

The

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SHORT-WAVE MAGAZINE

Exclusively for the
Short-Wave Listener,
Experimenter and
Transmitting Amateur

MARCH,

1938

VOLUME II
NUMBER 1

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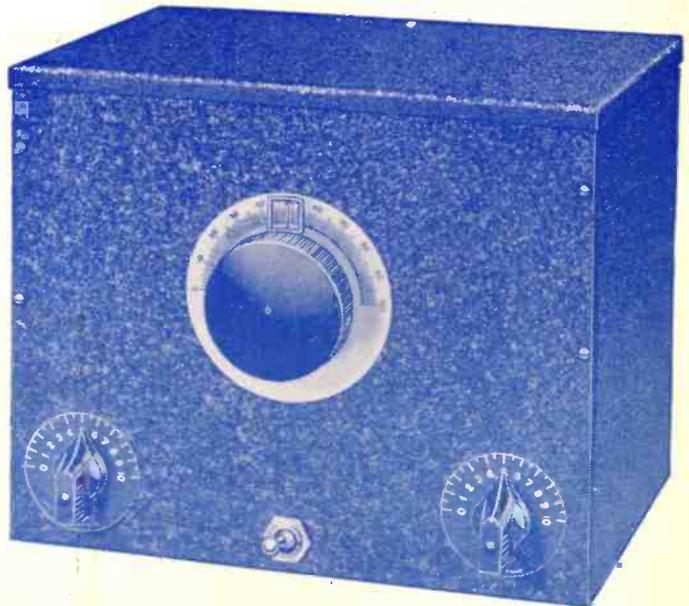
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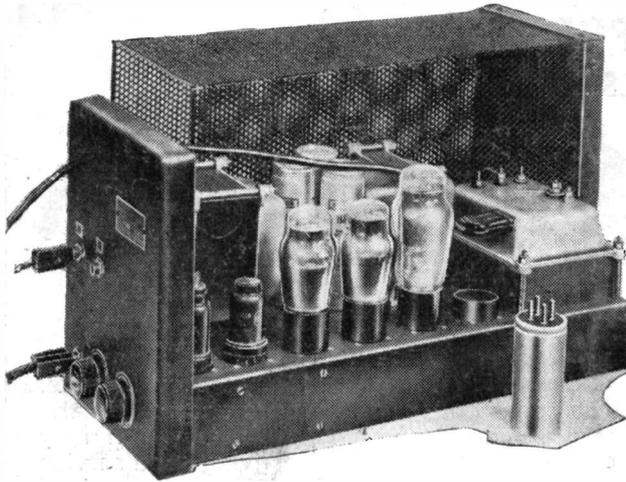
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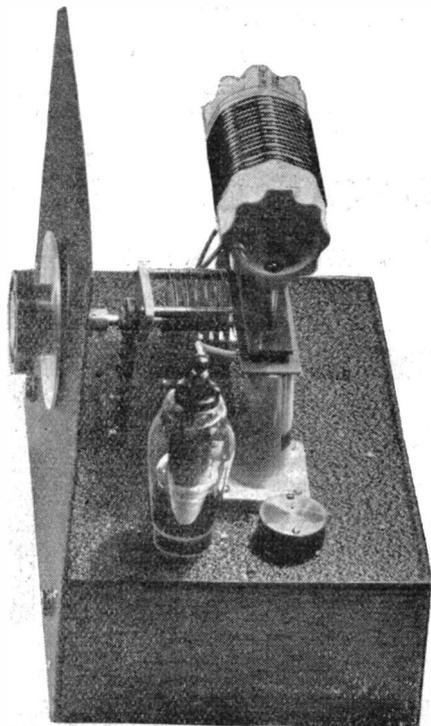
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THE SHORT-WAVE MAGAZINE

Vol. II.

MARCH, 1938

No. 1.

Editor: AUSTIN FORSYTH (G6FO)
Editorial Asst.: S. W. CLARK (2AMW)

Business Manager: C. T. MILDENHALL
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THE NEW BROOM

THOUGH we think that this page of the Magazine is probably the last to catch the reader's eye, let us say for anyone who may see it that we start our second year under somewhat different conditions from those obtaining when the last issue went out.

The change will be imperceptible to most readers, and we do not intend to enlarge on it. Suffice it to say that the aims and policy of the Magazine remain the same: The fostering of interest in all that pertains to short-wave radio. We shall make it our business and our duty to support by all possible means the cover title—"Catering exclusively for the short-wave listener, experimenter, and amateur transmitter."

As a Magazine, we are through our teething troubles, and we look forward with confidence to the continued support of that growing body of readers who, month after month, enable us to add a few more thousands to the printing order.

There is a saying that "The new broom sweeps clean." Be that as it may, it is not always necessary for the new broom to sweep clean if the old one has done its job. There is no point in change for the sake of change. Therefore, we are neither offering new and startling innovations nor, with the exceptions of the "Old Timer" and A. A. Mawse, a whole array of fresh contributors.

We shall continue to keep abreast, and even a little ahead, of the times, while on the practical and constructional side, our programme—which we intend to summarise briefly on this page in April—will be based on the requirements of the average reader, be he listener, experimenter or amateur transmitter.

In short, we aim at continuing to justify the many letters of commendation we have recently received, and we hope that readers will assist us with their comments, criticisms and suggestions.

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HAVE YOU HEARD...?

Interesting items of broadcast band news gathered from the log-book of

F. A. BEANE (2CUB)

DEPLORABLE RECEPTION conditions no longer hold sway, I am delighted to state at the time of writing—somewhere in the middle of February—resulting in a comprehensive and presentable log for the past few weeks. Of course all do not agree with me when I condemn conditions, and endeavour to justify statements to the contrary by speaking of reception of FR8-so-and-so, XZ2-blank-blank, and so on, during the “condemned” period, forgetting that I refer only to the b.c. bands, whereas they probably listen to both b.c. stations and amateurs, the one compensating, more often than not, for any possible depreciation in the other. However, since the remarkable Aurora Borealis display, when conditions were decidedly abnormal, things have certainly improved and, no doubt in company with numerous others, I have spent some very enjoyable hours and late nights with the receiver. Latin-America, above all, has predominated and has furnished a number of new transmissions, many of which are unrivalled for consistency. The Far East, too, has aroused much interest, its broadcasters proving almost as fascinating as those from the West and South-West.

But let me take you through the pages of my log-book, which bear ample witness to its use, not, I must admit, always orthodox! There is one leaf terribly black—thanks to an oil-stove and a “long story,” as A. J. Alan would say! But that is not what I am here to write about and so I present the news.

● Voices from Latin-America

As forecast a month or two ago, XECR, Mexico City, has resumed its weekly broadcasts of propaganda, music and prose. I call it propaganda as such it is, but it is inoffensive and worthy of your attention, therefore, it will prove worth your while to tune to 40.65 m., 7,380 kc., next Sunday at midnight until 01.00 (Monday morning). You may think of the noise prevalent in the vicinity of that wavelength, but do not let it deter you, for XECR has a power of 20,000 watts and is frequently R7-8 with English announcements every few minutes. You may wish to secure verification (yes, they appreciate reports and send a QSL); if so, address your report to: “Estacion XECR, Departamento de Publicidad de la Secretaria de Relaciones Exteriores, Mexico D.F.”—a mouthful, or simply the Secretary, Publicity Department of the Foreign Office.

Having logged XECR you may acquire a thirst for Mexicans, in which case take careful note of XECR's programme, then switch over to 48.62 m., about 6,170 kc., where you should find a very weak, but intelligible, relay of XECR, namely XEXA, another Government station. The address is “Estacion XEXA, Bucareli 12, Despacho 103, Mexico D.F.” I have logged both quite recently and believe that XEBT (50 m.) also radiates the same programme simultaneously.

XEWW, Mexico City, 10,000-watt station on 31.58 m., which verifies with a picturesque card, has been heard at 23.30 with chime signal, having apparently temporarily left the 19.79 m. channel.

The absence of HJ3ABX, one-time dominator of 49 m., has revealed what is to me a newcomer, viz., HP5H of Panama City, although at one time I heard this call in the 25 m. band, when COGF appeared to be relaying it. English was used almost exclusively at the time (03.30-03.45), the programme being reminiscent of those made familiar by HP5A, 5J, and 5B. I do not know the QRA, but suggest that reports be addressed to “Radiodifusora HP5H, Panama City.” The programme was extraordinary, consisting of a man singing popular songs, minus any kind of accompaniment—possibly another boxer!—and chimes were used; one between announcements and several prior to the station call at each quarter-hour. HP5A (25.64 m.), of the same city, has proved exceptionally good, when not mixed with CBI170.

Recent descriptions of Panama (interspersed between beer advertisements!), given by the familiar American-voiced Lieut. G. Williams, include “Panama—Crossroads of the World”; “Panama—Land of Romance,” which remind me of HP5B's delightful slogans “—, where the land was divided so that the world could be united” and “—, where palm trees blow and two oceans flow” of a few years back, when “Estacion Miramar” reigned supreme. However, things have changed thanks to competition and speculation.

Diminutive French Martinique continues to be heard through the medium of the 200-watt “Radio Martinique” on 30.93 m., but with a somewhat different schedule—16.15-17.45 and 23.00-01.00 (reported by D.P.B. of Holloway, who has a letter containing apology for delay in sending QSL's). The second session has been heard throughout and is commenced and concluded with the “Marseillaise.” Modulation has been exceedingly poor at times.

The Dominican Republic is again in the news, this time with HID, “Radio —?” Trujillo City, on about 32.3 m. First observed in October of last year, it became gradually weaker but is now R6-7 when conditions are favourable. Gives news in Spanish at 23.55 (7.15 p.m. Dominican Time). Full address is unknown but I feel sure that “Radiodifusora HID, Trujillo City, Dominican Republic” is sufficient. HIH (details January identification panels) on 44.25 m., has provided an amazing signal around 01.40 on occasions, the English announcement being given as “You are listening to HIH, located in Higuamo City, The Voice of Higuamo, operating on a regular frequency of 6,780 kilocycles.” Incidentally HID has been heard as early as 21.45.

YNPR, Managua, Nicaragua, has been well received around 01.30. The wavelength appears to be 34.9 m. (WOO, Ocean Gate, 35.02 m., made a

good "marker" for calibration). No identification signals are employed but the slogan is "Radio Pilot." On a much higher wavelength I have been puzzled by two faint transmissions, one on about 47.19 m. (YVIRH, 47.17 m., served as "marker") and the other near 48.4 m. Both appear in the log at about 02.50; the former may have been HRP1 of San Pedro Sula, while the second could have been TG2, Guatemala City, which is said to operate on 6,210 kc., 23.00-03.00 and was partly confirmed by the marimba music it was radiating, so characteristic of Guatemalan transmissions. Had I listened 10 minutes later I might have confirmed it, but at the time I was rejoicing in the fact that COCD (48.92 m.), erstwhile Cuban "star," was again a mighty signal, defying all others to oust it from its channel and supremacy!

Cuba is again well heard after a remarkable and extremely unusual decline in strength. Chief representatives are COGF (25.42 m.), Matanzas, often R7-8 at 21.30; COCQ (near 30.8 m.); COBC (*now moved to 30.2 m.*); COCM (near 30.45 m.); COBX (32.6 m.), all of Havana; COJK (34.6 m.), Camaguey; heard at 02.00 with English call "CMJK, Camaguey, Cuba," and also COCH (31.8 m.), one of the best known Havana stations. Of COCX, COBZ and COKG, I have heard little. A newcomer, COCA, Havana, is said to relay CMCA on about 32.9 m., but I have not discovered it. TTPG (46.8 m.) of San Jose, is often good, being heard with its famous travel talks between 02.00 and 03.00. The West Indies HH3W (31.10 m.), with 4-chime signal, has also been observed but not consistently.

● Colombian confusion

Considerable confusion exists, and always has, over the wavelengths allocated, adopted or commandeered, by the Colombians. These stations are notorious for their habitual wandering and I can name but few that have adhered to a frequency for long. For example: I first made the acquaintance of HJ1ABB, "La Voz de Barranquilla" in 1933, or so, when operating on 6,447 kc.; since then it has occupied various frequencies in the 49 and 31 m. bands, while it is now in the vicinity of 62 m.! HJ1ABB is not the only delinquent, however, for it appears to be characteristic of the majority. Fortunately many have drifted from the 31 and 49 m. haunts and settled where they will not seriously interfere with any other station. Careful observation shows that they are now operating on the following frequencies:—

	metres	kc.
HJ7ABD (ex-2ABD), Bucaramanga	31.13	9,630
	(actually nearer 31.15 m.)	
HJ1ABP, Cartagena	31.21	9,612
HJ6ABH (ex-4ABH), Armenia	31.51	9,520
HJU, Buenaventura (seldom heard)	31.55	9,510
HJ4ABE, Medellin	48.32	6,142
HJ6ABB, Manizales	49.10	6,110
HJ5ABD, Cali (seldom heard now)	49.30	6,085
HJ3ABF, Bogota	49.42	6,073
HJ6ABA (ex-4ABU), Pereira	49.58	6,054
HJ1ABG, Barranquilla	49.64	6,042
HJ2ABJ (ex-1ABJ), Santa Marta	49.80	6,025
HJ3ABX, Bogota	49.83	6,020
HJ4ABD, Medellin (seldom heard)	50.25	5,970
HJ3ABH, Bogota	61.22	4,900
HJ4ABP, Medellin	61.48	4,890
HJ1ABE, Cartagena	61.72	4,860
HJ3ABD, Bogota	61.86	4,849
HJ2ABC, Cucuta	62.63	4,799
HJ1ABB, Barranquilla	62.75	4,780
HJ6ABC (ex-4ABC), Ibague	63.29	4,740

I have logged all of these at some time or other and have recorded the majority in my log-book since the re-shuffle, those operating in the 62 m. band being strong around 02.00-03.00. HJ6ABC employs a 7- or 8-chime signal and the slogan "Ecos del Combeima"; HJ1ABB 3 deep-toned and others between announcements and HJ3ABD with 3, but much louder, chimes, while HJ1ABE may be heard with a Sousa march at the hour. To confuse matters still further, HJ3ABH also resorts to a three-chime signal, but favours us with an English announcement at the hour. Needless to say it is exceedingly difficult to keep an accurate account of the identification characteristics since they are changed so often, but one should be able to log any of the stations mentioned, under favourable conditions, with the aid of the above list, and I suggest that they should be tackled one by one from the l.f. end and held until definite identification is secured.

● Other South American News

The revitalized HCJB (33.53 m.) is again well heard and much stronger than with its original 250 watts. When logged recently it was using 4 chimes between each musical item and announcing as "Radio Ecuador, HCJB, Quito," later reverting to its official slogan "La Voz de los Andes." If you haven't logged it, do so now—it's good just after midnight. On 38.1 m., or so, I have heard another which may be HC2JSB, Guayaquil, using a 4-chime signal. Unfortunately I couldn't await the announcement at the time so did not identify it, although I have logged HC2JSB before.

The Venezuelans continue to predominate; the YV3RB, "Radio Barquisimeto" I introduced last month is causing controversy—some say it is YV3RD and others 3RV; I heard it in English and certainly thought it was RB, but I am not infallible, as you already know! YV4RB, Valencia, 46.01 m., has been heard closing at 02.30 with a clock striking 10, while the remainder of the YV's continue to cleave the ether as of yore!

PSH is also well heard but is slow in forwarding the promised QSL's; PRA8 continues to flirt with stations in the neighbourhood of 49.9 m., while VP3BG and VP3MR are frequently received from about 21.30.

● Concentrated news

I am rapidly drawing to the end of my space and so the remainder of the news must, of necessity, be greatly condensed! HS8PJ (15.77 m.) continues to operate between 13.00 and 15.00 on Mondays and the same time Thursdays but then on 31.55 m. On the higher frequency it is often a remarkable transmission but much weaker on 31.55 m.; JVP (39.95 m.) and JZI (31.46 m.) are heard nightly, about 19.30 until 21.00, the former being excellent; JIB (28.5 m.), 14.00-15.00, is generally weak; CR7BH (25.6 m.) has been heard closing at 20.30 on a Sunday, although schedule says 19.00 (has been heard closing at that hour on other Sundays); PIIJ (42.35 m.), FET5 (42.25 m.) and EA8AB, "Radio Club Tenerife," near 40 m., at 19.30, all well heard, also EA8AE (41.66 m.), "La Voz de Gran Canarias, Las Palmas, la emisora EA8AE," relaying "Radio Nacional de Espana" and closing at 24.00 with a request for reports.

Several mystery signals have been observed; there is "Radio Napoli" on 46.3 m. around 22.30; a station on approximately 45.5 m. calling JVT in Japanese (or was it Chinese?) and mentioning JVO

(Continued on page 30).

USING MAINS FOR THE "ALL-WORLD TWO"

By G5VU

AS PROMISED last month we give details for the conversion of this popular receiver to mains operation. Last month G5VU wrote of 10-metre experiences.

The circuit is given in *fig. 1*, and consists of a straightforward electron-coupled detector (6K7), choke coupled to a 6C5 audio stage (a pentode may be used, of course, if preferred, in which case the 6F6 is suitable).

Rebuilding is quite a simple job. First of all replace the valve-holders by two ceramic octal-types (Amphenol are easy to fit to this particular chassis). Mount L2 on top of the chassis in front of the l.f. valve (valve positions are the same as in the original model). This l.f. choke, by the way, may be obtained from G5NI (Birmingham), Ltd., at 7s. 6d. Any high-inductance l.f. choke, or even an l.f. transformer of suitable dimensions, with primary and secondary in series may be used but performance will suffer and the one specified is strongly recommended.

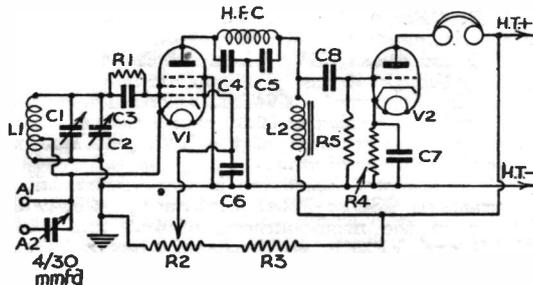


FIG. 1.

COMPONENTS FROM THE ALL-WORLD TWO :-

- | | |
|--|-----------------|
| C1—Tank Condenser | R1—3 megohms. |
| C3—.0001 mfd. | R2—50,000 ohms |
| C6, C7—The two sections of the 1+1 mfd. condenser. | potentiometer. |
| C8—.002 mfd. | R3—40,000 ohms. |
| | R5—1 megohm. |

NEW COMPONENTS.

- V1, V2—6K7, 6C5 (metal type)
 H.F.C.—Eddystone 1010
 L2—Thordarson, type T2927
 C2—15 mmfd. (Eddystone)
 C4, C5—.0001 mfd. (T.C.C., type M)
 R4—2000 ohms, 1-watt (Dubilier)

● .5 to 160 metres

Fit an extra socket for the alternative aerial coupling. Drill a hole in the chassis close to V1 and immediately between V1 and the coil holder. Fit an *insulated* socket into this, connecting the cathode of V1 to it. Decide which socket of the coil-holder you are going to use for the cathode

tap and connect a short piece of rubber-covered wire to this. Run this wire through a hole drilled in the chassis and fit the other end with a wander plug, which goes into the insulated socket. (See *fig. 2*.) The purpose of this is to obtain a short cathode lead when operating on 5-metres.

The rest of the wiring is quite straightforward. Make all leads as short and direct as possible. C4, for instance, should be soldered directly on to the valve holder. Remember that the top-cap of the 6K7 is the *grid* connection. R1 and C3 go straight from this to one of the fixed-plate terminals of the tuning condenser.

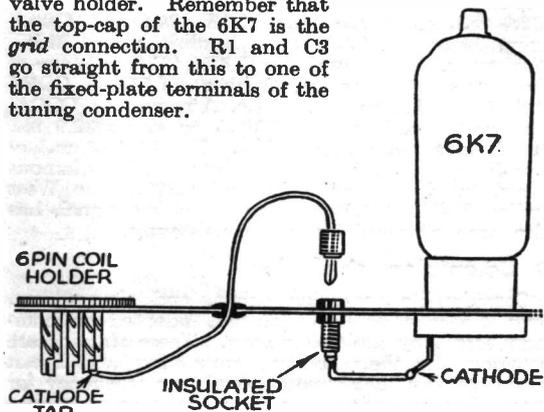


FIG. 2.

Coil details for 10 to 160 metres are given in the following table. All coils wound on Eddystone 6-pin non-threaded formers.

Band	Total Turns (L1)	Cathode Tap*
160	50 Close Wound	31
80	24	1½
40	12	¾
20	5½	¾
10	3	¾

* Turns up from earth end.

It will probably be found that the aerial socket marked A2 in the circuit diagram will only be used on 20 and 10 metres, the direct connection (A1) giving best results on the lower frequency bands.

● Operation on Five-Metres

On five-metres the tank condenser is disconnected from the tuning condenser and the coil is fitted directly to the terminals of the latter. The coil (*fig. 3*) is four turns 1 inch diameter, air-spaced, of 14 s.w.g. Two valve-pins are soldered to this coil which plugs into sockets fitted to the terminals of the tuning condenser by means of small brass angle brackets. The cathode tap on this coil is very critical; about ¼ to ½ a turn will be found sufficient. When the best position has been found solder a

short length of rubber-covered wire to this, fit a wander plug to the other end, and insert it into the insulated socket on the chassis (having first removed

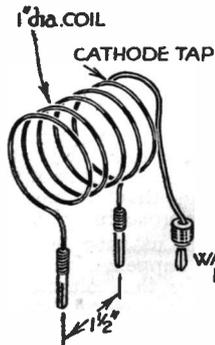


FIG. 3.

metres. A metal cabinet for the Eddystone "All-World Two" is supplied by Messrs. Stratton, and this helps greatly in abolishing hum.

● Results obtained

On 10, 20, 40, 80 and 160 metres results are excellent, being much the same as those obtained with the original "All-World Two" with the addition of greater sensitivity, more volume (a loud speaker is needed when listening to 7 mc. fones!), all-mains operation and 5-metres there if required.

On five, tuning is very critical, and a good slow-motion dial is essential. Reaction control is very smooth, however. R3 Morse signals have been copied solid with this receiver on 56 mc. (crystal-controlled transmitter). The local fones are received at R8 to R9 on the loud speaker.

For those who are anxious to get going on 5-metres and who do not want the expense of a separate receiver, this descendant of the "All-World Two" can be recommended.

One last reminder! Don't forget to disconnect the tank condenser when listening on 5-metres and to connect it to the tuning condenser again when going back to the lower frequencies.

the other plug, of course!) Aerial coupling depends on the type of aerial to be used and this is left to the discretion of the user. It is quite a simple matter to fit an aerial coupling coil alongside the tuning coil, on a pair of stand-off insulators.

With a well-filtered power supply giving about 200 volts for h.t. and 6.3 volts at .6 amps for the heaters, the receiver is as quiet as a battery receiver on the lower frequencies and only a slight trace of hum is audible even on 5

Result of German DX Contest

Results in the German DX contest held over the four week-ends of last August have now been declared. Scotland was counted as a separate country from "G," and GM6NX swept the board with the enormous total of 81,130 points (373 DX contacts). Runner up was GM8CN with 19,320 points (102 DX contacts).

Under the "G" heading, G2ZQ tops the list with a total of 55,157 points obtained through 191 DX QSO's. Second place was taken by G6YR with a total of 53,352 points (195 DX contacts). D4CDM was the top scorer in Germany, finishing with 865,878 points!

We hear that . . .

Conditions are improving rapidly on the 14 mc. band and the next few weeks should see a return to a more normal state of affairs.

Somebody thought a di-pole aerial was one which needed two masts. If you can't see this straight away, think it out.

Messrs. Jackson Bros., Ltd., 72, St. Thomas' Street, London, S.E.1, now catalogue some very nice 2-inch diameter knurled knobs at 6d. each, in either 1/4-inch, 3/16-in., or 1/8-in. shaft fittings. These are just right for the transmitter panel.

Messrs. Milnes Radio Co., of Bingley, Yorks, are in voluntary liquidation, but we are glad to know that plans are already in hand for the continued manufacture of the well-known Milnes Units.

