

Was XW correct in handling this? LS had asked the same question of Liverpool, and as the latter has made assurance Finchley police station was 'phoned. Here the officer in charge suggested the thing might be a joke. A "wireless listener" had called into another police station after hearing the QSO and message. However, the message would be dealt with immediately and at 18.05 a telephone call informed the London station that the message was through to Liverpool.

Conditions (Dec. 12) had prevented the Liverpool station working London; he therefore used a Scottish transmitter in the hope that GM would contact G.

Not so thrilling as our American friends' flood traffic, but all the same, you never know!

Is this the largest QSL card?

Reading through Bob Everard's list of W6 QSL's I see he mentions the size of the largest card he has. I think I can beat this: I have one from W6CQI measuring 14 in. x 5 in.—J. KAVANAGH, 63, Dawlish Avenue, Leeds, 9.

If you have a query

you would like answered sent it to "The Short-Wave Magazine," 84-86 Tabernacle Street, London, E.C.2, with a stamped addressed envelope and the coupon on page 40.

LISTENERS' DX CORNER

By The DX Scribe

DECEMBER HAS given us more weather variety than any other month this year. Snow and ice, fog and rain, bitter cold followed by almost summer warmth. Inconsistent weather, but consistently bad dx conditions.

So first of all we will have a look at some of the information brought to light by the logs of listeners who agreed to listen to definite stations.

Denis and Kenneth Bartlett (The Bartlett Weather Service) are running these tests, and they put forward an extremely interesting theory.

Take a look at an official meteorological chart (you will find this in most of the daily papers). On these charts you will see curving lines representing equal barometric pressure on all positions along the lines. These lines are also drawn round centres marked "High" and "Low." Usually round centres of low pressure there are greater fluctuations of the barometer, shown by more lines.

The theory depends upon how straight the lines of pressure are between the sender and the receiver. For instance: for good reception between America and this country the lines should be either few or running across the chart from west to east, i.e., left to right. If the lines are north to south, i.e., running from the top to bottom of the chart, and particularly if a great many lines and close together poor reception will be the result, probably a complete fade-out. Should the lines appear fairly straight, west to east half-way over the Atlantic, and in the other half be north to south, the reception is likely to have deep or rapid fading.

Thanks to all who have co-operated by listening. These tests are of vital use to all of us, so please do your bit towards their success. All you have to do is to listen to one station which you select, note its strength from night to night, and write the dope down on a log sheet. Logs sheets are supplied free on application to THE SHORT-WAVE MAGAZINE.

● Aerials

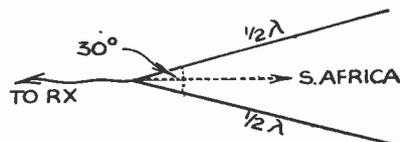
I often wonder why so few people try experimenting with their aerials. So many erect an aerial, get W2XAD and East Coast Yanks well, and then grumble because they can't hear other parts. That an aerial is good for East Coast Yanks is no reason why it should be good for the Pacific Coast ones, as a glance at an azimuthal map or globe will show.

Tales of American hams using rhombics with 350-foot sides are apt to be discouraging when space is limited, but W. E. DAVEY (Belfast) has taken the plunge and come forward with some fine dope on a simple beam which anyone can fix up.

He says: "I always found difficulty in receiving South Africans, so I fixed up a receiving beam directed on Johannesburg to see what it could do. It did.

"I used a 'Vee' beam, horizontal, indoors, about 32 feet from the ground, each side of the beam was a half wave, i.e. 33 feet. The angle between the two arms was barely 30 degrees, due to space. I tried it against the usual inverted 'L' and found

that with the beam I got an increase of one to one-and-a-half R points, and that QSB was somewhat less. I had hoped that the noise level would decrease but there was no appreciable difference, if anything it was worse with the beam. The beam cut about two R points off W's.



"It is interesting to note that ZU6P and FB8AH were R9 plus, and ZS6A almost R9!"

Thanks for the dope, O.M. I expect others will try out this scheme. If so let us know how you get on. It will be interesting to compare results.

● Logs

The general complaint is bad conditions. They are always bad this time of year but should start looking up about the second week of January. L. LEVITT (Leeds) has found 14 mc. very poor, many days quite blank, while others have been like 7 mc., i.e. local only. He has had a few lonesome signals from 18.00 to 20.00, one being ZU6P, fairly regular at R6 to R7. He says: "Bob Everard's QSL's must be a fine sight all pinned on the wall, but he doesn't take all the plums. I have W6NMI the first time he worked 20-metre 'phone, W5APM first G report on 20, W5GAR first G on ten, W5ZZF 16 watts, W7GEE 15 watts, W8LGO 35 watts, W9CKV 55 watts, first G, W9ZXL first G, VE4HU 10 watts, and ZE1JA, 36 watts."

How's that for a single valve job? I bet it makes many of the superhet gang jealous.

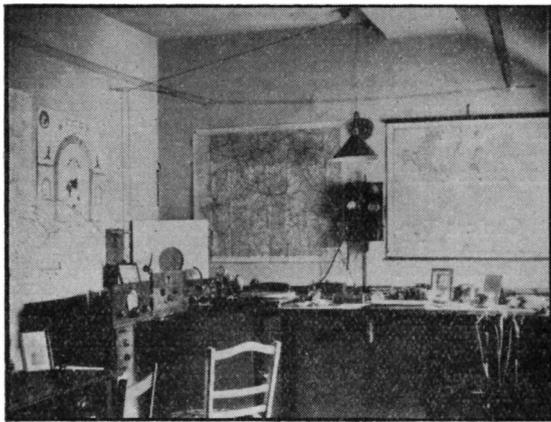
BOB EVERARD has spent most of his time on ten, and says that conditions there have not in general been up to the same time last year, but forecasts better things after January 1. On the other hand he has logged more foreign 'phones (outside U.S.A.) on 10 than during the same period last year. His best recently include first outside U.S.A. report to W6XFE (Police) and first G reports to W9ZNA, VE4ADV, and has received QSL's from W7CKZ, XZ2EZ (Burma), K7FBE, W9OKH, VE4ZK, 3AIB, AQ, AIW, ANF, IEA, VO1J, ZT6AL, and VK5TR.

From Dundalk, I.F.S., comes a letter from JOHN R. BOTHWELL complaining of the difficulty of obtaining components there. He cannot even get hold of coil formers! Another chance for British manufacturers. He says that short-wave reception is good in Ireland, proved by the logs sent by Irish listeners.

Also from Ireland is some more on the "group" effect. H. LUDLOW (Santry) heard four CO's within an hour on November 13, and five VP's from 19.00 to 21.00 on November 21st, when no W's were coming through. We seem to be proving this effect fairly conclusively. Congratulations to him on the neatest log we've seen.

L. G. BARRON (Whetstone, London) can show us how to do things cheaply; he constructed his set entirely from "junk" and uses valves which cost 9d. each at the Caledonian Market! He uses three separate aerials, an indoor 100-footer, a 35 feet south-west beam, and a 12-foot indoor aerial, beaming south-west. Who says that you have to have lots of valves to get dx?

T. W. Moss (Topsham, Devon) writes that there are few short-wave fans down his way. He himself is a Londoner by birth, and finds conditions jolly



T. W. Moss, 22 White Street, Topsham, Devon. "Junk" Converter/Ferranti Arcadia.

10 metre 'phone.

VP 9G, 9R, VE1 BR, DR, DT, LF, VE2 EW, KX, ANX, VE3ANF, VE5OT.

W3 AHS, AIR, AKE, AKX, ATC, AUC, BGP, BIW, BOP, BQ, BVE, BZI, CAD, CBT, CC, CHO, CHQ, COT, CRY, CWG, CYK, DID, DKZ, DLY, DPN, DQ, DSV, EDD, EET, EEV, EF, EGS, EHI, EHS, EOX, EPN, ERH, EQ, FAR, FBG, FGW, FIL, FLL, FLZ, FMO, FPU, FQV, FRE, FTR, FVD, FVR, FXU, GEX, GHS, GIF, GIO, GIZ, GPM, GQK, GOL, GOS, GSV, GUW, GVZ, GZG, GZN, HAX, HI, JPI, JSJ, JZJ, MD, PC, TFC, TIO, TRY, TUJ, ZX.

W4 AAH, AEJ, APK, AZB, BBP, CBP, CVU, DEQ, DRZ, DXM, DXP, ECS, EDD, EDN, EDQ, EEB, EGU, EJO, EKI, EQN, EYW, FO, FT, GB, GUK, HG, KU, NN, PD, PG, TL, ZF.

W5 CHG, EHM, ETR, FDE, FGT, FOD, FPW, GGX, GKZ, LRX, MME, TRZ, WX, XS, ZA, ZF, ZV, ZS.

W6 AK, DEP, DLS, ITH, JIU, LLA, LOY, LSN, LUB, MPS, MWD, NLS, NLS, OZH, PBD, SA.

W7 EMP, FDL, FTA.

W8 AH, AVB, BIQ, BKS, BSM, BTO, BVP, BYV, BZW, CBB, CFD, CHB, CHQ, CHT, CLS, CMC, CNA, DKX, DPY, DST, EBS, FVC, GFL, GWZ, HCR, HDT, HHH, HHZ, HSI, HXV, IGW, IHM, ISC, IKG, JFC, JLG, JLV, JVI, KYY, KPH, KTR, KUW, LAC, LGO, LJ, LMP, MAT, MFK, MHC, MNM, MYJ, NHH, NHO, NK, NXF, NYD, OJM, OOE, OTK, OWE, OZE, PEN, PHD, PLT, PPI, PSD, PTN, PWA, PWM, QFI, QGZ, QIN, QLI, QLK, QUL, QUL, VR, ROO, THQ, UXT, WOH.

W9 AGO, ARK, BBU, BHT, BOY, CCI, CGO, CIJ, CW, DMG, DHO, DJD, DJU, DN, DWU, EBI, EDO, EKD, ETT,

good down Devon. Now then, you Devon fans, show a leg. He uses a Ferranti Arcadia, and likes the way you can cut the speaker out and use 'phones. Pity other makers don't do likewise.

● Photos

The Editor told me that someone asked him at a club meeting whether the offer of the blocks of photos published was genuine! Well, I said so last month, so if you still don't believe it send yours along, and find out! Think how nice your cards will look with an actual photo of yourself or your shack printed on them.

This month the photo shows the shack of M. L. HUNT, Knutsford, Cheshire. He keeps his cards in an album, utilising the space on the walls for maps and test gear. He only sends reports when definite requests for them are made, so has not got quite such a large collection as others possess. His shack looks very neat and effective. Thanks for the dope, OM, and maybe we shall hear more from you.

● Airplane dx

From A.R.R.L. comes some information on the expedition searching for the lost Russian fliers. The call VE5SY has been allotted, and c.w. only will be used on the 14 mc. amateur band, and on 7,300 kc. The plane will only be able to fly ten days per month and there will be no transmissions during the full moon period. Who will be the first to pick them up?

CALLS HEARD.

FAA, FEY, GDO, GIL, GIT, GJX, GYD, HDZ, HJU, IJN, LOF, LOT, LUU, LZP, MDF, NEY, OSO, PBY, PZI, RMC, RNX, ROQ, SQE, TFT, TIQ, UGR, WTD, XKY, YDC, YIM, YLN, YQN, ZHB, ZMS, ZNX, ZUZ, K4 EIL, EMG, TI2 AV, FG, RC, NY2AE, HI7C, CO6OM, VOIJ, VOZZ, CN8AJ, YV5 AA, AK, CO8RQ, VU2CQ, W2IXA (Police on 8m.).

Bob Everard, Sawbridgeworth, Herts.

November 15 to December 15.

10 metres. All fone.

W1 APU, ADM, CAA, IFD, EWF, DQU, COO, KJE, DRI, GED, EUT, AEP, JIL, FZA, JGN, HEH, ELR, ARB, ILQ, HVS, JTG, IXP, DOK, ATQ, IMB, BJE, KUJ, JNO, ALB, ANA.

W2 AMJ, AMM, JKX, JCY, KAX, JOX, JHC, CJN, FWK, GFH, CFK, HZR, KHR, ICA, GNO, DOZ, DVM, ADG, IXT, FQD, AHX, EBT, HYJ, BMK, GWM, JKD, BAA, JIL, DVU, BUX, ADJ, JKO, KHX, JIH, IVO, EPD, GUM, DKJ.

W3 AUC, PC, DO, CBT, FOX, FAR, BIW, GIZ, GEX, GQS, AIR, DPN, ESE, FVO, FVR, FIL, FXU, CRV, GZG, GZN, AKX, GHO, CWG, VO, FGW, FMO, AHS, AKE, BRX, FLZ, RI, CYK, EPO, ZX, CAD, GUF, FFR.

W4 ZF, PD, AP, EQN, EDD, YC, NN, EYW, TL, BQI, EBM, EKR, CPB, DGV, CYU, AZB, GB, EKI, AEJ, DRZ, DXM, AUC, EEV, AHH, AQ, FT, DV, EGH, ECU, EHB, EC, CVV, EPA, BBP.

W5 GW, GKZ, FDE, GGX, ERV, DUK, EHM, ZA, FFG, EZH, BAT, GLW, BTL, BYW, WX, FGT, FPZ, ZS.

W6 SE, AK, NLS, MPS, CKR, SA (portable 1st District), NSM, OZC, JIU, NX, PBD, OXA, DED, FDM, LUB.

W7 NY, GGG, FDL, EMP.

W8 CKY, PHB, AOY, QLK, CFU, IWC, NK, OLY, NAT, QYI, KYY, JLW, KAY, NDL, IHI, OG, NHO, CJM, CYT,

QWB, CLS, QVR, EBS, QUI, FOC, LAC, PWA, AUW, GWZ, MID, JFC, ARA, HHZ, ZTJ, CHQ, NZU, OOE, NOH, BVP, FMI, NHP, OTK, LMP, RCO, JLO, PEN, JBI, CFD, FVC, NWO, AFU, HCR, ISC, MOL, LJ, KO, JRL, DDV (portable 2nd District), JKS, BIQ, FIP, BTO, PK, OSX.

W9 VJQ, AGO, UOR, ARK, IJN, WSB, TLQ, EYM, DWU, BBR, BBU, UDO, GIC, ZOR, ZHB, PQH, CL, NKX, MHM, WXT, RMC, LZF, LQ, WOA, YKR, RUK, BHT, BOY, LQT, EW, EBI, YHQ, YLV, DKU, RNX, CET, GWN, FEE, CCI, EKD, HDZ, DXP, FAA, LUV, VCI, JVV, OSO, ZNX, OS, YOI, YVL, KCI, GWM, PBY, TMP, SQE, UOJ, RQI, JJK, ZUZ, IIX, SPZ, UUH, DHK, YPV, JIL, LBB, LNO, PZI, YIM, UAK, CRD, QI, YVJ, FEY, RGT, HDU, BOF, ZYR, PUY, WOH, MMM, JNG, CHI, UEI, UIZ, WIP, ITQ, LO, AGM, AAG.

VOII, VOZZ, SPIHH, ZE1 JN, JR, JJ, HI7G, K4 EIL, EZA, EMG, DDH, EPO, EJC, ZT6J, ZS6 AJ, T, ZS2N, VP6YB, FA3JY, CN8 AJ, AV, VE 1BR, DT, DR, AT, JA, EA, 2JO, KX, DV, 3A1W, LU, AQ, AIV, AIB, ANF, NH, 4SN, AW, BD, ZK, TI2 FG, RC, PY5AQ, CO8RQ.

20 metres.

F8B AF, AH, VU2CQ, ZE1JA, ZS 1AX, K, 3F, ZT 2B, 6AL, ZU 5L, 6AK, C, N, P, VQ4CRE, KA1 ME, JR, AK, VO6 JQ, P, K4ENY, PY1GO, YV5 AK, AE, ABQ, 4AE, HI3N, VE 2AQ, 3AEL, CN8 AU, AM, MI, CO8RQ, VO 1I, J, X, 3W, ZBIL, VP 2AT, 6MR, PYIDI.

Police and other experimental phones, 8—11 metres.

Hartford Police, W1 XDT, XEY, XHC, 2XEM, XES, XGC, XFA, XUJ, 3XEY, XAK, 4XCE, 6XFE, XKW, 8XAI, XBE, XCF, XCY, 9XEH, XEY, XL, XLS, 9XAZ, XPD, XJL, 6XKG, W10XET.

L. Levitt, Well Lane, Kippax, Leeds.
Class B one-valver. Ant, 66ft,
N. & S.

20 metre fone.

CN8 AJ, AM, TA. CO2 OV, WW,
7CX. CT1 PM, QG, ZA, 2AB, CE3CO.
FA3 HC, QV, FB8AF, HCLAJ, HH2B.
H17I, HK4AG, LUI HI, 5AN, PY1 FR,
2AK, 5AQ, SVIKE, VA6AB, VE1 BP,
DQ, 2BK, DF, KI, 3AEX, AFD, BF,
GK, NF, 5BF, VK2 OJ, 3VV, VO 1P,
2N, 6D, JQ, VP3 THE, 9R, YV 4AB,
5AC, AD, AK, ZBIL, ZS3F, ZU 6J, P.

10 metre fone.

CN8AJ, FA3JY, H17G, HK3AA,
1ITKM, LU7AG, SP1HH, VE1 DZ, 2KX,
4OT, SR, YV5AK, ZE1JR, ZS6AJ, ZU6P.

W5 ALK, AHJ, BEZ, EDY, EHM,
EZE, FAC, FGG, FGP, FQH, GCE,
GLP, GTC, ZZP, 6AFZ, COZ, EYF,
FZL, ITH, JFO, JTO, MDX, MEZ,
NNN, ONJ, 7GBE, 9CBI, CJI, DKU,
HDZ, MTU, MTZ, IAG, PGI, QHF,
ROO, TTB, VAO, and W1, 2, 3, 4 and 8.

John R. Bothwell, 5 Stapleton
Place, Dundalk, Co. Louth, I.F.S.

20 metres.

W5ZS, 6JPW, 7AOF, AXZ, 5BEK, 6CUU,
V7 3KX, 2XU, SPW, K6NZO, LU4BL,
Y7KP, SV1CA, FA3HC, ZBI F, H, I,
L, U9VB, VK2HF, CO7CX, HH2B, U9ML,
ZL2KY.

Alan Owen, "Cartref," 3 Cawdor
Road, Inverness.

14 megacycles.

W5 ZX, NH, DVM, W6KB, W8 JNE,
XV, NYN, CNA, BIO, W4 CYU, WZ,
COS, HNH, W9 UAD, IXA, HC1FG,
H15N, KA3OH, KA1ME, K6NZO, OQE,
PY1 FR, NY, V7 3KX 2HF, AD, 4BD,
5AC, ZE1JB, VO1H, NY2AE, VE3QV,
VS2AK.

7 megacycles.

F08AA (Ham Broadcaster in Tahiti).

28 megacycles.

W1 HVJ, IPC, EZW, AGO, CIW,
IFD, HUG, WA, W2 BAD, IXN, FDW,
DNY, JQA, JIL, KCY, W3 CDI, XOK,
JIL, GSV, GHS, AKZ, W4 FT, CYU,
BTJ, EED, GOS, GB, CYP, DRZ, BYY,
W5 KIL, FGF, EZH, AKZ, MGP, FGT,
CFM, W6 OZC, NSM, CKR, MLS, BK,
MON, LFU, W7 CKT, KO, CPV, BPK,
EKA, GEE, EMP, ASJ, W8 OWE, KYY,
NSO, JAH, EBS, MDH, CFU, CLS,
BCO, AVD, HSP, W9 AGO, MDF, DPT,
ZOY, ZOR, LQT, SOE, TJJ, YLV.
VU2CO, SU5CH, LUIT, K6MUV,
ZU6M, ZE1JR, H17G, J9CC, K4FJV,
ZT3BG, ZL3CC.

W. Edwin Davey, 2 Fingal Street,
Woodvale, Belfast, N. Ireland.

20 metre fone.

ZS 1AH, 2N, 3F, 6A, AJ, W. ZT2B.
ZU6P, VQ4CRE, FB8 AF, AH, AK,
ZE1JA, VO 1Y, 6D, LU2BG, VE3XX.

20 metre c.w.

FB8AB, ZS2X, ZU 1D, 2G, PY2HM,
YV5AK.

Hector Ludlow, 8 St. Canices Ter-
race, Santry, Co. Dublin, I.F.S.
6 valve S.H. All loudspeaker.
November 1—24.

14 megacycles.

W5 DS, FMN, VEK, GIK, FKG, TT,
FHJ, SMO, W6 AFH, CUR, W7FOK,
W9FKQ (Colorado).

CO 2RA, JJ, WW, KI, 6OM, 7X,
CX, 8AK, RO, VO 1J, I, P, X, Y, 2Z,
4A, 6B, D, JO, YV 4AB, AA, 5AA, AK,
VP 2AK, AC, 3PHE (or THE?), XYU,
MR, 6BL, MR, TR, 7NA, 9R.

VQ4CRE, HH 1PH, 2B, 5PA, HI 5X,
3N, 4S, 7G, HJ3A, HK1EP, HPIK,
K4 ENY, SA, XE1 AS, MR, PY 2AK,
5AQ, ZS 3F, 5ZU, 6AJ, ZU6P, VE 1CR,
OR, LR, BK, BB, JA, CF, FK, DO,
2HE, CX, BG, 3QC, RO, TY, AEL, YQ,
NZ, AFB, DF, MG, MP, XX, HC, AGO,
AGS, 4OG.

Y12BA, XZ2EZ, LUIDA, SP1AT,
OQ5AA, VK3ZL, FB8AH, PIJ.

Gordon Barron, 39 Birley Road,
Whetstone, London, N.20.
"Junk Box" 0-v-1.

10 metres. 'Phone.

W1 AA, AJZ, AEP, APQ, ALB, AWZ,
BJE, BVL, BGT, CTL, CKV, COO, DOK,
DJK, DBE, DJJ, EER, EIR, EKN,
EUG, FLZ, GED, GGV, GDY, GBE,
HVS, IYE, IDV, IAS, IXP, JGM, JTG,
JNP, JIL, JHM, JRZ, JGN, JBW, KJJ,
KLD, KKL, KJE, KUJ, KTF, KRW,
KPN, KQF, LO, NB, SZ, SS, SZA, WV,
WR.

W2 AOG, AMF, AMM, APZ, ADJ,
ATG, AHX, AGM, AJF, AMJ, AHS,
BHY, BAA, BWC, CDT, CHY, CSN,
CPA, DOY, FPD, GNO, GUM, GMR,
GH, HCU, HEM, HTG, HHU, HPD,
HVK, IVO, IET, IAI, IXT, IUP, JCA,
IRY, IJU, JOC, JCY, JQX, JQJ, JME,
JYK, JIL, KHK, KBO, KCY, YA.

W3 AUC, BZI, BGP, BOP, BBI, BYP,
BHR, CBT, CWC, CRY, CAD, DPM,
ESD, ERD, FPU, FCW, FBG, FMO,
FIL, FN, FCJ, GSV, GDK, GFM, GHS,
GIO, GQX, GTL, GIF, GQS, GUW,
GZN, GJS, GKN, HI, KCX, PC.

W4 AHH, AUU, AZB, AEB, BYU,
CYU, CPB, DRZ, DXM, FT, FWK, GB,
NN, PD, TL, ZC, EEV, EHK, EBM,
EDD, ECI, EPA, EQN, EC, EJO, EKI,
W5 ALK, DFE, EHM, ECT, FPZ, FDE,
GCX, ZS, ZA, W6 AK, EBC, FA, GCX,
JJU, JNZ, NLS, OGC, FOX.

W8 AHC, CPC, CTN, CHO, CTC,
CLS, CJM, CFD, DOK, DW, EBS, FYC,
GWZ, HHH, HHZ, HCR, HFS, IHM,
IWC, ISC, IWC, JFC, JRI, JIN, KQ,
KRW, KYV, LGO, LO, NK, OTK, PEN,
PHD, PTN, PWM, PAZ, QWE, QUL,
W9 BOY, CCI, DTR, EYM, EVI,
GII, GIC, HDZ, IXI, IXR, MHM, OS,
PZL, PZA, QHS, RZM, TLO, YR, YLP,
YHQ, YQN, YLV, ZOR, ZHB, ZCF.

9 metre Police and experimental.

W2 XEM, XIJ, 3XEY, 1XDT.

20 metre 'phone. 4-valve superhet.
YP7KP, FB8AH VQ6D, J, JO, 4Y,
2Z, I, VE 9AL, 3BOP, VQ4CRE, ZS3F,
VP3THE, YV4 AM, AB, VP6TR, CE3AI,
1AR, PY7AI, XE2AH, VK2ZC.

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Box number advertisements are subject to an additional charge of sixpence.

The Advertising Department is willing to assist in the exchange of goods against cash where invited and agreed to by both parties.

HERE'S YOUR CHANCE TO SAVE MONEY.
The following new and unused radio snips offered by G5KA: Two TAYLOR T50's, 35s. each. M.R. Reisz type mike, with ring stand (all chromium) and input transformer, 32s. 6d. Raytheon RK23, 17s. 6d., 5-metre trans-receiver (two tube), professional built; fitted in magnificent cabinet holding batteries, fones, etc.; complete with latest pattern hand-mike combination and vertical rod antenna; this cost well over £15—best offer takes. 3-tube, 5-meter receiver (superregen); Eddystone components throughout; a terrific bargain at £4.—G5KA, 41, Kinfauns Road, Goodmayes, Ilford, Essex. Phone: Seven Kings 2888.

465 kcs. I.F. TRANSFORMERS, 4s. 6d. each; Osram X30, DH30, H30, 6s. 6d. each; Bulgin Short-Wave Coil Chassis (S.W.22), with Coils, 15s. Or Best Offers.—Box No. 5.

MORSE RECORDS. Marconi Training Signals. Six H.M.V. 10 in. Three Columbia. Any offers?—G2NS, 17, Swanmore Rd., Boscombe, Bournemouth.

QUALITY!!!—1937 10 (Metal) Valve CROSLEY CONSOLE, 5 bands, 13 to 2,000 metres, 12 in. "Magnavox," P.U. and Ext. plugs. £16 cash. Sold at £24.—2CWI, 24, Penrith Street, London, S.W.16. 'Phone, Streatham 0405.

FOR SALE.—"IMPERIAL SHORT-WAVE SIX," built by Scott-Sessions, December, 1936. Cost £29; Never used. What offers.—Mrs. TROTT, "Ballygunge," St. Margaret's-at-Cliffe, Dover.

SIGNAL RECORDING.—Unused head, tracker, cutters, needles, blanks. Cost £3 10s. Any offers?—G2NS, 17, Swanmore Road, Boscombe, Bournemouth.

B.T.H. Minor PICK-UP. Good condition, 7s. 6d. H.T.8 Westinghouse Rectifier, 10s. No offers.—R. B., 26, Fullers Avenue, Surbiton, Surrey.

"The Short-Wave Magazine" Specifies Tungram

In this issue, "The Short-Wave Magazine" gives the specifications for an Exciter Unit, which can also be used as a low power transmitter, designed for amateur construction.

In selecting the valves, they have exclusively specified Tungram, with two APP4g, one used as a frequency doubler and the other as a crystal oscillator.

In making their choice, "The Short-Wave Magazine" have had in mind Tungram's reputation for quality and reliability; for doing everything that a good valve should do—well.

The Tungram range is exceptionally wide and includes both British and American types; pin and octal bases. List may be had free on application.

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MANUFACTURED IN
TOTTENHAM, LONDON

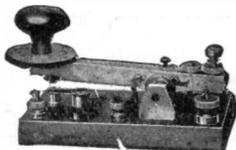
Barium VALVES

THE VALVE WITH THE NAME BEHIND IT!

The Tungram Electric Lamp Works (Gt. Britain) Ltd., 82, Theobalds Road, London.

Telephone: Holborn 3863

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A Guinea' **7/6**
Key for

TRANSMITTERS, MORSE AND SIGNAL KEYS, Royal Air Force model, balanced action, solid brass bar, tungsil contacts, indicator lamp. Type KBSL, a guinea key for 7/6. Other keys from 4/6 to 30/-. Learner's outfit complete, 4/9. Ask for special illustrated Key List "S.W."

HEADPHONES. Light weight, 2,000 ohms, 4/6. Single high res. earpieces, 2/6. Sullivan 120 ohm W.D. model. Aluminium body and headbands. Maker's price to-day, 15/-. Our price 2/9 per pair. 3d. postage.

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218, Upper Thames Street, London, E.C.4.

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The ideal short wave receiver. Powerful reception, with silent background. As used by amateur transmitters throughout the country. Hundreds of testimonials.

The complete kit of all components and accessories, with full instructions.

Only 12/6 (Post 6d.) Despatched per return Not Junk—but high quality precision S.W. components. Can be assembled by anyone in an hour. No experience necessary. Now is your chance to construct yourself a first-class Short Wave receiver for a few shillings.

Descriptive Folder Free

A. L. BACCHUS, 109, Hartington Road, London, S.W.8



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EXCITER UNIT

described in this issue

Q.C.C. Crystals as specified ...	15/- each
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Q.C.C. Standard 10-watt Coils.	
1.7 mc., 3-pin 10-watt coil ...	4/6
3.5 mc., 7 mc. and 14 mc.	
3-pin, 10-watt coils ...	4/- each
Q.C.C. Bases for above coils ...	2/- each
Q.C.C. R.F. chokes. Type A. Section wound ...	2/- each

ALL THE ABOVE ARE SPECIFIED

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Please write to Dept. "T.S."

THE QUARTZ CRYSTAL CO., LTD.

(G2NH & G5MA)

63 & 71 KINGSTON ROAD, NEW MALDEN SURREY

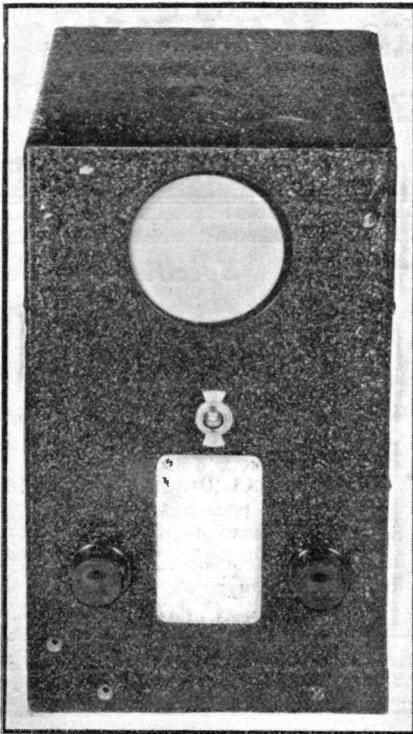
Telephone: Malden 0334

A USEFUL AND INEXPENSIVE CATHODE RAY UNIT

By G5GQ

IT IS A PECULIAR THING that the average amateur will spend many pounds on a receiver sensitive and selective enough to receive other stations, but will view with horror any suggestion that he should spend a small percentage of that sum in measuring instruments which will enable him to get the utmost from his transmitter!

Complaints are made that the location is bad, or the power is small, but rarely do "hams" admit that their transmitters are inefficient, or out of adjustment. Claims of efficiencies of 80% are glibly made, but cannot be substantiated by any figures. Probably if measurements are made the efficiency will be found nearer 40%.



● Check your quality

'Phone stations are the worst offenders. The bad quality heard on the 7 mc. band is due more to improper adjustment than to inferior equipment. One station, using a 5s. carbon mike will be heard turning out better quality than another using a £25 broadcast one. No matter what the quality is, reports from other stations invariably say that modulation is good, because few people dare be frank enough over the air to say that it sounds hopeless!

If they did the owner would not believe them, because so many others have told him that his modulation sounds "like B.B.C."

Some time ago I was experimenting with high-quality 'phone. The mike equipment went up to 15,000 cycles and average modulation was 65%, peaking at 90%. However, the very first station worked said he thought I was under-modulating. When modulation was pushed up to 200% peaks he said signals were much stronger, but that the top-note response had gone. If I had been using a low-quality mike he would have noticed no lack of top, because it would not have been there in the first place. There we have the main trouble with 'phone operation. The station the other end says we sound louder when we overmodulate (we don't think we are) and so we do overmodulate. Quality drops, side bands splash and spread, we QRM other stations, interfere with local BCL's, and then wonder why the G.P.O. drop on us!

The only way to operate decent 'phone is to measure the modulation, and the easiest way is with a cathode ray tube. "Expensive and complex," you say. But compare the cost with that of the simplest diode rectifier and 0.1 millimeter, you won't find much in it, while the cathode ray tube not only shows your modulation visually, but you can measure it, and also use it for many other purposes, such as checking the modulation of other stations, measuring amplifier response, hum level, etc.

● C.R.'s are not complex

Let's explode this "complex" myth first, before we describe the construction of a small unit, seen in the photos. At the back are four sockets, connected to the four deflecting plates. These plates are arranged in a sort of rectangle, two pairs each one of which faces the other. H.T. draws electrons from the cathode, they are focussed into a beam by the first anode, pass through the centre of the rectangle formed by the deflecting plates, and hit the fluorescent screen at the end, showing up as a spot of light. Now if we apply a.c. to one set of deflecting plates the beam will be deflected to and from, forming a line, and the number of times per second it moves to and fro will be the same as the frequency of the a.c. applied.

Right so far. Now for the a.c. voltage. We will arrange for a 1,000 cycle note to go through our speech amplifier; it can easily be done by a reverse-connected audio transformer in the input. Connect the output through a condenser and earth to one pair of deflecting plates. There, shown in *fig. 1* is the result, a horizontal line. Switch the amplifier off, and connect the other set of plates to the output of the transmitter via a link coupling. We get a vertical line, *fig. 2*, and this was actually traced by the carrier of the transmitter at G5GQ on 7,189 kc. Note that the tube doesn't worry about frequency, it is equally prepared to handle the 1 kc. audio, or the 7,189 kc. radio frequency.

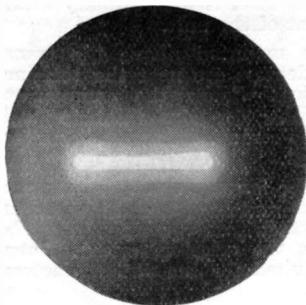


FIG. 1.

Photographs:—That opposite illustrates the unit with tube in position; switch is for mains, and controls are the potentiometers R3 and R9. Oscillograms (this page) are actual untouched photos, taken at G5GQ. The remaining photograph shows some of the components. The top section contains the tube only.

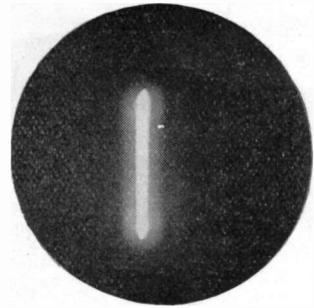


FIG. 2.

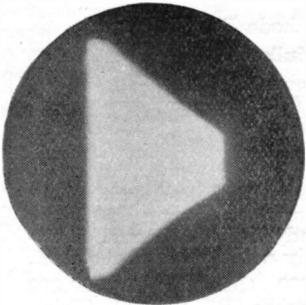


FIG. 3.

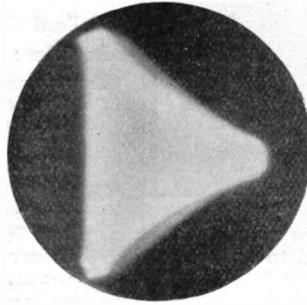


FIG. 4.

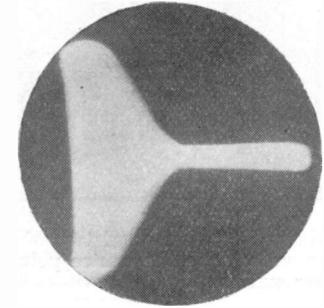


FIG. 5.

● Modulation measurements

Now that we understand how the tube works we can measure our modulation. Switch on both the carrier and the modulation, and the result will be *fig. 3* (in the form of a triangle with the apex cut off). The percentage of modulation is the ratio between the apex length and the base, and in this particular photo is around 78%.

The Mullard E40/G3 tube used has a 3-inch diameter screen, which is sufficiently large to enable accurate measurements to be made with a ruler, needs only 800 volts maximum at 5 mils. At £3 10. it is within the reach of every amateur and is very nearly the same price as the American 1-inch tube.

Note that the sides of the triangle are practically straight, indicating negligible distortion. As we increase modulation the apex gets smaller, until at 100% modulation it becomes a point. *Fig. 4* shows this condition, but a sharp point was not obtained because first the tube was run at full brilliance for photographic ease, and secondly, the valve was a suppressor-modulated RK20, and distortion occurs at over 90% modulation, also shown by curvature of the sides. Another interesting point is the "shadow curve" at the sides, caused by hum appearing as the amplifier gain was turned up.

Finally, the last photo (*fig. 5*) shows the typical curve of the average 7 mc. "spitch hound"; modulated 500%, but gosh, what a picture! Just look at the distortion, and think that you may turn out stuff like that, and other hams will only tell you it sounds louder! Not a straight line to be seen.

"That's all very well with a 1,000 cycle note, but how about speech?" Adjust the gain until with average distance from the mike, and at normal tones, the triangle appears as in the third picture, i.e., not more than around 75% modulation. Then on certain

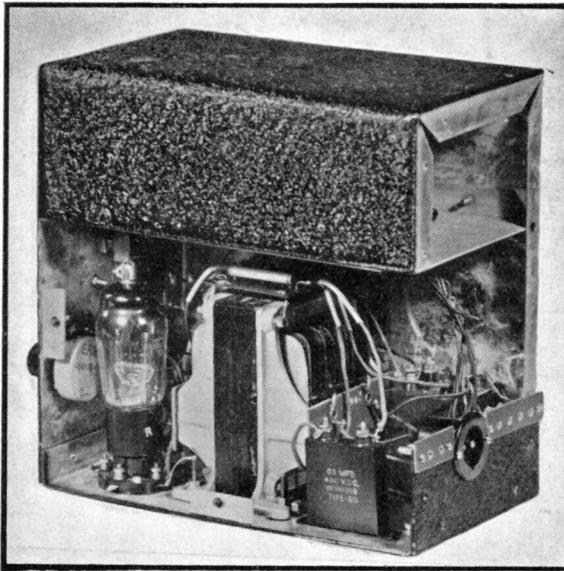
syllables you will modulate 100%, and a complete triangle will appear. The oscilloscope can be left in circuit permanently, and you can see at once if you are over, or under-modulating, and whether there is distortion in the modulated stage.

● Design

The complete unit consists of the tube, associated power supply, and the four deflecting plates brought out to sockets. In the front is the on/off switch, and two potentiometers, which supply the necessary voltages (taken from the power supply) to the first anode, and the grid. The right hand pot'meter (15,000 ohms) is connected to the grid, and controls the brilliance, while the left-hand one is the first anode control, for focussing. These are the only controls, and the unit can be used on any amateur frequency, whether 1.7 or 28 mc., equally effectively. Only one precaution has to be taken, the unit should not be used with only a spot showing, i.e., with no a.c. applied to the deflecting plates, as the spot will burn away the fluorescent screen. A separate 600-volt winding is shown on the transformer which can be used as a 50-cycle deflecting voltage should need arise.

Leads to the deflecting plates should preferably be screened to avoid stray pick-up. An unusual feature of cathode ray tubes is that the plus h.t. is earthed to the chassis, but as this has its own power supply it can be connected to the usual earth just as if the negative h.t. were connected to chassis.

In certain cases a "phase shift" occurs, indicated by two lines instead of one appearing when the 50-cycle base is used. This may be corrected by the insertion of a .1 mfd. (T.C.C. type 430) condenser connected between one side of the winding and chassis. Condensers are sometimes needed across



the mains input, and two of similar type connected in series with the centre point connected to chassis, are sufficient.

● Construction

The tube is mounted with the use of two wooden rests (suitably shaped to the curve of the tube envelope) and one aluminium bracket to which is fixed the holder. Two screws from underneath hold each in position after final adjustment is made. A forward or backward movement is necessary, therefore the holes are slotted so that the tube and brackets may be set with the tube in exact position. The wooden supports are lined at the edge on which the tube rests with a thin strip of baize. The holder must be capable of slight movement to allow turning the tube for correct level of a horizontal scan.

Flexible leads (shielded for preference) are brought through grommets in the platform. The photograph will give an indication of layout. After the transformer has been positioned the remaining components are placed with a view to easy wiring. The

best position for shortest wires is with primary windings led out to the front of the unit.

A resistor board is mounted above the transformer, while the condensers are near the terminal strip and mains socket. Screw the components direct to the box; rubber cushions (Hobbies) will then ensure clearance to screw heads where counter-sinking is to be avoided.

The front panel can be lowered during wiring and the potentiometers and switch should be wired in this position, afterwards the wiring can be placed conveniently as the panel is raised. Insulating washers are required for the potentiometers.

SPECIFIED PARTS.

Mullard E40/G3 Cathode Ray Tube.

Rectifier: HVR1 (Mullard).

Transformer (All Power):

2v. 1a. for E40/G3.

2v. 1a. for HVR1.

800v. 5 m.a.

600v. 5 ma.

Cabinet (Scott-Sessions). Fitted with Clix sockets and terminals and Bulgin P20 Mains Plug/Socket. Ready drilled. Messrs. Scott-Sessions can supply a kit, wired if required.