The 1937 edition of "A Guide to Amateur Radio," published by the Radio Society of Great Britain, 53, Victoria Street, London, S.W.1, has been sold out. Till the new edition appears in September next, the R.S.G.B. have had certain parts of the 1937 "Guide" re-printed in booklet form, price 4d. post free.

The Post Office will henceforth be taking stern measures with amateur transmitters guilty of off-frequency operation and abuse of the 7 mc. band.

WOODEN MASTS

Readers have from time to time written asking for details of lattice masts, varying their requirements as to height and proposed material. As we have had no practical experience in this connection we do not care to suggest a scheme that *may* stand the strain imposed by the variable weather conditions obtaining in this country.

Believing there is a strong demand for a tower of about forty feet in height and made with timber, we invite suggestions for publication. These will be used for final plans and the result will be the erection of a mast in a locality open to the four winds; not forgetting those with space limitations.

At first rough paper plans should be discussed. However, we must not overlook two important points: raising, and securing the structure; three

"strong" men should be the maximum number required for the former operation, while the second question requires careful thought if the mast is to be raised and lowered at intervals.

Now then, amateur engineers, get busy and let your fellow readers see what may be done by collective reasoning. The summer months will soon be with us so that tests will take us out of doors for a breather; also an incentive to get out will be the natural wish to put up all manner of wonderful arrays for five and ten metres. Then we shall want to take the receiver on the lawn to obtain that perfect transmission from a perfect aerial. And, looking even further ahead, we shall strive during the winter to attain those conditions recorded under ideal circumstances! Who will "break in"?

Adventures of an Op.

No. 3—**Revolution!**

By N. P. SPOONER (G2NS)

EVENTS RECORDED in this chapter took place on the eve of a new year, and it was while the thoughts of the staff were turning towards ways and means for the festive occasion, certain dissatisfied men were plotting to encompass their fellow-beings. Through their scheming it later transpired that, as a shell whined across the river to bury itself in the side of a Post Office building, the occupants of a fishing boat out in mid-stream saw the body of a naval officer go bobbing past them on the tide.

Feverish days passed, the inhabitants of the city resumed their peaceful occupations almost as suddenly as they had ceased them and, in striking confirmation of the wide-spread belief that only dogs and mad English go in the sun, one might have seen four visitors standing in the heat of Black Horse Square. In silence they gazed at jagged holes and the machine-gun bullet scars of the Post Office building and, calling later at the nearby Lisbon office, heard how splintered wood and a wandering bullet had suddenly checked the Wheatstone transmitter in its 200-words-per-minute stride while a very startled Op. fell over the slip basket, pushed his face through the glass cover of a syphon recorder and received the contents of a large gum-pot down his neck that he thought must be somebody's blood.

● "Sousa" makes a promise

At this stage we must retrace our steps and learn the events leading up to such hectic moments. It was one morning two weeks before, when going off night duty, that a local Op. named Sousa, who boasted that he played an active part in a secret society known as the "White Ants," came to me and enquired whether I would like to see some "fun." Having collected two other bright lads we postponed breakfasting in the mess and retired with Sousa to the canteen in order to find out the nature of the promised "fun."

Contrary to our expectations it was not Sousa's weakness for the fair sex this time but the offer of a front-row seat in a real live revolution in which the White Ants were taking a particular interest. We already knew that although Portugal had been an uneasy republic since 1910 there were still two parties in the country holding decided Royalist views but, in reply to eager questioning, our White Ant said "No! this is going to be a GOOD revolution. We have no time for futile Royalists."

And it took some persuasion and much neat "Black and White" to weaken him into a disclosure that zero hour was fixed for dawn on a certain Wednesday. The objective was the downfall of the existing president with the following re-election of one more to the revolutionaries' liking. The Navy was to be represented by the quarrelsome crew of one of the obsolete-type battleships anchored in the Tagus who had sworn furiously to bombard the capital while marines, White Ants, beachcombers and any interested onlookers were to attack units of the army or police force who still remained loyal to the government.

● Inside information

Naturally we fairly jumped at the offer and, at the same time, wisely refrained from any attempt to understand the political intrigue that we knew would be at the bottom of the approaching affair.

From time to time Sousa brought us news, when passing the circuits where we happened to be operating, and he told us gleefully that although the Government had somehow learned every detail of the coming outbreak the White Ants, on the other hand, knew all the Government counter-plans and both sides were now actively preparing for what Sousa prophesied would be a GOOD revolution if the street-fighting lasted at least three days. We thereby came to the conclusion that he apparently enjoyed a sanguinary souse almost as much as an alcoholic one.

At last Wednesday came and the trembling dawn, breaking with a heavy rain-storm, found the three of us fretting on duty while the wily Sousa had reported "sick" and had been missing since the previous afternoon. Suddenly the Lisbon land-line sounder ceased its chattering and we heard the first shell drone faintly across the river towards the town. "Line cut" was reported to the clerk-in-charge and we then spent the rest of the shift—and in fact the rest of the week—heartily cursing the Company and its duties that kept us confined to the cable station and quarters.

The following Monday a smiling sun brought back the truant Sousa and a suitcase crammed with looted automatic pistols that he proceeded to hawk to anyone he could interest in the next revolution. We managed to interrupt his illegal bartering and drag him off to a quiet grog-shop on the outskirts of the village where, with the light of battle in his eyes (and several tots), he told us of the glorious events of the past days.

● "It was like this . . ."

"Zero hour arrived," he related with waving arms, "all roads into Lisbon were barricaded, all communication cut and the railway lines blown up near the termini. Our gallant naval comrades rapidly fired three live shells into the town as soon as an officer, who had raised some absurd last-minute objection to our plans, had had his throat cut and his body thrown into the river.

"The first shell hit the archway over the street leading into Black Horse Square where, in 1908, Dom Carlos and the Crown Prince were despatched. No sooner had it burst than every door in the neighbourhood was bolted and barred, every shop-shutter run down, and the streets left deserted to give us fighters unrestricted freedom of movement.

"The second shell buried itself in the side of the Post Office, situated as it was between the Arsenal, that shielded our gallant Marines, and Black Horse Square where two companies of government mur-

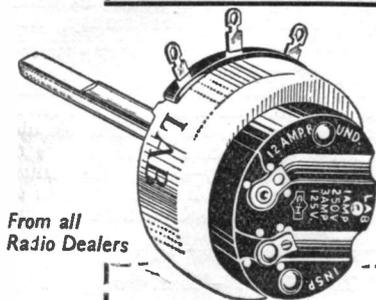
(Continued in col. 2, page 10).

The

LAB

TESTED

VOLUME CONTROL



And Now for Pitcairn!

This lonely isle in mid-Pacific is to have a transmitter for 21- and 42-metre working, replacing a 10 years' old "spark" rig

By "KAYAK"

SHORT-WAVE listeners and hams are no doubt impatiently awaiting the word "go" from the new short-wave transmitter now on its way out to Pitcairn Island.

Full details of the station appeared in the January issue of "QST." For those who do not see this magazine the transmitter will cover the 21- and 42-metre amateur bands (telegraphy and telephony) and the 600-metre shipping. The input will be between 60 and 80 watts. As no power supply is available on the island, all gear will be run from accumulators which in turn will drive generators for the supply of high tension.

For over 10 years the station has been working "spark" on 600 metres. For the same length of time the "inhaling" side has been looked after by a Marconi crystal receiver. Ships over 1,000 miles away have been heard on this.

● Radio, and other conditions

Pitcairn Island is located nearly half-way between South America and Australia. The whole island takes up only $2\frac{1}{2}$ square miles of the Pacific! Yet on this little space there live over 200 people! The island was discovered in 1767 but remained uninhabited until 1790. It was during this year that Young, Christian and their small party of mutineers from H.M.S. *Bounty* (not forgetting their Tahitian wives) landed there. In 1856 the population had increased to 192. By this time the island was getting too small for them, so at their own request they were all shipped to Norfolk Island, a desolate spot some 900 miles off the east coast of Australia. Forty of them soon became homesick, however, and were shipped back to Pitcairn. In 1879 the population had risen to 90.

The islanders lead a simple but happy life. The soil is fertile, producing coconuts, bananas, breadfruit, pineapples and tomatoes. As a radio location the island should prove perfect. On 21 metres the station should push a strong signal to all parts of the world. Nothing definite can be said as to when this will be ready to go on the air.

Treacherous rocks surround Pitcairn and unless the weather is good no attempt will be made to land the gear from the S.S. *Arangitiki*. This vessel is on its way from Panama to Auckland and conditions permitting it will land its seven cases of radio apparatus early in February.

● Be Patient!

On the shipping wavelength the call-sign of PITC has always been used. Whether this will still be so on the amateur bands remains to be seen. It should be remembered that the island is quite out of touch with world events. It is doubtful whether Mr. Young (the operator of the station) is

aware that the amateur prefix for Pitcairn is VR6; if not, he will probably still use PITC.

Once the station is in working order it is doubtful whether QSL cards will be forthcoming easily; DX listeners should not be impatient however, as visits to the island by passing boats are scanty, and QSL's may take months to do the outward journey alone!

Although the U.S.A. kindly gave all the radio equipment free of charge, the island is a British colony. All hams contacting the station should make it a worth-while QSO. Send some words of cheer to that isolated community—surely they must need it! In your own way you have the means of making their life a little happier. Use those means!

"ADVENTURES OF AN OP."—(cont. from page 8).

derers waited with their cursed machine-guns. Encouraged by this fierce shell-fire our eager Marines hurled themselves through the Arsenal gates and charged the military assassins. They were met by such a hail that the survivors were forced to the roof-tops where they continued with sniping tactics."

"And then, old bean," we interrupted him, "seeing that the revolution was not going to be a GOOD one, we presume you thereupon lost further interest in the affairs of your nation, what?" "On the contrary, seniors, I kept up the supply of ammunition and firearms until the last!" he replied in a grievous tone which explained how he came by the looted automatics so suspiciously like the stock of old Johannes, the Dutch gunsmith.

"Ah, it's all over now," he sighed as we left him to fight it all over again with the proprietor and the staff, "but one day we'll have a GOOD revolution, seniors."

We caught him in a chastened mood some days later and enticed him into Lisbon where, under his guidance, we found and examined the damage. The evening very nearly saw the start of a fresh revolution when we decorated the bayonet of an astonished sentry, lounging outside the Arsenal gate, with a long crisp roll and, after scaling the walls we fed a group of political prisoners behind bars with packets of shrimps stuck on walking-stick points.

News travels swiftly and the hilarious Sousa was last seen attempting to calm the garrison's wrath at our contempt of their sentry and the night-watchman of the local gas company was not unduly surprised to find three mad Englishmen asleep in the early hours on one of his coal heaps . . . which, after all, was in a direct line between Lisbon and a certain cable telegraph station!!!

Next Month - - - - - "BAPTISM"

On the Amateur Bands

By "THE OLD TIMER"

In which we introduce "The Old Timer." He has been in the game for years and listens to you regularly on all the amateur bands with a multi-valve s.s. superhet, modulation checking gear and unlimited experience. He transmits with high power, but is law abiding, and he will attempt to bring you, month by month, news and opinions of the amateurs and their doings.

CONTEST! We have heard that word before. Some have no use for it in amateur radio, others think it's the only word in the amateur vocabulary, so as this is the peak of the contest season I propose to discuss a few points concerning contests and contest operation.

Since the beginning of the year the British amateur has had the opportunity of entering the R.S.G.B. 1.7 mc. test, the Senior B.E.R.U. and Junior B.E.R.U. and, during this month, both the c.w. and 'phone contest organised by the A.R.R.L. Unfortunately the R.E.F. thought it would be a good idea to run their "Coupe R.E.F." during B.E.R.U., and even more unfortunately allowed 'phone operation; yes, I said allowed 'phone operation, but many of the entrants did not appear to read the rules and tried so hard to modulate self-excited oscillators that not only did their carriers burst, but the 14 mc. band appeared to do likewise.

THE SHORT-WAVE MAGAZINE 1.7 mc. DX effort will be over when this appears, and it is interesting to note that the R.S.G.B. 1.7 mc. test was the best supported in the history of this domestic event; over 130 individual calls were logged from G, GW and GM.

At the time of writing the Senior B.E.R.U. has just finished and my ears are ringing with "Test B.E.R.U.," mostly from G stations who will not learn that a reply is very rarely to be obtained by such procedure. Last year's British winner, G2ZQ, made only two QSO's on "Test" calls, yet worked over 90 stations. The only way to win this event is to listen carefully and log every Empire station heard, with dial setting, and call them systematically, changing frequency if necessary, until you learn from which end of the band they commence to listen. This year, though, as many entrants did not appear to overcome the intense QRM at the band edges; crowds of stations were heard to call a given station in the few kc. at the ends of the band, only to hear "test B.E.R.U." churned out once again.

It is good to know that the British Post Office are checking for off-frequency operation during contests. This year many a "pink slip" will find its way to its erring owner. The Empire stations, however, beat the G's, and some notable examples were VO3X, VO3O, VP2AT, who were all 30-50 kc. outside the h.f. end of 14 mc. Once again, ZB1H called a 5-minute "Test" after every contact, and many people still firmly believe he uses elastic for his receiving aerial.

The electron coupled oscillator is at the same time the blessing and the curse of amateur radio. Built by a man who knows his electrical principles a real T9 note can be produced all over the band. Listen to SU1WM, SV1RX, G6NF or G6CJ. But give the

theoretical circuit to a beginner, or to someone who is too lazy to learn, and you produce chirps, yoops, creeping signals and a foul note, and what is worse, such an operator always overmodulates this filthy carrier! As for those who know their resultant signal is rotten, let them learn how to make a choke choke, and keep the r.f. where it should be. Then, except for the overmodulation merchant (and he will be ever with us) all will be peace again.

Before we leave contests, I must mention the type of amateur who considers that if he enters, he must win by the most cunning methods possible, using the argument that if he can find loopholes in the rules he deserves to win. To cite one case; the "amateur" who used 50 watts on his buffer stage and ten watts on his final, with the final as a condenser to feed the aerial, just because the rules stated that not more than 10 watts should be used on the final amplifier. The whole idea of contests in this country is to provide an opportunity for operators in certain districts to be on simultaneously, thereby giving valuable data on conditions, and at the same time a sporting event for all to enter in real sporting spirit. Your conscience is the only umpire—except the frequency-checking stations!

● 7 mc. again

And now let us turn to our old standby, 7 mc. What of those who were insisting that the band be split into two parts, one for 'phone, and one for c.w.? As prophesied by a few old timers, the band went dead to local signals after 18.30 G.M.T. during December, and is still in that condition. Those of you who are only interested in 'phone will say that the band went quite dead, but others with patience and good receivers managed to pull through some really good DX. G6WY was able to work all continents during January between 19.00 and 21.00 G.M.T., having contacts with CR6AF (Angola), VK2, PY, VU2FV and many U.S.A. stations. Some interesting new countries have come on the air, at least "new" for some years. SV6SP is in Canea, Crete, being the first amateur on the island. A few weeks before commencing operation he was signing SV1SP in Athens. PX2B is another in the tiny Republic of Andorra between France and Spain. He asks for cards to be sent via R.E.F. Many will remember old PX1AA/PX1A who was quite genuine in that country, but only sent cards to a lucky few. EA9AI is a doctor in Melilla, Spanish Morocco and operates on 'phone and c.w. on 7,150 kc., and QSL's direct. EA9AH in the same town is occasionally heard on 14 mc. 'phone.

Spanish 'phone is still giving us the "authentic" story of the war. Both sides slanging each other hard in English a few kcs. apart, but even they are

silenced on some evenings by Nature's brush—skip. Some EA's have become a bit tired of this and have turned their attention to working amateurs, both on 'phone and c.w.; one even calls himself "Radio Malaga" and works without a call. Others are EA1BQ, EA1CC, and EA5BO. QSL cards for these stations cannot be sent via any national radio society, but only direct to the address given by the Spanish station.

● DX conditions

It was always presumed that when we approached maximum sun-spot activity the conditions on the high frequencies would bring us DX as easily as locals. This maximum is supposed to be reached during the season of 1938-39, but although we are so near, the prophecy has fallen short of fact as far as this winter is concerned. Up to the end of September last year, conditions on 14 mc. were very good, but then came the slump, and we are in this slump even now. 28 mc. has not been equal to the two preceding years, although many signals have been, and still are, coming through. The strength has been lacking, especially of 'phones, and although we hear S9 signals from U.S.A. on many afternoons, you must remember these may come from 1 kw. stations, using beam aeriels. A beam is so easy to erect for operation on this frequency. Well-known British 'phones G6NF and G5KH find difficulty in getting over this year, whereas they worked Americans in strings last year.

● The L.F. Bands

It is interesting to record the reception by G6RB of W6VC in two-way contact with ZL1DI on 3.5 mc. This took place at the end of January at about 08.00 G.M.T. and both sides were logged. This is the first time for many years that Californian signals have been received on this frequency in England, although G2PL heard weak c.w. on schedule from W6CXW last season. Contacts with the Antipodes are rare on "80," but there have been a few during the last few years. G6RB has worked VK2LZ and VK4EI, G2PL worked ZL1DI, G2ZQ worked VK3EG, G6WY worked VK4EI, ZL4FO and ZL4BR, and G5KG actually raised VK4EI using 10 watts input! This was two years ago.

● And now—Cairo

Finally I would like to say a few words about the Cairo Conference. You all know now that the I.A.R.U. is to be represented by Messrs. Warner, Siegal and Watts. Mr. Watts is G6UN and the President of the R.S.G.B. Mr. Warner is W1EH and the secretary of the A.R.R.L., while Mr. Siegal is the legal adviser to the American League and has a W3 call. Many countries are suggesting curtailments of some of our present privileges and bands, but we hope that we shall retain what we hold, with the possible exception of a 20 kc. channel in the middle of the 1.7 mc. band for radio-equipped observation balloons. Whatever Cairo gives us, let us use it to the best advantage of everyone concerned—and there are about 60,000 licenced amateurs in this old world.

An Original Carrier Control System

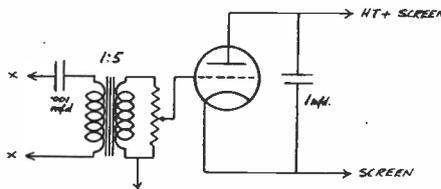
By G5IH

THE SIMPLICITY of this system of carrier control may deter some readers, so first it should be said that many reports have been received that the effect at the receiving end is better than that of any other system.

A valve is biased just beyond cut-off and placed in series with the screen lead of the pentode stage which is to be controlled. A transformer in the grid circuit of this control valve is fed (via a .001 condenser) from the modulation choke or transformer.

The circuit needs no further explanation, so it will suffice to enumerate a few advantages and hints:—

1. It only requires four "junk" components.
2. There is very little power taken from the modulator.
3. The carrier does not vary in strength with the amplitude of modulation.



4. The valve that is to be controlled must be a pentode, and subsequent stages must be battery or eliminator biased, so that the plate current will fall back when drive is removed.
5. The system may be used on any pentode stage including the exciter provided that it is crystal controlled. (The reports mentioned above were received when controlling the crystal oscillator).
6. The control valve may be any type that will pass the screen current (only a few milliamps) and should be biased just beyond cut-off. A two-volt battery valve of the old general-purpose type with the filament run on a.c. is entirely satisfactory.
7. The transformer may be of the receiver type, and the ratio is, of course, not critical.
8. The difficulty in controlling the c.o. is in avoiding modulation of that stage. By feeding from the modulator through a .001 condenser much of the audio frequency range is eliminated; the remaining audio, even from a 2-watt modulator, is more than enough to work the control valve; the "lag" condenser by-passes the rest of the audio, and for that reason a condenser is used alone to give the necessary small lag.
9. The volume control should be adjusted so that the smallest convenient sound switches the carrier full on. This will help the lagging of the receiving gear which does not like controlled carrier, and also removes the undesirable effect of a carrier varying in strength with the amplitude of modulation, which is included in the principle of other systems.

Mentioning the Magazine to Advertisers helps you, helps them and helps us.

Transmission for Beginners

By A. A. MAWSE

THAT THERE is a great demand for simple and straightforward information on amateur transmission, suitable for "grounding" the beginner, is amply proved by the correspondence and enquiries which reach us daily.

We therefore introduce this new series, in one sense a continuation of "From SWI. to Full Licence," by saying that it is our intention to give readers just that fundamental knowledge which is so important if anything useful is ultimately to be achieved. Though it is possible to buy ready-made transmitting apparatus (at a price), the licence conditions in this country are such that nobody can go on the air without being able to satisfy the Post Office that they have some knowledge of transmitting technique and experience in the operation of transmitters.

It is obviously the reverse of helpful to start the beginner off on relatively complicated circuits and ideas, and the new series now following aims at being useful to the reader who is capable of building simple apparatus—such as a good short-wave receiver—without experiencing headaches if, say, the detector valve fails to oscillate on the first test.

The series will aim at building up to an understanding of those circuits, theories and ideas which appear not only in other parts of this Magazine, but also in the handbooks which beginners are often induced to buy.

To do the best we can, we want to hear from you, too.

* * * *

The heading and introductory note having led you gently to the commencement of a series in which we hope you will be interested, we must first say that transmitting licences are not to be had for the mere asking—in order that Dick can speak with Harry, or because Jim would like to send a message to his rich uncle in Australia! No! And if this happens to be your idea, one of two courses are open: give up the intention, or think again and read on.

● Licence Conditions

No transmitting experiments may be conducted unless authorised by the Postmaster General; this is no hardship to the earnest beginner, for application to The Engineer-Chief, Radio Branch, G.P.O., London, E.C.1, will bring full details (which the average intelligent short-wave listener-constructor can understand) of conditions pertaining to the granting of a licence.

With this summary of conditions is presented a Form which, among simpler and more formal questions, asks the reasons for requiring a licence; the proposed receiver and transmitter circuits (all stations must be equipped for receiving), and those wavebands in which experiments will be conducted.

These three matters require careful consideration in an application for the first transmitting permit,

which is known as the Artificial Aerial Licence, and for which there is a fee of 10s. per annum. It should also be noted that one of the conditions of this permit is that signals must not radiate beyond the house.

If you have files of this magazine the circuit requirements will be fairly easy. The writer is using the Class B one-valver for receiver, so there is no need to commit oneself to some elaborate scheme that later cannot be fulfilled. It is wise to be what you are—a beginner.

Taking next the reason for making the application, we cannot, obviously, give this for you. There are countless experiments possible—design of transmitters, modulation experiments, aerial tests, weather phenomena, to mention only a few—but the G.P.O., quite rightly, will not grant a full licence for conducting experiments that may be carried out with an A.A. licence.

● The Amateur Bands

The allocation of frequencies also has limitations, and for the benefit of those not acquainted with the amateur bands, here they are:—

1.	1,720	to	1,995	kc.,	or	174.4	to	150	m.
2.	3,500	„	4,000	„	85.7	„	75	m.	
3.	7,005	„	7,295	„	42.83	„	41.12	m.	
4.	14,005	„	14,395	„	21.13	„	20.83	m.	
5.	28,010	„	29,990	„	10.71	„	10	m.	
6.	56,000	„	59,980	„	5.36	„	5	m.	

Since numbers 2, 5 and 6 will not be granted with a new permit, we shall confine our activities in these articles to the 160, 40 and 20-metre bands. The first is used for local work (recent tests have shown DX possibilities for this much neglected band); 7 mc. is similar, and generally used by beginners (it reminds one of the shallow end of a swimming bath with the "full up" notice displayed!), though real DX is there under good conditions. This leaves the main DX band, referred to as 20 metres, or 14 mc. We hope to show the inadequacy of the former expression by using frequency terms throughout.

Although a knowledge of the Morse code is not necessary for A.A. licensees, a test has to be passed before the full permit is granted. This condition may seem a stumbling block, but if regular short practices are carried out during the period covered by the first licence (there is no time limit) then when the time arrives for graduating we should be ready.

The main thing to understand is that the A.A. permit allows the installation and use of transmitting apparatus without any special knowledge being required, i.e., it is for *gaining experience*.