Resistors: 2 200,000 (R1, 2); 2 500,000 (R4, 10); 4 2-megohm (R5, 6, 7, 8). (Erie).

Potentiometers: 100,000 (R9); 15,000 (R3) (Erie).

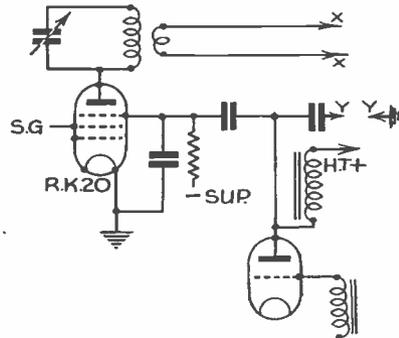
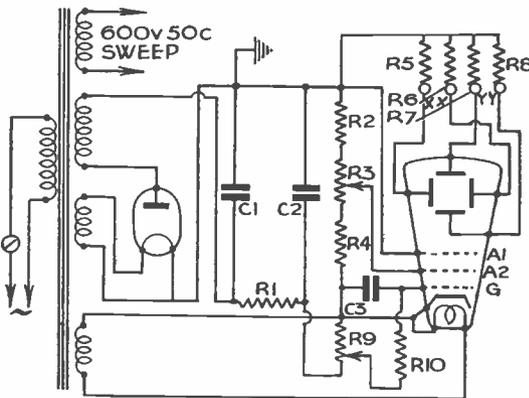
Tube and Valve Holders: VH24, VH19 (Bulgin).

Switch: Bulgin S80.

Condensers: 2 .5 (1,000 v. working); .1 mfd. (T.C.C.).

Miscellaneous: Insulating washers, valve cap (for rect.), resistor group board, 2 coils of Quikwyre, quantity of 4 b.a. screws (Bulgin).

For the information of readers interested in photography the oscillograms were copied with a Zeiss Tessar lens with an exposure of 150 seconds, aperture 4.5, using Agfa Isopan film.



Adventures of an Op.

“ Bread and Butter ”

No. 1 of a New Series by N. P. SPOONER (G2NS)

“EVERYBODY’S JOB is easier than one’s own” it is believed and it should therefore prove of interest, to most of us, to learn what this vexed question of Work means to the “other fellow.” A more modern jangle asserts that “If there’s radio—why work?” which probably accounts for the fact that an amateur, coming on the air about 8 a.m., “just for, one quick QSO before getting off to work,” can often still be heard two hours later apologetically remarking “I say, old man, I really must get away, I’m rather late as it is!”

● The “ Take Off ”

Now, this is an “adventure” series but as, to many of us, the finding and keeping of work is just as much of an adventure as action in the more accepted sense of the word, I make no further apologies for relating to you what might have been your first steps, at the age of about 16, towards becoming an operator in the cable telegraph service.

Let us wander, therefore, back to the dim days of our youth and find, first of all, a fond parent or fairy god-mother able to advance the sum of £36 and, willing to board, lodge and clothe us for the next eighteen months. Right away we are able to restore the donor’s equilibrium by pointing out that some of this will be returned as weekly pocket-money and, if we are transferred abroad, a cheque for £30 as a help towards buying the necessary kit, will be given by the company with a paid steam-ship ticket.

We pass a general knowledge entrance examination, the three essentials of which appear to be good spelling, good handwriting and a bump of geography and, becoming probationers, we find diggings within easy reach of a training school.

Our first job is to thoroughly rid our minds of the idea that we shall have anything whatever to do with sound and we commence by memorising the international Morse code as printed, black-and-white “dots and dashes.” Here it is opportune to pause, perhaps, and express our sympathies with anyone who, having been reared on this “dot and dash” business, attempts later to change over to reading signals by sound as “dits and dahs!”

● Sending—with a difference

Having learned the code by heart we carry out a few simple wrist and finger exercises and are then introduced to hand sending. We find that we are to use what appears to be two keys, placed side by side, with ebonite discs in place of the more familiar pictures of ebonite knobs. Upon pressing the key on the left with the first finger-tip we signal a dot and, by slightly swinging the wrist over towards the right, we can depress the other key with the second and third fingers close together and signal a dash. It will thus be seen that a dot and a dash, each having its own separate key, are of exactly the same duration.

From here we pass on to the “village blacksmith” department—the perforators, and the reason for all

the hammering is that voracious automatic transmitters require suitable food in the shape of oiled tape, known as “slip.” This slip must first be perforated with holes capable of controlling the signals sent out by the transmitter and to do this, we hammer away at a hand perforator.

It is entirely mechanical and mounted on a wooden box containing a roll of blank slip and a rest to support the messages to be “punched” up. Three metal keys, rather like buttons, are struck as required for a dot, space and a dash respectively with small, rubber-tipped, iron punching handles and the slip is thus not only perforated but is automatically pulled through the instrument as well. Steel punches, shooting forward as the keys are struck, perforate holes in the slip which signal dots or dashes when passing through a transmitter.

Quite apart from what we tell our friends we can do, we shall be expected to pass out at a minimum of twenty words per minute at this “punching.” At about the same time we learn to handle an electrically operated key performer, which is an automatic perforating instrument controlled by the ordinary sending key already described, and not, as might be expected, by a typewriter keyboard. Having punched up our messages, we wind the slip on a spool and feed it into an automatic transmitter, ten feet of slip run through in 15 seconds equalling a speed of about 200 words per minute. The driving power for our transmitter is usually a heavy weight with a train of wheels and, in operation, two rods in the transmitter rise above the level of the slip, through the perforated holes, and send a dot or dash to the line or cable in exact accordance with the perforations.

● Recording

Upon turning to the receiving side of our training we find that the syphon recorder is chiefly used. Here again we have slip, but not oiled, and this is pulled over a platform. One end of the syphon, which is simply a fine glass tube, rests in an ink-well and the other end rests on the slip so that, when no signals are being received, it marks a steady ink line down the centre of the slip. Directly a dot is signalled the syphon swings *above* the centre-line and marks an inverted “vee,” returning at once to the centre-line if nothing further is signalled.

We have already seen that a dot and a dash are of the same duration, so when using what is known as “cable code,” we naturally have to differentiate somehow between the two and therefore make the syphon swing *below* the centre-line for a dash. This also looks like a “vee,” but the proper way up.



To illustrate this, we have a dot (fig. 1 (a)), dash (b), the letter “L” for instance (as shown by (c)), being read as dot, dash, dot, dot. Actually, over
(Continued on page 28.)

HAVE YOU HEARD . . . ?

An abstract of the past month's conditions, as compiled and presented by

F. A. BEANE (2CUB)

COINCIDENCE! I wonder how often we find coincidence in radio reception? Generally I am not susceptible to such trivialities as numerology, mental-telepathy, spiritualism, and so forth—but coincidence; that's different! It's like this: I collect verifications (yes, I know I shall be condemned in the eyes of some!) not because they decorate my walls as would scalps a wigwam, but because they give me the data so essential to my articles. Now I often glance through my list of potential veri's and think to myself, "H'm, about time that came in," and next morning, lo and behold, there comes the veri. It has happened scores of times and is really very extraordinary.

More recently I sent a report to ZP14 (I didn't know it was ZP14 then, and merely addressed my report "Estacion Onda Corta ???, Villarica, Paraguay) and the date of sending was October 13th; the confirmation came on December 13th! So, you see, that's why I believe in the business, but don't go and stare fervently at your list of veri's to come for I don't suppose it will help a great deal! Now to business.

● Verification from Paraguay

Seldom do we get the opportunity of logging this remote country, but, as I urged in the November SHORT-WAVE MAGAZINE, now is the time to hear it; it—ZP14—is still there but on 49.78 m., and not 49.75 m. as I miscalculated. The best time to listen is around 21.30 when it is usually a good signal and may be heard announcing often as "Radio Cultura, Villarica, Paraguay." Their QSL card is an exceedingly plain affair, the dullness only being relieved by the stamps placed on the reverse, and its value as a source of information is almost nil, especially as they give their wavelength as 48.78 m., 6,150 kc., when they are most definitely on 49.78 metres. But still, what is a mere metre or two to a South American? Their full title is "ZP14, Radio Cultura, La Voz del Corazon de Sud America," which, presumably, conveys that it is "Radio Culture" and "The Voice of the Heart of South America," the address being "Radiodifusora ZP14, Friedmann Hnos., Villarica, Paraguay."

Paraguay is not alone in providing Latin-American news or in receiving the glare of publicity; oh, no, not by a long way! Brazil has commanded much attention by radiating regular broadcasts over the commercial telephony PSH and by placing PRA8, aptly termed the "distorted wanderer" by a fellow scribe, on 49.89 m. after a long and very conspicuous absence. The former may be heard between 00.00 and 02.00 on 29.45 m., 10,220 kc., with programmes apparently intended for the outside world, all musical items being interspersed with announcements in Portuguese and English, the latter being, generally, "You are listening to short-

wave station PSH, Rio de Janeiro, Brazil, transmitting a special test programme, originating in the studios of PRF4, Radio Journal do Brasil, Rio de Janeiro." Sometimes the wavelength/frequency announcement is added or publicity given to Brazilian produce. Reports are requested and verification promised, the address being "Radio Companhia Internacional do Brasil, P.O. Box 709, Rio de Janeiro, Brazil."

Reception of the rejuvenated PRA8 reminds me of the great struggle I once had to convince an obstinate American editor of its existence, in which he asserted that such a place as Pernambuco simply did not exist. After six months I eventually proved it by securing their verification, much to the bewilderment, and perhaps embarrassment, of the gentleman in question. I am afraid that I even got rude about it, but was so indignant to think that just because my station was not audible, strangely enough, in America, it should not be received in this country! That was in 1935 and I had the honour of gaining the first QSL sent to this country. After becoming sadly notorious for wandering in and out of the 49-metre band, PRA8, then "A Voz do Norte," suddenly disappeared after over a year's existence to reappear a few weeks ago on 49.98 m. At present it may be heard coming on the air at 21.00 with the Brazilian National Anthem, followed by a rapid announcement "PRA8, Radio Clube de Pernambuco," strength being good although reception is often marred by heterodyne interference. For further information see the identification panels presented elsewhere.

● Curacao, South Africa and Mozambique

I do not claim to be the first to record reception of Curacao in this country for it was only due to the vigilance of a friend that I ever thought of searching for it. The call-sign is PJCI and the wavelength approximately 50.5 m., or very slightly below (in wavelength) the powerful YV1RL, and, according to my informant, it comes on the air at 23.35 with the Dutch National Anthem, although I have not heard it until midnight. Strength is generally weak and identification simplified by the language employed; the only Dutch-speaking station in the vicinity.

Little is heard of South Africa in this country, despite its numerous outlets in the b.c. bands, but recently a ZRH, with an alleged power of 22 kw. made its debut on both 31.5 and 49.9 m. On the former it has been logged quite well in this country by fellow listeners, but I have only heard it occasionally on 49.9 m. between 18.00 and 20.00 at weak to fair strength. Unfortunately the major portion of the programmes is in Afrikaans, a language with which few are familiar, with only an occasional English announcement interspersed for our benefit.

However, if you should manage to hear a weak station, sandwiched between DJC and Moscow, utilizing a language phonetically similar to Dutch and using three trumpet calls at the hour, you may be certain that it is ZRH, and don't hesitate to address a reception report to P.O. Box 4559, Johannesburg.

CR7BH, Lourenco Marques, Mozambique, has frequently been observed on 25.6 m., but little has been recorded of its sister station 7AA on 48.77 m. On several occasions I have been puzzled by a signal on a slightly higher wavelength which I originally supposed to be CR7AA, since, like CR7BH, a lady announcer was heard at times and once an unintelligible English announcement. At 20.00, however, it has either disappeared or been engulfed in the QRM, while on one occasion it seemed to have got tangled up with W8XK (48.86 m.) which is then, invariably, a good signal.

● Conditions and Shanghai

So far I have not made any comments regarding conditions during the past month, although I suppose I should have done so at the beginning. Actually I have not found them so deplorable as recently described to me by a listener over the telephone, but it appears that he was referring to the twenty-metre amateur band to which I seldom resort despite its enormous popularity. On the b.c. bands they have been, perhaps, erratic and I know that quite a number of my potential late nights have been curtailed by at least two hours, with the result that I have crept off to bed—abjectly—shortly after midnight! However, generally speaking and without referring to my log, I find that conditions are usually poor at the beginning of the month, improving towards the end, especially immediately before, during, and after the full moon. Others may not agree, but a full moon and I always agree—when dx'ing!

China is retaliating to Japan's etheric warfare and may be heard on Sundays through the medium of XGW, Shanghai, on 28.79 m. Listen at 14.00 when you should hear an English news bulletin given by a female announcer, whose voice is so pleasantly British that it will immediately gain your attention. At 14.15 she bids her unseen audience "Good Night" and is followed by a number of chimes, reminiscent of a child's toy xylophone, and a news bulletin (apparently!) in Chinese, also given by a sweetly modulated female voice. By this please don't think that I have a weakness for feminine voices! XGW generally leaves the air just before 15.00, and would, undoubtedly, appreciate reception reports, the address being "T. C. Loo, Engineering Dept., Chinese Government Radio Administration, Sassoon House, Jinkee Road, Shanghai, China." Be careful, however, that your report is accurately detailed or Mr. Loo will not oblige with a veri!

Yet another interesting signal emanating from Asia is that of PMH, Bandoeng, Java, on 44.6 m., 6,720 kc., which may be heard almost any afternoon, radiating native music, until the end of its transmission at 16.00.

● With the Locals

Seldom do I devote time to the Europeans, but often in my search for dx I note little changes in their wavelengths or additions which at first prove confusing until well acquainted with. Quite recently I was astounded to find HVJ's peculiar metronome (actually the ticking of a clock), familiar chimes of

St. Peter's and call "Laudetur Jesus Christus, Stazione Radio Vaticano," on 49.4 m. at 19.00, while on another occasion Moscow thought fit to wander to 49.75 m., only to have its propaganda in Italian wiped out by the mysterious bogey of the ether, the siren effect so frequently observed in the region of 30 m. some time ago. RKI (39.95 m.), of Moscow, now broadcasts simultaneously with RAN (31.25 m.) after midnight, while an old friend—RV59, formerly the station of the Red Army—may occasionally be heard with telephony on 45.38 m.

A "Radio Napoli" (no, not a harmonic) has been heard at 23.24 on about 47.35 m., vociferating in favour of the so-called National Spain, while on roughly 45 m. a Salamanca station has been heard amusing itself with "The Dance of the Cuckoos," quite an appropriate signature tune for chaotic Spain, perhaps! GSL has resumed transmissions on its 49.10 m. channel to the discomfiture of other frequenters of the channel and to the wearer of headphones.

● Other DX Notes

FZF6, Fort-de-France, Martinique, 30.98 m., is still audible between 23.45 and 00.45, but appears to have diminished in brilliance, while CJCX, after a promising debut on 49.9 m., seems to have vanished in the orthodox Canadian manner. FZF6 has not yet verified in spite of its request for reports and COCM, which recently announced that QSL cards were on the way, is likewise slow. VP3MR (49.92 m.) continues to put in a good signal until close down in the region of 00.30; CXA2, Montevideo, 50 m., is often quite strong as early as 21.45, when not usurped from the channel by Moscow; COKG, Santiago, Cuba, continues to broadcast on about 33.7 m.; HIH, San Pedro de Macoris, Dominican Republic, 44.25 m., is quite strong around midnight and the Venezuelans have predominated in and around the 49 m. band.

The martial vociferations of Popular Front and insurgent Spain have not claimed my attention of late, although I have observed an interesting, and so far unidentified, transmission on roughly 42.5 m. which may have been a "Radio Barcelona"; in fact, I am positive that I heard that announcement on one occasion. At 21.00 a clock may be heard booming the hour, while the musical programmes are interspersed by a somewhat unique identification signal—the crowing of a rooster and clucking of hens. On approximately 39.5 m. a station of the Portuguese Popular Front Party at Oviedo, may be heard coming on the air at 20.15 with the "Internationale" and concluding its broadcasts at 20.45 in a similar manner, the programme consisting of Spanish war news and a talk in Portuguese given by a female speaker. FET1, "The 'National' Broadcasting Station, Salamanca," 42.82 m., has been heard with the Ted Lewis "Good Night Song" at 21.30, but afterwards continuing with the "Radio Nacional de Espana" programme. Incidentally I would like to mention the sad lapse I made in my November article when I inadvertently stated that the rebel programmes originated in Valencia, and, of course, it should have been Salamanca. Such carelessness on my part may even cause the Iberian Peninsula to be swept with yet another revolution!

In conclusion I should like to add that XGW, Shanghai, has been heard at 14.00 on a weekday since this article was begun.

Making an Amateur Band Wavemeter

By S. C. CLARK

TO THE radio experimenter, be he amateur transmitter, short-wave listener, or all-wave dx hound, a wavemeter is the most important piece of auxiliary apparatus attached to the receiver. The most useful kind of wavemeter is the heterodyne type, as the harmonics may be used for calibration of wavebands higher in frequency than the fundamental of the wavemeter.

In describing the construction of a suitable heterodyne wavemeter for the most useful of the amateur wavebands, it must be pointed out that the accuracy of such an instrument is entirely dependent on the rigidity of its mechanical construction and the use of a good dial—the Lissen "Decimal" is very suitable.

● The Circuit

The diagram shows an oscillator circuit using an a.c. mains pentode. It is general to see a battery valve used in a wavemeter circuit, but the use of a heater type valve will enable better calibration to be obtained, as small fluctuation in the filament voltage of a battery valve will produce considerable alteration of the calibration.

It will be seen that the tuned circuit is of the Hartley kind and is connected between the anode and screening grid of the valve. For amateur purposes it is more convenient to use a modulated tone

determined by the values of the grid leak and fixed condenser. Standard values have been chosen as these are easy to obtain and give out quite a suitable note.

● Construction

The only component which need be home made is the coil, which consists of 26 turns of 24-gauge enamel wire wound on a 1½-inch former. A tap should be made at the sixth turn, also a couple of end turns must be spaced out, for getting the 7 mc. band in nicely between the maximum and minimum of the condenser.

The wavemeter components may be laid out on a small panel and baseboard, each being about six inches square. The variable resistance is mounted on the panel alongside the tuning condenser. When a separate filament supply is used it should not be mounted on the wavemeter baseboard itself; if it is preferred heater current may be from the receiver.

One of the interesting features of this circuit is the fact that it will oscillate very strongly with a low h.t. voltage, a nine-volt grid bias battery will be ample. Indeed, if the voltage is too high the l.f. note will stop, though the valve will continue oscillating at the tuned frequency. As in this respect the voltage may be somewhat critical, a 50,000 ohm variable resistance has been included in series with the h.t. lead.

Any a.c. pentode will be found quite satisfactory, though an MPT4 was found particularly suitable. It is important to earth the cathode, otherwise there will be a bad ripple in the modulated note.

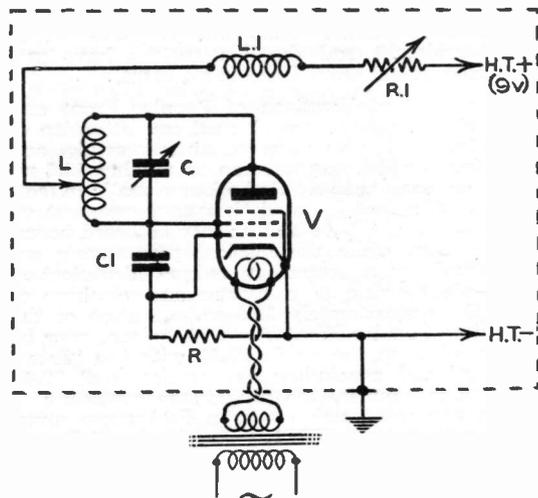
In trying out this heterodyne wavemeter for the first time it may be found that the strength of the oscillation is too great for accurate calibration. In this case, it is best to screen the entire wavemeter in an earthed aluminium can. The condenser spindle can then be brought out by means of a short insulated extension handle. This will also prevent any possible effects from hand capacity, as it must be remembered the tuned circuit is "up in the air."

● Calibration

There should be little difficulty in calibrating the 7 mc. band as most amateur stations are crystal controlled and frequently state the exact frequency they are working on. A suitable graph should be drawn or the constructor may make his own scale on which frequency readings may be recorded direct.

In plotting a graph dial readings should be plotted against frequency in kilocycles. Each division on the graph paper should represent two kc., in this way a convenient sized graph will be obtained, and at the same time it will be possible to read accurately to one kc. The British 7 mc. waveband extends actually from 7,005 to 7,295 kilocycles; the tuned circuit with the values indicated will cover just over 300 kilocycles, therefore it should be possible to get the band spread nicely over the whole of the dial.

Before the wavemeter is accurately calibrated the end turns of the coil should be fixed with a dab of secotine and the coil should be coated with collodion.



R—2 megohms. L—As text.
R1—50,000 ohms. L1—Short-wave h.f. choke.
C—20 mmfd. V—A.C. pentode (MPT4).
C1—.0003 mfd.

than to rely on the zero beat method of wave measurement, hence this circuit also gives out a high pitched whistle of about 2,000 cycles with the constants shown. The control grid of the valve is used to inject this low-frequency oscillation into the tuned circuit, the tone of the l.f. note being deter-

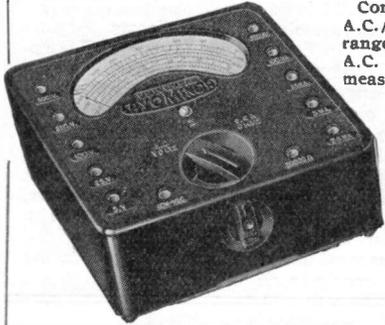
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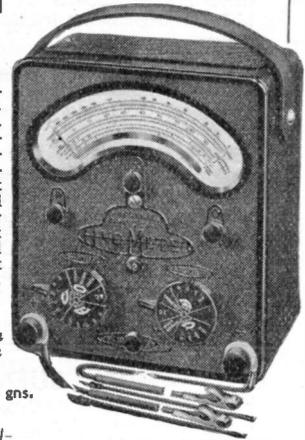
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GUIDE TO THE WORLD'S S.W. BROADCASTERS

MODIFICATIONS AND ADDITIONS

COKG, Santiago de Cuba, formerly on 48.39 m, 6,200 kcs, has moved to approximately 33.7 m, and announces periodically in English as "Short-wave station COKG in Santiago, Cuba, P.O. Box 137," chimes being interspersed between announcements.

HJ4ABE, Medellin, Colombia, "La Voz de Antioquia," appears to have moved to approximately 48.83 m.

CB615, formerly "Radio Service," Santiago, Chile, no longer exists, the transmitter having been taken over by "Emisoras Otto Becker" of the same city.

VP3MR, Georgetown, Br. Guiana, now operates Mon. to Sat. 21.15—01.15 and Sun. 12.45—15.45 G.M.T., according to a recent verification, but is generally heard closing in the region of 00.45 on weekdays.

CB1170, SANTIAGO

(Chile)

Metres: 25.64. Kc.: 11,700. Power: 1,000 w.

Operating schedule: 16.00—20.00 and 22.00—05.00 daily.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 6,850 miles.

Postal address: "Radios Otto Becker, Casilla 706, Santiago, Chile."

Identification characteristics: Broadcasts Anglo-American Hour in English on Tuesdays, Thursdays and Saturdays from 23.00—23.45. Announces in English as "You are listening to stations CB eighty-nine (CB89 on 890 kcs) and CB one thousand, one hundred and seventy, Radio Otto Becker, on 25.64 m, transmitting the Anglo-American Hour." In Spanish it is given as "CB89 y CB1170, Radios Otto Becker, Santiago, Chile." At present operating on a slightly higher wavelength.

Verification of reception reports: Sends card bearing type-written message of verification.

HJU, BUENAVENTURA

(Colombia)

Metres: 31.55. Kilocycles: 9,510. Power: 1,000 w.

Operating schedule: Tue., Thur. and Sat. 01.00—04.00; Mon., Wed. and Fri. 17.00—19.00; Sun. 23.00—01.00 (possibly discontinued).

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,900 miles.

Postal address: "Radiodifusora HJU, La Voz del Pacifico, Ferrocarriles Nacionales, Ferrocarril del Pacifico, Buenaventura, Colombia."

Identification characteristics: Announces often in English, employing the slogan "La Voz del Pacifico" (The Voice of the Pacific) at frequent intervals. Also mentions "Ferrocarriles Nacionales" (National Railroads—the station owners).

Verification of reception reports: Confirms accurate reception reports with QSL card bearing the National Colours and an engine wheel.

HIG, TRUJILLO CITY

(Dominican Republic)

Metres: 47.77. Kilocycles: 6,280. Power: 100 w.

Operating schedule: 12.10—13.40; 17.40—19.10 and 01.10—02.40 daily, according to the station's verification, but generally irregular.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora HIG, Sr. A. Cordero P., Trujillo City, Dominican Republic."

Identification characteristics: Announces in Spanish as "HIG (ah-tchay ee hey) en ciudad Trujillo, Republica Dominicana," generally at 15 minute intervals; i.e. at 01.40, 01.55, 02.10, etc. English and chimes are used infrequently.

Verification of reception reports: Confirms with plain card.

PRA8, PERNAMBUCO

(Brazil)

Metres: 49.67. Kc.: 6,040. Power: Unknown.

Operating schedule: 21.00—01.30 approx. (after over 12 month's absence from the air).

Standard time: G.M.T. less 3 hours.

Distance from London: Approximately 4,000 miles.

Postal address: "Estacao PRA8, Radio Clube de Pernambuco, Pernambuco, Brazil."

Identification characteristics: Comes on the air at 21.00 with Brazilian National Anthem, announcing rapidly immediately after, and at frequent intervals as "PRA8, Radio Clube de Pernambuco, Brazil." Four or five vibraphone notes are radiated at 15 minute intervals, and the carrier has a distinct hum. A studio clock sometimes strikes the hour. At present operating on 49.89 m.

Verification of reception reports: Sends card of remarkable design.

HIH, SAN PEDRO DE MACORIS

(Dominican Republic)

Metres: 44.31. Kilocycles: 6,780. Power: 150 w.

Operating schedule: Irregular; frequently audible around midnight.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora HIH, Sr. Domingo Dominguez, San Pedro de Macoris, Dominican Republic."

Identification characteristics: Announces in Spanish as "HIH (ah-tchay ee ah-tchay), La Voz del Higuamo, San Pedro de Macoris, Republica Dominicana," generally at 15 minute intervals, i.e. at 00.40, 00.55, etc. Also occasionally employs chimes, or announces in English.

Verification of reception reports: Confirms with card bearing large call-sign, but inclined to be slow in replying.

HIL, TRUJILLO CITY

(Dominican Republic)

Metres: 46.15. Kilocycles: 6,500. Power: 50 w.

Operating schedule: 16.40—18.40 and 22.40—00.40 daily, but apparently irregular at present.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora HIL, J. C. Pellicer, Apartado 623, Trujillo City, Dominican Republic."

Identification characteristics: Announces in Spanish as "HIL (ah-tchay ee ellay) en ciudad Trujillo, Republica Dominicana," generally at 15 minute intervals. No identification signal or slogan used.

Verification of reception reports: Sends card bearing large call-letters.

HIZ, TRUJILLO CITY

(Dominican Republic)

Metres: 47.50. Kilocycles: 6,315.

Power: Believed to be 100 w.

Operating schedule: Not definitely known, but between 22.30—02.30.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora HIZ, Frank Hatton, Trujillo City, Dominican Republic."

Identification characteristics: Once known as "La Voz de los Muchachos" but appears to have discontinued using that title. Now uses 5 chimes and call in Spanish "HIZ (ah-tchay ee thay-tah), Broadcasting Nacional en ciudad Trujillo, Republica Dominicana"; news bulletin is generally given at about 23.40 and preceded by a siren wail. Rarely uses English.

Verification of reception reports: Confirms with plain card, but very difficult to obtain.

HIN, TRUJILLO CITY

(Dominican Republic)

Metres: 48.05. Kilocycles: 6,245. Power: 750 w. (or 26.6) (or 11,280)

Operating schedule: Officially 17.00—19.00 and 00.30—02.30, but apparently irregular at present being heard sometimes earlier or later.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora HIN, Broadcasting Nacional, Trujillo City, Dominican Republic."

Identification characteristics: Call in Spanish "HIN (ah-tchay ee ennyay), ciudad Trujillo, Republica Dominicana," to which the slogan "Broadcasting Nacional" is sometimes added. In English it is given as "Short-wave station HIN, Trujillo City, Dominican Republic." This station was originally known as "La Voz del Partido Dominicano."

Verification of reception reports: Originally verified with attractive card, but now difficult to obtain.

H11A, SANTIAGO DE LOS CABALLEROS

(Dominican Republic)

Metres: 48.5. Kilocycles: 6,185. Power: 100 w.

Operating schedule: 16.40—18.40 and 00.40—02.40 daily; rarely heard at present.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora H11A, Apartado 423, Santiago de los Caballeros, Dominican Republic."

Identification characteristics: Uses chimes, about 7, which are spaced to spread over almost 30 seconds and coupled to the title "La Voz del Yaque." English used occasionally.

Verification of reception reports: Sends extremely attractive card.

HIT, TRUJILLO CITY

(Dominican Republic)

Metres: 45.25. Kilocycles: 6,630. Power: 200 w.

Operating schedule: Daily except Sundays 17.30—19.00 and 23.00—02.00; Saturdays 04.00—06.00; irregular at present.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora HIT, Apartado 1105, Trujillo City, Dominican Republic."

Identification characteristics: Reference to "La Voz de la R.C.A. Victor"; occasional English announcements and bugle call. Reports are sometimes acknowledged over the air in the same language.

Verification of reception reports: Confirms with QSL card

H11J, SAN PEDRO DE MACORIS

(Dominican Republic)

Metres: 51.15. Kilocycles: 5,865.

Power: Originally 42, now 100 w.

Operating schedule: 17.10—18.40 and 23.10—02.10 daily.

Standard time: G.M.T. less 4 hours, 40 minutes.

Distance from London: Approximately 3,600 miles.

Postal address: "Radiodifusora H11J, Fausto M. Donastorg, P.O. Box 204, San Pedro de Macoris, Dominican Republic."

Identification characteristics: Occasional announcements in English; in Spanish at 15 minute intervals, generally as "Emisora H11J (ah-tchay uno ee hota) en San Pedro de Macoris."

Verification of reception reports: Sends neat card in National colours and giving complete details.

AROUND THE HAM SHACKS

4—G5CG

By D. J. LEGGE

THIS STATION is a consistently low power one, the input never exceeding 25 watts. But for all its low power it puts down a T9+ signal in most corners of the globe. The QRA of this station is Mr. C. Gregg, Police Lodge, 46, Highbury Road, Bulwell, Notts. It's quite a coincidence about his initials being the same as his call, isn't it? As you'll probably deduce from the QRA 5CG is a policeman; but don't let that deter you from visiting him, hi! He's a very nice and obliging fellow.

● Shack Lay-out

The apparatus used here is located in a spare room upstairs; but it is still a ham shack for all that. The room is medium-sized and the apparatus is placed along one wall, in front of the window, to the right of the door. In the far right hand corner of the shack is the framework of a six-foot wooden rack, the transmitter having been placed in here at one time but as results were not too gratifying it was removed to its original position.

In the far left-hand corner of the room is a large table at which 5CG does most of his writing, such as entering up his log book, addressing QSL's, etc. Above this table on the wall are the cards which verify the fact that 5CG has WAC. He needs one more contact, this being with VU, to qualify for his WBE certificate. So good hunting, 5CG!

● Transmitter Line-up

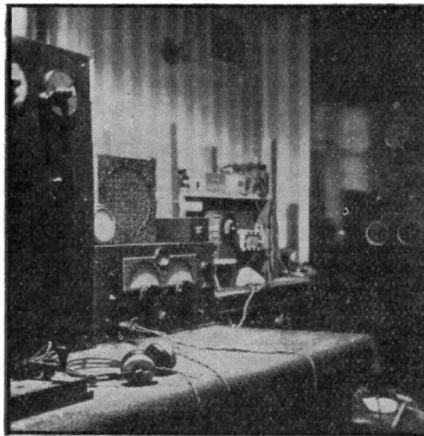
The transmitter panel is about three feet long and two feet high. It is of all-wood construction, and has one shelf at the back on which is mounted the radio-frequency portion of the tx. The valve line up for this section is a PM24m as the crystal oscillator which is link coupled into another PM24m as a buffer-doubler into a type T50 as the final amplifier. The power supply is on the bottom baseboard, this will deliver 500 volts at 120 ma. The rectifier is a type 83 mercury vapour valve. The high-tension from this supply to each stage can be varied at will by the adjustment of three power potentiometers mounted on the panel.

When the transmitter is in operation on 7 mc. fone is generally used. In order to accomplish this with a minimum of trouble and audio power, the T50 in the final stage is replaced with an RFP15 which is suppressor grid modulated. A few hams have had bad luck with the RFP15's but no trouble has been experienced here. The speech amplifier used for fone operation is separate from the transmitter and is built up on a flat sheet of aluminium. It has two stages and consists of an MH/41 transformer coupled to an AC/pen. The output from this is approximately 3 watts and the total output from the transmitter on fone is 15 watts. The high-tension for the speech amplifier is obtained from a remodelled Ekco eliminator.

● Receiver and Aerial

The receiver is an RME69: a nine-valve single signal superhet. It tunes continuously from 9-550 metres, and it has a beat oscillator, R strength meter, a.v.c., crystal filter 'n everything; a real FB receiver. It has been in use here about nine months; 5CG says that when he first had it he never went to bed for a week.

The tuning of this receiver was a revelation to me, it is one of the smoothest tuning receivers I have ever handled. The large dial on the left controls the main band-set condenser and the one on the right the band spread. The tuning condensers are so free that they seem to run in an oil bath, a mere flick of the hand being sufficient to send the pointer right around the dial. Being located on the main road and having a trolley bus route by the door it is only natural to assume that there will be some interference on the receiver. But this is not so, the interference up to a wavelength of 160 metres is negligible.



On the right is the 6 ft. rack, alongside is the speech amplifier with mike. Centre, R.M.E.69.

The aerial used at this station is a 7 mc. Zepp. The pole is about 40 feet high and the other end is anchored to the chimney stack. All the dx QSO's from this station have been carried out on this aerial. A 7 mc. doublet has been tried but with little success. OK's, ON's and PA's could be worked with comparative ease but VK's, W's and PY's could not be raised at all.

G5CG has been on the air for five years, he is a member of the R.S.G.B. and the A.R.R.L. The transmitter here is the original one with which he started although, at that time it had no panel to it. He is now making plans to build a fresh tx in the vacant rack referred to before. This will be for c.w. only, the existing one will still be retained for fone operation. He has not quite decided yet on the valve line-up to be used but he is decided on the use of Yank tubes throughout.

Well, in 5CG's own words, it is about time for him to do some more sleuthing, so we'll say 73 es dx OM.

Reflected Waves and Side-splash

in other words—All Sorts of Things

ONE OF THE most popular features of THE SHORT-WAVE MAGAZINE is the "DX Corner." Starting in quite a modest way, with a single column, it rapidly grew to three pages, the keenest short-wave listeners contributing to its success. The "Corner," under the editorship of the DX Scribe (who collates and comments on general conditions and the inferences which may be drawn from readers' logs), just naturally grew that way.

Although reception experiences by reader-reporters have for some time been popular and of proved value in the listeners' organisations bulletins this was the first time the system was applied by a national journal. Those readers who keep their back numbers, and I gather by the letters received and the continual demand for them that most of you do, will find it interesting to study the "Corner's" evolution. Collective reporting is not only more representative and interesting than the usual method but when each log reports the receiver used it also serves as an ideal means of judging the performance of each new hook-up one tries. No doubt you have already noticed that many of the logs are secured by readers with small home-constructed receivers.

● A Moral

Almost every month the star performance of the "Corner" has been put up by Bob "The-keenest-listener-we-know" Everard, whose logs leave many of the very keenest ether hunters out of breath. W. E. Davey (B.S.W.L.330), also well known to Cornerites as an enthusiastic and experienced dx'er, once asked "Does Bob Everard go to bed at nights?" and many others must have wondered the same thing. Bob (or properly R. D.) Everard, was the winner of the B.L.D.L.C. dx contest some eighteen months ago and at one time edited the amateur stations section of the B.S.W.L. REVIEW (he was a co-founder of that organisation) and has written a number of useful articles in this magazine.

He has now 1,700 QSL verifications, all b.o. or fone, over 200 of which are from stations who stated that his was their first European or G report—and he doesn't use a communication-type receiver either! About a thousand of his veri's were secured with a converter and that without band-spreading or even what one might call a real slow-motion drive. What better evidence can anyone ask that regularly successful dx'ing is not a question of skill but an intelligent interpretation of the right times and wave-bands to listen to.

Before Bob Everard became one of the world's premier listeners he was a keen postage stamp collector and won about a dozen International Philatelic Exhibition awards and once had the honour of having his collection of original covers viewed by H.M. King George the Fifth at Buckingham Palace.

● The Sending of Veri's

Jumping to the other end of the subject of QSL's—sending them. It is the proud boast of G2UV that not a single report to his station has

passed without an acknowledgment. Bearing in mind that he is one of the old-timers, I would nominate him for the most courteous World title. Incidentally 2UV was the first European amateur to issue QSL cards. In 1921 when he first reported transatlantic signals (they were U and not W stations in those days) he received cards in acknowledgment. Realising the value of the idea he issued his first QSL in the form of a visiting card, about 4 by 2 inches. He felt it was a visit in spirit and thus a card announcing his identity was called for, a view shared by others who soon had their own "visiting cards." Shortly after, he produced the now familiar postcard in one colour which was soon extensively copied, following it in 1923 with the first two-colour edition.

● Things to come

Since that time, QSL cards have become more and more elaborate, many recent ones contain photos of the transmitter or operator, the shack, a home-town view or even symbols of local industry or legendry, while some particularly ambitious efforts have a combination of them all with a few other ideas worked in, sometimes necessitating a considerable enlargement in the size of the card. Comic cards are not infrequent and the "futurist" type are coming into greater favour.

While I have a personal preference for the plain and dignified style I must admit that many of the more ornate are admirable and some truly artistic. The uniform styles used by the members of the exclusive clubs, the South Bay Amateur Association (The Dx gang—100% crystal and W.A.C.) and the World Contact Association (all members W.A.C., W.B.E., R.S.G.B. Xtal) both Californian, are to my mind splendid examples of dignified design. K6NZQ uses a card showing a Hawaiian girl and sunset in Hilo Bay, while G2NS includes a potted autobiography in his and SU1RK features Sphinx, pyramid and palm trees. Other interesting cards emanate from J2IN (containing the music of the Japanese National Anthem) and W6CVD tells the world he prints his own (Hi) while W8DWV, from whom I have seen several different editions, concludes with the slogan "Any QSL deserves a reply." It is noteworthy that the more elaborate veri influence is spreading to broadcasters—HB9D uses a card depicting Zurich by night and the Russians have for some time past been verifying with composite photos of Soviet personalities, recent ones showing the North Pole flyers.

I sometimes wonder what will come next in the way of novelty but apparently this question does not bother the stately B.B.C. They still do not verify reception reports of short-wave transmissions, which must seem churlish to Empire and foreign listeners especially after one or two of their engineers are reputed to have sent veri's they made it known that those cards were issued without the authority or approval of the Corporation.

Gene Lap.

● E.C.O. Working

For clarity in explanation, the electron-coupled oscillator circuit is drawn to the left of V1 in the diagram, and is enclosed by dotted lines. It will be seen that all that is needed to change from straight crystal or tri-tet to e.c.o. is to take out the crystal, plug in the fixed condenser C10 in place of it, and tap the cathode down L1. Suitable tapped coils at L1—which can of course also be used as cathode tuning coils for tri-tet working—are given in the table of values, or can be made up quite easily. Only a very small amount of excitation, or distance of the cathode tap from the earthy end of L1, is necessary. About 10% of the number of turns on L1 is usually ample.

E.C.O. operation gives a choice of any frequency, the setting of it being controlled by C1, and the drive to V2 taken off from the tank circuit L2/C2, which must never, in either tri-tet or e.c.o., be

pointed out, the harmonic output from the exciter is so good, there should be no need to have the cathode side of V1 on a frequency higher than 3.5 mc., as frequency variation of L1/C1 through this range will obviously allow the use of any desired frequency on any band from 7 to 28 mc.

Coming now to the operation of the second stage V2, the first point to note is that this valve is always worked as a doubler, rather than as a buffer amplifier. There are several reasons for this, one being that an APP4g used as a straight amplifier on the higher frequencies is prone to self-oscillation and requires neutralising for complete stability. The capacity of the necessary neutralising condenser is very small indeed—something less than 2 mmfd.—and is not very easy to arrange. Further, the sensitivity of the valve is such that any stray r.f. from the preceding stage will “trigger” it, and conversely, this means that it works well as a doubler with very low r.f. input.