● Preliminary Cost Considerations

We shall attempt first the construction of an oscillator that looks as simple as a one-valve receiver, which is yet capable of forming the founda-

tion of a first-rate transmitter. It is assumed that readers who have in mind the making of an application are versed in receiver construction.

A point often overlooked in a series such as this is cost. The writer is as much concerned with this aspect as anyone else, and in giving his experiences month by month is mindful that he must use anything spare that can be pressed into service. Where hard cash has to be expended it will be spent with a keen eye to the future—that time when we sit back and take stock; let there be no misgivings over a cupboard stocked with . . . nothing.

One more official requirement must be considered before we turn to practice. Every transmitting station must have as part of its equipment a crystal; the average amateur generally acquires several in a very short while. At about 15s. apiece a goodly sum may be invested—and lost by such mishaps as applying too much voltage or careless handling.

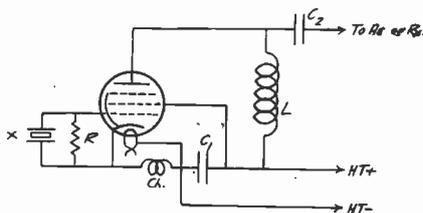
One way to avoid such possibilities is in the use at first of transmitters that are not frequency-controlled by a crystal, but extreme care has to be exercised in order that transmissions are kept within the band limits tabulated above. If we do not use a crystal in the transmitter our chances of off-band operation are great; imagine receiving difficulties if it were illegal to listen a few kilocycles outside either end of the narrow confines of the amateur bands!

Where does the necessity for a crystal arise if we decide to use an electron-coupled as against a crystal-controlled oscillator? The answer is that we must use a crystal for checking frequency, since it is as easy to get outside the band with e.c.o. as with any non-crystal-controlled transmitter.

● Frequency Measurement

The circuit below shows a 100 kc. quartz "bar" in an oscillator that will generate harmonics right through the amateur bands to 56 mc. As an example, we should have in the 7 mc. range the 70th, 71st, 72nd and 73rd harmonics as markers for calibrating a frequency meter. We may use any one of these, or points between, after a curve has

A 100 kc. QUARTZ CRYSTAL OSCILLATOR.



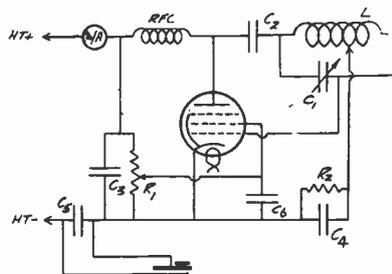
- X—Crystal (Q.C.C. 100 kc. bar, mounted in type C holder).
- R—Grid leak, $\frac{1}{2}$ -megohm. (Erie 1 watt).
- Ch.—Radio-frequency choke (150 turns of 28 s.w.g. on a $\frac{1}{2}$ -in. dia. wood former).
- C1—Bypass condenser, .01 (Dubilier, type 691).
- C2—Coupling condenser, .0001 (Dubilier type 691).
- V—Osram MPT4.
- L—Old type plug-in coil (300 turns).

been obtained from the meter. Such a meter and its calibration was described in the June and July issues of this magazine.

● A Practical Transmitter

Our allotted space is nearly filled; there is just room for bare details of our first transmitter. It is to be a 1.7 mc. self-excited Hartley using an Osram MPT4. Most of us are acquainted with this popular 1.f. pentode and will either have a specimen on hand or know where to get one at the right price (without having to report failure of the domestic set, it is hoped!). Already we have effected a saving by using this valve in two units, and later other ideas for its application to amplifier and modulator will be presented.

HARTLEY 1.7 mc. OSCILLATOR.



- L—25 turns 18 s.w.g. enamelled wound on 3-in. former, $\frac{1}{8}$ -in. between turns.
 - C1—Receiving type condenser, .0005.
 - C2, C4—.002 mica condensers.
 - C3—.0003 " "
 - C5—.005 " "
 - C6—.002 " "
 - Ch—RFC, 300 turns 28 s.w.g. on $2\frac{1}{2}$ -in. paxolin former.
 - R1—30,000 ohm 3-watt potentiometer.
 - R2—50,000 ohm 1-watt potentiometer.
 - V—Osram MPT4.
- The meter used was an Avominor, 0-60 m.a. range.

Most components in the list of parts will be found stored away somewhere in the shack, and if readers will assemble them between now and next month we shall then compare notes to see how your layout tallies with a photograph of the finished and tested model. We hope to relate experiences with this transmitter, and explain the dummy aerial to be used.

A simple power supply is necessary; if possible construct a hook-up for the time being. Keep in mind our effort to spend wisely: we shall deal with packs later on, therefore consider well before buying mains transformers that may find no use in the final rig.

Acknowledgment is made to the Radio Society of Great Britain, publishers of the "Guide to Amateur Radio," for some of the information given here.

Getting Going on 56 mc.

TWO CIRCUITS AND
SOME AERIAL POINTERS

By A. J. DEVON

THERE ARE SOME who think that operation on the u.h.f. bands is only worth while in the summer months, when it is possible to get up on high ground with the gear; others consider any band on which neither DX nor even QSO's can be relied upon to be a sheer waste of time.

To the first of these we would say that the real future of 56 mc. and the u.h.f. ranges in general depends not upon spasmodic fine-weather outside work, but on their development as communication bands in the same manner as that in which 28 mc. is being used. To the second category of amateurs who are largely interested in QSO'ing for its own sake, we suggest that the well-known short-range value of 56 mc. (as distinct from experimental DX working) is worth cultivating, not only as a means of reducing congestion on 7 and 14 mc., but also in view of the fact that this local work can be successfully carried out with the simplest gear.

● Simple 56 mc. Oscillator

While the use of self-excited oscillators on the high frequencies is to be deprecated where any serious experimental work is contemplated, nevertheless it is true that for anyone unaccustomed to 56 mc. and only interested in "working round the town" at first, much can be learnt from such a transmitter; it is simple to build, easy to operate and gives scope for carrying out useful aerial experiments.

The circuit of *fig. 1* represents about the simplest self-excited transmitter for 56 mc. working; known as the series-tuned ultra-audion, it can be made to give better r.f. output than the push-pull circuits often used, and under modulation conditions, the stability is almost as good. At all events, a quench (super-regenerative) receiver will not show any difference as regards stability between this circuit and a push-pull arrangement. And when using self-excited oscillators for u.h.f. transmission, modulation by either voice or tone is nearly always essential, due to creep, chirp, etc., under straight c.w. conditions, which means that a super-regenerative receiver must be used for reception, since the waveform of the transmission is a mixture of amplitude and frequency variation. Something like a really bad trawler 'phone on 149 metres, in fact. A quench receiver irons all this out, and the frequency variation has to be very bad indeed before instability becomes noticeable.

The transmitter shown in *fig. 1* can be built up on a wooden baseboard less than 6 inches square, and

anode-controlled in the usual way with any available modulator. All values are given with the diagram. A Mazda P.220A valve is recommended, as for some reason it gives more r.f. output and will tune to a higher frequency than the same type in any of the other half-dozen makes which have been tried. The same is true of them when used in the ordinary push-pull oscillator. The only point to watch when using the P.220 class of valve in this circuit is that the anode un-modulated input should not exceed 2-2½ watts at 150 volts h.t.—otherwise the valve will rapidly lose its emission. This low power is

The Series-Tuned Ultra-Audion for 56 mc. working.

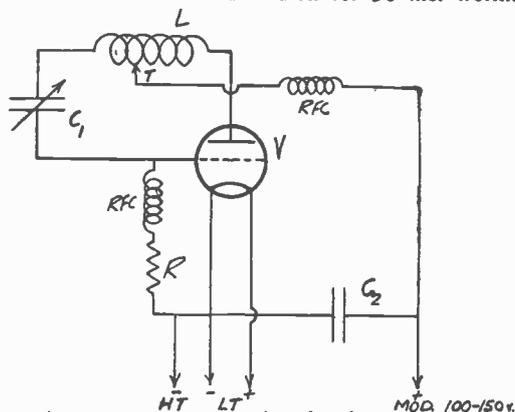


FIG. 1.

L—5 turns No. 14 enamelled, 2-inch diameter. Any similar type of self-supporting coil will do.

C1—85 mmfd. low-loss variable.

C2—.001 mfd.

RFC—50 turns No. 32, enamelled, slightly spaced on ¼-inch diam. former.

R—25,000 ohms, 1-watt.

V—Mazda P.220A.

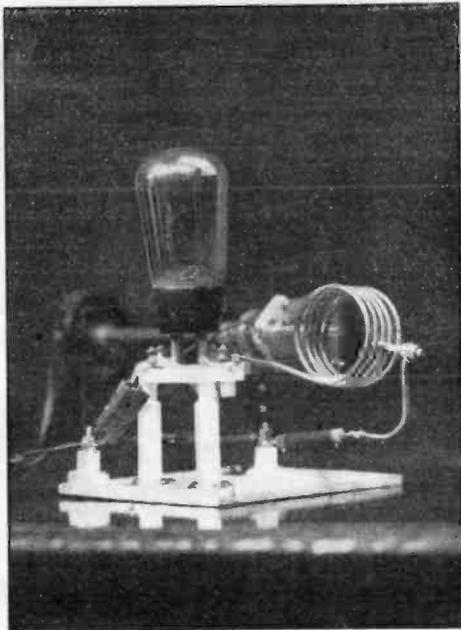
quite sufficient to radiate a very strong local signal if the aerial is properly arranged, so that there is nothing to be gained by increasing the input.

The adjustment of the oscillator is simple. The h.t. tap T is varied on the tank coil (a quarter-inch either way makes quite a lot of difference) till minimum plate current, about 5 to 7 ma. under the conditions stated, is obtained at the desired frequency. Since series tuning is used, the frequency

coverage even with a 85 mmfd. variable condenser at C1 is usually not enough to tune the whole band, and it is as well to arrange matters so that the required setting comes with C1 about half-mesh. This can be done by pulling out or squeezing in the windings of the tank coil. Owing to the high frequency involved and possible vagaries of construction and choice of components, it cannot be said with any certainty that this coil-condenser combination will actually tune to 56 mc. in every case. Therefore, be prepared to look for the band.

● Calibrating on 56 mc.

There are several ways of finding the band when using a self-excited oscillator. The most obvious one is to make up a small absorption wavemeter



One way of building the 5-metre Ultra-audio transmitter. The baseboard is 4 ins. by 6 ins. only. Slow-motion can be fitted, but direct control is quite satisfactory. The clip on the coil is a valve-pin.

(NOTE.—A photograph and some further details of the R.K.34 p.a. will follow next month.)

(a 3-inch loop of stiff wire across a 25 mmfd. variable condenser with an extension handle and mounted on a piece of wood will do nicely) and take it round to one's neighbour who is known to be on 56 mc., calibrating from his transmitter. If there is no neighbour or any doubt about his calibration, eight feet of wire clipped to the plate coil will be a fairly reliable cross-check. The coupling should be made very loose, by tapping away from the anode end, and C1 gently moved till a peaking effect appears on the plate milliammeter. This will be

fairly sharp unless the coupling is too tight, and since 8 feet is the resonant length for 56 mc. this will locate the band roughly. Now, by listening on the ordinary short-wave receiver tuned to the 14 mc. band, loud beat-notes will be heard in the latter from the 56 mc. oscillator. The strongest of these "overtones" which can be found as C1 is moved about the point at which the aerial peaks will finally fix the frequency on 56 mc. Note that owing to the narrowness of 14 mc. in relation to 56 mc. in terms of frequency, almost any setting of the "overtone" in the former band will correspond to the fundamental coming near the l.f. end of 56 mc. This will be more readily understood by

Using the RK-34 Twin Triode in a 56 mc. PA.

The valve is indirectly-heated, requiring 0.8 amps. at 6.3 volts. Either straight c.w. can be used by keying in preceding stages, or modulation by choke control. The aerial link coil is two turns of stiff wire wound over L1 to clear.

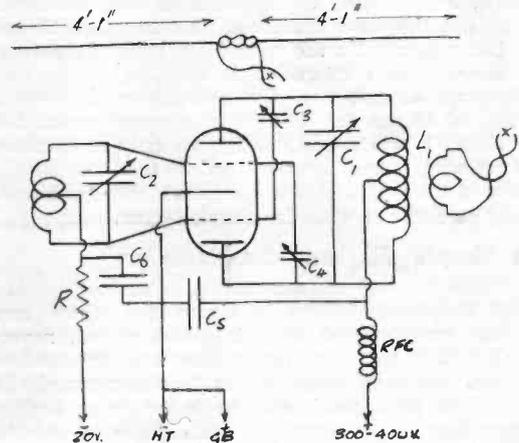


FIG. 2.

L1—4 turns No. 16 enamelled 1-inch diameter, self supporting.

L2—3 turns as above.

C1, C2—50 mmfd., or near, low-loss midget variable.

C3, C4—Two-plate midget variables for neutralising.

Cut-down receiving type will do if the spacing is increased.

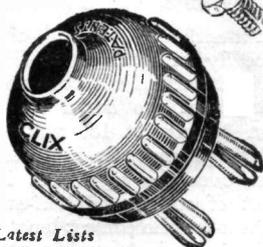
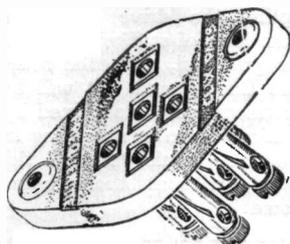
C, C6—.0003 mfd. mica.

R—2,000 ohms, 2-watt.

RFC—As in fig. 1.

(Note.—The inductance values of L1, L2 can be altered if necessary by reducing or increasing spacing between turns.)

reference to fig. 1 on p. 28 of our issue of July last, which shows the frequency relation of all amateur bands. It should also be mentioned here that "fixing the frequency on 56 mc." is only a relative term when using a self-excited oscillator on that band and calibrating by the method suggested. It is clear that accurate frequency adjustment on the



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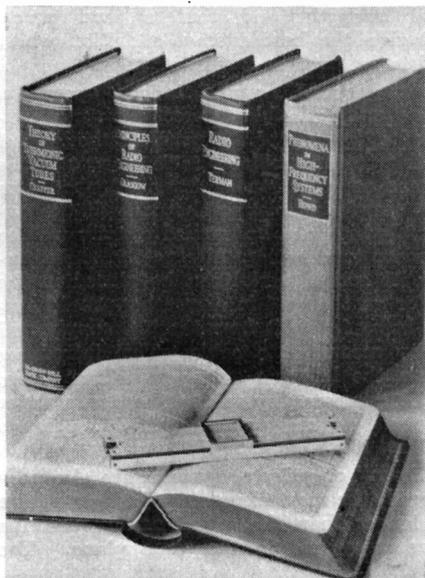
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u.h.f. ranges is a difficult matter when working with a simple oscillator of this type, but the point is that the band can be found and the working wavelength fixed in it within limits close enough for preliminary experiments to be carried out.

Having once located the band and obtained a cross-check by means of QSO or by calibration against a wavemeter of known accuracy, it is as well to make up immediately a simple absorption wavemeter of the kind suggested; this should be solidly constructed and the limits marked. Then, one always has the comforting thought that any transmitter can be checked into the band reasonably accurately, and it is possible to alter the frequency without fear of going outside.

There are, of course, other methods of tuning oscillators to 56 mc. The Lecher wire arrangement is accurate, but rather troublesome to set up. Another is to count harmonics from the frequency meter on a receiver which has a *continuous* tuning range from the highest known frequency—usually in either the 14 or 28 mc. band—down to 56 mc. This is also awkward and, moreover, can lead to serious errors.

● Driven Stage for 56 mc.

The circuit diagram *fig. 2* shows how to use a double-triode valve such as the RK-34 (designed for u.h.f. working) as a driven p.a. on 56 mc. The Exciter Unit described in December when adjusted for 56 mc. output with a 7 mc. crystal will give enough excitation to drive this p.a. to ten watts or more.

The RK-34 has its plate connections at the top of the valve, reducing inter-electrode capacities and facilitating lay-out, which should be carefully arranged such that the connecting leads are as short as possible. If the valve is mounted on its side and above the baseboard, the grid and plate tuned circuits can be brought close enough to reduce the connections to something like half-an-inch. The two inductances should be mounted right on their respective variable condensers, these being raised off the baseboard and having Eddystone extension controls for tuning.

Neutralising is a little bit tricky, and if small knobs are used on the shafts of the two neutralising condensers, they should be slotted and adjusted with an insulated screw-driver or similar tool, slight movements being made on each till it is possible to tune through the drive frequency on the tank condenser C1 without disturbing either a milliammeter in the grid lead of the RK-34, or the plate meter in the output stage of the Exciter.

Actually, the performance can be improved by using split-stator condensers for tuning grid and plate circuits, since the electrical centre of the two inductances is accurately located by this method. The "J.B." 30 mmfd. midget twin condensers are very suitable for this, though the spacing is too close for voltages much over 200v. h.t.

It follows from the above that in the circuit as given the coils must be accurately centre-tapped.

If the lay-out is made absolutely symmetrical, this can be done closely enough by measurement.

With regard to coupling the drive from the Exciter, a fixed single-turn loop of stiff wire should be arranged to clear the grid coil, with the same degree of coupling at the Exciter end. It will be found that the best adjustment will be obtained by this method. The fixed bias shown is necessary in case the drive fails; the p.a. would "fly off the handle" if this happened, without there being battery bias to hold it down.

Before trying to load the RK-34, make sure that the plate mils. at resonance are from 5 to 15 ma. with plenty of r.f. in the tank. Bias adjustment, the arrangement of the link, and accurate tuning of the Exciter stage are necessary to get the last ounce, and it is essential to tune the p.a. stage very carefully to obtain this.

● Simple Radiating Systems for 56 mc.

Going back to our ultra-audion in *fig. 1*, the simplest way to radiate locally with this is to clip 8 feet of wire on the tank coil and adjust both the tapping point and the length of the aerial till a good draw—not more than 16 ma. at 150 volts—is obtained at the desired frequency. It is better to start with a few inches over the eight feet in the aerial, trying the effect of cutting off half-an-inch or so at a time. The test for the correct length at the working frequency is that which enables the aerial to be tapped on and taken off without altering the oscillator frequency appreciably on a quench receiver in the same room.

The aerial can be either vertical, horizontal, or at some angle between the two. Some very interesting points will emerge in this connection if tests are carried out with a local station a mile or so away. It will be found in most cases that both transmitting and receiving aerials must be in a certain position—not necessarily the same—for maximum signal strength, and that a semi-vertical setting will give the best average radiation where it is desired to get over to several stations.

The remarks above assume indoor operation, though it is equally possible to erect the aerial outside and feed it by any of the usual methods—but direct coupling to the oscillator tank, except in the case of the end-on arrangement described, should be avoided. A simple doublet is shown with the circuit of *fig. 2*, which can be applied equally well to the ultra-audion transmitter. Alternately, the transmitter with its end-on aerial can be placed in the roof-space (or on the roof in a weather-proof housing), power being fed to it from the h.t. supply and modulator by means of a cable. This introduces difficulties on the l.t. side owing to voltage drop, which can be overcome by taking the accumulator up aloft as well, switching on and off with a simple relay—Oh, yes, it all works!

Simple "beam" or reflector systems are also very easily arranged, the most elementary being a wire a few inches longer than the actual aerial, placed a quarter-wave away and in the same plane. The

direction of maximum propagation will then be away from the reflector such that the aerial is between it and the distant point.

The doublet shown in *fig. 2* is also an effective radiator (it too can have a reflector behind it if desired) but the two arms require careful trimming for maximum draw on the transmitter frequency. This length varies from place to place over fairly wide limits, and depends a great deal on the immediate surroundings of the aerial site. It is, however, easy to erect and adjust, and the feeder can be any reasonable length—100-foot lines are not uncommon.

Though the point of local working has been emphasised here when using simple apparatus of the type of *fig. 1*, very much greater ranges up to 15 or 20 miles or even more can be covered if the stations are well elevated and approximately within "visual" range. Apart from this, the band holds great possibilities as regards the development of long-distance working for the serious experimenter using a stabilised transmitter and receiver. In fact, it is on the frequencies above 28 mc. that the greatest scope for experiment now lies.

SPECIAL PARTS REQUIRED FOR FIGS. 1 & 2.

Ultra-Audion Tx.

C1—85 mmfd. midget variable, Webb's Apex. One set Eddystone extension controls (1008), S/M driving head (1012); flexible coupler (1009), adjustable bracket (1007) and J.B. knob, No. 2159.

R.K.34 P.A.

RK-34 valve and holder. Webbs. C1, C2—50 mmfd. midget variable, Webb's Apex. C3, C4—15 mmfd. midget variable, Webb's Apex. Two sets Eddystone extension controls as above. Two 'J.B.' knobs, No. 2159, and two ditto, No. 2157.



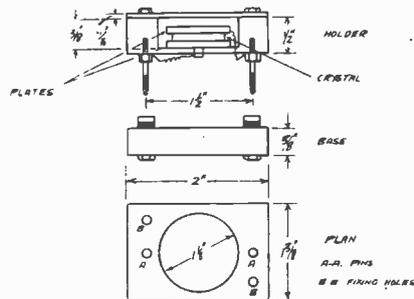
Under the Guidance of the Science Master, the boys of West Central School, Bath, are very interested in Amateur Radio. They have a 7 mc. transmitter under call 2COU.

A Simple Enclosed Crystal Holder

By G18TS

Perhaps one of the costliest and yet simplest components which the amateur taking up transmission has to purchase is the crystal holder. He nearly always buys one of the open variety because it is fairly cheap. Although this type serves its purpose very effectively, it is always exposed to dust and is liable to suffer from vibration or sudden shock; an enclosed one is completely free from these two disadvantages.

The holder here described was made out of some 1/8-in. thick paxolin to the dimensions shown in the sketch. Having cut a piece 2 in. x 1 3/4 in., a 1 1/8 in. diameter hole is cut in it to a depth of 3/8 in., thus allowing space for the two plates and the crystal.



These plates are of brass, turned to a thickness of 3/32-in. and 1-in. diameter. The lower one has an 1/8-in. stub to allow for a connection underneath. The plates must be perfectly smooth.

Two plugs are screwed into 4 B.A. tapped holes, a wire being taken from the top electrode through a hole in the base to one, and the other being connected to the stub already mentioned. The cover, which is 1/16-in. paxolin, is held down by two screws as shown.

A small base, also of paxolin, accommodates two sockets; two countersunk fixing holes complete this very inexpensive but efficient component.

Power Pack for the 1.7 mc. Transmitter

Several enquiries have been received asking for fuller details of the power pack used with the 1.7 mc. transmitter described in our issue of February.

Both mains transformers are manufactured by Messrs. All Power Transformers, Ltd., this particular power supply unit actually being designed for general use. While it is convenient to have the two illustrated on p. 10 (February), it should be noted that a similar pack could be made up with transformers of other ratings for running valves of a different type.

NATIONAL RADIO SOCIETY

By the Hon. Gen. Secretary, C. F. BIGGS

ONCE AGAIN correspondence has been considerable, and I am very pleased indeed with the response of the representatives and members, to whom I tender my sincere thanks. You will have already noted the Divisional Plan and proposed Constitution; now comes the Regional Plan and this concludes re-organisation as far as administration of the Society goes.

● Regional Plan

The country is divided into four areas under capable managers, and each manager will appoint district representatives, the district reps. appointing their county reps. and the county reps. their town reps. These should be submitted to headquarters for approval and confirmation.

NO. 1 AREA, NORTHERN.—Manager: Mr. A. Park, 14, Fairfax Road, Prestwich, Manchester, Lancs. Area covered: North-West, North-Eastern, East and West Midlands, Western, South-Western, Scotland and Overseas Divisions.

NO. 2 AREA, SOUTHERN.—Manager: Mr. R. S. Stevens, 43, Pettits Lane, Romford, Essex. Area covered: Southern, Eastern and Home Counties, East Ham and Eastern Postal Area.

NO. 3 AREA, IRELAND.—Manager: Mr. J. G. White, 18, St. David's Terrace, Dublin, I.F.S. Area covered: Irish Free State and Northern Ireland.

NO. 4 AREA, LONDON.—Manager: Mr. J. C. L. Goldsworthy, 24, Penrith Street, Streatham, S.W.16.