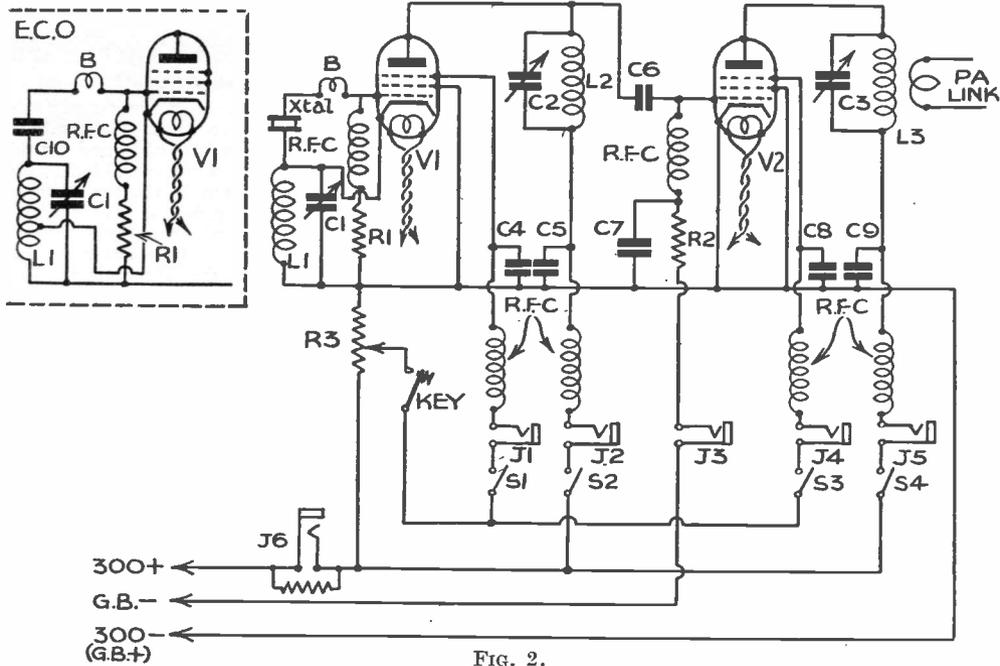


FIG. 2.

operated at the same frequency as that to which the cathode side L1/C1 is tuned. To do so places a dangerously high strain on the valve and crystal (in the tri-tet) and produces overheating, instability and a bad note with the e.c.o. connection. In any case, the 2nd and 4th harmonic output at L2/C2 is always ample for exciting the second stage.

If e.c.o. working is required on 1.7 mc., the cathode coil L1 should be wound for the medium-wave broadcast band. In discussing the use of the first stage as an electron-coupled oscillator generally, it will be found that in the interests of stability and a good note, it is always advisable to have the cathode side on as low a frequency as possible, either 1.7 or 3.5 mc. Though e.c.o. working is quite possible on 7 and even 14 mc., there is a tendency for creeping and roughness in the note even if the first stage is very lightly loaded, which is always desirable in any e.c.o. circuit. Since, as has been

Assuming, therefore, that 28 mc. output is wanted from a 1.7 mc. crystal, V1 is switched to the tri-tet connection, and its tank circuit L2/C2 tuned to 14 mc., V2 then doubling to 28 mc. An interesting point to note here is that while the 8th (14 mc.) harmonic may not be visible at L2 as more than a faint glow in a tuning loop, the doubled output of 28 mc. at L3 in the tank circuit of V2 will probably be sufficient to light that same bulb to full brilliancy! This is incredible, but true. Tuning L2/C2 to 7 mc.—which would produce a better glow in the loop—does not necessarily improve the 28 mc. output at L3, since V2 is then working as a quadrupler, and requires considerably more grid input than it does as a doubler. In other words, the weaker r.f. input to V2 when V1 is working to its 8th harmonic is more useful with V2 doubling than the stronger input is when V2 has to quadruple.

The above remarks illustrate the point, apart from the question of neutralising V2, of always operating the second stage as a doubler. The 16th harmonic—1.7 to 28 mc. through the two stages of the exciter—is quoted as the extreme case and represents just about its effective limit. It is, of course, far better to use either the 4th or 8th harmonic, as this ensures ample drive being available for the 50-watt p.a. stage or high-power buffer amplifier.

Before concluding these remarks on the different ways in which this exciter can be used, there is still another point which requires explanation. When taking out the 8th or 16th harmonic with either crystal or e.c.o. control, it is obvious that a slight amount of creep—probably quite unnoticeable on the monitor—will be multiplied 8 or 16 times in the output, as the case may be. This is not likely to happen with either straight crystal or tri-tet connection of V1 provided that the cathode condenser C1 is correctly adjusted in the case of tri-tet working, and C2 not kept too near resonance with straight crystal. But with e.c.o. a drift of 500 cycles plus or minus on the cathode side when it is tuned into the 3.5 mc. band, will cause creeping of plus or minus 4 kc. on 28 mc., 2 kc. on 14 and 1 kc. on 7 mc. Actually, if the excitation is kept low with the e.c.o. connection and V1 lightly loaded, there should be no creep on a frequency as low as 3.5 mc. With the cathode side on 1.7 mc., the tendency for any creeping to occur will be even less, but then the multiplying factor when working to 28 mc. becomes 16, while the r.f. output at the tank of V2 will be less. It therefore becomes evident that the best frequency-range to choose for e.c.o. operation is 3.5 mc., which combines minimum frequency drift with highest output.

● Construction of the Exciter

So long as it is built as one unit, the form of construction is not important, since in most cases readers will not only have many of the necessary parts by them, but will also have to plan in the exciter with their existing equipment. However, for the benefit of those others who may be fired by this article to build such a piece of apparatus for the first time, a full list of parts is given herewith, while the remarks following cover one possible form of construction.

A panel 15 inches by 9 inches, and a baseboard 15 inches by 10 inches, should be arranged to give a sub-chassis space of 3 inches. The baseboard should be divided so that there is a space of 9 inches by 10 inches available for V1 and its associated circuits, leaving 6 inches by 10 inches for V2. The condensers, switches, and meter jacks should be mounted symmetrically on the panel, and the valveholders, which are the familiar Clix baseboard-mounting type on legs, together with the coils, coilholders and crystal mount arranged on the baseboard. In the sub-chassis space beneath the baseboard go all the fixed condensers—except that coupling the plate of V1 to the grid of V2—together with the r.f. chokes and bias resistors. The power variable resistor R3, which controls the screen-grid voltage, should also be mounted on the panel in the sub-space so that it can be adjusted from the front.

The r.f. wiring above the baseboard must be in No. 16 enamelled or light copper strip so far as coil-condenser circuits are concerned, i.e., the three “tanks” C1/L1, C2/L2 and C3/L3, and for the rest of the wiring above the chassis, Bulgjin “Quikwyre” is very suitable. Those who have built the “Ideal

Receiver” should have some over! In the sub-space, it will be found that the wire-ends of the various small components involved will be long enough in most cases. Here another point arises; as far as possible, all earthy ends should be taken to one common connection. This can either be a large terminal, a piece of copper about one inch square supported on a stand-off insulator, or something similar. With a metal chassis, it is important to avoid the temptation of earthing to the nearest convenient point, because in so doing potential gradients are set up in all sorts of unexpected ways, the result being that losses are introduced and instability will occur.

The connecting leads can either be taken to a row of terminals arranged on a panel along the back of the sub-space, or a multi-way cable can be used. In the latter case, it is best to make one up for oneself, rather than to use the commercial types, which are usually not heavy enough to carry the l.t. current or sufficiently well insulated for voltages much in excess of 200 or so.

● Operating and Adjusting the Exciter

The heaters of the two APP4g's together require 4 amps. at 4 volts, with a plate supply of 300 v. maximum and not more than 180 volts on the screen. This latter voltage is obtained by adjusting the variable power potentiometer R3 till the screen current is slightly less than 5 ma. per valve. If the screen-lead meter jacks are fitted as shown in the diagram, this can be easily checked. Slight variations above or below this figure are not important, since in practice it will be found that the screen current of V2 depends both on the amount of drive from V1 and the loading on V2.

With switches S3 and S4 open and V2 plugged in—make sure first of all that there is in fact 4 volts across the two heater terminals or 4 amps. in the l.t. supply lead, as proper operation depends on full l.t. being applied—adjust the first stage for, say, tri-tet working. This involves a crystal and tuning of the cathode circuit. With V1 entirely out of tune (both condensers at maximum) the plate current reading will be “off-scale”; as the cathode circuit is brought into tune by rotating C1 towards minimum, the plate mils. fall back to a value of 30 ma. or thereabouts, and a glow will be visible in the tuning loop when presented to L1. This will not be very bright, and it should be dimmed still further by swinging C1 more towards minimum. The point here is that if the cathode circuit is tuned dead to the crystal frequency, the latter is considerably over-loaded and fracture is more than a possibility; apart from this, full output is not obtained on the plate side. Actually, for a 3,500 kc. crystal, C1/L1 should be tuned to about 5,000 kc. for correct operation, but under practical conditions it is enough to set C1 as far towards minimum as possible. To make sure that sufficient crystal excitation is being obtained, a 60 ma. fuse-bulb should be wired in series with the crystal, as indicated in *fig. 2*, and the glow should never be more than about half-brilliance.

Having thus adjusted the cathode side and obtained a plate current of about 30 ma. the next step is to resonate the tank circuit of V1, C2/L2. Here another important point needs discussion. Any frequency multiplier circuit of this type, if it is efficient, will select not only the 2nd and 4th harmonics—the even harmonics are nearly always those we require on the amateur bands—but also the odd

ones; the 3rd, 5th and so on. Hence, when tuning the plate side, it is essential to make quite sure that the correct harmonic is being obtained. The most certain way of doing this is by means of a simple absorption wavemeter with a bulb indicator. This can be calibrated sufficiently accurately from the receiver, as all that is required is to find the bands, and not any particular frequency in them.

As C2 is swung from maximum towards minimum capacity, the 2nd harmonic will produce a pronounced change in plate current, the 3rd a similar effect but not so marked, and the 4th still less. The 8th may only give a movement in a fairly sensitive meter. Having selected the harmonic required, say, 7 mc. from a 1.7 mc. crystal, or 7,020 kc. from 1,755 kc., which is to be doubled again to 14 mc. in V2, the latter is brought in by switching on first the plate and then the screen voltage. The plate current reading to V2 will now be fairly high, 40 to 50 ma. or more with C3/L3 out of tune, but as C3 is varied from maximum to minimum, this reading will drop back as the various harmonics are brought into tune. As V2 is always to be operated as a doubler, check with the absorption wavemeter that 14 mc. has been found, which in this example will be an actual frequency of 14,040 kc. The plate current to V2 will go back to about 15 or 20 ma., and it should be possible to blow the tuning loop when held near L3.

The exciter unit will now be giving output on 14,040 kc. from a 1,755 kc. crystal, with a total current consumption of about 40-45 ma. This will rise to about 60 ma. or thereabouts when the link between L3 and the p.a. stage is properly adjusted. The arrangement of this link follows standard practice and need not be discussed here, except to say that when the grid of the p.a. stage is brought to dead resonance, some compensation for the extra loading will be necessary by re-adjustment of C3. The final touch is, when the exciter is running and driving the p.a. stage, to go round all dials and set them for optimum r.f. output at the tank of the p.a. In this connection, however, the temptation to try and get still more punch by bringing C1 nearer crystal resonance should be strenuously avoided. Anyway, the tuning on this condenser will be so flat that no noticeable improvement will be possible, and as it is brought near the crystal frequency, the r.f. output will start falling off.

The amount of fixed bias on V2 should be varied between -15 and -30 volts till best r.f. output is obtained. Alternately, a variable grid-leak resistor, such as the Varley 3-watt type, can be used at R2 to give better control. As regards metering, a single 0.50 ma. instrument can be mounted on the panel with a flexible lead terminating in a plug so that each of the five current points can be checked. It is as well to use a good dead-beat moving-coil meter, as it is impossible to make proper adjustments with the cheap moving-iron type having a wobbly needle. If a regular check on the total current consumption is required—it is very useful to be able to keep this under continuous observation—an additional close-circuit jack can be inserted in the h.t. positive lead. If a shunt is wired across this jack such as to double the 0.50 scale, the meter will automatically read the total current when it is plugged in.

● Keying

This is carried out by inserting the key in the common screen lead, and if the exciter is correctly

adjusted, will give clean, clickless keying with complete r.f. cut-off. A little difficulty may arise in the latter instance in that the APP4g's, in common with many sensitive pentodes, will still function very weakly with the screen connection entirely broken. This is particularly the case if a lively crystal is being used, and if the regulation of the power supply is poor, the plate voltage when the key is up may rise to over 350 volts, resulting in the crystal just continuing to oscillate. These valves are so sensitive that even with V2 doubling, there may be a trace of r.f. output at L3, which might be enough—though it may not be visible in the tuning loop—to trigger an efficient p.a. stage to such an extent as to produce a spacer. This weak note when the key is up can always be heard in the monitor, and steps should be taken to eliminate it either by de-tuning C2 a little, and/or increasing fixed bias on V2. If this does not work out well, it will be necessary to key in the cathode of V1. On the other hand, it may be possible to tie down the p.a. stage by means of a little extra

(Continued on page 30.)

TABLE OF VALUES

Valves :

Two Tungstram APP4g.

Condensers :

- C1—.00025 mfr. Cyldon (R.D.C.).
- C2—.0001 mfd. Cyldon (R.D.C.).
- C3—.0001 mfd. Cyldon (R.D.C.).
- C4, C5, C7—.002 mfd. T.C.C. mica.
- C6—.0002 mfd. T.C.C. mica.
- C8, C9—.001 mfd. T.C.C. mica.
- C10—.0003 mfd. T.C.C. mica.

Coils :

Q.C.C. Standard "Ten-Watt" type, plain.
For all-band operation 1.7 to 28 mc. one coil is required for each, with three bases to match. These coils can be tapped as required for e.c.o. operation.

Resistors :

- R1—25,000 ohm, 1 watt., Erie or Dubilier.
- R2—10,000 ohm, 2 watt., Erie or Dubilier, or Varley 3 watt, 25,000 ohm variable.
- R3—30,000 ohm power type, Varley.

R.F. Chokes :

RFC—Q.C.C., Raymart or Eddystone. It is advisable to place an ultra short-wave type r.f. choke in series with that in the grid of V2 if much 28 or 56 mc. work is to be done. This should go in on the grid side.

Miscellaneous :

- 1 Crystal holder and crystals, Q.C.C.
- 2 7-pin valveholders, Clix baseboard type or as required to suit construction.
- 6 Single-circuit close-circuit jacks and plug to match, Bulgin or Igranic (Webbs).
- 4 Single-pole toggle switches, Bulgin.
- 1 0.50 ma. moving coil meter, with double-scale shunt to suit across J6. Sifam, Ferranti, Bulgin, etc.
- 7 Terminals, Clix.

Practical Aerials for the Average Location

Don't blame your location, try a different aerial. G2PL and G8LT give details of results obtained with types which can be erected in even the most restricted space

By P. PENNELL (G2PL) and R. W. ADDIE (G8LT)

IT IS CLEARLY impossible that more than a minute portion of this interesting and extensive subject may be covered in condensed notes such as these. The remarks are based upon actual experiments conducted jointly at G2PL and G8LT. It cannot be too heavily stressed that the work was carried out in two widely differing locations namely, the flat fen country in the Cambridge area and the sandy undulating region at Woking, Surrey.

How often do we hear on that often abused 7 mc. band: "I don't seem to be able to get out at all—it's a rotten location." Our aim here is to disprove this fallacy and to show that for every existing location there is possible some satisfactory form of radiator. The factors most affecting propagation are firstly, surrounding buildings and nearby objects which seriously alter its polar diagram and, to minimise this, the aerial should be erected as high and as far away as possible from such obstacles. Secondly the nature of the subsoil plays a more important part than is generally imagined in the successful operation of a radiator. Thirdly, and certainly not the least in importance is the direction in which the aerial is laid, since it must be realised that any high-frequency radiator has certain definite lobes of maximum radiation and it is therefore highly desirable that these be made to fall where they will be of most use. Furthermore, not only is there directivity in a horizontal plane but this must also be considered in a vertical plane. The latter is important since, in all but a very few cases we have to deal with the reflected and not the direct or ground wave, consequently, whilst a high angle of radiation may be desirable for short distance work, we try to make the angle of incidence of our transmitted wave on the reflecting layer as small as possible when great distances are to be covered with a minimum of re-reflection.

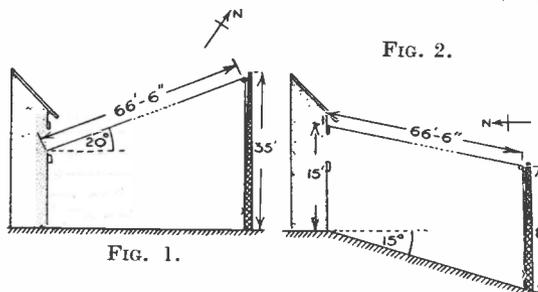
● End Fed

This class of radiator is perhaps the simplest to design and erect and, although its popularity to-day is not so great, they should by no means be overlooked. The simplest is the 66-foot end-fed aerial which can be made to function on 7, 14 and 28 mc. with a reasonable amount of efficiency. The ideal conditions under which it may be erected are in a north-south direction, canted towards the south and fed from the north end. In this position it has been found to give efficient radiation in nearly all directions, and tested by G2PL at Cambridge it was put up in a NE-SW line, highest at the NE end and fed at the SW (fig. 1). Although this was far from the ideal arrangement, yet excellent results were obtained using low power on all three bands but in a Westerly direction only, and, despite many

changes this directional effect was always noticed as long as the aerial was kept as described above. At Eastbourne too the same type was employed, under very poor conditions, placed in a north-south axis—fed at the north and canted to the south (fig. 2). This appeared to give omni-directional results on both 7 and 14 mc., but 28 mc. was never tried there. In passing, it should be stated that the subsoil in Cambridge is a mixture of gault and sand, while at Eastbourne it consists of a large percentage of mineral ore.

Two important factors emerge from the experimental work, the first of which is that the 66-foot end fed should never be placed truly horizontal but must be canted in one direction or another as shown above.

The second fact is that the cutting to resonance of the aerial should be done very carefully, and the followed method is to be highly recommended. The p.a. should be tuned to resonance on 7 mc. without any load, and a note made of the condenser setting for this condition to be fulfilled. Next, tap



on the end-fed wire of approximately 67 feet and again tune the final plate condenser to minimum, taking careful note as to whether more or less capacity is needed to do this. If more capacity is required, then the wire is too short, but if less, then it is too long and a short length must be removed from the end. This procedure is repeated until tapping on the aerial does not necessitate the retuning of the p.a. plate condenser.

No formula can decide the exact length required in any particular case since the very fact that one end of the wire has to be brought in to the transmitter must alter its effective length. Loose coupling is not recommended here, since the direct tap has proved itself the most efficient.

The next in popularity is the 132-foot end-on aerial which can confidently be recommended as a thoroughly reliable system, since it may be employed on all bands from 28 to 3.5 mc. under extremely varying conditions and with consistent

results. The exact length appears not to be very critical in practice, it may however be determined by the same method as has been previously mentioned. Like its 66-foot counterpart it seems to work best when canted, or even "kinked." A flat top 132-foot aerial does not give such promising results.

At Cambridge in the NE-SW direction at a height of about 33 feet and fed at the S or SW end as before it has been found the best radiator for efficient omni-directional transmission on 28 mc. that has ever been employed (fig. 3).

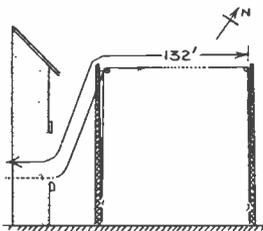


FIG. 3.

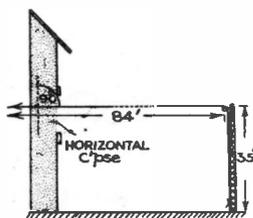


FIG. 4.

and 1.7 mc. the counterpoise may be extended to 17 feet for more efficient transmission.

Marconi types of aerial are useful to those who are unable to erect long wire radiators of 132 or 264 feet, hence any existing aerial may be adapted for use as such. To take an example, in the Cambridge location the most versatile aerial has been the 66-foot matched-impedance single-wire-fed Hertz. In order to operate this on 1.7 mc. and 3.5 mc. a 66-foot counterpoise was erected in the manner indicated (fig. 8). On 1.7 mc. it was coupled through a parallel tuned coil; series on 3.5 mc. as fig. 7.

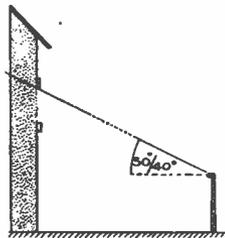


FIG. 5.

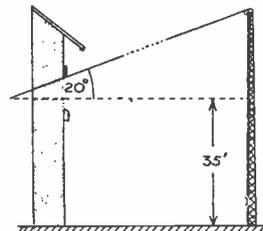


FIG. 6.

Using high or low power, results are proportionally the same, R9 has been received from all continents but South America (R8), using 100 watts input; ZS1H, W6JJU and VK2GU all reported the signals as the most consistent and loudest of Europeans over a three-month period in the winter of 1936.

On 14, 3.5 and 7 mc. the aerial is a little more directional, especially on the lowest frequency band. Notwithstanding this fact it works efficiently in many directions, and in this particular case it has produced excellent results for communication with the American continent.

In case one should wonder if a 33-foot end-on merits a trial it may be said that its shortness does not allow it to radiate with any degree of efficiency on 14 mc., and of course a 1/4-wave radiator is useless on 7 mc.

The next important class of aerial to be described before embarking on the Marconi aerial for transmission on the 1.7 mc. and 3.5 mc. bands is that designed by W3EDP; it may be used on all bands from 10 to 160 metres. It is 84 feet long, and on 10 metres is tapped direct on to the p.a. coil.

Experimental work at G2PL has shown it to be slightly directional at this frequency, but in a westerly direction it appears to be excellent and on 14 mc. it comes into its own. It is tapped on one end of a coil having the same number of turns as that in the p.a. tank circuit, and to the other end, at right angles to the 84-foot wire, is attached a length of 6 feet 6 inches—in the same room as the transmitter; the coil is then inductively coupled to the p.a. tank and the distance adjusted until the desired amount of energy is extracted from the final amplifier.

Tests have been conducted using a flat plane, canted down to and away from the transmitter, i.e., to the NE, and results have varied but little. To take an example—with the aerial as in fig. 5 R9 was obtained from several VK's and R8 from W7. With the aerial as in fig. 4 or in fig. 5 the same report was obtained, contrary to one's expectations—W7 being in a westerly direction. The canting of an aerial in a NE direction should have produced a weaker report in the opposite direction. On 7, 3.5

Many people are of the opinion that these systems are ineffective; let this be contradicted immediately. On 3.5 mc. employing the system indicated in fig. 8 the effectiveness of the transmissions has been greater than with the 132-foot end-fed aerial. Reports over several months prove that this array produces a greater signal strength in America than the other types. It was the only aerial to put signals into Australia and New Zealand.

On 1.7 mc. there is insufficient space to erect a 264-foot end-fed aerial and so the system in fig. 8 has been used and employing it America, Canada, North Africa and Finland have been contacted—no mean feat for that particular band. This form of Marconi is not limited to the main aerial shown in fig. 8 but to any kind having a 33-foot top or even a 66-foot end-on, of course the size of the coupling coil to be employed will vary with the class of main aerial.

● Single Wire Fed Aerials

From the end-fed variety of aerial we pass to the type of radiator which is suspended in the air and fed by a single transmission line, this perhaps is the

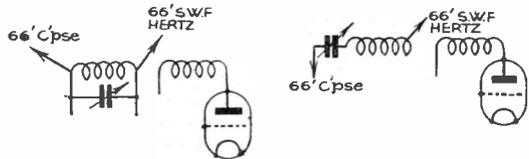


FIG. 7.

simplest and easiest to erect of fed radiators. The top may be either of the 33-foot, 66-foot and 132-foot class, the exact length being determined by the formulæ:—

$$L = \frac{474,150}{f \text{ (kc.)}}$$

where L is the length of top in feet,

$$L \text{ (feet). } F$$

$$X = \frac{180}{F}$$

where F is 23.2 and X is the distance of the tap from the centre.

The radiator should, if possible be erected at least a half wavelength away from all objects, the feeder can be of any length provided it does not fall into harmonic relationship with the band upon which transmission is to be conducted. It must drop at right angles from the top for at least 15 feet and then continue in a gentle curve to the p.a. tank coil, avoiding all right angle bends.

The actual conditions, under which the aerial is erected vary from place to place, for those who wish to experiment with the tap two hot-wire ammeters may be set one quarter-wave apart in the feeder and the tap adjusted until they read the same. The

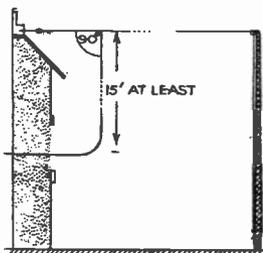


FIG. 8.

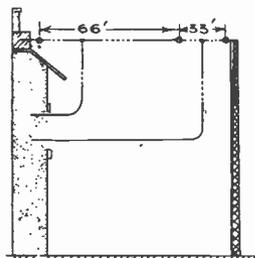


FIG. 9.

current distribution will then be constant along the whole line, but for ordinary purposes the formulæ have been found satisfactory and the tapping point is not very critical although theoretically any radiation from the feeder line should be detrimental to the system.

A very unusual system, which has two great advantages, is that employed at station G2PL; firstly, omni-directional transmission and secondly, it may be efficiently employed on all bands from 1.7 to 56 mc. inclusive. Fig. 9 illustrates the vital factors, and it should be link coupled to the tank

coil by an identical inductance. On the higher frequencies it has proved omni-directional and very efficient when excited from low-power transmitters. On the lower frequencies the 66-foot section plus the counterpoise of similar length is employed.

Clearly this system has many advantages, for each section may be used separately and if difficulty is found in contacting one particular location on one section this is remedied either by changing to the other or exciting the two out of phase. A variation would be to erect the 33-foot section in a vertical plane or even to alter it from the straight line and place the two radiators at 45 degrees to one another,

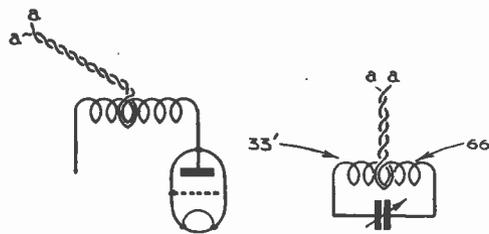


FIG. 10.

both these variations have been successfully tried by other stations.

A vertical 33-foot s.w.f. aerial produces excellent results if erected slightly out of the vertical plane, but in this case it has been found that the location plays a very big part. One important remark should be made, namely that for maximum transfer of energy when using one section direct tap has been employed, but when using the two sections the link coupling method is the most satisfactory because it gives the best matching of impedances (fig. 10). (To be concluded.)

"ADVENTURES OF AN OP."—cont. from p. 13. a long length of cable, the sharp points of the "vee" become rounded, like the proverbial sea-serpent's humps. There is no QRM, thank goodness, but signals can get decidedly "snakey"!

Now, supposing we were to take the slip illustrated in Ted McElroy's article on page 24 of this magazine's March issue and run it through our transmitter, then the dots would appear as fig. 2 (a) and the dashes as (b), the letter "L" being interpreted by our syphon recorder as (c).

We grow so accustomed to both kinds of signals that reading them becomes as rapid and as easy as the printed page of a book and we are able to either transcribe them into longhand on delivery forms or, after pulling the slip through a gum pot, stick it down on message forms which can be handed to another operator for re-punching and re-transmitting.

Sometimes it is speedier to entirely dispense with our syphon recorder and, in that case, we replace it with a receiving perforator. This instrument will automatically give us fresh, perforated slip exactly identical to that being fed into the transmitter at the sending end. This fresh slip can then be run straight into another transmitter for re-transmission or, more spectacular still, we can feed it straight from the receiving perforator into a printer which automatically typewrites the message in plain alphabet on to slip. After pulling this through a

gun-pot we can stick it down to delivery forms and despatch it to its destination.

Think of it! No QRM, perforated slip going through in London and printed characters squirting out in Egypt or wherever the end of the cable happened to be!

● A Pause—and then . . .

During our training we have been sending and receiving messages that once actually passed over the Company's cables and, after having been filed for the necessary length of time, have been released to provide actual working conditions in the training school.

We have been keeping our operating-error percentage down to the required figure and at last the day arrives for our final examination when we pass out at a minimum of twenty words per minute sending, receiving and perforating.

Home we go to receive our families' congratulations and await orders to join the staff, as junior operators, of either the head office, the cable landing point on the Cornish coast or any station in Europe, South America, Africa, the Mediterranean, India, Australia or China. Five years of mixed steady traffic, mad over-time rushes, local political interruptions, sobriety and wild binges face us before we shall see England again, if transferred to foreign service. Perhaps off-duty romance or adventure will smile upon us . . . who knows?

A half-wave rectifier allows current flowing in one direction only to pass, consequently in the case of 50-cycle mains, it drops to zero 50 times a second, and a pulsating output results. This, however, flows in one direction only, that is, it is unsmoothed d.c. A choke placed in the negative lead removes a.c. ripple, while the positive comes from a winding connected to the filament. Since the filament is always plus, the rectifier filament winding has to be insulated to carry double the transformer output of 550v. a.c. Above this voltage a separate rectifier filament winding on the transformer is essential.

The condenser C1 is considered to carry both d.c. and a.c. because the ripple previously mentioned has the same effect on superimposing a small a.c. current on the d.c., consequently an electrolytic type cannot be used: a paper condenser will stand for higher voltages than are likely to be imposed upon this one, and accordingly is quite suitable here.

I hope you haven't neglected your Morse lately, because that is essential for full ticket, even if your knowledge of radio is very good.

I am afraid that last month I said this article was to concern modulation, but after writing that I came to the conclusion that it would be more useful to get a c.w. mains transmitter going and then modulate that. Now I think it will be as well to leave next month's article until February, in case I change my mind again.

"1.7 TO 56 MC. WITH TWO VALVES"—*continued from p. 25.*

bias so that the slight amount of r.f. from the exciter is not sufficient to produce any spacer.

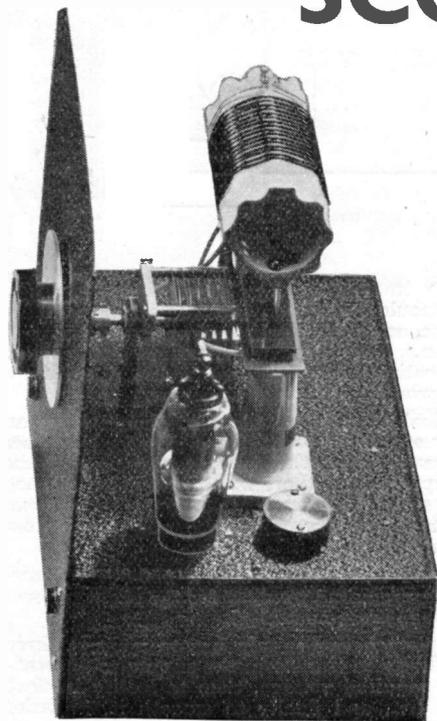
The above difficulty is one we have experienced in practice, and it has been curable by either one of the methods named. Cathode keying in V1 is the complete cure if the adjustment of other circuits is not to be upset, but the crystal load is increased thereby, and to get an absolutely clean signal, careful design of the key-filter becomes necessary.

It is interesting to note here that this matter of stray r.f. from preceding stages when they are apparently dead has given rise to the myth, on the part of certain persons who never use a c.w. monitor, that r.f. pentodes need neutralising. . . Think it out!

Finally, in connection with e.c.o. working, it should be noted that the same precautions as regards frequency selection are just as necessary, if not more so, and that C1 controls the frequency, its tuning being sharp. As it is varied through its range a whole family of notes, of all shapes and sizes, will be heard in the monitor. The right one can be found by noting where the correct harmonics come on C2 when using tri-tet or straight crystal, and then holding a loop near L2 while swinging C1. Adjustments for the quality of the note and the exact frequency required are then made by varying C1 and C2 slightly till a clean signal is heard at the desired spot on the monitor or frequency meter dial.

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Let us quote you for making the transmitter opposite (described December), also the Cathode Ray Unit (page 10, this issue).

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On the Amateur Bands

"Ham" News by G5GQ

FOOD AND DRINK usually attracts hams, so down to Croydon to the annual supper party of The Surrey Radio Contact Club to join in the fun.

Chairman H. Bevan Swift (G2TI), R.S.G.B. ex-president, said that for the first time British amateurs are being officially represented at Cairo, the representative being Arthur Watts (G6UN), another R.S.G.B. ex-president. He hopes that we shall retain most of our bands, but expressed doubts about 3.5 mc.

Ham Whyte (G6WY), only British member of The Century Club (for those who have worked over 100 countries), and A. D. Gay (G6NF), of frequency measuring fame, dropped in during the evening and tackled me about my harmonics. 6WY says he has never heard me louder on 14 mc., and 6NF gets me well on 28 mc., while actually I am on 7 mc.! Aerial in use is a doublet, fed by 75-ohm cable, so is most unsuitable for harmonic radiation. We live and learn!

How many volts will an RK20 stand? 6NF and I argued this out, but came to no decision. Yanks say that they will stand a couple of thousand, provided the mils are kept down, but can anyone give us actual results with this voltage, especially on 28 mc., because we are not exactly keen on blowing ours!

● "Once upon a time"

L. W. Hooke (G5XH), brought the old days back vividly with his stories of ham radio in the early days of broadcasting. He had his gear in a shed in the garden, and this shed had a tin roof. Interference with his neighbours' reception was brought to his attention by the sound of bricks and bottles, hurled by infuriated BCL's, landing on the tin roof. As his source of power was a gas engine, he says that what with the noise of its exhaust, and the barrage on the roof, operation was somewhat trying!

This gas engine was originally owned by G2TI, who ran it indoors with the exhaust led up the chimney. However, the noise used to travel down other people's chimneys as well, and the owners expressed their disapproval in no uncertain manner, especially when it was used in the early hours of the morning. Such was ham radio in 1923-26.

Dinners and old times remind me of the Old Timers' Dinner which R.S.G.B. is organising. All who have held licences continuously since 1928 (or before) are eligible, but Jack Clarrieoats tells me that many of them are too lazy to drop him a line saying they will be there. At the last R.S.G.B. meeting he approached over a dozen who had not written, and they agreed to turn up. We all want it to be a success, so drop him a line, please. It means a lot of hard work, so it's up to us all to do our bit.

● QRO—QRP

The old argument, QRO versus QRP again. G5AA, speaking in a debate, remarked that the low-power man had to couple his aerial tightly to get any power into it, so spreading beyond his fair share of kilocycles. The high-power man has power

to spare, can couple his aerial loosely, occupies far less space, and causes less interference with his neighbours. My suggestion is that they grant 5-kilowatt permits to all 'phone stations. Then they couldn't modulate 500%—unless they were millionaires.

● Clubs

Clubs have been through a slump these last few years, but recently awakened general interest in short waves has brought something in the nature of a boom. I have heard old hands complain that they do not like the influx of short-wave listeners, but they are vital to the club movement, because the SWL of to-day is the fully fledged transmitter of tomorrow. I often look through some of my old SWL cards, and find reports from present day old timers, who are down on SWL's, but who were SWL's then!

● 7 mc. Again

Spend a few days on the Lid's band (7 mc. to you). It's harder to work a G on 40-metre 'phone than it is to work a Yank on c.w. There should be a training school to teach some of our hams how to use a receiver.

Just before midnight the other p.m. I heard W1EH calling CQ DX on about 7,120 kc. Only had 50 watts going on 7,015 but chanced a call, and back he came. W1EH is, of course, K. B. Warner, secretary of A.R.R.L. He told me that he had just switched on by chance as he was waiting for a friend to turn up, and that my signals came quite as a surprise. He is using 500 watts to a diamond antenna centred on London, and was putting in a pretty hefty signal. Asked about Cairo he said that he thought we would retain all bands except 1.7 mc. in certain European countries, and that the general outlook was rosy. Jim Lamb, star A.R.R.L. designer, I was sorry to hear, is ill, and is away on six months' sick leave. Wonder if he can be that time away from his single-signal jobs?

The new A.R.R.L. station, memorial to the late H. P. Maxim, is now started, and will soon be in operation. Its location is out in the country, and beam aeriels are to be used, so it should be very consistent over here.

● Cross Modulation

Working duplex 'phone with local G5HI, we both can hear our own transmissions coming back, although 'phones, not speakers, are used at both ends. Switching out modulators does not seem to make much difference, so it appears to be some species of cross modulation. Local listeners rather like it because they can hear both ends without swishing round. I have not noticed this effect on stations further afield, so apparently it only occurs when the field strength of each station is very high.

● Finale

Prize story of the month is about the ham who wanted a modulator. Reading that two 6L6's in class AB push-pull would give 50 watts; he has purchased one, hoping to get 25 watts audio from it.

NATIONAL RADIO SOCIETY

Divisional Representation Planned

By F. C. BIGGS (Hon. Sec. pro tem)

I WISH to express thanks for the very large number of letters received in support of the reorganisation of the above society.

Committee meetings were held in London on November 29 and December 11. Amongst business discussed were resolutions confirming the appointment of Mr. Biggs as hon. sec. pro tem, and Mr. Goldsworthy as hon. treasurer, pro tem. Instructions were also given to the former to draft a list of rules for consideration at a future committee meeting.

A message of congratulation was sent to H.M. the King on the occasion of his birthday, which was acknowledged.

● Divisions

We have decided to divide the country up as follows:—

N.W. DIVISION.

Mr. A. PARK, 14, Fairfax Road, Prestwich, Manchester, Lancs.

Lancs., Mr. M. Brown; Westmorland; Cheshire and North Wales, Mr. H. Arnfield and Mr. D. Robinson; Isle of Man.

N.E. DIVISION.

Mr. T. C. FROSTICK, 30, Woodside Terrace, Hailey Hill, Halifax, Yorks.

Durham, Mr. F. Larwood; Cumberland; Yorks, Mr. K. Teale; Northumberland, Mr. G. C. Castle.

E. MIDLANDS DIVISION.

Mr. G. F. SHEPHERD, 287, Wragley Road, Lincoln. Lincoln, Mr. P. Bailey; Notts and Derby, Mr. C. Drakley and Mr. A. Clipstone; Leicester; Northants, Mr. W. Cornwall; Rutland.

W. MIDLANDS DIVISION.

Mr. J. HUGHES, 11, Nelson Street, Coventry, Warwick.

Staffs, Mr. Fisher; Warwick, Mr. Avery; Worcester.

WESTERN DIVISION.

Mr. T. L. STEVENS, Post Office, Donnington Wood, Wellington, Salop.

S. Wales; Salop; Hereford; Gloucester; Monmouth. Names required, please.

S.W. DIVISION.

Mr. S. RICKETTS, 16, Cromwell Road, Yeovil, Somerset.

Devon, Mr. P. Leach and H. Hall; Somerset; Cornwall, Mr. J. Ellering; Dorset; Wilts, Mr. A. Rutter; Channel Isles.

SOUTHERN COUNTIES DIVISION.

Mr. A. F. LAMBOURNE, 31, Baker Street, Reading, Berks.

Hampshire, Mr. BARRS; Isle of Wight; Berks; Bucks; Oxon, Mr. R. Robbins.

EASTERN DIVISION.

Mr. C. R. THOMPSON, The Chestnuts, Orford, Woodbridge, Suffolk.

Bedford; Hunts; Cambs; Norfolk; Suffolk; Herts, Mr. C. W. Field.

HOME COUNTIES.

Mr. R. S. STEVENS, 43, Pettits Lane, Romford, Essex.

Sussex; Essex, Mr. Boseley; Middlesex; Kent, Mr. Chapman; Surrey, Mr. Moore; East London, Mr. Barber.

SCOTLAND.

Rep. wanted please.

I.F.S. and N.I. DIVISION.

Mr. J. G. WHITE, 18, St. David's Terrace, North Circular Road, Dublin, I.F.S.

Irish Free State, and Northern Ireland.

LONDON DIVISION (Postal Districts).

Mr. C. J. L. GOLDSWORTHY, 24, Penrith Street, Streatham, London, S.W.16.

North, Mr. Constable; N.W., Mr. Sprange; W., Mr. Woolecote; S.E. and S.W., Mr. Lowe.

Will all County Representatives send in their reports to the Counties' Divisional Representative on the 1st of every month, and the Div. Reps. will forward same to Headquarters with their report on the 5th of every month. These dates *must* be complied with to enable my report to appear in **THE SHORT-WAVE MAGAZINE**. The Lancs. and Essex news sheets will also contain reports.