● Activities

HEADQUARTERS.—This is a source of worry to your Executive. As you are aware, we were compelled to suspend activities through no fault of ours, but this will be dealt with in full at the next meeting, and two of the most important points—the DX Contest and the Representatives' Cup—will be considered and a scheme will be forthcoming to the satisfaction of all. Now do your duty and elect your officers and committee for the ensuing year.

Will all members who sent in lists for the DX Contest please forward duplicates, which must be witnessed by another member. On receipt, all will be carefully checked by an independent person who is in no way connected with the Society, and a certificate will be attached to each, so please make lists as neat as possible.

NORTHERN.—The QSL, Exchange and Identification Bureaux are run by Mr. A. Park, No. 1 Area Manager, who will be pleased to answer any queries; enclose a stamped addressed envelope.

SOUTHERN.—Full particulars from No. 2 Area Manager. The Short-Wave Commercial Phone Station QRS Service is run by the joint Chelmsford Representatives, Mr. M. R. Goshon and Mr. F. Cunningham, 32, Park Street, Chelmsford, Essex.

The Translation Service, which has been so successfully managed by Mr. Goshon will, owing to pressure of business, be undertaken by Mr. E. P. Sprange, N.R.S.15, 44, Hoop Lane, Golders Green, London, N.W.11, full particulars can be obtained from him; enclose a stamped addressed envelope.

The first meeting of the East Ham Branch was held on February 2 at the Brampton Road Schools and was very well attended. The chair was taken

by Mr. F. Stringer, in the unavoidable absence of the Hon. Gen. Secretary. Mr. G. Storey asked that the following points be considered: (1) Branches to be given more notice of meetings of the Executive to enable them to get resolutions to Headquarters in time; (2) A complete list of rules and policy be sent to all members; (3) More publicity be given to the Society; (4) Headquarters room open to all members.

Mr. A. Bird was then called upon to say a few words on behalf of the W.S.F.R.A. Any members wanting particulars should write to 35, Bellwood Road, Waverley Park, Nunhead, S.E., and enclose a stamped addressed envelope.

It was announced that club meetings would be held fortnightly on Wednesdays at 8 p.m. in the Schoolroom, commencing from February 18. Full particulars from Mr. G. Storey, hon. secretary, 105, Ranelagh Road, East Ham.

IRELAND.—This area is doing well but the Area Manager would welcome enquiries from members as they still need County and District Representatives. Members in this Area are reminded that they can obtain Society stationery on application to the Manager.

LONDON.—Holding very well-attended meetings every Wednesday at 8 p.m. Club Room, 24, Penrith Street, Streatham, S.W.16. New members welcomed.

● News Sheets

These News Sheets are for members only, and they are advised not to show them to non-members.

HEADQUARTERS AND NORTHERN.—Obtainable from Mr. A. Park for 12 months, post paid, for 1s., this News Sheet, in addition to containing the Secretary's full report and all decisions of the Executive, prints items of general interest and all Headquarters' decisions, appointments, etc.

ESSEX NEWS SHEET.—At present only available to Essex Members. Particulars from Mr. F. Cunningham and Mr. Goshon, Joint Editors, 32, Park Street, Chelmsford, Essex.

● Round the Areas

LONDON: Mr. Goldsworthy will be pleased to answer any queries for London members if they enclose a S.A.E. **NORTHERN:** more County and town representatives wanted. **EAST MIDLAND:** Mr. Albert E. Clipstone, G8DZ, has been appointed Div. Rep. and will welcome enquiries from members and non-members if they enclose S.A.E. (15, Epperstone Road, West Bridgeford, Notts). This appointment has been made vice Mr. G. F. Shepherd, who has resigned. **S.W. Div.:** Mr. S. Rickets, 16, Cromwell Road, Yeovil, Somerset, will also welcome enquiries. **ESSEX:** Any member of the N.R.S. can attend meetings of the Chadwell Heath and District Radio Society, which are held every Tuesday at 8.30 p.m.; Regional Manager (2BVN) or the secretary, Mr. R. C. Beardow (2BXXB), 3, Geneva Gardens, Chadwell Heath, will be pleased to give details. **KENT:** Mr. G. Baynes, N.R.S.404, 1, Upper Dane Street, Cliftonville, Margate, the East Kent District rep., would like to form a local chapter of the N.R.S. in his area. **MIDDLESEX:** Mr. G. Routledge (2DDV), 91, The Drive, Feltham, Middlesex, has been appointed County rep.; members in this area should write him. **SURREY AND SUSSEX:** Members please get in touch with your Area Manager, as

(Continued on page 30).

LONG-DISTANCE LISTENING — MARCH

(All times quoted are G.M.T. unless otherwise stated)

PROBABLY LONG BEFORE the English listener becomes accustomed to the other differences between domestic and American broadcasting he is greatly impressed with America's Sunday programmes. It stands out a mile—yet there is but little difference in our respective national attitudes to the Sabbath. Despite the recent brightening in our Sunday programmes, the B.B.C. still seem satisfied to give us something if we want to listen and not to devise programmes so attractive as to *make us listen*.

In the States, Sunday is radio's big day, when all stations get really busy, radiating star-studded programmes from early morning to early next morning; one New Yorker goes the whole hog and sees the clock right round! A glance at the following *weekly* Sunday features illustrates the determination of the sponsors of these programmes to command the listener's attention with the newest, swellest and greatest of everything that the Almighty Dollar can capture, ranging from swing music through variety to symphony.

- p.m.
- 1.45 Radio Spotlight—Variety. W2XE, 13.94 m.
 - 4.30 Major Bowes Capitol Family—Variety.
W2XE, 13.94 m.
 - 5.0 N.B.C. Home Symphony. W2XAD, 19.56 m.
 - 5.30 Radio City Music Hall.
W8XK, 19.71 m. and W3XAL, 16.8 m.
 - 7.0 Magic Key, Symphony (Frank Black).
W3XAL, 16.8 m.
 - 7.30 Thatcher Colt Mysteries. W2XAD, 19.56 m.
 - 8.0 Philharmonic Symphony Orchestra of
New York (John Barbirolli).
W2XE, 25.36 m. and W1XAL, 25.4 m.
 - 10.0 Magazine of the Air—Variety, Music.
W2XE, 25.36 m.
 - 11.0 Comedy Stars of Broadway. W8XK, 19.71 m.
 - 12.0 Jeanette McDonald—Variety.
a.m.
 - 1.0 Variety programme starring Nelson Eddy.
W2XAD, 19.56 m. and W2XAF, 31.48 m.

● Over there—and comparisons

Listeners in this country sometimes wonder how the ordinary American citizen chooses his programme from such a wealth of first-class material. It does seem a little incredulous to us when first we hear how loyal U.S. listeners are to their favourite broadcasters, even adjusting business and social engagements so as not to miss hearing them, and we cannot imagine ourselves hurrying home specially for so-and-so.

Over there, they don't have to study the schedules to see when their favourite items are on the air; they know them to be at a given time on a given day regularly each week, and so they make a point of listening, just as in this country we might turn to our favourite spots in a newspaper or magazine. No English programme item has yet won such faithfulness—but I am beginning to wonder if it is coming and Mr. Sunday-at-two Middleton is to be the first!

Recently I had an opportunity of discussing the relative merits of home and American broadcasting with a U.S. listener. He was, by the way, agreeably surprised with the quality of our "government-controlled" broadcasting, but thought it needed

much more pep and less pause. He was quick to notice that the entertainment side, simply as entertainment, did not get such a short end as he imagined, nor was the educational leaning as heavy as he had been led to believe. But he simply could not get over the leisurely pauses—time filled with ghostly ticks and bell-peals. The psychological effect seemed to be "dollars dripping away to waste." In America, an hour-radio-show over a National network may cost up to 20,000 dollars and listeners must not be lost by annoying gaps; anyway, it would be high treason to the sponsor. Thus the lavish production—presented with a showmanship often equal to the artistic talent—at high pressure.

● Star American Programme

I asked him what he considered were the most popular of the current lighter programmes in the States, not necessarily his own choice. He named three Variety Hours—Chase and Sanborn, Rudy Vallee's and Hollywood Hotel. The Chase and Sanborn Hour is to be heard at 1 to 2 a.m. on Monday mornings from W3XAL on 49.1 m. and comes from the Hollywood N.B.C. Studios.

Among the regular artistes are Nelson Eddy (his place at present temporarily being taken by John Carter), Don Ameche as M.C., Edgar Bergen, Charlie McCarthy and the Stroud Twins (comedy team) and usually two or three guest artistes also take part. Rudy Vallee is on every Thursday at the same time and from the same studios. He is particularly notable as a discoverer of new tunes, many of them subsequently becoming really popular, which he skilfully blends with high-speed comedy acts. Vallee and his Connecticut Yankees are the backbone of the programme, and the guest artistes include many well-known film and radio stars.

Both these programmes are radiated from W2XAD and W2XAF, while Hollywood Hotel is to be heard at 2 a.m. on Saturday mornings from W2XE on 25.36 m. It is, by the way, as well to tune to 'XAD and 'XAF at 9 p.m. on Fridays to get the latest programmes information, when "What's ahead" announcements are made on outside broadcasts of national events, etc., as well as minor programme modifications.

● European Listening

Turning to Europe, we find Rome still leading the way in quality of programme material. They welcome ideas for programme improvement, so if you are interested let them have your views and write—Station 2RO, 5 Via Montello, Rome, Italy. Two transmissions likely to be of special interest to readers occur in their American hours at 12.30 to 2 a.m. (25.4 metres). On the morning of the 30th Roberto Galeazzi talks on the problems of deep-sea diving suit design and describes how it feels to stroll about 600 feet below surface, and on the 1st April, a talk on Guidonia, Italy's aviation centre, will be broadcast.

The French TPA2, 3 and 4 stations and OLR2A, 2B and 3A (Prague) continue their multi-national programmes, the English parts of which, although they have still not quite acquired the outstanding lustre we now look for in international broadcasting, are of a high order of entertainment value.

GUIDE TO THE WORLD'S S.W. BROADCASTERS

H18Q, TRUJILLO CITY

(Dominican Republic)

Metres: 48.40 approx. Kilocycles: 6,200 approx.
Power: 300 watts.

Operating schedule: Believed to be 16.00—19.00 and 22.00—02.00.

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

Distance from London: Approximately 4,000 miles.

Postal address: "Radiodifusora H18Q, Emisora Carta Real, Avenida Espana No. 12, Trujillo City, Dominican Republic."

Identification characteristics: Uses English, generally using the title "Emisora Carta Real."

Verification of reception reports: Sends QSL card.

HCJB, QUITO

(Ecuador)

Metres: 33.5. Kilocycles: 8,950. Power: 1,000 w.
Operating schedule: Tuesday to Saturday and Sunday, 12.00—13.15; 16.30—19.30 and 21.45—03.15.

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

Distance from London: Approximately 5,200 miles.

Postal address: "Radiodifusora HCJB, Clarence W. Jones, Casilla 691, Quito, Ecuador."

Identification characteristics: Slogan "La Voz de los Andes" (The Voice of the Andes); announcements in English, sometimes as "HCJB, The Voice of the Andes," or "Station HCJB, H as in Harry, C as in Chicago, J as in Jones, and B as in Broadcast—the Voice of the Andes." Signs on with recorded march "Patria"; off with Ecuadorian National Anthem; 4 chimes at intervals. Operates simultaneously with HCJB (73 m.), etc.

Verification of reception reports: Verifies with novel black and white card.

H19B, SANTIAGO DE LOS CABALLEROS

(Dominican Republic)

Metres: 51.02. Kilocycles: 5,880.
Power: Thought to be 25 watts.

Operating schedule: Irregular, but may be heard between 00.40 and 02.40.

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

Distance from London: Approximately 4,000 miles.

Postal address: "Radiodifusora H19B, Apartado 95, Santiago de los Caballeros, Dominican Republic."

Identification characteristics: Employs English, announcing sometimes as "H19B—B as in Boston," or in Spanish as "Broadcasting Hotel Mercedes." Signs off with piano solo.

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

HCJB, QUITO

(Ecuador)

Metres: 73. Kilocycles: 4,107. Power: 200 w.
Operating schedule: Tuesday to Saturday and Sunday, 12.00—13.15; 16.30—19.30 and 21.45—03.15.

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

Distance from London: Approximately 5,200 miles.

Postal address: "Radiodifusora HCJB, Clarence W. Jones, Casilla 691, Quito, Ecuador."

Identification characteristics: Operates simultaneously with HCJB, "La Voz de los Andes" and "La Voz de Quito" (308 m.), but employs the slogan "Broadcasting Provincial." All are known as the "pioneer radio missionary broadcasters." Announcements are as for "La Voz de los Andes" and other characteristics similar. Amateur call—HC1JB, "Radio Rodante."

Verification of reception reports: No doubt confirms with same card as HCJB on 33.5 m.

HCK, QUITO

(Ecuador)

Metres: 50.98. Kilocycles: 5,885. Power: 250 w.

Operating schedule: Officially Tuesday and Saturday, 01.30—03.30, but has been heard at other hours in the past. Has not been audible in Gt. Britain for some time; possibly discontinued.

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

Distance from London: Approximately 5,200 miles.

Postal address: "Radiodifusora HCK, Direccion Graf. de Telegrafos, Telefonos y Inalambricos, Quito, Ecuador."

Identification characteristics: Call in Spanish "HCK, Radiodifusora del Estado, Quito, Ecuador." Often works other stations after conclusion of programmes.

Verification of reception reports: Verifies with card of unusual design.

"El Prado," RIOBAMBA

(Ecuador)

Metres: 45.31. Kilocycles: 6,618. Power: 2,000 w.

Operating schedule: Fridays 02.00—04.00. Has been known to operate on 15,440 kcs from about 22.00 to 01.00 during June.

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

Distance from London: Approximately 5,300 miles.

Postal address: Radiodifusora El Prado, Apartado 98, Riobamba, Ecuador."

Identification characteristics: Opens with station chimes; lady announcer; call in Spanish "Estacion Radiodifusora de 'El Prado' en Riobamba, Ecuador." Occasionally mentions HC1FG, an amateur station situated in the same city.

Verification of reception reports: Sends formal letter verification.

HCETC, QUITO

(Ecuador)

Metres: 43.51. Kilocycles: 6,895.
Power: Unknown.

Operating schedule: Believed to be 01.15—03.30, except Mondays.

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

Distance from London: Approximately 5,200 miles.

Postal address: "Radiodifusora HCETC, Empress de Teatros y Cinemas, Apartado 134, Quito, Ecuador."

Identification characteristics: Employs the slogan "Radio del Teatro Bolivar, Quito."

Verification of reception reports: Believed to verify by QSL card.

N.B.—This station is sometimes known as HC1ETC. Official frequency 9,351 kcs, but not adhered to.

HC2CW, GUAYAQUIL

(Ecuador)

Operating schedule: Weekdays 16.30—17.30 and 00.00—04.00; Sundays 20.00—22.00.

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

Distance from London: Approximately 5,400 miles.

Postal address: "Radiodifusora HC2CW, Alvarado & Wilmot, Casilla 1166, Guayaquil, Ecuador."

Identification characteristics: Signs on and off with selection "Sangre Ecuatoriana"; employs the slogan "Ondas del Pacifico" (Waves of the Pacific) at frequent intervals.

Verification of reception reports: Confirms with QSL card.

HCODA, GUAYAQUIL

(Ecuador)

Metres: 31.78. Kilocycles: 9,447.
Power: Unknown.

Operating schedule: Apparently irregular.

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

Distance from London: Approximately 5,400 miles.

Postal address: "Radiodifusora HCODA, La Voz del Alma, Guayaquil, Ecuador."

Identification characteristics: Frequent reference to the call and slogan, "HCODA, La Voz del Alma."

Verification of reception reports: Unknown.

N.B.—This station is sometimes known as HC2ODA.

HC2RL, GUAYAQUIL

(Ecuador)

Metres: 45. Kilocycles: 6,666. Power: 150 w.

Operating schedule: Sundays 23.45—00.45; Wednesdays 02.15—04.15, occasionally until 04.45.

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

Distance from London: Approximately 5,400 miles.

Postal address: "Estacion HC2RL, Dr. Roberto Levi, P.O. Box 759, Quayaquil, Ecuador."

Identification characteristics: Programmes begun and concluded with the Ecuadorian National Anthem "Salve, O Patria"; uses English calling "Hello America, this is station HC2RL, Guayaquil, Ecuador" often. Also refers to "Quinta Piedad" at times.

Verification of reception reports: Sends card depicting "Quinta Piedad."

HC1PM, QUITO

(Ecuador)

Metres: 52.40. Kilocycles: 5,725. Power: Unknown.

Operating schedule: Sundays 02.00—04.00.

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

Distance from London: Approximately 5,200 miles.

Postal address: "Radiodifusora HC1PM, J. Leonardo Ponce, Casilla 664, Quito, Ecuador."

Identification characteristics: Signs on with march from "Aida"; slogan "El Palomar" (the pigeon house!).

Verification of reception reports: Believed to confirm with QSL card.

MODIFICATIONS AND CORRECTIONS.

Colombian Wavelengths and Call-signs: Changes have been made (see article "Have You Heard . . . ?" elsewhere).

Distance from London: Trujillo City should have read "approximately 4,000 miles."

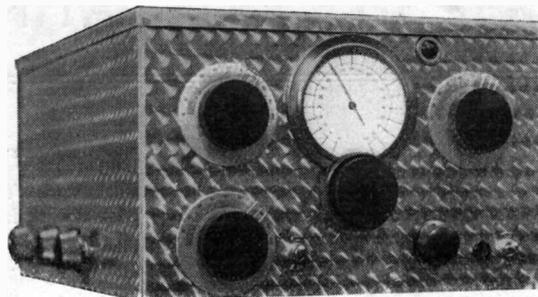
H13C: Errata, situation is La Romana, not Trujillo as inadvertently stated. Distance from London: Approximately 4,000 miles.

H1H: English announcements given as in article "Have You Heard . . . ?"

H11L: Confirms reception with QSL card.

COBC: Moved to approximately 30.2 m.

COCM: Moved to approximately 30.45 m.



The S.-W.M. "IDEAL" RECEIVER

(MAINS VERSION)

By AUSTIN FORSYTH, G6FO (EDITOR)

WE COME NOW to the final article on the "Ideal" Receivers, which have been fully described—as regards the battery version—in our successive issues between August and December, 1937, inclusive.

The mains "Ideal," pictured here, was also covered quite fully last month, so it is only necessary in this article to deal with a few of the points peculiar to this set as a mains receiver with built-in power pack. The major considerations of design have already been discussed and, as regards the construction, the only way this differs from the battery model is that the chassis is totally enclosed and mains valves are used, with the power unit accommodated between the front panel and the screening boxes. The actual photograph reproduced herewith is of a still later mains version, in which condenser-controlled reaction was incorporated for experimental purposes; it will be noticed that in the circuit diagram accompanying this article, detector regeneration is by the cathode-tap method, with a variable resistor R7 in the screen. This has been found perfectly satisfactory, and though condenser reaction does, perhaps, give slightly better control and can easily be used if desired, it has been decided not to alter the original design. Mains receivers built in accordance with the information given this month and last will not, therefore, have the slow-motion control at the bottom-left of the main panel, and in the drilled chassis obtainable from Messrs. Paroussi, the on-off switch should be mounted in this position.

● The Valves

As in the case of the battery model, Hivac valves are used throughout—three AC/VPb, one AC/Y and a UU.60/250 rectifier. The AC/VPb has its grid brought to the top cap, hence the lay-out adopted for the battery model need not be altered

in the slightest degree, i.e., all the r.f. wiring is kept above the chassis level and inside the screening boxes. Note that the cathode bias resistor R11 has been calculated for an AC/Y, and if any other valve is used, it will have to be changed accordingly. In the monitor stage, V4, no actual coupling is required between its plate and the grid of the detector V2, since a sufficiently strong beat-note is obtainable by stray coupling through the wiring. We were a little disappointed when we discovered this, as it was thought that the chassis design would be absolutely "r.f.-proof"! This is, of course, rather too much to expect in a home-constructor design where it is impossible to box everything up in the way a factory-receiver is built; moreover, no special precautions were taken to prevent r.f. leakage through the wiring. The nett result is that a bit of trouble is saved in that it is not necessary to worry about arranging a coupling.

● The Chassis

As mentioned, this is very similar to that used for the battery "Ideal," except that in addition to the internal screening boxes, the whole assembly is built into a large aluminium cabinet with a lid. The screening boxes are individually fitted, and the whole shell can be taken to pieces by removing about two dozen screws, since no rivetting is used. The underside of the chassis is divided into compartments—answering the screening boxes on the upper side—by means of ribs which are drilled at convenient intervals for taking wires through. Thus, everything is made as easy as possible.

As regards assembly, the main points which need to be watched are the placing of the power pack components, of small dimensions and specially made by All-Power Transformers, Ltd., and the fitting of the controls on the front panel. These should be

packed up behind in the manner described for the battery version, otherwise the band-spread drive—the Eddystone full-vision dial in the centre—will not “sit” properly, while the band-set and monitor tuning knobs will not be flush with their scales. These small points will be obvious on examination of the chassis and parts, as will be the placing of the power unit, since everything is made to fit.

● Wiring

The best plan to adopt is to build each stage separately, taking all “earthy” leads in that stage to one common point on the chassis. When using a metal assembly, it is always a mistake to fall for the temptation to earth to the nearest convenient bolt or screw-head. It does not matter much between 1.7 and 7 mc. certainly, but on 14 and particularly 28 mc., unexpected coupling effects and undesirable r.f. potentials are built up by having a number of different return points. This is true of any receiver, and not only the one we are discussing at the moment.

The wire specified in the list of parts will be found very handy, in that it is not only insulated properly, but this insulation is easily cleared by pushing back the covering; or a neat cut can be made with a sharp knife or razor-blade.

When the wiring has been completed, the leads at the same potential which happen to be near one another—such as those to the switches, potentiometers, h.t. lines to different points, etc., should be bound together with braiding from ordinary flex. This makes a neat job and ensures rigidity. There are naturally limits to this sort of thing—for instance, it would not do to tie several inches of the wire connecting the plate of V1 with L3 to the lead between the screen of V1 and R3.

All the small condensers and resistors can be carried in the run of the wiring, as can the r.f. chokes, which should be joined in as near as possible to the plates of their respective valves and be placed close to one another. An inch or more of the stiff wire at each end of these chokes will have to be snipped off to do this. Note that the idea of using two in series in this fashion is to ensure effective operation below 15 metres; therefore, the two chokes in the plate of V1 particularly must not be placed parallel, but end-to-end.

The last and most important point in connection with the wiring is the arrangement of the l.t. leads to the valves, and the two valves most sensitive in regard to hum are V1 and V2. If there is the slightest trace of a.c. at the grid of V1, the result is very bad hum as the regeneration control R3 is turned up, owing to the amplification obtainable through all three stages when the set is working at full sensitivity. Hence, a certain amount of experiment will probably be necessary in individual cases with the placing of the l.t. leads, which should be in sheathed cable with the sheathing earthed at several points. These same precautions apply equally forcefully to the detector stage, and it may be necessary to take the main return not straight to the centre-tap of the l.t. winding, but to an adjustable “hum-dinger” connected across it.

The complete elimination of hum is never very easy in a receiver of this type, but if reasonable precautions are taken with the wiring and the specified degree of smoothing used with the same components, it should be possible to get a silent background on 'phones even on ten metres. This is, obviously, the aiming point in regard to hum elimination. In one of the models, it was found very helpful to run the leads to the switches—all on the front panel—with screened cable for that distance where they pass through the power-pack compartment. The sheathing should be earthed, otherwise distressing and unnecessary noises will result.

● Adjustment and Tuning

Having completed the wiring and tested through, the next step is to find a signal and see what happens. Here we should say that in our own experience of the design and construction of receivers or, for the matter of that, any apparatus which one has to build and get working for one's self, it is better to begin testing on the most “difficult” band, i.e., it is never very hard to get results on 1.7 mc., but it's when the 28 mc. coils are wound that the fun starts! In this case, the best band to try for first is 14 mc., because if all or most of the snags are eliminated at this frequency, there is not likely to be much trouble anywhere else.

The specified coils will find each band somewhere between 20 and 70 degrees on the band-setter and, with the detector oscillating, search for some commercial or broadcast station or, better still, one of the 14 mc. amateur-band marker stations. Then, with the r.f. regeneration control turned down, adjust the trimmer C1 till the station on tune peaks. This is best done with the detector oscillating *gently*, because as the trimmer approaches the correct spot, the detector loading is decreased and oscillation becomes fiercer. The same applies to the r.f. regeneration; if this is not turned down low enough, V1 may go into oscillation while the adjustment is being made.

Having got the r.f. stage peaking nicely—this adjustment was more fully described on p. 26 of the October issue—bring up R3. As V1 gets “hotter and hotter,” so the signal will increase in strength till a point is reached where V1 oscillates and no further gain is possible. The correct setting for the regeneration control R3 is when V1 is just *below* the point of oscillation. R2, the r.f. gain, will affect things a little, in that if the plate voltage is changed by alterations of bias (R2)—it should not be—the r.f. stage will tend to “spill over” and go into oscillation as R2 is decreased. This means a corresponding downward adjustment of R3. The degree of locking between these two controls, which should not in any case be much, therefore depends upon how near the point of oscillation V1 is operated.

When the noise-level is high or local interference bad, it is sometimes desirable to work the r.f. stage at low gain but with maximum regeneration, thus sharpening the tuning and improving selectivity. A little practice with R2 and R3 enables any desired adjustment of the r.f. stage to be reached and main-

tained, and listening on the crowded 7 or 14 mc. bands will indicate the best way in which these controls should be used to meet differing conditions.

On all bands, the taps are so arranged that each covers from 80 to 90 degrees on the band-spreader, leaving enough over-lap for the commercial marker stations to be brought in. In this connection, note that the whole international 3.5 mc. band, 3500-4000 kc. is covered, and not just the smaller portion of it allotted to amateurs in this country. This explains the difference in the ratio of total turns to tapped turns in the 3.5 and 7 mc. coils. If only the British 3.5 mc. band is required, it is simply a matter of taking out the band-spread tap a bit further down L2 and L4 on the 3.5 mc. set of coils. Note that all coil taps are counted from the "earthy" end.

Both the operation and the application of the monitor-beat-oscillator have been fully discussed in previous articles, so that there is no need to repeat here, except to say that the b.o. is used in exactly the same way as on the battery "Ideal."

● — And Finally

This receiver is primarily designed for amateur-band operation, though its tuning range is continuous between about 9 and 200 metres. For those who have had some experience of short-wave receiver construction, it will present no particular difficulties. For the beginner, however, it is not advised, nor will it satisfy listeners only interested in loud-speaker reception of short-wave broadcasting stations. No three-stage set will work a speaker

really well except on the loudest signals, and most readers who build the mains "Ideal," or who have built the battery model, will be amateurs using it for the amateur bands, chiefly with headphones. There is of course nothing to prevent extra amplification being added to bring signals up to good speaker strength, and the first model has been extensively used under these conditions.

As regards the aerial arrangement and the winding L1, the turns values are for an average 85-foot inverted-L aerial, but with shorter or longer aeri-als, doublets and the like, some modification of these values will be necessary.

RAYMART COIL FORMS

These are moulded in RD 4 low-loss dielectric material and have hollow resilient pins which allow wires to pass through and be soldered, thereby avoiding losses and noisy operation through high resistance contacts.

Specified for the

MAINS "IDEAL" RECEIVER

Two Type CF4 4-pin Plain ...	1/6 each
Three Type CT4 4-pin Threaded ...	1/8 each
Four Type CF6 6-pin Plain ...	1/9 each
Six Type CT6 6-pin Threaded ...	1/11 each

Have you sent for your copies of the 66 PAGE SHORT-WAVE MANUAL. 7½d. Post Free, and the NEW RAYMART SHORT-WAVE CATALOGUE, 1½d. Post Free. They are both invaluable to readers of this journal.

RADIOMART

44, HOLLOWAY HEAD, BIRMINGHAM, 1.

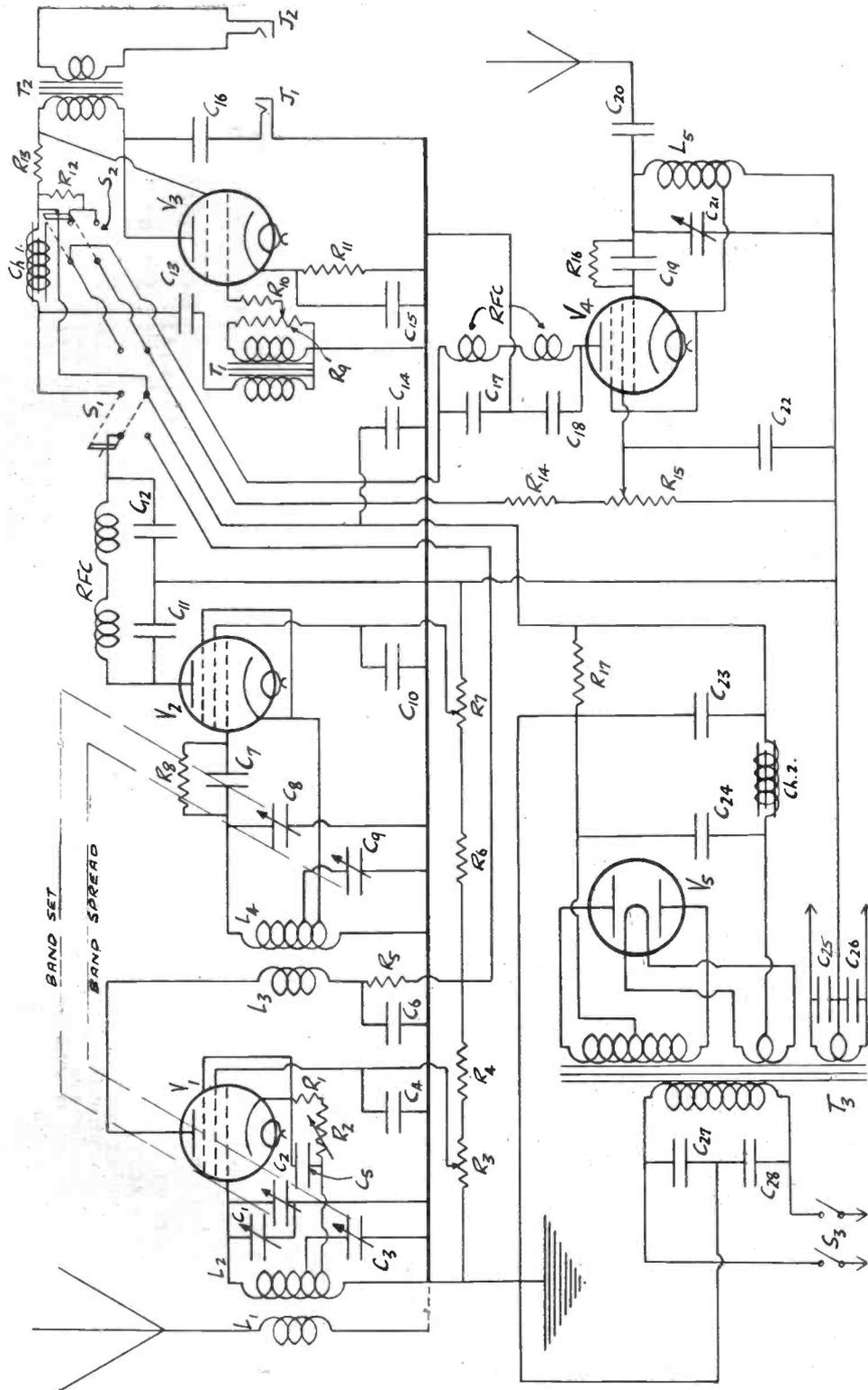
COMPLETE COIL DATA

Band.	Stage.	L1.	L2.	L3.	L4.	L5.	Reg. tap.	B-s tap	Wind.	Space.
1.7 Mc.	RF.	15	43	—	—	—	1 turn.	26	Close	5/8"
	Det.	—	—	15	53	—	1 turn.	25	Close	1 5/8"
	BO.	—	—	—	—	50	5 turns.	—	Close	—
3.5 Mc.	RF.	12	20	—	—	—	1 turn.	14	Close	5/8"
	Det.	—	—	12	24	—	1 turn.	14	Close	1 5/8"
	BO.	—	—	—	—	33	4 turns.	—	Close	—
7 Mc.	RF.	5	10	—	—	—	1 turn.	3 3/8	Threads.	5/8"
	Det.	—	—	8	12	—	1 turn.	3 3/8	Threads.	1 5/8"
	BO.	—	—	—	—	16	3 turns.	—	Threads.	—
14 Mc.	RF.	4	6	—	—	—	2/3 turn.	1	Threads.	5/8"
	Det.	—	—	5	7	—	2/3 turn.	1	Threads.	1 5/8"
	BO.	—	—	—	—	7	1 1/8 turns.	—	Threads.	—
28 Mc.	RF.	3	2 3/8	—	—	—	1/2 turn.	1/2	Threads.	3/4"
	Det.	—	—	4	3 3/8	—	1/2 turn.	1/2	Threads.	1 1/2"
	BO.	—	—	—	—	3	1 turn.	—	Threads.	—

NOTES.—Odd-number turns are easily counted by counting ribs of coil-form, 8th column gives position of regeneration tap in all three stages, and 9th column the band-spread tap, which it is important to take out equally on both L2 and L4. 11th column gives spacing (top line) between L1 and L2, and bottom between L3 and L4.

Circuit of the "Ideal" Receiver

For List of Parts see next page



LIST OF PARTS : S.-W.M.

"IDEAL" MAINS RECEIVER.

R.F. STAGE : V1.

- V1—Hivac AC/VPb.
- C1—Trimmer condenser, Eddystone 978.
- C2, C3—0001 mfd., Eddystone 900/100.
- C4, C5, C6—.01 mfd., Dubilier 4421/E.
- R1—450 ohms, 1-watt, Erie.
- R2—10,000 ohms, variable, Lab.
- R3—50,000 ohm potentiometer, Lab.
- R4, R5—10,000 ohms, 1-watt, Erie.
- Two 6-pin coil forms, plain, Raymart, CF6.
- Three 6-pin coil forms, threaded, Raymart CF6.
- Two 7-pin coil/valve holders, Clix V.5, screw terminals.
- Two sets extension controls, Eddystone 1008.
- 1 S/M driving head, Eddystone 1036.
- Two insulated brackets, Eddystone 1007.
- Two flexible couplers, Eddystone 1009.

DETECTOR STAGE : V2.

- V2—Hivac AC/VPb.
- C8, C9—0001 mfd., Eddystone 900/100.
- C10—.01 mfd., Dubilier 4421E.
- C7, C11, C12—0001 mfd., Dubilier 690W.
- R6—10,000 ohms, 1-watt Erie.
- R7—50,000 ohm potentiometer, Lab.
- R8—3 megohms, Erie.
- RFC—Two RF chokes, Q.C.C., A and B.
- Two 6-pin coil forms, plain, Raymart CF6.
- Three 6-pin coil forms, threaded, Raymart CF6.
- Two 7-pin valve/coil holders, Clix V.5, screw terminals.
- One Eddystone full-vision dial, 1070.
- Two flexible couplers, Eddystone 1009.
- One midget s/o insulator, Eddystone 1019.

L.F. STAGE : V3.

- V3—Hivac AC/Y.
- T1—5:1 coupling transformer, All Power.
- T2—Multi-ratio output transformer, R.D.C. (Epoch).
- Ch.1—High-impedance coupling choke, All Power.
- C13, C14—.01 mfd., Dubilier 4421E.
- C15—12 mfd., Dubilier 3016.
- C16—2 mfd., Dubilier 9200.
- R9— $\frac{1}{2}$ -megohm volume control, Lab.
- R10—25,000 ohms, $\frac{1}{2}$ -watt, Erie.
- R11—300 ohms, 1-watt, Erie.
- R12, R13—2,000 ohms, 2-watt, Erie.
- One 7-pin valveholder, Clix V.5, screw terminals.

MONITOR STAGE : V4.

- V4—Hivac AC/VPb.
- C17, C18, C19—.0001 mfd., Dubilier 690W.
- C20—Trimmer condenser, Eddystone 978.
- C21—.0001 mfd., Eddystone 900/100.
- C22—.01 mfd., Dubilier 4421E.
- R14—10,000 ohms, 1-watt, Erie.
- R15—50,000 ohm potentiometer, Lab.
- R16—100,000 ohms, $\frac{1}{2}$ -watt, Erie.
- RFC—Two RF Chokes, Q.C.C. type A and B.
- One 7-pin valveholder, Clix V.5, screw terminals.
- One 4-pin valveholder, Clix V.5, screw terminals.
- Two 4-pin coil forms, plain, Raymart CF4.
- Three 4-pin coil forms, threaded, Raymart CT4.
- One set extension controls, Eddystone 1008.
- One flexible coupler, Eddystone 1009.
- One adjustable bracket, Eddystone 1007.
- One slow-motion head, with knob and dial, Eddystone 1036.
- One midget s/o insulator, Eddystone 1019.

POWER PACK : V5.

- V5—Hivac UU.60/250.
- Ch.2—Smoothing choke, All-Power Transformers, Ltd.
- T3—Mains transformer, All-Power Transformers, Ltd.
- C23—16 mfd., Dubilier F.2920.
- C24—4 mfd., Dubilier 0283.
- C25, C26—0.1 mfd., Dubilier 4603S.
- C27, C28—1 mfd., Dubilier 9201.
- R17—25,000 ohms, 3-watt, Erie.
- One 4-pin valveholder, Clix V.5, screw terminals.

MISCELLANEOUS ITEMS.

- J1, J2—Single-pole jacks, plugs to match, Webb's.
- One Plug and Socket, Clix type M.
- Three terminals, two red, one black, Clix type B.

BULGIN ACCESSORIES.

- S1—DPDT switch, S.98.
- S2, S3—DPST switch, S.123.
- Dial light, D.9.
- 3 coils Quikwyre, red, three ditto, black;
- $\frac{1}{2}$ -lb. No. 24 enamelled wire; 4 packets bushing washers;
- 2 doz. r^h 6.BA screws, $\frac{1}{4}$ -in.; 2 doz. do. do., $\frac{1}{2}$ -in.;
- 1 doz. do. do., 1-in.; 3 doz. 6.BA half-nuts; 3 doz.
- 6.BA full nuts; 6 doz. 6.BA washers; 4 doz. rubber
- grommets, 3 ft. screened flex.

CHASSIS.

- Drilled to specification, and including screening boxes, E. Paroussi.



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SPECIAL NOTICE TO ALL SHORT-WAVE LISTENERS

The Secretary of the British Short-Wave League (the World's premier organisation for the DXer) begs to inform S.W. enthusiasts everywhere that re-organisation of the League has just been completed and invites enquiries from all interested. Subscription 7/6 per annum (or 3/9 half-yearly). Benefits include the League's organ, the "Short Wave Review," access to such facilities as "HEARD ALL CONTINENTS" Certificates, QSL, Distributing Bureau, the use of a BSWL number (now recognized throughout the universe), etc., etc. A 2d. stamp will bring full particulars and a copy of the "Review." Address your letters to the Secretary, F. A. Beane (2CUB), Ridgewell, Halstead, Essex. If you have any queries regarding DX or identification just send them along.

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Dept. SM3.

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OUR OFFER of the Class "B" Receiver housed in a "PAREX" Aluminium Cabinet for £3 9s. 6d., including valve, is still open. (postage 9d.)

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Phone: Chancery 7010.

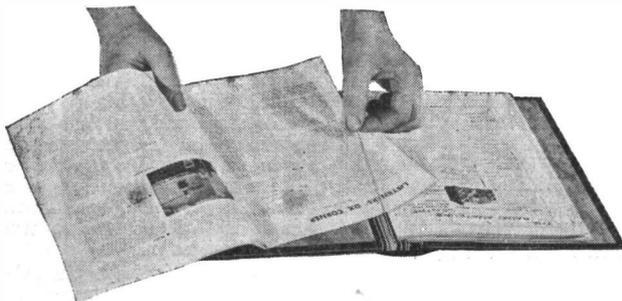
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We hear that . . .

A reader, drifting into a radio bankruptcy sale the other day, noticed a brand-new pair of Brown's A 'phones. When the auctioneer held them up, remarking that of course headphones are not much used nowadays, they went for half-a-crown. . . but not to our reader, who thought they weren't worth that!

"Venesta" plywood flooring blocks make excellent baseboards and panels! Obtainable from builders' merchants, decorators' suppliers and paint and varnish stores, various finishes and thicknesses are available at prices much lower than those for ebonite or metal in the same size. These wooden blocks have clean-cut edges and work easily.

"N.R.S. NOTES"—continued from p. 20.

representatives are wanted in these areas. LINCOLN: Mr. T. S. Brister, N.R.S.444, "Lyncroft," 22, Sherbourne Street, Cleethorpes, Lincs., has been appointed C.R. for Lincoln.

● Notes

There are still a number of entries in the old membership book which are indecipherable. Will all members who have not already done so send in their names, addresses, N.R.S. number, and date of joining. This information is required for the new membership cards and certificates as soon as they are ready. 1½d. stamp should be enclosed.

Mr. Albert E. Clipstone, G8DZ, has been appointed technical adviser of the Society, and he will be pleased to help any member. Write 15, Epperstone Road, West Bridgeford, Notts., enclosing S.A.E.

The membership up to February 15 is as follows:

Members	471
Hon. Associates	5

Total ... 476

Mr. F. A. Beane, N.R.S.439, who is secretary of the B.S.W.L., will welcome members' enquiries if they will write to him at headquarters, Ridgewell, Halstead, Essex, enclosing S.A.E. Members should work in harmony with other societies to assist membership of both.

All applicants for membership shall sign the following declaration form and abide by the rules of the Society, a full copy of which are contained in the current issue of the Headquarters and Northern News Sheet.

APPLICATION FORM.

I, the undersigned, wish to become a Member of the National Radio Society, and if my Membership is accepted, I agree to be bound by the rules.

NAME..... ADDRESS.....

Receiver(s)..... No. of Ver's.....

P.O. No..... for 1s. and S.A.E. enclosed.

Date.....

Name.....

Address.....

Address to Hon. Gen. Secretary, Mr. C. F. Biggs, 86, Lordship Lane, Tottenham, N.17.

"HAVE YOU HEARD"—continued from p. 5.

—if it wasn't a Japanese ship I am no s.w. fan!; a station relaying 2RO on 49.10 m. and which may be the Italian Somaliland "Radio Marina" and a transmitter on about 48.85 m. at 16.50 onwards with news bulletin, apparently originating from CS2WD, Lisbon.

Nearer home: Pontoise has been heard testing in the 31 m. band and Arabic transmissions have been heard from it, GSC and the Italians' 2RO (31.13 m.), IRF (30.52 m.) and IQY (about 25.15 m.) shortly after 17.00. OER2, Vienna, has been heard at 15.00—an old friend to whom a warm welcome is extended, while a FR1 of Cartagena (the Spanish one!) has been heard in the neighbourhood of 42.5 m. with English talks around 21.30, later requesting postcards indicating the kind of music preferred—and a further request for a package of gramophone records!

Of Australia I have heard but little; VK2ME has proved extremely disappointing, VK3ME fair just after 09.00, while it has been far too cold to get out of bed at 07.00, or so, for VLR! Of the South Africans I have found VQ7LO (49.3 m.) as early as 16.50 and ZRH (49.94 m.) has proved superior to ZRK (49.15 m.), when free from local interference or the effects of the "siren-bogy" attacking Moscow, VZSPS (50 m.). Incidentally, the Programme Manager of VQ7LO informs me that the station has never at any time employed a "roar of a lion" identification signal—American journals please copy!

● Last-minute news

I heard XETA relaying XET on 11,760 kc. between 00.00 and 01.00; was slightly heterodyned by DJD but otherwise very good. Employs 5 (possibly 6) chimes between announcements and mentions "R.C.A. Victor"; address "Radiodifusora XETA, Apartado 203, Monterrey, Mexico"; VUD (or VUB), testing on 60 m. until 01.30, and HP5H announcing its QRA as P.O.Box 1045, Panama City.

THE LOAN OF APPARATUS TO CLUBS.

It is with the greatest regret that we have to announce the discontinuance of this scheme, at least for the time being. The reasons are many and various, perhaps the chief one being the totally unexpected demand by clubs generally for THE SHORT-WAVE MAGAZINE apparatus on loan.

This, while being very gratifying, has presented us with a serious problem; that of getting the gear round in reasonable time. In some cases, it has meant duplication, allied to the fact that we have been faced with some very awkward situations where owing to local difficulties, club secretaries have not been able to keep to the arranged schedule. This has led to disappointment and annoyance all round, so that in fairness to all concerned, we have decided that the scheme must be abandoned unless and until some better method can be worked out. It is obviously as impracticable for us to build, say, the 7 mc. transmitter four times over as it is to keep a club waiting six months before they can get it.

We sincerely hope that those who may have been disappointed will appreciate the facts of the situation, and understand that we have had to withdraw the offer purely by stress of circumstances.

RADIOQUEST AND SIDE-SPLASH

By "CENTRE TAP"

NO DOUBT MANY READERS will have some difficulty in believing that a large number of letters are received every week asking for pictorial diagrams of apparatus described because they are unable to follow a circuit.

I recently had the task of coaching a beginner in the art of circuit reading. Feeling he would learn more easily by doing a little thinking for himself, I asked him to draw in simple outline a pair of headphones, a loud-speaker and a microphone. His sketches were quite naturally very like the symbols used for those components in circuit diagrams, and so I asked him to depict in a similar manner the electrical elements of such components as a coil, l.f. choke, transformer, switch, plug and jack, etc. This was not quite so easy, but he soon grasped the idea and after a little further instruction he was able to "wire" a paper drawing of a two-valve receiver. The chief difficulty was the valves, but that information can be found in all valve-manufacturers' lists.

If you are unable to read circuits, try this method, and practice, working gradually upwards from simple circuits, getting a friend to check your "paper wiring." Those who are asked for assistance by beginners could well adopt such a method. You owe it to amateur radio, you know! It grew, and will best continue to grow, in the "helping hand" spirit.

Giving point to the above, I recently received a copy of an Italian radio paper. I cannot read a word of the language, but I could enjoy "reading" the pictures and circuits.

● The Relationship of Wavelength and Frequency

Although it is generally understood that a wireless wave travels in a series of undulations and the distance between the crest of one wave and the crest of the following wave is the wavelength, beginners are often puzzled by the term frequency and its relationship to the wavelength. To express it simply, the frequency is the number of waves (or cycles) completed in one second's travel, which, of course, varies according to the length of the wave.

To calculate this it is first necessary to realise that radio waves travel at a speed of 186,000 miles per second—that is, at the same rate as light. That distance, converted to metres in which measurement wavelengths are always quoted, is approximately 300,000,000 metres, and therefore all that it is necessary to do to ascertain the frequency of a wave is to divide its length into that figure. The answer is the number of cycles, which can be readily converted into kilocycles or megacycles.

A kilocycle is one thousand cycles and a megacycle is one million cycles, the former being used chiefly in describing the frequencies of the broadcast bands, the frequency of short waves being usually quoted in megacycles as in the case of the list of stations on the inside back cover of THE SHORT-WAVE MAGAZINE. Conversely, the wavelength can be found by dividing the frequency into 300,000,000.

● What to do with old H.T. Batteries

If I had to reply to this question through the columns of a humorous journal I should unhesitatingly reply, "Throw it in the dust-bin," and, for once, that piece of advice also makes the best answer to the same question in a serious vein. As a battery runs down its internal resistance increases and the audio-frequency currents in the anode circuits of the detector and l.f. stages cannot leak away to earth as freely as with a new battery, or in other words a battery with a low internal resistance. This causes feed-back, the effect of which is a high-pitched whistle and, as the internal resistance of the battery further increases, motor-boating. This can be cured by decoupling the valve, thus offering a high impedance through which very little of the audio-frequency currents can pass. Any that do are bypassed through the condenser to earth.