● Aims and Objects

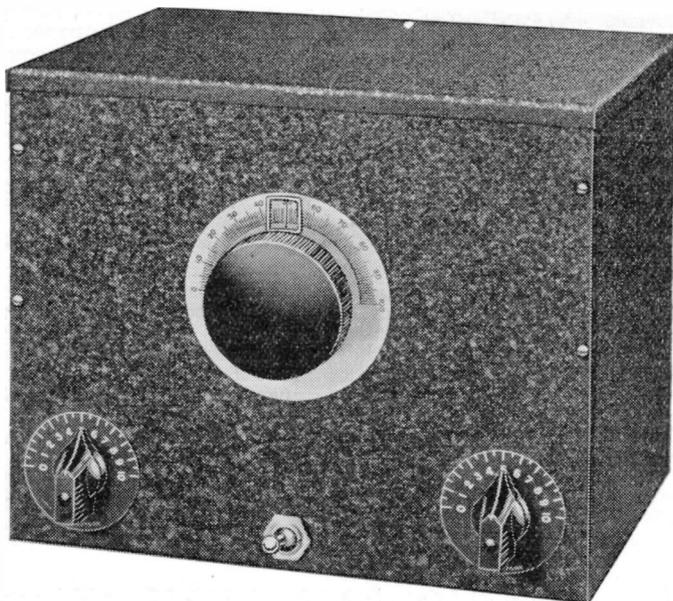
- (a) To aid radio enthusiasts and to promote friendship and goodwill.
- (b) To include in its membership all Nationals, whether they be British or otherwise.
- (c) To promote a good fellowship either by correspondence or personal contact.
- (d) To write letters to brother hams who are cripples or invalids and to send papers and magazines.
- (e) Finally, to bring about a bond of friendship among amateurs and others in all parts of the Globe, and to foster the interest in short-wave radio to the less experienced listener.

(Continued on page 34).

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● Activities

N.W. DIVISION.—Particulars can be had, also the news sheet on application, enclosing a stamped addressed envelope, to Mr. A. Park, 14, Fairfax Road, Prestwich, Manchester, Lancs.

HOME COUNTIES.—Full particulars from Mr. R. F. Stevens, 43, Pettits Lane, Romford, Essex, who also has a news sheet but at the present moment this is only available to Essex members, but will be sent to others if the applications warrant—so come on you Home Counties members.

I.F. STATE AND N.I.—Holding a "Best All-round Rx contest" on January 26, 1937. Entrance fee, one shilling. Rx's must be home constructed of any design, kit sets are barred. Judging by comparative results, note will be taken of workmanship, performance, components and general neatness. A cash prize, depending on the number of entrants, will be awarded. All applications for entrance must reach Mr. J. G. White, 18, St. David's Terrace, North Circular Road, Dublin, I.F.S., on or before January 19. (For I.F.S. members only.)

Members recently visited the local broadcasting station and were very kindly shown around by Mr. Carroll, the Engineer present. Arrangements are being made for a tour of the Studios in the New Year. Members interested should get in touch with

their Div. Representative. Meetings every Wednesday at 8 p.m.

NOTTINGHAM, E. MIDLAND DIV.—This branch, which incorporates the Nottingham Amateur Radio Society, is making rapid progress and welcomes new members. The next meetings are: Jan. 4, at 199, Sherwood Street, Nottingham; Jan. 18, at 15, Epperstone Road, W. Bridgford, Notts.

LONDON Div.—Meeting at 24, Penrith Street, Streatham, S.W.16, every Wednesday, at 8 p.m.

● Membership Cards

All applications for membership must be sent to Headquarters together with postal order (1s.), payable to N.R.S. and crossed. Stamped addressed envelope to be enclosed or sent through your Representative.

Cards will be sent out to all members as soon as the design has been approved. You will notice a slight change in some of the members' numbers owing to withdrawal of the honorary members.

Please address your headquarters enquiries to C. F. Biggs, 86, Lordship Lane, Tottenham, London, N.17.

In conclusion, on behalf of the Executive Committee, I wish you all a Happy and Prosperous New Year.

THROUGH THE WINDOW

“THE RADIO AMATEUR'S HANDBOOK”

Published by The American Radio Relay League, Hartford, Conn., U.S.A. Obtainable from: G5KA, 41, Kinfauns Road, Goodmayes, Ilford. 564 pp., 5/6, post free.

Those who have never seen "The Radio Amateur's Handbook" have missed reading one of the most extraordinary books ever produced. Extraordinary because it is produced by amateurs for amateurs.

Back in 1926 The American Radio Relay League (the American national radio society), found that they had so many queries from their members on various problems of short-wave transmission and reception, that they decided to publish a book dealing with short-wave apparatus from the amateur point of view, and from the most simple to the most complex receivers and transmitters. It was written by amateurs, members of the League, who knew exactly the sort of information other members wanted. Each year the Handbook is revised and brought up to date by the inclusion of knowledge obtained through the year.

It begins by introducing the non-technical reader to short-waves. He is told how to build receivers (from one to sixteen valves), how to design them, the types of aerial he can use, how to reduce man-made static, and all the many problems common to the newcomer are dealt with likewise. Then he is introduced to amateur transmission, and is shown how to build, design, and use transmitters of every type. Any problems he may encounter, whether in reception or transmission, are sure to be mentioned within its pages.

This year, apart from the inclusion of a great deal of new information on subjects previously dealt

with, extra chapters are included on emergency equipment, and aeriels.

With such a wealth of material it is impossible to select any particular part for special mention; each section is of equal value to those interested.

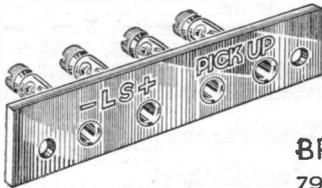
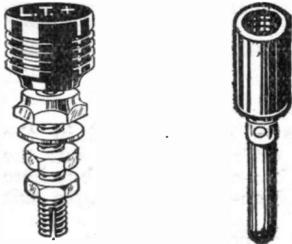
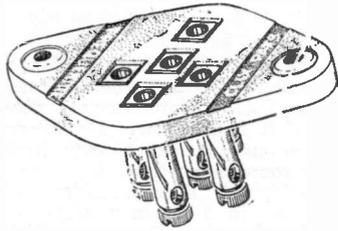
Those who have never seen the Handbook should not fail to get a copy, while others who have last year's edition should not miss the added information in the new (1938) volume.

EDDYSTONE NEUTRALISING CONDENSER

We have received from Messrs. Stratton and Co. (Eddystones) a sample of a new neutralising condenser. This consists of one fixed and one moveable brass disc, the movement being controlled by a screwed thread. The maximum capacity of the condenser is 4.2 mmfds. and it is intended for operation at high voltages. The actual condenser unit is mounted on a single 2¼-inch stand-off insulator, reducing mounting space to a minimum. An extension shaft may be fitted for front of panel operation. The price is 6s. 6d.

Another interesting new Eddystone product is the type 1086 knob. These, of 1¼-inch diameter, are replicas of those used on the Eddystone Precision Dial. The knob is cut away to fit the fingers, ensuring easy control. Priced at 9d. and 1s. 3d. for knob with metal insert, they should prove a very popular line.

A split-stator condenser is also newly released, and is of brass construction with steatite insulation. Dimensions are 2 x 6 ins., with double spacing. This type is rated for 12,000-volt working and the capacity is 35 mmfd.



For the "EXCITER UNIT"

The Clix components illustrated in this advertisement are all specified for use in the above unit.

The higher the frequencies, the more important it becomes to use low-loss contacts, or in other words "CLIX," the contact components which, because of their proved high efficiency are used by the leading set designers, experimenters and home constructors.

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Two 7-pin 1/2 each

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If by some chance you have been ploughing a lonely furrow in your experimental work why not make a New Year's Resolution to join the Radio Society of Great Britain?

The annual subscription is moderate (London 21/-, Provinces 15/-).

The Society, founded in 1913, to-day has a membership well in excess of 3,000. Each month the T. & R. Bulletin is sent post free to members. This Journal contains on an average 60 pages of up-to-date technical and topical information—written by and for radio amateurs.

The December issue contains a full-length constructional article dealing with a 50 watts 56 Mc. crystal controlled transmitter; descriptions of typical 56 Mc. stations, and new ideas for 56 Mc. receivers. In addition the usual regular features appear including "The Month on the Air"; Calls Heard; New QRA's; District Notes, and a host of other up-to-the-minute technical and topical information.

In addition, the second of a new series of monthly contributions by "Uncle Tom" under the title "Twelve Years Back," appears in our January issue.

Resolve to-day to write for a copy of this issue (price 1/- post free) and ask for full details of membership.

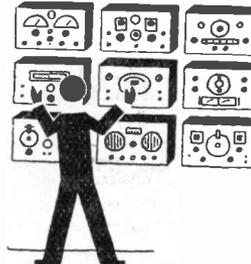
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January Programmes

WITH THE ever-increasing number of high-power short-wave broadcasters it becomes more and more difficult to decide what to listen to by way of relaxation, and with such a wealth of first-class entertainment from all parts of the world it inevitably happens that one has an uneasy feeling that something better is being missed. On account of changing world times many of the world's greatest artistes are available to short-wave listeners at all hours of the day and night, but a glance at the schedules for January is sufficient to see that, even so, many good things will have to be missed because of their taking place simultaneously.

● World News

To many, the most intriguing part of short-wave programmes from abroad is the news services in English. Quite a fair percentage of this news is domestic and although it gives one a better understanding of the social and economic conditions of the country concerned, it is the international news—when heard from all points—that provides the greatest interest. The French Government TPA stations, 2, 3 and 4, on 19.68, 25.25 and 25.60 metres respectively, give news in English daily at the following times:

(3) 9.40 a.m., (3) 8.10 p.m.,
(2) 12 noon, (4) 4.30 a.m.,

the last being hardly convenient to listeners here.

News in English from 2RO operating on 31.13 metres can be heard at 7.40 p.m. and the American Hour commencing daily at 12.45 p.m. starts with news, as does the Far East programme at 11 a.m. 2RO it must be remembered operates on 25.4 metres up to 5.20 p.m.

News from American stations is to be heard at the following times:

P.M.	Call	Metres	
12.55	W2XE	13.94	Weekdays
2.25	W2XE	13.94	"
2.40	W3XAL	16.8	"
2.55	W2XE	13.94	Sundays
4.00	W2XAD	19.56	"
4.00	W3XAL	16.8	"
4.30	W2XAF	31.48	"
5.00	W3XAL	16.8	Weekdays
11.30	W2XAD	19.56	"
11.30	W2WAF	31.48	"

● Exploration

An expeditionary party of scientists led by Dr. William H. Holden is exploring the little known Sierra Akari range extending along the hinterland of British Guiana and Brazil, with the intention of studying tropical diseases, collecting reptiles, amphibians, small mammals, insects and botanical specimens. A large transmitter is being stationed 600 miles up the Essequibo River from Georgetown, and the party will maintain contact by means of a hand-driven field generator-operated transmitter. In addition to helping in charting bearings by establishing triangulation between the base and the British Government station at Georgetown, plans have been made to broadcast their adventures and discoveries over the N.B.C. network during the next few months. Perhaps a few fortunate dx'ers will hear the Holden Expedition communications direct.

The less serious programmes for January offered by the Columbia Broadcasting System, the National Broadcast Co., and the G.E.C. International stations, continue to be of a high order. Broadcast entertainment technique has reached a very high standard, and what is more important, it is progressive. Gone are the days of "filament dimmers"—a term commonly used in the early days of broadcasting to describe the weaker turns which made listeners "dip" the filaments of their bright-emitter valves to save current while leaving a just-audible signal so they would know precisely when the depression lifted.

● Weekly "High Spots"

From such abundance of good material in the January schedules it is difficult to single out the items with the greatest box-office appeal, but here are ten selected *weekly* high-spot features, to suit all tastes and moods.

- Sun. 1 a.m. "Believe it or not," by Ripley.
W2XAD 19.56 and W2XAF, 31.48 m.
4.30 p.m. Major Bowes' Capitol Family—
Variety W2XE, 13.94 m.
7 p.m. "R.C.A." Magic Key W3XAL, 16.8 m.
8 p.m. Philharmonic Symphony Society of
New York W2XE, 25.36 m.
10.30 pm. Guy Lombardo and his Orchestra
W2XE, 25.36 m.
Mon. 8.30 p.m. "Broadway Matinee"
W3XE, 25.36 m.
Tues. 12.30 a.m. Modern Radio Course
W1XAL, 49.6 m.
Wed. 2.30 a.m. N.B.C. Minstrel Show
W8XK, 19.71 m.
12 midnight, Amos 'n' Andy
W2XAD, 19.56 and W2XAF, 31.48 m.
Thurs. 8.30 p.m. "Magazine of the Air"
W2XE, 25.56 m.

Call the first of my selection late Saturday night if you prefer, but this is a very popular feature and worth sitting up to hear on each occasion. The eighth item also means delayed retiring! The fourth on the list, the Philharmonic Symphony Society of New York, is conducted by John Barbirolli. The sixth is the C.B.S.-B.B.C. exchange and is of additional interest in comparing direct with the re-broadcast reception. The ninth, Amos 'n' Andy, are often described as the world's best-known radio act and have made hundreds of "appearances" on the air. Of course, if you have heard them hundreds of times before you will not be quite so excited, but if not make a special point of hearing them this month.

2RO opens a twice-monthly series in the American hour with "Famous voices of yesterday" which includes recordings of "immortal" voices such as Caruso and Tamango. These will be at 12.55 a.m. on the 12th and 26th on 31.13 metres, while on Jan. 9 at the same hour the celebrated prima-donna Luisa Tetrazzini, will give some memoirs of her stage career and sing one or two *arie* which made her famous.

Two new Italian stations are now to be heard testing on the 16 and 19 metre bands. They are reported to be 2 kw. auxiliary transmitters and they will probably relay all the 2RO programmes in February.

Successful Independent Test of the "S - W. M." ONE - VALVE TX.

Conducted by L. F. PARKER (G5LP),

Hon. Secretary, Wellingborough Radio Society.

IT WAS WITH pleasure that I received notification from the designer (5GQ) that the one-valve transmitter described in the December issue was to be loaned to me for a short period for test purposes.

On Saturday, December 4, I heard the transmitter in operation when I had a QSO with 5GQ, during which signals were received at R8 on c.w. and R7 on fone on a 1-v-1 receiver. It was evident that the transmitter must be an efficient little job and with keen anticipation I awaited delivery.

● Aerial Consideration

The rig duly turned up on Tuesday morning and in the afternoon I unpacked it and connected a 400-volt power supply. The juice was switched on and the tank condenser swiftly rotated to bring the valve into oscillation. An end-on aerial was clipped on to the tank coil and G5GJ called on c.w. The call was successful and a report of RST569 was received. I was not satisfied however with the aerial loading and changed over to a W3EDP aerial, 40 feet high and running north/south, and the remainder of the tests were all carried out with this.

● 569 from Moscow

Operations had now to be suspended for tea and at 6.15 p.m. the transmitter was again switched on and a test call pumped out. By now the local G's had all faded out and the usual welter of mush and continental telephony, including the Spanish war stations, made the band one hideous noise, and I had very little hope of hearing any replies, but to my surprise U3BY in Moscow came back with a 569 report. This was very good going and a happy augury to the events that followed.

For c.w. a positive bias of 45 volts from a dry battery was connected to the suppressor grid and with a normal click filter shunted across the key no difficulty from key clicks was experienced, and break-in operation could be used.

● Listener-interest

For telephony operation, a negative bias of 25 volts was found to be suitable, and with a G.E.C. "Home Broadcaster" mike and a one-valve battery amplifier utilising a PM2A battery valve and 30 to 40 volts h.t., very full modulation was obtained, and an input of 7 to 9 watts on telephony brought R7 to R9 reports from all over the country. Reports from SWL's were asked for during the telephony transmissions and some opinion of the number received can be gauged when I state that it took me two hours on Saturday afternoon to write cards out for the listeners' reports!

A significant point to note is that out of the 39 contacts made, 34 were as a result of replies to my test calls and only 4 such calls were unanswered. Three other stations were raised from test calls on fone but owing to QRM, contact was lost and they are not therefore included in the following list.

- Dec. 7 G5GJ (c.w.)—16.40 G.M.T., RST569, Thorne.
 U3BY (c.w.)—18.20, RST569, Moscow.
 U5LG (c.w.)—20.15, RST579, Kiev.
 SP1DT (c.w.)—20.25, RST579, Poland.
 YR5MV (c.w.)—20.45, RST579, Oradea.
 „ 8 G5TU (c.w.)—09.50, RST589, Birmingham.
 G8QN (c.w.)—10.15, RST579, Leicester.
 G8IJ (c.w.)—10.40, RST589, Wombwell.
 GW8NP (fone)—13.30, Q5 R5/7, Cardiff.
 G3AA (fone)—14.00, Q5 R7, Notts.
 G50B (fone)—14.20, Q5 R8, Southampton.
 G2NK (fone)—15.10, Q5 R7, Bromley.
 „ 9 G5GH (fone)—10.10, Q5 R8/9, QRA not obtained.
 G8LY (fone)—10.25, Q5 R5/6, Hampshire.
 G5TU (fone)—11.10, Q5 R3/7, Birmingham.
 G8SI (fone)—12.30, Q5 R8, Q.R.A. not obtained.
 G5PA (fone)—13.15, Q5 R9, Bedford.
 G3AO (c.w.)—16.35, RST579, Manchester.
 G5PA (c.w.)—16.45, RST589, Bedford.
 LY1AP (c.w.)—18.45, RST568, Kaunas.
 SM6OT (c.w.)—19.10, RST588, Gothenburg.
 SPICE (c.w.)—19.20, RST579, Gdynia.
 F8WU (c.w.)—19.35, RST589, France.
 „ 10 G8FF (fone)—11.10, Q5 R8/9, Cambridge.
 G8FI (c.w.)—12.00, RST589, Kingstreet.
 G6XG (c.w.)—12.15, RST579, Barnsley.
 G6VC (fone)—12.30, Q5 R7, Gravesend.
 G6ST (fone)—13.00, Q5 R6/7, Wickham.
 GW8NP (fone)—13.25, Q5 R6, Cardiff.
 G8VU (fone)—16.20, Q5 R8, Manchester.
 „ 11 G8AR (fone)—12.30, Q5 R7, Sunderland.
 UK3AH (c.w.)—19.40, RST579, nr. Moscow.
 „ 12 G8VZ (c.w.)—11.20, RST589, Princes Risborough.
 G2XO (fone)—12.00, Q5 R7, London.
 G8TV (fone)—15.50, Q5 R7, Romford.
 EI8M (c.w.)—16.30, RST569, Dublin.
 G8OB (c.w.)—16.45, RST589, Liverpool.
 SM5PL (c.w.)—17.55, RST578, Stockholm.
 D4YUM (c.w.)—18.15, RST553, Dresden.

● Thank you !

From this list it will be seen that no difficulty at any time of the day was experienced in making contacts. The T8 reports were received when smoothing was reduced for c.w. operation.

It is evident that the regenerative crystal oscillator, advocated so much by Jones in America, has come to stay and the output of the transmitter tested had to be seen to be really appreciated.

I must thank those stations who helped me so much by standing by for tests which I made during the QSO's, and also a word of thanks to the listeners who responded so strongly to my request for reports; QSL's have been despatched to each of the latter.

Finally, my best thanks to 5GQ for the loan of the transmitter, the handling of which was a delightful experience.

The "S-W.M" 1.7 mc. Tests

By G6FO

THE RESPONSE to the proposed 1.7 mc. Tests suggested last month has been very good, but there is room for plenty more, and it is hoped that further names will be received after this notice appears. Readers who are interested in 1.7 mc., either as listeners or transmitters, are asked to join in by forwarding a request for details through the Editor, and anyone who may be seeing this for the first time will find further information in our issue of December.

Several readers have already indicated their wish to co-operate as listeners, and their help is very much appreciated, as there is a great deal that a properly-operated listening station can do, such as logging not only the RST of the G, W or other dx signals which may be heard, but also noting variations in conditions from day to day over the period and relating 1.7 mc. results in general with what is happening on the other amateur bands at the same time. So we shall be very glad to hear from as many non-transmitters as possible, and here it should be said that the schedule and call-signs of those taking part will not be published *before* the Test—this information will be circulated to all concerned by post—but at the conclusion a full story will appear in this magazine, based on the results obtained and logs submitted. Therefore, do not wait for the arrangements to be announced—you will only know about them by writing in.

● Points for Transmitters

So far as stations on this side of the Atlantic are concerned, it will be evident from a little consideration of the American 1.7 mc. c.w. 'phone allocation that all G stations must operate on frequencies between 1,720 and 1,800 kc. in order to have the best chance of being heard or worked. The American telephony sub-band is from 1,800 to 2,000 kc. and is full of high-power 'phones which effectively drown any still, small dx voices. That, then, is the first point to be borne in mind. The second is that nothing less than a signal with a c.c. characteristic will be any good, as our low-power 10-watt transmissions will have to be received through a high noise level, and probably under rather bad QRM conditions. The signal should therefore be p.d.c. and dead steady. It is quite possible to put out on 1.7 mc. a signal c.c. in character using only a single-valve self-excited oscillator type of transmitter, but crystal or e.c.c.o. control is definitely advisable.