The method of decoupling is shown in the accompanying diagram and whenever current from the same battery is used to feed more than one valve its employment is advised. Decoupling is also necessary when taking the full or nearly the full current from a high tension battery eliminator from which different voltages are tapped from a common resistance.

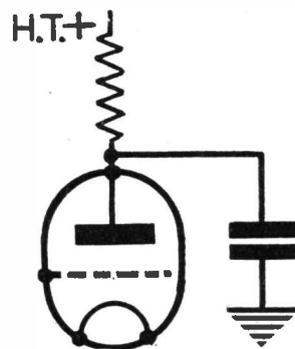
Components in the anode circuit such as the h.f. choke, or the resistance in the case of parallel-fed transformer coupling, would, of course, be inserted between the anode of the valve and the decoupling resistance. If the voltage drop is too severe a low frequency choke should be used in place of the resistance.

* * * *

Older type intervalve transformers were marked OP, IP, OS and IS, indicating inside or outside ends of the winding. They should be connected in the following manner, OP to high tension, IP to anode (of preceding valve), OS to grid (of following valve) and IS to grid bias.

* * * *

A non-acid soldering flux can be made by dissolving resin in methylated spirit. Powder the resin well to speed up dissolving time. The acid content in proprietary fluxes assists in cleaning the work, so a little additional care in that respect should be exercised when using the above preparation. It is used in the normal manner and is particularly suitable for thin wires where acid, which causes corrosion, is liable to lead to a future breakdown.



LISTENERS' DX CORNER

If YOU WILL just take off your earphones, or cut your receiver switches, concentrating for a minute on what I have to say, I think we shall all get more news and more enjoyment from this page.

● Co-operation

First, this is *your* page; it is your medium for telling the other fellow what you are hearing, and what you are using to hear it. If you have any pet idea that you find improves your reception, then we all want to know about it. It may seem commonplace to you, but your idea may be just what the other man is trying to work out for himself. If you are in doubt about some mysterious station logged, then send in your query to the "DX Corner" and somebody will enlighten you. I want you to get together and use this page to your own advantage, sending your addresses along if you want to find another short-wave enthusiast in your district. Good friends are made that way.

I know that on many occasions I have heard something I thought was a real "snip," and immediately went out to try and find someone to whom I could unburden my soul. Well, we are all interested, and when you feel you must tell somebody or "burst," then just sit down, write us, and we'll help you to recover your equilibrium! Send your thoughts, ideas and logs to us not later than the 13th of each month, and make this the most interesting page in the whole magazine.

● Logs

Frequently when looking through logs. I notice errors in call signs, obvious errors due to poor reception conditions, the accent of the operator, or just lack of care on the part of the listener. In one log this month ZB1A has been reported as having been received on 20-metre 'phone. Now, ZB1A has not been active for about two years, has given up his licence, and never worked 'phone in his life! The reception was undoubtedly either ZB1C, ZB1E, ZB1L or ZB1H, all of whom use 20-metre 'phone; these stations are operated by Maltese, with their own peculiar accents.

Following such erroneous "reception," a card is probably sent and the recipient (if such there be) at once thinks some "thug" has been pirating his call, and the sender is disappointed because no verification is received. Motto:—Always make quite sure you have the call letters correct before reporting.

● Maltese stations

Having mentioned the four active Maltese amateurs using telephony, it may interest you to know something of the history of s.w. transmissions from the island. Owing to the large number of government radio stations, all private or broadcast transmissions were forbidden up to four years ago, and before this time a few intrepid amateurs transmitted c.w. signals using the prefix VP3 followed by one letter. In due course, however, permission was granted by the local authorities for c.w. transmission only, starting with the series VP3A. Within the

year the prefix was altered to ZB1 and there are now ten active amateurs. Permission to use telephony was first granted last summer, and is only given where the applicant can satisfy the authorities that his apparatus will produce a good clean signal. Other active (c.w.) stations are: ZB1J, ZB1K, ZB1O, ZB1P and ZB1R.

● The Morse Code

The remarks last month about the advantages of knowing the code have bitten right home. I thought they would, because to my mind a s.w.l. unable to read call-signs isn't even in the first ten as far as real knowledge of conditions and DX is concerned. Just see what G. F. KEEN, 50, Wilbury Crescent, Hove, 4 has to say: "I should like to express my complete agreement with you . . . my own log certainly unholds the super-abundance of c.w. DX over 'phone; one of the features of the month has been the high percentage of c.w. signals on the air." Again—A. P. L. CASLING, 6, Ollerbarrow Road, Hale, Cheshire: ". . . rub it into the readers that DX is impossible without a knowledge of the code." Thank you, listeners, I'm glad you agree.

● L.S. for Reception

This page would be incomplete without BOB EVERARD, so herewith his opinions on things generally: "With reference to the rather extraordinary letter from RAYMOND HARGREAVES appearing in your column for February, just why should s.w.l.'s be fools if they use the loudspeaker for DX stations on the short waves? Out of my 1,700-odd "veri's" from 97 colonies or countries, at least 1,000 have been heard on the loud speaker!! In fact, for a long while I used nothing else, and these QSL's are all for 'phone or b.c. reception. I have heard on the l.s. over 60 W6's, 25 W7's, 20 Colorado W9's, 10 VE5's, and 28 VE4's. Also, does Mr. Hargreaves seriously term such reception as TFJ, W2XAD-XAF, W9XF, and W3XAL real DX? He says he has never heard VK or ZU; well, if he listens even occasionally now on 20 m. in the early afternoons or evenings, and after March from 06.30-08.30 G.M.T., I don't see how he can miss finding some Aussie 'phones, while S. Africans can now be heard from about 17.00-20.00 G.M.T. in the evenings. As to ZL's, of course there are only a few of them as yet (plenty on c.w.—Ed.) on 'phone, and about the best time is 18.00-19.00 G.M.T. So cheer up, Mr. Hargreaves, conditions are not nearly so bad as you wish to make out. I have logged recently on my Marconi 346 A.C. S.H.6, F18AC, Fr. Indo-China; CR7MF, Port. E. Africa; FR8VX, Reunion I.; TG9AA, Guatemala; W6JKR, 6CUU, 6ITH, 6BAY, 7GGG, 7FDL, FB8AH, 8AD, 8AF, and S. Africans, ZU6P, ZU6N, ZT6J, ZS2N, ZS1K, ZT1M, ZT1R, ZU5Z, ZT6Q, ZT6AK, ZS6AJ, ZS6AA, ZS3F and OQ5AA, PY6AI, PY7GA, K6NMB, etc."

● QSL Cards

Bob goes on to say: "Regarding 'Silent Listener's' letter on the same page, I most emphatically do not

agree with him that collecting QSLs is selfish. A QSL is the only *proof* of DX or other reception. Anyone can *say* they have heard Timbuctoo, but if you possess a QSL thanking you, or verifying your report, you then have the only definite evidence. Does getting out of bed and denying oneself an hour or two's sleep, plus cost of s.w.l. cards, postage, etc., in order to try and give weak DX stations encouraging reports, constitute selfishness? Most certainly not, but very much the reverse." Thank you, Bob, for your well thought out opinions on two very important matters, and I am sure that Mr. Hargreaves and "Silent Listener" will accept your challenge in the spirit of helpfulness in which it is meant. But don't forget you have had considerable experience of the art of short-wave listening, perhaps more than most of us.

● 7 mc. DX

Straight away a challenge arrives for Bob from A. P. L. CASLING (see above for address). "My special interest is DX on 7 mc. . . , I only now need Asia to give me HAC on this band. (Try for VU2FV any evening on 7040 kc.—Ed.). I'll challenge Bob Everard any day to a 7 mc. contest." Get to it, you two!

● WX and DX

ANTHONY HOBSON, 99, Woodhouse Road, Doncaster, writes saying that he finds temperature variations affect DX reception and skip distance on 14 mc. When the weather turns cold European stations come in very strongly, and when it warms up again the W's start rolling in. He asks if other listeners have noticed this effect? Personally, I think radio conditions are controlled by effects far away from the atmosphere belt, but he has raised an interesting point for your consideration. Anthony is very interested in Bob Everard's logs and wants to know at what signal strength he receives most of his DX as he always goes for the weakest stations. He has not yet got any QSL's and is envious of Bob's collection, but asks if Bob has heard HI5F? He encloses a very neat home-made SWL card, so we hope he will "roll out of a warm bed" now, and send a few of them to the weakest DX he can hear.

G. F. KEEN, the code champion, tells us that ZL's and VK's come through about 08.00 G.M.T., Asia predominates at lunch time and late afternoon, and about 19.00 G.M.T. the S. Africans are at their best; after that the band is dead, until at 22.30 G.M.T. the East Coast Americans come roaring through.

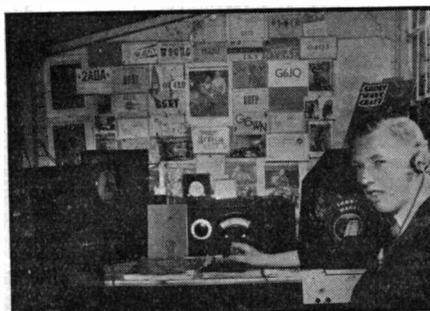
● Scottish Reception

Welcome Scotland!—GORDON BIRRELL, 1, Renny Place, West-Ferry, Dundee.—He is of the opinion that most s.w.l.'s experienced similar results to Mr. Hargreaves, but has had better luck than the latter. The last W6 heard (W6CQI) was on 2/11/37, the last W5 on 27/11/37, and the last S. Americans between the 5th and 10th of November. The 8th November was his last really good day, bringing in:—OQ5AA, XE2AH, LU2EE, OA4R, CE3AO, YV5ABF, CX3BL, CO2WW, CO2JJ, VE2RU, 3GK, 3XQ, 3EF and all U.S.A. except W6 and 7. Stray DX was heard during the three winter months of November, December and January, such as ZU6P, VU2CQ, VP6TR and YV5AA. February blossomed forth with better things including W1, 2, 3, 4, 9, VE1CF, VE1AW, VE1BR, YV5AZ, VP6MR, VE2DB, VE2GK, YV4AB, CO2RH, VO2Z, VO1N,

ZE1JA, ES5D, PY6AI, KA1ZL, KA1JR, FI8AC, CO7VP, YV5AC, HK1GC, PK1ZZ, FR8VK, PY7GA, PY2JC, CO2MA and HI5X. Now, the great point of interest is that his receiver is only a simple battery 0-v-1 with a single wire inverted L aerial running E-W, with headphones. Quite the opposite of Mr. Everard! Well done, Gordon!

● Shack photos

We are obliged to several of you for sending in your shack photos, and we are publishing the one submitted by WILLIAM COLCLOUGH (2CKL). His transmitter uses 6A6 (osc. doubler) and a '210 p.a.



The receivers used are 4v. s.w. superhet, 0-v-2 portable and 0-v-1 for 28 and 56 mc. All this gear is home-built (I wish there were a few more like you) and he has HAC (verified) and HBE.

ARTHUR NEWALL also sends in a fine photo, but space does not permit us to publish it this month. He has an a.a. licence with call 2CKA and is a member of B.S.W.L. He uses G.E.C. 6v. battery s.w. superhet and the Ultra S.W.2, of which details were published in April 1937 issue of S.-W.M. He wishes to exchange s.w.l. cards and his address is 33, Ladysmith Street, Shaw Heath, Stockport. Another a.a. man writes to us again, D. C. CHAMBERLAIN (2CHD), Red Roof, 67, Wiltshire Road, Thornton Heath, Surrey. He uses an 0-v-2 in conjunction with a WB.37S speaker. His log contains 'phone reception from 76 countries, and some of his better and latest catches are:—YI2BA, W6CQK (1st G report), W5FRA (1st G), VK4XM (1st G), VK5AW, VK2AJ, VK5HM, CX1AA, VPD, VPD2, K6MZK, OAX4G, W8XAI and W9XAZ (10 metres), also ZMBJ (Awatea), all of which are verified. All continents have been verified 8 times. Thanks for the photo also.

● Introducing the Young 'Uns

JOHN B. BURTT, Reckitt House, Leighton Park, Reading, is 16 years old and logs both 'phone and c.w. DX. He is unable to do late night sittings owing to school regulations not being in keeping with such procedure. But just look at his best, VR2FF in Suva, Fiji Islands, a fortnight ago on 14 mc. I heard him myself about 7 years ago on 7 mc., but have had no luck since. John also heard ZD8A on 28 mc. and queries his authenticity. We can answer him by stating that old ZD8A is now ZE1JA, and that to the best of our knowledge no other operator has taken over the old station in Ascension I. JA2A is another queer call heard on 14 mc., but we have our doubts about this one! 103 countries and 38 "Radio" zones have been heard, and at 16 that's very fine listening. You can't beat that, Bob!

● Analysis of Conditions

John Burt (2DKQ) sends a comprehensive analysis of conditions for reception on 14 and 28 mc. for the period Feb. 1-14, which I am sure will be of general interest. Here it is:—14 mc., 08.00: Far East and Australia, J, ZL, VK and sometimes W5 with PY. 09.30: Locals, ZL and VK still in background. 12.30: Near East, SU and YI. 13.00-17.00: best DX period, S. Africa, Eastern Australia, VS2, VU, KA, HS, XZ, VS8, F18, with heavy QRM from locals. 18.00-19.00: African Continent, ZS/T/U, ZE, CN, FA, with 15 minutes of VK and ZL. 20.30-21.30: N. and S. Americans, PY, VP2, VP6, CX, VO, VE, CM and YV. Band usually dead by 21.30 or a little later. Now for 28 mc. 09.00-12.00: Locals, N. Africans. OH, YL, F, CN, and FA. 12.00-14.00: America starts with W8. 14.00-16.00: W's (east coast) with occasional ZT and W4. 16.00-17.00: W8, 9, very strong. 17.00-17.30: East Coast U.S.A. only. 17.30-18.00: W6 and W7. 18.00-19.00: Central America, W4, W5, and K4. Band dead about 19.15. That should be interesting to check against your own logs.

● Does that Station QSL?

BRYN HAMMOND, Toronto House, Alexandra Road, Abertillery, Mon. writes to us for the first time, and would like listeners to report from whom they have obtained QSL's. In future we will endeavour to do this wherever possible. Bryn is 14 years old and

uses an R.G.D. 6-valve "all-wave" super with an outdoor 22-feet inverted L. His DX heroes are, Bob Everard and F. A. Beane, and he wants to see their photos! He has received cards from the following: COBC, FZF6, EAR, HJIABP, W1XAL, W2XAD, VP3THE, HBL, HBP, EAJ8, EA9AH, FET11, VE9HX, PSH, VP3MR, RAN, RKI, RNE, etc. He receives ZE1JA, ZE1JR and FB8AD at R9 plus. Does OQ5AA QSL? He wants to know.

G. W. BARRON sends his usual log but points out that it is useless to give the same call heard, month by month, so he is starting a new fashion by reporting only the new ones he hears. What do other readers think of this?

R. BOYCE, 395, Uppingham Road, Leicester, sends us his shack photo, so there are now several in the files for future publication, and we have enough for a few months. (But we always like the ones in which the operator does not take up all the room!) He uses a loud speaker for reception but has not yet heard a VK through it. We expect he will by the time this is in print, as they are coming through every morning now (middle Feb.).

You will note that, in response to many requests, we have combined the DX Correspondence page with the DX Listeners' Corner. We think this is a good arrangement and makes a better combination of ideas, DX and general chit-chat. If you like the idea, then please write in and say so. All suggestions welcomed!

CALLS HEARD

Bill Anderson, 93 High Street, Newburgh, Fifehire.

20 metre phone; 1-v-1, home constructed.

CN8 AR, AV, AU, AI, H15X, VU2CQ, YV5AB, CT2BC, TF3C, VE1 DR, FG, DO, AW, 2CA, BC, VO6 D, JO, CO 60M, 2KC, LY, W2 BBI, GIZ, COL, DZ, AZ, IX, JQ, IKV, GO, CRB, FBP, UK, W3 MD, EOZ, DLL, BFH, FGI, ANZ, DRA, W4 BY, DRZ, CYU, AHH, ASE, DAA, W5 ECL, DVM, FNH, W6CQI, W8 JOE, NSF, MPX, RL, CNA, KQ, DW, QCF, HFU, MJT, OKU, KML, W9 ODO, FRC, CMF.

G. W. Barron, 39 Birley Road, Whetstone, London, N.20.

10 metre phone; 0-v-1, Junk Box. 15:1:38—15:2:38.

W1 HJP, IWG, GWK, GGN, SE, JNX, TW, W2 FGB, IDI, W3 FGI, FEA, FVO, GPD, W4 EDQ, EMS, W5EGU, W8 MZE, MNM, W9TTD, K4 EJC, ESH, CN8AV, G6KG.

10 metre c.w.

HR4AF, W8LYQ, G2 LA, GO, NM.

20 metre phone. (4v. s.h.)

W5 JC, AKZ, DEW, DO, W6 NNR, FCL, LU 4AD, 1HL, DJ, 3HA, 7AG, 4BL, 9AX, PY 2CK, FF, 4BL, LA, 2CP, VO1 Y, I, X, 2Z, 4Y, 6D, CO2 RA, WW, JJ, EG, 60M, 7CX, VP, 8EC, YE, MA, SU 2TW, 1RD, CH, GP, VE1 DO, DR, FG, GP, AW, CF, ET, 2BV, 3EO, XX, NF, VK2 AV, GU, NO, TR, VV, XU, ZC, 3KX, WA, ZZ, FAS CF, JK, ZZ, LC, 3HC, QV, JY, YV5 ABY, ABF, AB, KAI ZL, ME, JR, XZ 2EZ, DY, Z56 AJ, 3F, ZT2 G, Q, ZU6P, FT 4AR, 3AU, CX3BL, HK1GC, FB8AD, FR8VX, CT 2AB, BC, ZBI E, L, H, HI 5X, 3N, XE1GK, VP6MR, K4 ENY, DDH, HH2B, VQ4KTB, VU2CQ, VS2AK, F18AC, G4FR (working G5G) (9.2.38) QRA yacht "Valdora". ZE1JA.

20 metre c.w. (4v. s.h.)

ZBJ, W2 GW, MX, DT, 1RV, VG, CJI, W5TQ, ZL 4FK, ZL, VK2A1B.

John B. Burt, Reckitt House, Leighton Park, Reading.

10 metre phone and c.w.; 1-v-2, 20 ft end-fed aerial.

1:2:38—14:2:38.

ZT6AK, ZDBA?, FR8VX, K4 EMY, KD, U3FB, VE1 DR, BR, CA, AP, 2IL, JH, EA, 3HP, WA, KS, OP, VO3B, CN8 MA, AV, FASRX, HCUJW, ON4FT, OH5NF, OA, EI6G, YL2CG, SV1CA, W1 YLC, JKC, DQK, DSY, IVO, COO, HVS, IPA, JRZ, KTG, IWF, JPM, RN, DBE, ALA, CSR, DO, ISX, IIS, KPP, CTW, ADA, BU, KRW, DZE, IYE, CW, BJE, BPE, CIE, HVC, VTZ, PAK, BPN, HIO, OF, GDV, W2 CYX, BOK, AJC, FPU, JM, AMM, HGU, JCV, KHR, TP, AHX, COG, GFV, JME, BMA, ZA, BAA, KGP, BXU, KKP, COK, VH, TA, CKQ, DBY, JZO, TP, CIO, AHS, GMU, BNO, GMD, UZ, HFS, COL, JWD, JYZ, TG, JYK, AVS, W3 EIZ, GPU, FU, AXU, VS, DBP, HC, PC, GZC, ON, GPM, GPS, CPT, CBT, FC, ACR, GSB, AEE, FPU, JCY, GFB, JM, EEW, DVM, GZ, GIV, BKB, W4 AZB, EJE, GCP, BBP, DMC, DGC, ADD, NT, AZP, EIR, EEB, FT, AHH, ECF, EBB, EPT, EDD, EEW, AJX, MR, ABT, COK, CDE, W5 FSX, FDE, GHL, GA, TW, DF, GF, JR, FAH, FVE, W6 MAY, ID, VC, LFW, FUR, EMV, CDV, ACX, EDD, SV, BAM, RV, JAH, W7 BBS, FMO, EAA, GGG, W8 FKO, ALM, MTK, NKU, RAC, HWC, HGU, JIN, BTI, NCR, OIN, CHQ, NO, AHZ, HRD, AVB, ASC, DST, LAC, FO, FY, BWX, IIL, AZD, JJW, OE, IIR, MZD, POK, JBI, GTG, ANN, OAC, ME, GE, LEC, RC, LZK, KC, IWG, MLR, NHQ, KYY, MW, NWO, OPO, VAP, QGZ, MSK, OTV, HHZ, ILU, OKK, DPC, OTK, AZ, BW, LYQ, FKO, NHQ, GGY, JFC, NAB, BCT, BY, QUL, W9 JN, ILL, WSY, GMV, WSO, ZHB, RQM, NSC, KGM,

DGS, RAE, FMI, WFG, WO, GB, TPI, TGN, SWO, TPN, UYD, PSY, KNM, YLB, MTP, EBY, GAR, VGQ, GUR, FAA, IUR, CMV, AGO, WJD, JLD, ZNL, PAE, NEU, HUV, AVJ, BOY, UUR, BRE, VHT, ARM, HBV, BXM, VIP, HAQ, VGQ, EII, GGB, FS, WON, GIC, TTB, RPA, HUE, RH, SUV, KYU, UBB, RRT, ROQ, YLX, VQZ, ROU, ONK, MCN, YLF, FAA.

20 metre (mostly c.w.).

VK2 AIB, ADE, AF, AFR, AH, AU, AUH, BH, IU, OL, KZ, YL, IO, OK, NO, NY, NR, HZ, OE, YE, YD, 3QK, DA, BR, IW, JB, NS, KP, TI, EG, EB, XU, NM, FE, KX, EK, XN, IK, XP, 4HU, AP, SN, IV, 5AK, SW, EZ, XJ, 7QZ.

ZL 1MR, 2AC, CW, CA, LQ, CR, OU, LB, LG, CU, MT, TW, 3FZ, KG, BZ, AX, FH, 4DO, NB, CH, LY, BA, BR, FK, CS, KN, FD, CK.

CR7AY, ZS 1AU, B, 6U, ZT 2U, Q, 6Y, ZU 1D, 5P, 6P, U, V, VS 2AK, 8AA, CN8 AA, AX, AI, AJ, MT, AL, VE 1HC, AW, EA, 2DU, 3ARA, CM2 AV, AZ, VO 3K, 4Y, 6D, VP2 AT, CD, WV, 6LN, K4KD, CX2 BX, 1BM, BG, VR2FF, Y12BA, U6WB, ZE1 JP, JJ, FASKM, JI IG, 2OV, DI, VI, JJ, LH, 3WL, JA2A, PY 1BD, MX, 2AL, TL, 3AD, AL, 4BL, 5AG, BO, 8AG, SU1 DB, HB, YV5AZ, VU2 CQ, FR, DA, EM, FV, AU, GJ, KA1 ME, ZL, AF, PR, 7EF, HS1BJ, XZ2DY, F18AC, ZBI H, P, K6JOE, YN1AA.

A. P. L. Casling, 6 Ollerbarrow Rd., Hale, Cheshire.

28 mc. phone and c.w.; home constructed 0-v-1.

YU2 CQ, AN, ZU6P, ZS6T, CN8AR, FA3 HC, JY, HI7G, K4EMG, CO7CX, FM8AA, VE1 BR, CO, W5EEL, ZBJ.

14 mc. phone and c.w.

ZL4DQ, FA3 JY, 8LC, ZE1 JV, JA, JG, JR, ZS1 AV, B, AK, ZTIM, ZUIT, ZT 2B, 6AV, M, AC, 5Y, Q, ZS 3F, 6M.

ZU6U. K4 FAY, ESH. HH5PA. VO1 D, 3P. 6P. W9VVA. K5AN. VP8 AT, TG. HH2B. CM2AO. PY4BL. VV 4AB, 1AC. CR7AU. CN8 AZ, MU, AY, AJ. VS2AK.

7 mc. phone and c.w.

K6NFU. ZL2IW. W1 AFR, DGW, EZL, W3DLG. SULAM. U5AJ. UK5AA. VF2TG. PY2 CQ, DN, 1BR. CN8AJ. FA 3QV, 8LR.

Bob Everard, "Oakdene," Lower Sheering Road, Sawbridgeworth, Herts.

10 metre phone; converter and s.h.6. mains. 15:1:38—15:2:38.

TG9AA. CN8AV. ZS6AJ. ZT6J. VE1 BR, DR, CO, AP, BB, 2HG, KX, ID, MX, CA, NK, 3ANF, AQ, AGS, SY, AIB, TY, 4SN, DK, AW. FA3JC. VU2CQ. K4 DDH, FAY, EIL, EPO, EJG, EZR, EMG, ENT. CO 7CX, 8RQ. VP9R. NY2AE. TIEFG. HI7G. VP6YB. HI2P. YV6AL. CT1ZA. FA3JY. XE1GE. G5 ZG, VT, KH, 6WU, 8FZ. LU7AG. ZE1 JR, JJ. SV1 CA, KE.

W1 DLJ, RJE, KFC, APU, DQK, GKJ, IYE, AEP, KBT, DAY, KJJ, IWG, TW, WV, HRS, AFG, JOS, DBB, GZL, SE, KQG, IAO, IKS, JTG, JGN, GWK, COO, BBX, BUG, JPM, IQ, KOM, WU, EWY, JIE, KKL, CJN, CAV, CAA, ANA, JOT, KRW, CKV, JIL, KC, JUI, BVL, BOO, IGD, GDY, IDV, IPV, CND, JZR, FMQ, ELR, ME, KNB, ADE, ARB, HWH, DDE, AWO, HJP, EZS, KPP, BOK, ELO, AKZ, JVV, HXU, BSA, KKF, KWD, ETA, HYJ, JNX, BWY, HVS, JRN, FZA, BQQ.

W2 GUM, JCY, FGB, KHR, AMM, DVV, HXO, JIH, DH, BHV, KGY, JAO, KKQ, BYB, ICA, CSN, AHX, GFH, JOC, GMR, AMJ, DRY, FWK, IFL, KQP, JQX, HPZ, ITA, DXT, DMJ, ISY, MB, ALK, FOD, DFM, JXS, CKG, CDG, AOG, CYO, EKG, EXI, JOQ, GAH, IVO, JXI, HYJ, GHV, ALP, JZQ, HJU, BXA, BAA, DTE, KAX, FIL, JLR, IZK, KKB, JSO, KBK, JSO, KXJ, IDL, HHM, GUX, BYD, CIW, W3 FVO, CBT, FTR, BZI, EVQ, GSV, ASI, GIZ, BOZ, CKT, AKK, AKX, GZN, CRY, PC, FTU, FXU, GXO, HDA, GQS, FLZ, CAD, FEA, FZE, GHS, GIS, FLG, GGI, AFH, GWM, LN, BIW, GTL, ZD, GPM, FAR, AIR, AEG, CIJ, ANH, W4 EEV, ZF, AZB, DRZ, GB, EJE, EWX, DDM, EKI, BQI, PD, OC, DCK, EDW, EYH, EPX, BGT, EQJ, EDO, EDD, EEB, DEK, AUU, FT, DXM, AHH, EOO, EOB, CLK, CPB, EUS, EMF, ECK, ECF, FS, EFN, AUS, HKE, W5 ZA, EHM, BAT, GHB, EEL, FDE, GPX, QQ, EGU, CHC, BSK, AHJ.

W6 NLS. CKR, CUU, GCX, ERT, NWK (Portable) No. 3 District, AM, PBD. W7GGG: W8 GGG, LAC, KYV, EBS, DST, OE, JFC, IWG, OTK, CIM, NZU, BEV, QWB, MZE, BTO, NOL,

QVB, CNA, JAH, CPC, QXT, REU, RAE, ALT, AHC, HHH, QGZ, NKS, QUV, DSU, MID, CHO, JVI, ANO, CFD, CJO, PGV, NGJ, QBO, AIJ, CLS, BVP, NYU, HSP, CUV, EUK, NBR, QYI, PK, QOV, HHZ, MNM, EPM, MLR, JLW, MSK, LGO, OLK, QMF, CDH, NXF, MAP, OOE, CIR, OTV, OJM, POP, AFO, IAU, QOT, KCI, PKO, PJX, NHQ, LWA, FXC, NSO, W9 FAA, CHI, TMP, YLV, AGO, SOE, JOL, GPC, YWN, ZNA, EW, UUR, REG, RRX, EYM, WAL, WOH, WOA, WFG, BBU, UYD, WBW, LKI, LZP, CSI, ZHB, SPV, POH, FEY, RGT, KOE, SWQ (portable, 1 Dist.), WIP, ARN, BOF, UKW, BHT, WOR, ARK, DWU, TII, USU, QI, HDZ, PUV, VRC, AVS, WNO, PZI, GGY, YDC, OFI, UXA, TIO, VFB, TTB, BPL, TJY, AEQ, BTO, SJV, JJK, QFO.

CR7MF. F18AC. FR8VX. FB8 AF, AD. VU2CQ. VS2AK. ZS 1K, AX, 2N, 3F, 6AA, AJ. ZT 1M, R, 2Q, 6AM, AK, J, 2C, ZU 5Z, 6N, P. ZBI L, E. KA1 ME. HS, ZL, BH. PK 1ZZ, 3GD, 4AU. K6 OQE, KMR. XZ2EZ. VQ4KT. ZE1 JA, JR. PY6 AI, AB, 7GA. CT2 AB, BC. K4 DDH, FAY. VP6MR. CN8 MP, AM, AF. FA3 QV, JC. FT4 AU, AR. SU2TW. YR5TI. HH2B. YV 1AC, 4AB, 5AA, AK, ABY. SUIRD. CO2 KC, HY, RH.

Hartford Police. W1 XHC, XDT, 2XES, XEM, XIJ, 3XAR, 4XCE, 8XLU, XCY, 9XL, XLS, 3XEY, 8XAI, 9XAZ, 1XOY.

Some recent QSL's include ZS6AA, ZTIM. ZU6AK. FB8AD. W6 JKR, 9YDC. ZE1JA. W5 GDB, 9ZKD, UGR (30 w), ZWW (50 w). CT2BC. W1XOV, VK4KO. W5 FPZ, 9EYW. PY5AQ (28 mc). W9 UAK, AKJ, 8QOV, 9WBW. VE3QL. W9 WIP. BLL. VQ4UTB. W9 WTC, ARN. F18AC. CR7MF. XZ2EZ.

Bryn Hammond, Toronto House, Alexandra Road, Abertillery, Mon.

14 mc. phone; 6v. s.h.
W6 COI, KSO, FCL. HI5 N, X. CO 7CX, 20Y, WB. VE1 DQ, CR, AW, LR. VO1 I, Y, X, 4A, 6D, 1J, 2Z. VP3THE (almost nightly for a week). PY 7CL, 4BL. YV5 AB, ABY. LU2 CL, 9BV, 1DA. CX2AK.

OQ5AA. FR8VX. ZS1AX. ZE1 JA, JR. VQ4KKB. ZU6P. ZT 6AM, 2TZ, 1M. ZS 1S, 3F. ZU5X. FB8 AH, AD. SU1 SG, KG, AX, GP, RK, 2TW. FA3 HC, QV, JY. FT4 AI, AN. CN8 AM, AI, MA, MB, AG. AD, AV, AA, AG, AR, MW, AX. CT2 BC, AB. EA9AH. YT7TJ. ZBI L. E. C. LX1TW. Radio Malaga, EA3SI. VU2CQ (nightly for a week). ZMBJ (S.S. Awatea, 33 m, October).

7 mc. phone.

EA 1AV, 9AH, 4RN, 7BB, 3SI. FA 3HC. QV.

14 mc. phone, 20.00—23.30 (13:2:38).

PY 6AE, 7LI, 2JC. CO 7VP, 8VC, BC, 2JL. LU 2BW, 4CS, 2JW. YV5 ABY, 4AB, 1AA. T12 RC, FE, CX 2AK, 3AI. VP6MR. VE1 DQ, FQ, ET, EC, FG. VO1Y. FT4AI.

Anthony Hobson, 99 Woodhouse Road, Doncaster.

14 mc. phone. 26:1:38 - 13:2:38.

CT1 CM, NO, PW, QG, PM, NB, QA, EF, KP, 2BC. CN8 AM, AV, MW, MU, AI, AJ. FA3HC. IIMN. OZ3U. ZBIE. ES5D. OK1SZ. LA 1G, 6R, 8C. PA0AD. YR5PB. CO 60M, 7CX. VE1BR. YV5AC. VQ4KT. VU2CQ. VK2ACO.

G. F. Keen, 50 Wilbury Crescent, Hove, 4.

20 metre phone; 0-v-2 home constructed, with 20 m. doublet for W1, 2, 3.

CN8 AL, AA, MA, AJ, CN. AB, AV. SU1 CH, 2TW. ZBI E, L. YV 5AZ, AB, IAG. 5ABY. ZE1JA. FR8VX. K4ENY. CO 60M, 7CX, 6VP. VU2CQ. VQ4KT.

20 metre c.w.

HS1BJ. FR8VX. CT2 AB, BB, ZL4 VK, BF, 2LB. VQ2CJ. VU2FV. CM2AO. ZT 6AC, 2U. ZU 5G, 6P. ZS 6EQ, AA, 1AX, 6S. ZE1JV. YV5AK. SU1GT. ZBI J, H, C. CN8 MA, AS, MG, AX, AY. VK3NS.

Conrad G. Tilly, 95 Chesterfield Road, Bristol, 6. 0-v-3 l.s.

40 and 20 metre phone.
VE3XX. ZS6AJ. LUICA. FA 3HC, 8ZZ (40), BE (40). ZE1JA. FT4AU. VP3THE. CT 2BC, 1FS (40), PR (40). QM (40). ZBIL. ZU6P. LA8C. CN8AV. CT1FV (40). LU4CZ. OK1SZ. ZS1AX. VQ4KT. CN8AI. FA3JY. CN8MU. FA8EH. ZT2G. ZS3F. ZBIE. YV5ABY. CO7CX. LA6R. ZT1R. K4FAY. CO2LY. C060M.

R. F. Wibberley, Hazels, Tuesley Lane, Godalming, Surrey.

20 metre phone; t.r.f.-v-1 13:1:38—13:2:38.

W1-31, W2-37, W3-34, W4-24, W5 DEW, CT, DPP, AMR, JR (portable I), BDV. W6 XR, MCF, LRA, OSF, JYP. W7 BDO, AIT, EQP, VO, DJA. W8-24, W9-19. CO 7UP, 8EC, 2LV, 60W. FR8VH. J2LL. KA1 ZL, ME, LH, LU1 HI, 5CZ. OE6DK. SU1 RK, RH, KE, GP, 2CW. VE1 FG, BQ, CF, AF, FR, 3EI, BK. VK 1MX, 2JU, XU, 3AX, PL.

SWLs Please Note !

ZE1JR and ZE1JA, of Salisbury, S. Rhodesia, both putting very strong 14 mc. 'phone signals to all parts of the world, are being flooded with requests for SWL verifications. While appreciating these reports, they are men of little leisure, and the situation has become embarrassing. In an endeavour to meet SWL's half-way, they ask that those wanting QSL's should prepare a special card for return, with the reception and other details, leaving space for the signature of ZE1JR or ZE1JA, as the case

may be; this card must be accompanied by a large enough self-addressed envelope and a reply coupon. Requests for verification other than on these lines will be ignored, and SWL reports with reply coupons only cannot be answered under about 12 months. *Verb. sap!*

Certain SWL's, over-anxious for QSL's, have started sending enthusiastic reports to A.A. licence-holders. Even if you do receive an A.A. station, he doesn't want to know about it!

Mentioning the Magazine to Advertisers helps you, helps them and helps us.

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2d. per word. Minimum 2s.

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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.

BARGAIN.—Superhet S.W. Converter, complete cabinet, valves (Philco, U.S.A.), for use with any broadcast receiver, 3v. (Self-powered) A.C. 230v., 15-200 metres inclusive, calibrated megacycles. First-class order, £3. Further particulars HAMBLY, 52, Culverden Rd., Balham. Phone, Streatham 7806.

EDDYSTONE KILODYNE AC5: excellent condition. First reasonable offer.—DENNY, 116, Glenview, S.E.2.

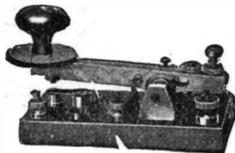
B.T.S. "Adaband" SHORT-WAVE CONVERTER, 13.71 m., Battery Model. £2 5s. 0d.—B, School, Mellitus Street, W.12.

0-v-1, 30s. CLASS B ONE, 20s.—2CCS, Post Office, Donnington Wood, Wellington, Shropshire.

COMPONENTS FOR SALE.—Transformers: Ferranti AF3, 8s. 6d.; Igranite 1:5 ratio, 7s.; R.I. (old type), 1:5, 4s. **CONDENSERS.**—Three, capacity .0005 mfd. 2s. each. **SUPREMUS MAINS H.T. UNIT,** Input 220/240 volts, 50 cycles, output, 2i0/230 v. at 10, 20 or 30 ma., 17s. 6d. **ARCHER H.T. UNIT** for use on 220/250 v. D.C., output tapped at 60v., 80v. and 120v., 10s. All the above are in good order and will be sent carriage paid.—Box 7.

In the mention of H.A.C. Kits in our February issue, the address of A. L. Bacchus was given as situate in the S.W.19 postal district. Any delay in reply from Mr. Bacchus is due to the fact that the correct address should have been given as 109, Hartington Road, S.W.8.

ELECTRADIX BARGAINS



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."

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

Telephone: Central 4611

PRESS-BUTTON TUNING

Messrs. E. K. Cole, Ltd., Ekco Works, Southend, Essex, send us some interesting literature dealing with their latest development—press button control.

The mechanism is entirely automatic, and incorporates a motor-controlled system with electrical tuning. That is, on selecting any one of a row of 11 buttons, the corresponding station is accurately tuned in without any further attention being required. A feature of this development is the fact that the buttons can be set, by the listener himself at his own fancy, to control any eleven stations—long, short or medium wave—within the range of the 8-valve superhet, to which the system has been applied.

The motion in tuning-in or changing over is extremely rapid, as can be judged from the fact that pressing, say, the "London Regional" button with the "National" on tune, brings in the former within three seconds. A release-button is also provided, which has the effect of throwing out the automatic control and converting the receiver to ordinary knob tuning. The whole mechanism is fully protected—in the electrical sense—and the accuracy of motion and of tune is maintained throughout the life of the set. In other words, there is no need for the inexperienced listener to be afraid of the receiver being damaged through incorrect operation.

In effect, Messrs. Ekco have linked the radio receiver with the automatic telephone; but the price for the set described is only 18½ guineas, which makes it well worthy of the consideration of the keen listener.

PIEZO QUARTZ CRYSTALS

Limited quantity—125 kc., a unique opportunity to obtain a reasonable and costly crystal at a fraction of the original price, ideal for Wave Meters, Standard Frequency Test, or could be reground for other frequencies; now, amateur transmitters and others, here is your chance at 4/6 each.

PIEZO QUARTZ CRYSTALS and 125 kc. I.F. Transformer, ideal combination for Single Signal Superhet; 7/11 per pair.

HUGE PURCHASE OF RELAYS, made by well-known manufacturer, resistance 3,300 ohms, cost 25/- each; our price 5/- each.

RADIO CLEARANCE,

63 HIGH HOLBORN, W.C.1.

Telephone: HOLborn 4631.

"Ferranti" Transformers, all ratios, from 2/6 each.

Send for your "Short-Wave" Components and we will quote you.

UNIVERSAL RADIO CO.,

221 CITY ROAD, LONDON, E.C.1.

THROUGH THE WINDOW

THE NATIONAL NC-80X AND NC-81X RECEIVERS

TWO NEW "CLIX" PRODUCTIONS

Control Panel.

A casual glance at this new control gives the impression that it has not been altered, but closer inspection reveals the contacts to be silver-plated, the spring stronger, and the fitment generally more robust. The price, however, remains 1s.

This gadget is intended primarily for connecting and switching external loud speakers. The second speaker leads are inserted in an insulator which may be withdrawn (h.t. is not broken) or used as a switch, which has positive action. One of the many uses of this ingenious panel is for the addition of another pair of phones to the small receiver; a touch with one finger, and the second pair are cut in or out of circuit.

Octal Valve Connector

This is a spring-clip cap connector, very neatly made, with a black insulated sleeve into which the lead is inserted. The nickel-plated cap screws into this sleeve, thus securing the wire. The price is 1½d., black finish only. Both these items are obtainable from Messrs. British Mechanical Productions, Ltd., 79a, Rochester Row, London, S.W.1.

A NEW BOOK

Messrs. Sir Isaac Pitman and Sons, Ltd., Parker Street, Kingsway, London, W.C.2, who have for many years specialised in practical handbooks of every description—many of our readers must have been weaned on some of them—have now added "Radio Upkeep and Repair" to the list. By Alfred T. Witts, A.M.I.E.E., this cannot strictly be classed as a new book, because it is now in its 3rd edition. The sixteen chapters are entirely practical in their treatment of such matters as testing components, fitting a gramophone pick-up, adding a.v.c. to a receiver, and so forth. What might be called the theory side is also dealt with in an easily-understood way, without recourse to formulae or text-book style. There is useful information on many points like Class B and Q.P.P. amplifiers, battery economizers, circuits for the heaters of all-mains valves of every type, and the care of accumulators—of which too little is known these days.

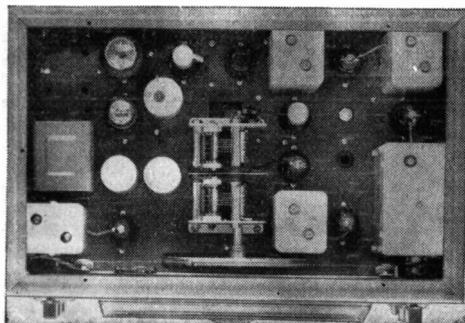
The chapter headed "Short-Wave Receivers," while being rather short, yet covers many of the faults which a beginner would find puzzling and which are rarely adequately explained by writers in the radio press. It should not be expected that this section will be full of circuits and ideas for improving an existing short-wave receiver. It deals only with the commoner faults experienced in the simplest sets, since it is evident that much of the advice and information given in other parts of the book is equally applicable to both short-wave working and reception on the broadcast bands.

The book is well illustrated—some are, perhaps, a little old-fashioned in appearance—and its 189 pages are carefully indexed. Of a handy size, bound in blue and with a dust-cover, it costs 5s.

The difference between these two receivers lies in the fact that the NC-80X has a practically continuous frequency coverage from 30 mc. to 540 kc.—except for a small gap around 1,560 kc., the i.f. frequency—whereas the NC-81X is specially designed for spreading fully the amateur bands 1.7 to 28 mc.; frequencies between these ranges cannot be tuned.

The brief details following cover the main features of both receivers apart from the difference mentioned above. The circuit is a ten-valve super-heterodyne, with incorporated crystal filter which remains in operation under all conditions. This filter is of entirely new design, so far as commercial receivers are concerned, since its selectivity is continuously variable over 400 cycles for c.w. reception, and over 5 kc. for 'phone.

Switching the tuning-ranges is accomplished by the well-known National automatic plug-in system, which has proved so successful on the NC-100. The motion is controlled by a knob on the front panel,



which also carries the beat-oscillator switch, selectivity adjustment, a.v.c. control and main off-on switch. The output stage uses a 25L6G, giving 2 watts u.p.o., preceded by a linear detector, three i.f. stages, the e.c. h.f. oscillator and first detector, additional valves being used for the a.v.c. action, b.o. stage and rectification. The image suppression compares favourably with many receivers having elaborate pre-selectors.

The tuning system is interesting in that it is accurately calibrated in megacycles, the pointer being corrected for parallax and moving against a full-vision dial. Two vernier motions are fitted, and it is possible to log accurately any station within the frequency range of the particular receiver used.

Both sets are designed for a.c./d.c. operation from 115v. supplies, but can of course be adapted for the a.c. voltages ruling in this country by means of an auto-transformer. Either receiver is also obtainable for working from batteries, using a 6v. l.t. supply at 2.8 amps. and 135v. h.t. at 35 ma.

The NC-80X and NC-81X cost £25 each in both mains and battery types, and an 8-in. P.M. speaker is £1 extra, if required.

Messrs. Webb's Radio, Ltd., 14, Soho Street, Oxford Street, London, W1, will be pleased to handle all enquiries and have stocks for immediate delivery.

A REPAIR SERVICE

The Distovox Service Co., 119, Bunhill Row, London, E.C.1 have specialised as official repairers to many firms for a number of years, and a separate department caters for rewinds of transformers, resistances and chokes, thereby offering quick service in this direction. Another speciality is the modernising of receivers, commercial or home constructed, backed by an experience covering ultra-short-wave and diathermy apparatus to simple broadcast receivers.

RADIO ENGINEERING LIBRARY

Five books, aggregating 3,000 pages and containing 2,000 illustrations, recently published in separate editions, by The McGraw-Hill Book Co. are now available solely as a library offered by the Phoenix Book Co., Ltd., 66, Chandos Street, Charing Cross, London, W.C.2.

The collecting of these works of authority on modern principles forms a valuable asset to all interested in radio design, engineering, research or general study. A vast field has been covered, which is emphasised by the fact that one of the volumes, "Radio Engineering Handbook," engaged the attention of 28 specialists working under the editorship of Keith Henney.

CLUB ACTIVITIES

We are glad to give space in these pages to any club, irrespective of its affiliations, with the sole proviso that secretaries keep their notes to a reasonable length. In response to requests for advice regarding affiliating to a national society, we suggest that any club having a transmitting interest should unhesitatingly identify itself with the Radio Society of Great Britain, the only officially recognised organisation, which is not only well established, but it is also primarily responsible for most of the privileges amateurs now enjoy.

ABERDEEN: The Bon-Accord Short-Wave and Television Society

Secretary: JOHN A. HORN, 4, Broomhill Avenue, Aberdeen.

Difficulty was experienced in securing suitable accommodation but the society now meets at 92, Crown Street, at 7.30 on Mondays and Thursdays, and on every second Sunday at 9 a.m. Morse classes have commenced and an A.A. transmitter is to be installed.

BRADFORD Short-Wave Club

Secretary: S. FISCHER (2BMO), Edenbank, 10, Highfield Avenue, Idle, Bradford, Yorks.

Busy building a new transmitter; other activities are also afoot. On January 21 a lecture and demonstration on "Anti-interference" was given; the position of the club rooms at the junction of two main roads, and a quantity of electrical apparatus in the premises, enabled Mr. Perkins of Belling and Lee, Ltd., to show interesting and effective methods. On February 9 members visited the Halifax Radio Society.

For those so desirous, purchase may be spread over a period of eighteen months; shorter terms or a cash settlement also form part of "The Phoenix Plan," which is clearly set out in a folder that will be sent on application to our readers who mention this magazine.

THE CATHODE-RAY TUBE

Messrs. Mullard Wireless Service Co., Ltd., 225, Tottenham Court Road, London, W.1, have devised an extremely interesting chart, done in colours and coded, which shows both the internal construction of the cathode-ray tube and the type of work which can be carried out with it.

There are eighteen named parts of the tube given on the chart and twelve reproductions of the appearance of the screen under operating conditions, covering such applications as the measurement of the depth of modulation of transmitters and the analysis of the wave-form of complex sounds.

Messrs. Mullards remark—and rightly, in our opinion—that this chart is not intended for "broadcast" distribution. It is necessarily large, measuring 40 ins. by 27 ins., and is therefore scarcely suitable for decorating the living-room! For those interested in the cathode-ray tube from the technical point of view, however, and for teaching institutions, it will be found particularly useful.

BRENTWOOD Amateur Radio Society

Secretary: J. R. DEANE SAINSBURY (2CYW), "Brunook," Crossways, Shenfield, Essex.