The third point is that the success of the Tests will depend upon accurate schedule-keeping by all concerned; the general idea of this was explained in December. Anybody sending outside his schedule times will probably be talking only to himself, as the arrangement is that all stations on this side transmit while all across the Atlantic listen, and *vice versa*.

● Aerial Systems for 1.7 mc.

While, as on all bands, some sort of fundamental arrangement is desirable, the Hertz becomes a

problem owing to the fact that at least 265 feet of wire must be got out, and in the quarter-wave Marconi there must be not less than 90 feet if anything like efficiency is to be obtained.

Where there is already in use a 7 mc. Hertz aerial, either Zepp or Windom fed, this can be operated very well on 1.7 mc. by working it against ground or with a counterpoise as a Marconi. With Zepp feeders, this is done by disconnecting the neutralising arm entirely—so that the roof and 'live' arm become in effect an inverted L—and taking it to one side of a coupling coil of, say, 20 turns 3 inches or so in diameter. The other side of this coil goes either to earth or to a counterpoise consisting of a single wire from 8 to 10 feet above ground and run out as far as possible. In direction, it may be under, at right angles to, or behind the aerial.

This aerial coupling coil is then tuned to resonance with a parallel condenser of something like .0005 mfd., with a hot-wire ammeter in series with the lead-in. Adjust for maximum deflection on this meter consistent with proper power input to the transmitter and a good note. The actual value of the coupling coil depends on the electrical characteristics of the aerial-counterpoise system, but the aim should be to get fairly low condenser capacity at resonance tune, which may involve tapping up or down the coil suggested. This, by the way, can be link-coupled to the p.a. tank if it is more convenient.

Any average site which will hold a 7 mc. aerial system of the usual type will probably also accommodate somewhere or other a 40- to 60-foot counterpoise, which might even have to be sloped for site convenience. If so, this does not matter so far as loading up the system is concerned, though it may affect results as regards directional effects.

A 7 mc. Windom would be operated in precisely the same way, the odd length out of resonance taking its chance, just as in the 2BI arrangement. A 7 mc. doublet could also be operated with a counterpoise or against ground simply by joining the two ends of the feeder together at the station termination. The whole thing radiates under these conditions, and, as the Editor will confirm, works surprisingly well.

It cannot be said that these few remarks in any way cover the whole question of 1.7 mc. aeriels, but for the time being, they may give some of our readers who are concerned on this point a lead as to how they can adapt their own radiating systems for operation on the "top band."

By the way, drop in that card to-night. We want you in the Test.

CORRESPONDENCE,

dealing with G8FP's Cathode Modulation problem, etc., has been held over until next month. We hope with that issue to commence the regular publishing of readers' letters of interest.

CLUB ACTIVITIES

BLACKPOOL & FYLDE Short-Wave Radio Society

Secretary: H. FENTON, 25, Abbey Road, Blackpool.

Increased activities have necessitated a change of QRA to "over the garage at rear of" 454, Lytham Road, South Shore; first turning on the south side of Watson Road.

"Top Band" interest

1.7 mc. is claiming attention for local QSO's. Regular multiple working is being arranged: 6VQ, 5MS, 8AK and 8GG are keen, VG feels "fed up" with condx on other bands. 6MI has been fortunate in moving to a better radio QRA. AK is rebuilding his station—separate battery-powered transmitters for 1.7 and 14 mc.—besides R.N.W.A.R. work he is re-wiring the receiver. GG has satisfactorily erected a new 1.7 aerial system for the contest and rebuilt his fone gear; during spare time can be heard on 14 mc.

A.A.'s report "busy," as do non-licensed members. 2CFC is helping 2HL with a 7 mc. fone rig; 2CWW is finishing his co-ld stages while waiting delivery of a Super-Pro; 2CKD preparing for P.M.G. 2nd Class Certificate.

CHADWELL HEATH & District Radio Society

Secretary: R. BEARDON (2BZB), 3 Geneva Gardens, Chadwell Heath.

Being the first report in our columns prospective members will be interested to know that a really warm welcome is offered—we have met 2BZB and know. Annual subscription 2s. 6d.; plus a weekly fee of 6d. which includes tea; meetings each Tuesday at Ralph's Cafe, tram terminus, Chadwell Heath. Application is informal; drop in at the meeting, write the Sec. or call at the above address.

Converter acquired

Local mains presented difficulties which have now been surmounted by the purchase of a converter and an amplifier is being constructed from gear given by members, commencing with the power pack.

2DBT is the call granted to G. Sanderson last month, at the age of 16—we add our congratulations to those of 2DBT's fellow-members.

DOLLIS HILL Radio Communication Society

Secretary: J. R. HODGKINS (2CQF), 102, Crest Road, Cricklewood, N.W.2.

Membership has increased to 46 keen amateurs who meet at the Brantcroft Schools, Warren Road, at 8 p.m. every Tuesday. December events included a visit to the G.E.C. North Wembley works; a talk on 10-metre transmission and reception by Mr. Wilkins (G6WN); simple mathematics and Ohms Law were the subjects of a talk on December 21.

EXETER & District Wireless Society

Secretary: W. CHING, 9, Sivell Place, Heavitree, Exeter.

Exeter members are fortunate in the matter of programmes, a regular series of high quality lectures are reported and those of the past month were no exception. That of November 23 excited much interest during question time when the lecturer,

Mr. V. Searle, M.Sc., of the University College of the South-West ably answered queries arising from his subject "Atoms, Electrons and Ions." Slides added to a thoroughly enjoyable evening.

Visit to generating station

Mr. Cornish of the Electricity Board conducted a tour over the generating station on November 29 and provided members with an insight to automatic stoking, turbo generators and control. The switch-board claimed special attention and the meters that record whether Exeter owe the C.E.B. for electricity or *vice-versa* were studied.

A history of short-wave radio was given by Mr. Cornish of G.E.C. early in December. That portion of the lecture relating to aerials provoked most interest and the Bruce aerial caused comment; however, the members showed preference for the inverted "V" for consistent results.

Loud speakers were tested and reproduction curves given at the December 13 meeting with the aid of frequency records.

Meetings each Monday, 3, Dix's Field.

KETTERING Radio and Physical Society

Secretary: IRVING L. HOLMES (2AXF), "Miami," The Close, Headlands, Kettering.

Headquarters: Ivy Cafe, Gold Street, Kettering; Permanent Club Room: Pollard Street; Meetings: weekly Monday evening, 7.30; Short-wave section and Morse class: Tuesday evenings, 7.30; Photographic section: Wednesday evening, 7.30.

Fading—a solution

Mr. F. K. Webb, of Pye Radio, Ltd., lectured on "The Problems of Short-wave Reception," pre-facing his remarks with a survey of what actually comprised the short-wave bands, proceeded with the effects of the Heaviside and Appleton layers. These layers were constantly shifting, he said, and this accounted for the effect known as fading, and mentioned that several American amateurs used two aerials for reception so that one, placed some distance from the other, received the full signal at its peak, whilst the other aerial was under the effect of the fade, and the two were mixed just before entering the receiver with the result that a comparatively steady signal was received.

The working of the Milnes h.t. battery formed the subject of a lecture by Mr. F. G. Glanfield, of Milnes H.T. Units to members on Nov. 29.

Further lectures are being arranged, and the secretary would be pleased to hear from anyone who would give a talk, especially on amateur radio subjects.

KINGSTON & District Amateur Radio Society

Secretary: D. N. BIGGS (G6BI), 44, Pooley Green Road, Egham, Surrey.

"Test Apparatus" formed an interesting subject in a lecture given by Mr. Wilkins of The Automatic Coil Winder and Equipment Co. on November 17. After the meeting the secretary announced two meetings each month, commencing January, at The Three Fishes Hotel, Richmond Road, at 8 p.m. Next meeting, January 5.

Further information concerned the holding of three group meetings to be held at members' QRA's. These will be a "56 mc." Group, "Propagation and dx," and "artificial aerial." Each has its own manager.

The December 15 meeting provided members with an opportunity of meeting Mr. Jonah Barrington, *Daily Express* critic and Mr. B. J. Wardman

(G5GQ). Mr. Allen of the Evrizon Co. exhibited the single signal superhet and a 56 mc. demonstration was staged by the 56 mc. group manager.

MAIDSTONE Amateur Radio Society

Secretary: P. M. S. HEDGELAND (2DBA), 8, Hayle Road, Maidstone.

This society is now flourishing, having a regular membership of twenty-two, including five a.a. licence-holders, Radios 2BFW, 2BMP, 2BTI, 2BXW and 2DBA, and one full call holder, G8UC. The large clubroom, fitted with heating, can be opened on request on almost every evening, Wednesday and Saturday afternoons, and Sundays, in addition to meeting nights, providing opportunities for carrying out experiments or work on the large work-bench. A high aerial has been installed.

At recent meetings the provisional code of rules was revised, re-tabulated, and augmented, being divided into two sections—general society rules and clubroom rules. Mr. Harold Goldsmith has consented to become president.

The library, under the direction of Mr. W. J. Gribben, now embraces nearly four hundred radio journals. Subscription is a nominal entrance fee of 6d. and 3d. weekly. Meetings at 7.45 p.m. every Tuesday at the Clubroom, 244, Upper-Fant Road, Maidstone.

Anyone interested in radio matters in general, the short-waves and transmitting, with a technical knowledge (however small—one of the objects of the Society is to help those beginners who really want to learn) will be heartily welcomed.

SHEFFIELD Short-Wave Club

Secretary: D. H. TOMLIN, 32, Moorsyde Avenue, Sheffield, 10.

New premises have been found at Ebenezer Street, Shalesmoor, and on Wednesdays at 8 p.m. the regular meetings are held. Classes are also conducted on other nights. Apparatus is being installed and an a.a. transmitter is soon to be installed. The beginner is catered for by Morse and other classes, who is invited to apply for further details. Annual subscription, 10s.

SURREY Radio Contact Club

Secretary: A. B. WILLSHER (2CCZ), 14, Lytton Gardens, Wallington, Surrey.

"Despite bad weather a large number of members sat down to an excellent dinner at the Cafe Royal, in Croydon, on the 14th of last month. We were honoured by the presence of Mr. Bevan Swift (G2TI), our chairman, who gave us the toast of "The Club." After dinner the draw for some extremely good prizes was commenced (each member's invitation bore a number). The first prize—a 7 mc. crystal—was eventually drawn by our secretary, who assured us no longer would we be troubled by rough T1 notes.

"At this stage we were delighted to see Ham Whyte (6WY) and Mr. Gay (6NF), who entertained us further with a selection of real ham yarns and stories. Your editor (5GQ), who was also present, offered a year's free subscription to THE SHORT-WAVE MAGAZINE, which was won by one of our newer members. 8TB had the good fortune to win one of Messrs. Webbs' Radio Maps; Mr. Pickard (6VA) who was present, had made this prize possible. Later an entertaining group of films was shown by Messrs. Watkins and Richardson of Norbury. The meeting closed after thanks to all who had made it possible."

THORNTON HEATH, The Short-Wave Radio and Television Society

Secretary: Mr. J. T. WEBBER, 368, Brigstock Road, Thornton Heath.

Mr. W. G. J. Nixon of the G.E.C. gave another interesting address followed by films illustrating the manufacturing processes of Osram valves, on December 14, concluding the evening by dealing with questions on various types used by the members. In thanking Mr. Nixon the chairman commented on his understanding of amateur interests.

Business seems likely to take 2AOX from the neighbourhood. He has been an active officer and supporter for many years and will leave a vacancy which may prove hard to fill. He takes with him the members' wishes. As he is temporarily retiring from active radio a sale of his gear, most of which was given for the benefit of club funds, was held on the 21st, the opportunity being taken to incorporate members' surplus components.

A welcome awaits anyone interested in radio at St. Paul's Hall, Norfolk Road, on Tuesdays, 8 p.m.

TONYREFAIL & District Radio Society

Secretary: E. POWELL (2BPW), 44, Pritchard Street, Tonyrefail, Glam.

Recently members carried out some very interesting tests with a Stentorian Speaker Model 38S, on loan from The Whiteley Electrical Radio Co., Ltd. By the time this is in print members will have paid a visit to the Cardiff studios of the B.B.C. The society has three members with a.a. licences, they are: Mr. C. H. Williams (2BYM); Mr. W. T. Rees (2CUU) and the hon. secretary.

More members are needed so that an interesting programme can be planned for the new year. Those readers interested are invited to attend the meetings on Wednesday nights at 7 p.m., at 81, Pritchard Street.

WEST SUSSEX Short-Wave and Television Club

Secretary: L.A.C. J. WILLIAMS, 2BBB, H.Q. Flight, 43 (F) Sqdn., R.A.F., Tangmere, Sussex.

Two members have recently been granted a.a. licences with the calls 2BGH and 2CIX.

Cathode Ray Demonstration

Meetings were held at "The Waggon and Lamb" on November 19 and 25. Mr. A. F. Hollins of the Mullard Wireless Services Cathode-Ray Tube department gave two lectures on "Cathode-Ray Tubes and Associated Apparatus." The first lecture (on the 19th) covered the design, construction and operation of tubes in general and was illustrated by lantern slides. The club was presented with a type E40-G3 tube at this lecture.

At the second lecture Mr. Hollins demonstrated the use of a cathode-ray tube in an oscilloscope, preceded by a short talk on the design of the instrument and some of its many uses.

WHITSTABLE Radio Amateurs

Secretary: W. CROSSLAND (G5CI), 13, Queen Road, Whitstable.

This club has now entered upon its fifth year of active existence and the sixty-fifth meeting will be held at G5CI, 13, Queen's Road, Whitstable, on February 5, at 7.30 p.m. A full programme, including the showing of field-day films has been arranged, and readers are invited to attend.

The rebuilding fever has attacked local amateurs—G3BD building a 6L6-T20; 2AAM, a 53-RK23-T20; and 2AXU is trying a simple 59 tri-tet, whilst G5CI is enjoying 100% QSO's with many British and European stations on 7 mc.

QUERY COUPON

S.-W.M. 1/38.

Station	Dial	Call	Wave	Freq.
PITTSBURGH		W8XK	13.93	21.54
DAVENTRY		GSI	13.93	21.53
WAYNE		W2XE	12.94	21.52
DAVENTRY		GSH	13.97	21.47
BANGKOK		HS8PJ	15.77	19.02
DAVENTRY		GSG	16.86	17.79
BOUNDBROOK		W3XAL	16.87	17.78
HUIZEN		PHI	16.88	17.77
ZEESEN		DJE	16.89	17.76
WAYNE		W2XE	16.89	17.76
BUDAPEST		HAS3	19.52	15.37
SCHENECTADY		W2XAD	19.57	15.33
DAVENTRY		GSP	19.60	15.31
BUENOS AIRES		LRU	19.62	15.29
ZEESEN		DJQ	19.63	15.28
WAYNE		W2XE	19.65	15.27
DAVENTRY		GSI	19.66	15.26
BOSTON		W1XAL	19.67	15.26
RADIO COLONIAL		TPA2	19.68	15.24
EINDHOVEN		PCJ	19.71	15.22
PODEBRADY		OLR5A	19.71	15.23
PITTSBURGH		W8XK	19.72	15.21
ZEESEN		DJB	19.74	15.20
HONG KONG		ZBW4	19.75	15.19
DAVENTRY		GSO	19.76	15.18
TOKIO		JZK	19.80	15.16
SOURABAYA		YDC	19.80	15.15
DAVENTRY		GSF	19.82	15.14
VATICAN CITY		HVJ	19.84	15.12
ZEESEN		DJL	19.85	15.11
SOFIA		LZA	20.24	14.88
WARSAW		SPW	22.00	13.63
SANTIAGO (Chile)		CB615	24.39	12.30
REYKJAVIK		TFJ	24.52	12.23
MOSCOW		RV59	25.00	12.00
RADIO COLONIAL		TPA3	25.23	11.88
PITTSBURGH		W8XK	25.27	11.87
LISBON		CSW	25.34	11.84
PODEBRADY		OLR4A	25.34	11.84
WAYNE		W2XE	25.36	11.83
LISBON		CT1AA	25.36	11.83
ROME		I2RO4	25.40	11.81
TOKIO		JZJ	25.42	11.80
VIENNA		OER2	25.42	11.80
BOSTON		W1XAL	25.45	11.79
ZEESEN		DJD	25.49	11.77
DAVENTRY		GSD	25.53	11.75
HUIZEN		PHI	25.57	11.74
WINNIPEG		CJRX	25.60	11.72
RADIO COLONIAL		TPA4	25.60	11.72
HAVANA		COCX	26.24	11.43
RADIO NATIONS		HBO	26.31	11.40
BUENOS AIRES		LSX	28.99	10.35
RUYSELEDE		ORK	29.04	10.33
LISBON		CSW	27.17	11.04
MADRID		EAQ	30.43	9.86
HAVANA		COCQ	30.77	9.75
LISBON		CTICT	31.00	9.68
BUENOS AIRES		LRX	31.06	9.66
LISBON		CT1AA	31.09	9.65
CARTAGENA		HJ1ABP	31.25	9.62
CARACAS		YV5RA	31.25	9.60
MOSCOW		RV96	31.25	9.60
RADIO NATIONS		HBL	31.27	9.59
PHILADELPHIA		W3XAU	31.28	9.59
SYDNEY		VK3ME	31.28	9.59
EINDHOVEN		PCJ	31.28	9.59

Station	Dial	Call	Wave	Freq.
DAVENTRY		GSC	31.32	9.58
LYNDHURST		VK3LR	31.32	9.58
MILLIS		W1XK	31.35	9.57
BOMBAY		VUB	31.38	9.56
ZEESEN		DJA	31.38	9.56
PODEBRADY		OLR3A	31.41	9.55
SUVA (Fiji)		VPD2	31.46	9.54
ZEESEN		DJN	31.45	9.54
JELOY		LKJ1	31.48	9.53
TOKIO		JZI	31.48	9.53
SCHENECTADY		W2XAF	31.48	9.53
HONG KONG		ZBW3	31.49	9.52
MELBOURNE		VK3ME	31.55	9.51
DAVENTRY		GSB	31.55	9.51
CARTAGENA		HJ1ABE	31.58	9.50
RIO DE JANEIRO		PRF5	31.58	9.50
MEXICO CITY		XEWV	31.58	9.50
MADRID		EAR	31.62	9.49
HAVANA		COCH	31.82	9.43
BANGKOK		HS8PJ	31.85	9.35
LIMA		OAX4I	32.12	9.34
BUDAPEST		HAT4	32.88	9.12
RADIO NATIONS		HBP	38.48	7.80
TOKIO		JVP	39.95	7.51
SAN DOMINGO		HIT	45.25	6.63
NANKING		XGOX	43.99	6.82
VALENCIA		YV4RB	46.01	6.52
MARACAIBO		YV1RH	47.12	6.36
MARACAIBO		YV5RP	47.84	6.27
HAVANA		COKG	48.39	6.20
MARACAIBO		YV5RD	48.78	6.16
WINNIPEG		CJRO	48.78	6.15
PITTSBURGH		W8XK	48.86	6.14
JELOY		LKJ1	48.94	6.13
HAVANA (CUBA)		COCQ	48.94	6.13
GEORGETOWN		VP3BG	48.94	6.13
BOGOTA		HJ3ABX	48.96	6.13
MEXICO CITY		XEUZ	49.02	6.12
WAYNE		W2XE	49.02	6.12
CHICAGO		W9XF	49.18	6.10
BOUNDBROOK		W3XAL	49.18	6.10
BELGRADE		YUA	49.18	6.10
TORONTO		CRCX	49.26	6.09
HONG KONG		ZBW2	49.26	6.09
NAIROBI		VQ7LO	49.32	6.08
CHICAGO		W9XAA	49.34	6.08
LIMA		OAX4Z	49.33	6.08
GEORGETOWN		VP3MR	49.42	6.07
MARACAIBO		YV1RD	49.42	6.07
PHILADELPHIA		W3XAU	49.50	6.06
CINCINNATI		W8XAL	49.50	6.06
COPENHAGEN		OXY	49.50	6.06
MOTALA		SBG	49.50	6.06
BOGOTA		HJ3ABD	49.59	6.05
BOSTON		W1XAL	49.67	6.04
PANAMA CITY		HP5B	49.75	6.03
ZEESEN		DJC	49.83	6.02
BOGOTA		HJ3ABH	49.85	6.01
HAVANA		COCO	49.85	6.01
PODEBRADY		OLR2A	49.92	6.01
MONTREAL		CFCX	49.96	6.00
MEXICO CITY		XEBT	50.00	6.00
MOSCOW		RW59	50.00	6.00
VATICAN CITY		HVJ	50.26	5.97
MARACAIBO		YV1RB	51.28	5.85
CARACAS		YV5RC	51.72	5.80
KHARBAROVSK		RV15	70.20	4.27

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