At the meeting of February 11 an interesting demonstration was given by Mr. B. A. Pettit (2CRJ) of his short-wave receiver. Conditions were not favourable and no DX could be heard on 14 mc. On the b.c. bands DX was heard and the efficient handspread system enabled various stations to be tuned in with ease. A visitor was Mr. R. C. Beardow (2BZB), hon. sec. of the Chadwell Heath Society.

The society will soon be on the air under their call sign G8HV. The Post Office have consented to Mr. A. H. S. Scott (G6UP) being second operator. Mr. H. N. Tweddell is now 2DJB. The journal of the society is to be published quarterly.

Future programmes are: March 11, demonstration by the H.P.R. Electrical Company of their 7-watt amplifier and double-button microphones; March 25, lecture; April 8, lecture and demonstration by Mr. S. R. Walker of the Automatic Coil Winder and Electrical Company; April 22, "The Equation X-X-O," Cinematograph film showing in a practical form the construction of harmonics.

BRIGHTON Branch: World Friendship Society of Radio Amateurs

Secretary: F. R. JUPP, 12, Brading Road, Brighton, 7.

The attendance at the meeting held at 2, Cheap-side, on January 21, was the largest recorded. The c.w. class was followed by a discussion on tuned and untuned h.f. stages. Mr. Norman Owen (2AFO), late secretary, was welcomed on a visit from Kettering. The merits and demerits of various receiving aerials, ranging from simple di-poles to the more ambitious "Rhombic" were discussed at the Feb. 4 meeting. Five-metre receivers and aerials were also mentioned.

CHADWELL HEATH & District Amateur Radio Society
Secretary: R. BEARDOW (2BZB), 3 Geneva Gardens,
Chadwell Heath.

This society held four meetings between Jan. 18 and Feb. 15. The funds are in credit, and there are various projects afoot, such as the starting of a library and the collection of test gear. Morse classes are held, and a scheme is being drafted for the answering of technical queries. The local Press has been approached to give publicity to the society's activities, which include lectures and demonstrations by manufacturers. Headquarters: Ralph's Cafe, Trolley Bus Terminus, Chadwell Heath, where meetings are held every Tuesday at 8.30 p.m.

DEPTFORD Men's Institute Short-Wave Radio Club
Secretary: A. S. WILSON, 11, Bennett Street, S.E.8.

On January 28 the club held an exhibition of short-wave apparatus at the Clyde Street L.C.C. School, Deptford, S.E.8. The gear represented as a central exhibit, an amateur transmitting station arranged under the club call, 2BDB. The transmitter rigged for c.w. or 'phone was an APP4c c.o. and RK23 p.a., together with a 10-watt power supply. The communication receiver was a Halli-crafter "Skychief," transmitter and receiver control panel, frequency meter-monitor, etc. were on view. The rest of the exhibit showed various types of commercial and home-built receivers. There was also a 5 m. portable transmitter. QSL cards, certificates and photographs of foreign and Empire amateur transmitters completed a successful show.

The club has several transmitters, others are preparing to apply for a.a. calls. Meetings, Tuesday evenings, 8 to 10 p.m.

DOLLIS HILL Radio Communication Society
Secretary: J. R. HODGKINS (2CQF), 102, Crest Road, Cricklewood, N.W.2.

A full month is recorded for February, meetings consisting of talks and demonstrations by Mr. E. Cholot (Lissens); Mr. R. H. Stevens; Mr. S. R. Wilkins (Avo); and visits were paid to Dr. C. G. Lewis' laboratory and to Messrs. Vitavox.

This month there is a similar variety offered the fifty-five members and any interested readers. A five-metre section provides added attraction for the summer months.

EALING and District Short-Wave Club
Secretary: W. COLCLOUGH (2CKL), 31, Lancaster Gardens, Ealing, W.13.

Mr. Hathrill (2CCK) recently gave a description of his receiving aeriels (two half-waves in phase for 14 mc.). A junk sale was held on February 2 and the proceeds are going towards the new club magazine "The Monitor"; copies may be had by non-members for 3½d. post free. Newcomers are 2APP, 2ARR and Mr. W. O. Clarkson.

EASTBOURNE and District Radio Society
Secretary: J. P. GLICKMAN, Kersal, Brodrick Road, Hampden Park, Eastbourne.

At the general meeting held in a new club-room. The Science Room, Cavendish Senior School, Mr. J. A. Penfold lectured on "High Quality Amplifiers." He described in detail the evolution of the r.c.c. amplifier and the calculation involved and enumerated the various forms of distortion, and gave illustrations of their cause, effect, and cure.

EDGWARE Short-Wave Society
Secretary: E. YALE, 40, Raeburn Road, Edgware.

The first lecture of this new society was given at the Edgware Constitutional Club, Edgware, by Mr. L. Brandt (G2KQ) who gave a talk on "Low-Powered Transmitters." After an enthusiastic meeting the lecturer promised a 9-valve 18-watt short-wave set to the first new member who still had no artificial aerial licence and could read 12 words per minute Morse by March 9. Meetings: Wednesday evenings at 8 p.m.

ENFIELD Radio Society
Secretary: L. FENN, 47, Cecil Avenue, Enfield, Middlesex.

Practical work has been started and in the course of a few weeks its scope will be widened. Morse classes are popular and plans are being formulated for field days. Members and friends visited Messrs. Teleradio's television demonstration room for a lecture on the principles of television by Mr. A. Wilberforce of the Marconiphone Co. Difficult questions put to the lecturer were readily answered.

EXETER & District Wireless Society
Secretary: W. CHING, 9, Sivell Place, Heavitree, Exeter.

The first meeting of the Spring Session was held on February 7 at No. 3, Dix's Field, Exeter, the lecture being given by Mr. H. A. Bartlett, who took for his subject "First considerations for the would-be transmitter," and commencing with the receiving end carried his talk to the final transmitting stage.

At the next meeting Mr. E. Gibb of Bristol gave a lecture on "The Evolution of the Superhet." Its growth from the early days (1917) was discussed and each stage analysed. Many questions were put and fully answered.

March dates: 7th, Mr. V. C. Regan, "Measurements in Radio"; 14th, lecture and demonstration of the Hammond Organ, by Mr. R. C. Lawes; 21st, Industrial Rectification and its uses, by Mr. W. S. Pyrah; 28th, Electronics, by Messrs. Mullard.

HALIFAX Experimental Radio Society
Secretary: J. S. KILPATRICK (G5QS), Lynn Cottage, Lightcliffe, Yorks.

A visit was paid by Leeds and Halifax members of the World Friendship Society of Radio Amateurs to the meeting on February 9. The visitors were invited to co-operate in 56 mc. field work for operating stations further afield. Meetings are held in the Halifax Friendly and Trade Societies' Club (Room 15) every Wednesday evening at 7.30.

ILFORD and District Radio Society
Secretary: C. E. LARGEN, 44, Trelawney Road, Barkingside, Ilford.

Meetings for March: 3rd, television demonstration by G.E.C.; 10th, "Mr. Stott's Bulgin gadget evening"; 17th, Mr. H. G. Menage lectures on Rothermel Piezo crystals; 24th, Mr. W. G. J. Nixon (G.E.C.) will speak on contrast expansion. These meetings will take place in St. Alban's Church Room, Albert Road. The Club's Bulletin maintains its lively format, an added feature is a list of members' addresses.

KETTERING Radio and Photographical Society
Secretary: IRVING L. HOLMES (2AXF), "Miami," The Close, Headlands, Kettering.

Mr. J. S. Blair, in a recent talk on "The Use of Electronic Devices in Industry," mentioned the

uses of various types of valves, relays, photo-electric cells, thyratrons, etc., in connection with automatic switches, recorders, thermostatic devices, etc., and illustrated his talk with slides prepared by the photographic members.

On Jan. 24, Messrs. F. E. Henderson, A.M.I.E.E. and Mr. W. G. J. Nixon, of the Osram Valve Department staged a talk and demonstration on "the developments in the design of valve amplifiers." With the aid of a very comprehensive array of apparatus the development of the triode and also the pentode were explained and demonstrated. The high-light of the lecture was a demonstration of the volume "Contrast Expander."

KINGSTON and District Amateur Radio Society

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

Out of a membership of 54 this society has 16 fully licenced members and 18 A.A. licences. The newly-formed A.A. Group is proving successful. "Anyone requiring Morse practice should come along, they're sure of a welcome!"

There was a good attendance at the February meetings. Mullards are giving a lantern lecture on "Valves for Television" on March 2; there will also be a lecture on March 23rd. Visits from other societies are invited which the club would in turn reciprocate. Meetings are held at The Three Fishes Hotel, Richmond Road, Kingston, at 8 p.m.

SOUTH LONDON and District Radio Transmitters Society.

Secretary: H. D. CULLEN, G5KH, 164, West Hill, S.W.15.

A successful year's work was concluded with the annual dinner at the Half Moon Hotel, at which the guest of honour was H. Bevan Swift, Esq., A.M.I.E.E. An interesting summer programme has been arranged including outings and field days. Meetings are held at the Brotherhood Hall, West Norwood, on the first Wednesday in every month.

The next meeting takes place on March 2, when a talk on "Amateur Radio in Finland" will be given by OH20B.

SURREY Radio Contact Club

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

On Feb. 1, Mr. Stuart Davis, director of Davis Theatres gave a demonstration of high fidelity reproduction and recording. Using a Telefunken pick-up, which has a flat characteristic, and employing a sapphire point, he played some Telefunken records via a volume expander unit and the tone corrector and selector unit. Thirty watts output could be obtained with only .6 per cent. third harmonic distortion, providing care was taken in obtaining the correct screen and anode voltages. The chairman, Mr. Gay, made a record on Mr. Davis's recording gear on a Simplat disc which after being hardened was played back five minutes after. Mr. Davis said it was his best recording and all present appreciated the reproduction obtained.

SLOUGH and District Short-Wave Club

Secretary: J. H. WHITE, 20, Chalvey Road East, Slough, Bucks.

At the fortnightly meetings frequent junk sales and displays intersperse lectures on such topics as "The early days of radio," "Valves and their uses,"

and "receiving aerials," while there is at present a series by Mr. K. Sly on "Fundamentals." Listening contests are also frequently arranged.

G6DS has had trouble with his masts during recent gales; G6PR is still working DX with aerials tied to neighbouring chimneys; G8QP, who is now c.c. on 7,100, has been busy on c.w.; 2BMI has a two-stage 'phone running on batteries; 2DAJ is completely rebuilding.

THORNTON HEATH Short-Wave Radio and Television Society

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

Recent activities have included a talk by Mr. E. J. Pickard, G6VA, of Messrs. Webb's Radio, on the Harvey Transmitter UHX10 which he demonstrated; and a joint meeting with the Croydon Radio Society when Mr. H. J. Walters of Belling and Lee gave a talk and demonstration on electrical interference.

The G8GY test announced last month was postponed until the 22nd, the evening of the 15th being the occasion of a television demonstration by Mr. Watkins (of Watkins and Richardson). Readers are invited on March 8, when a lecture on Contrast Expansion of grammo. reproduction and Automatic Gain Control with Microphones will be given by Mr. J. Nixon of the G.E.C.

WEYMOUTH and District Short-Wave Club

Secretary: W. BARTLETT, 59a, Franchise Street, Weymouth.

Call sign G8WQ; headquarters, 15a, Hope Street. Meetings are held on Wednesdays at 7.30 p.m.; Morse classes on every Monday at 7.15 p.m. A new transmitter is now in the course of construction. Permission has been given to use 20, 40 and 160 metres. Four members hold full licences and one A.A.

WHITSTABLE Radio Amateurs

Secretary: W. CROSSLAND, G5CI, 13, Queen's Road, Tankerton, Whitstable, Kent.

Meetings for March and April are as follows:— March 5, an Exhibition of R.S.G.B. National Field Day films; April 2, a talk by G5CI, entitled "American Valves for Amateur Transmission and Reception." Both meetings are at 7.30 p.m. at G5CI.

G3BD is trying grid modulation on his T20; 2CMI is perfecting telephony on his m.o.-p.a.; 2AAN is still experimenting with class B crystal oscillators and G5CI is working plenty of European stations on 7 mc. c.w. with 8 watts input to a 6L6c.

WIRRAL Amateur Transmitting and Short-Wave Club.

Secretary: J. R. WILLIAMSON, 49, Neville Road, Bromborough.

An electric lamp to represent the sun and a globe atlas were used by Mr. Norman Campbell Hobbs, G8AA, to illustrate the second part of his talk on "The theory of DX." Mr. Hobbs spoke of the effect of light and darkness on long distance transmission and reception using the light and shadow on the globe to simulate conditions prevailing at different times of the day and night and at different seasons.

Mr. Cumberlidge has been granted his full licence and is now G3CK. Headquarters: Beechroft Settlement, Whetstone Lane, Birkenhead. Meetings last Wednesday evening in each month.

QUERY COUPON

S.-W.M. 3/38.

SHORT-WAVE BROADCASTING STATIONS

Abbreviations: S—Sunday; M—Monday; T—Tuesday; W—Wednesday; Th—Thursday; F—Friday; Sa—Saturday.
All times G.M.T., twenty-four hour system.

M.	KC.	CALL-SIGN, LOCATION, SCHEDULE.	M.	KC.	CALL-SIGN, LOCATION, SCHEDULE.
13.93	21,540	W8XK, PITTSBURGH, 12.00-13.00.	31.35	9,570	KZRM, MANILA, M-F, 21.30-23.00, 10.00-14.00; Sa. until 15.00! S. 09.00-15.00.
13.94	21,520	W2NE, WAYNE, 13.00-18.00.	31.36	9,565	WIXK, MILLIS, 11.00-05.00.
13.97	21,470	GSH, DAVENTRY, 10.45-17.00.	31.38	9,560	DJA, ZEESEN, 05.05-16.00.
15.77	19,023	H8SPJ, BANGKOK, M. 13.00-15.00.	31.41	9,550	OLR3A, PRAGUE, irregular.
16.86	17,790	GSG, DAVENTRY, 08.15-23.00.	31.45	9,539	DJN, ZEESEN, 05.05-16.00.
16.87	17,790	W3XAL, BOUND BROOK, 14.00-02.00.	31.46	9,535	JZJ, TOKIO, 19.30-20.30.
16.88	17,770	PHI, HUIZEN, S. 13.25-16.00; M. 00.00-01.00, 13.25-15.30; T. 13.25-15.30; Th. 13.25-15.30, 00.00-01.00, 03.30; F. 13.25-15.30; Sa. 13.25-15.30.	31.47	9,534	VPD2, SUVA, 10.30-12.00.
16.89	17,760	DJE, ZEESEN, 05.05-16.00.	31.48	9,535	LKC, JEJVOY, 10.00-13.00.
16.89	17,760	W2NE, WAYNE, discontinued.	31.48	9,535	W2XAF, SCHENECTADY, 21.00-05.00.
19.52	15,370	HAS3, BUDAPEST, S. 14.00-15.00.	31.49	9,530	ZBW3, HONG-KONG, 04.30-06.15, 08.00-14.30.
19.56	15,310	W2XAD, SCHENECTADY, 16.00-02.00.	31.50	9,523	ZRH, ROBERTS HEIGHTS, 04.45-12.30.
19.60	15,310	GSP, DAVENTRY, 18.45-23.00.	31.51	9,520	OZF, SKAMILIBAEK, 19.00-23.40.
19.62	15,280	LRO, BUENOS AIRES, 12.00-24.00.	31.51	9,520	HJ4BH, ARMENIA, 13.00-16.00, 23.00-03.00.
19.63	15,280	DJO, ZEESEN, 05.05-16.00.	31.55	9,510	H8SPJ, BANGKOK, Th. 13.00-15.00.
19.65	15,270	W2NE, WAYNE, 18.00-19.30.	31.55	9,510	G8B, DAVENTRY, 02.20-04.20, 08.15-10.25, 17.30-01.30.
19.66	15,260	GSI, DAVENTRY, discontinued.	31.58	9,500	VK3MI, MELBOURNE, w'days 09.00-12.00.
19.68	15,243	TPA2, PARIS, 11.00-16.00.	31.58	9,500	PR15, RIO DE JANEIRO, 21.45-22.45.
19.68	15,243	W1XAL, BOSTON, 18.30-21.00, ex. Sa.; S. 15.00-16.00.	31.58	9,500	NEWW, MEXICO CITY, 03.00-05.00.
19.70	15,230	OLR5A, PRAGUE, tests around 12.00.	31.63	9,484	EAR, MADRID, 21.00-00.00.
19.71	15,220	PCJ, HUIZEN, T. 08.30-10.00; W. 14.00-17.00.	31.80	9,428	COCH, HAVANA, 12.00-05.00.
19.72	15,210	W8XK, PITTSBURGH, 14.00-24.00.	32.09	9,350	COBC, HAVANA, 11.55-05.30.
19.74	15,200	DJB, ZEESEN, 05.05-16.00 and 21.50-04.00.	32.10	9,348	HBL, RADIO-NATIONS, Sa. 22.30-23.00.
19.76	15,180	G8O, DAVENTRY, 08.15-15.00 and 21.15-23.00.	32.15	9,330	OAX4J, LIMA, 17.00-20.00, 22.00-06.00.
19.80	15,160	YDC, BANDOENG, 03.30-07.00; 10.30-15.00; 23.00-00.30; S. 00.30-07.00, 10.30-15.00.	32.88	9,125	HAT4, BUDAPEST, M. 00.00-01.00; Th. 00.00-01.00; Sa. 23.0-24.00.
19.80	15,160	SBG, STOCKHOLM, M. to Sa. 16.00-22.00; S. 14.00-22.00.	33.32	9,030	COBZ, HAVANA, 12.42-05.03.
19.82	15,140	G8F, DAVENTRY, 08.15-17.00.	33.50	8,950	HCBJ, QUITO, between 12.00-03.15, ex. M.
19.84	15,123	HVJ, VATICAN, 15.30-15.45.	34.62	8,665	COJK, CAMAGUEY, 01.00-02.00.
19.85	15,110	DJL, ZEESEN, 15.40-21.30.	38.47	7,780	HBP, RADIO-NATIONS, Sa. 22.30-23.00.
20.04	14,970	LZA, SOFIA, 11.00-12.30, 18.60-20.45; S. 06.00-22.30.	40.65	7,350	NECK, MEXICO CITY, M. 00.00-01.00.
22.00	13,635	SPW, WARSAW, 23.00-01.00 or 02.00.	44.64	6,720	PMH, BANDOENG, 10.30-16.00.
24.52	12,230	TFJ, REYKJAVIK, S. 18.40-19.30.	45.00	6,660	HC2RL, GUAYAQUIL, S. 22.45-00.45; W. 02.15-04.15.
25.00	12,000	VZSP5, MOSCOW, from 11.00.	45.25	6,630	HIT, TRUJILLO, between 17.15-05.45.
25.23	11,880	TPA3, PARIS, 07.00-10.00; 16.15-23.00.	45.31	6,618	PRADO, RIOBAMBA, F. 02.00-04.30.
25.27	11,870	W8XK, PITTSBURGH, 00.00-03.00.	46.01	6,520	VY4RB, VALENCIA, 16.30-17.30, 22.30-02.30.
25.29	11,860	G8E, DAVENTRY, discontinued.	46.80	6,410	TTPG, SAN JOSE, between 12.00-04.30.
25.34	11,840	OLR4A, PRAGUE.	46.88	6,400	VY5RI, CARACAS, 00.00-04.00.
25.36	11,830	W2NE, WAYNE, 19.30-05.00.	47.10	6,396	VY5RF, CARACAS, 23.30-02.30.
25.40	11,810	I2RO, ROME, 10.00-18.30.	47.15	6,362	VY1RH, MARACAIBO, between 11.30-04.30.
25.42	11,800	COG1, MATANZAS, 22.00-01.00.	47.28	6,345	VY1RG, VALEPA, 22.30-01.30.
25.42	11,800	JZJ, TOKIO, 19.30-20.30.	47.85	6,270	VY5RF, CARACAS, 23.00-04.00, approx.
25.42	11,800	OPR3, VIENNA, 14.00-22.00.	48.05	6,245	HIN, TRUJILLO, 23.30-02.30.
25.45	11,790	W1XAL, BOSTON, 21.45-23.30; S. 20.00-23.30.	48.31	6,210	VY1RI, CORO, between 15.30-02.30.
25.49	11,770	DJD, ZEESEN, 15.40-04.00.	48.78	6,150	VY5RD, CARACAS, between 15.30-03.00.
25.52	11,750	G8D, DAVENTRY, 02.20-04.15; 08.15-10.25; 13.55-23.00.	48.80	6,150	CJRO, WINNIPEG, 23.00-05.00.
25.60	11,720	CJRN, WINNIPEG, 23.00-05.00; S. 18.00-03.00.	48.83	6,140	W8XK, PITTSBURGH, 08.00-06.00.
25.60	11,720	CR7BH, LOURENCO MARQUES, 17.10-21.00; S. 15.00-19.00.	48.88	6,136	CR7AA, LOURENCO MARQUES, see CR7BH (25.6 m.).
25.61	11,710	TPA4, PARIS, 23.15-06.00.	48.92	6,135	VE9H, HALIFAX, 15.0-05.00.
25.63	11,700	SDP, MOTALA, evenings.	48.92	6,135	VP3BG, GEORGETOWN, between 15.15-00.45.
25.64	11,700	HFA, PANAMA CITY, 16.30-19.00; 23.00-03.00.	48.94	6,132	COCD, HAVANA, between 14.00-06.00.
25.64	11,700	CFD7, SANTIAGO, 16.00-20.00; 22.00-05.00.	49.02	6,125	LKJ, JEJVOY, 16.30-22.00.
26.01	11,530	SPW, WARSAW, as SPW (22 m.).	49.02	6,120	W2XE, WAYNE, discontinued.
26.23	11,440	COCX, HAVANA, 13.00-06.00; S. 13.00-17.00; 23.00-03.00.	49.10	6,110	VUC, CALCUTTA, between 07.06-17.06.
27.17	11,040	CSW2, LISBON, testing evenings.	49.10	6,110	G8I, DAVENTRY, 23.20-04.15.
27.26	11,000	PLP, BANDOENG, as YDC (19.8 m.).	49.10	6,110	HJ6AB, MANIZALES, 23.00-05.00.
28.93	10,370	H8AB, TENERIFFE, between 19.35-01.00.	49.15	6,105	KRW2, KLIPHEUVEL, 17.00-21.00.
29.04	10,330	ORK, KUNSELEDE, 18.30-20.00.	49.18	6,100	YUA, BELGRADE, between 06.00-22.00.
29.24	10,260	IMN, BANDOENG, as YDC (19.8 m.).	49.18	6,100	W3XAL, BOUND BROOK, 00.00-06.00.
29.35	10,220	PSH, RIO DE JANEIRO, 22.00-23.00; 00.00-02.00.	49.20	6,097	ZRJ, MARASBURG, between 04.45-16.30.
30.18	9,940	CSW3, LISBON, testing.	49.26	6,090	CRCX, BOWMANVILLE, 17.00-01.00.
30.51	9,830	COCM, HAVANA, 13.00-04.00.	49.30	6,085	VUD, DELHI, testing.
30.52	9,828	FAQ1, MADRID, evenings.	49.31	6,083	VQ7O, afternoons until 19.15.
30.80	9,740	COCO, HAVANA, 12.00-06.00.	49.40	6,072	HVJ, VATICAN, 19.00-19.15.
30.93	9,706	"RADIO MARTINIQUE," Fort-de-France, 23.45-00.45.	49.42	6,070	VP3MR, GEORGETOWN, 21.15-01.15.
31.06	9,660	LRX, BUENOS AIRES, 14.30-04.00.	49.46	6,060	SDO, MOTALA, 18.30-22.00.
31.09	9,650	CS2WA, LISBON, T. Th. Sa. 21.00-24.00.	49.50	6,060	W3XAU, PHILADELPHIA, 01.00-04.00.
31.10	9,645	H83W, PORT-AU-PRINCE, 18.00-19.00; 00.00-01.30.	49.50	6,060	W8XAU, CINCINNATI, between 10.45-07.00.
31.13	9,630	I2RO, ROME, 17.21-02.00.	49.59	6,050	G8A, DAVENTRY, 17.20-23.00.
31.15	9,630	HJ7AB, BUCARAMANGA, 12.00-03.30.	49.67	6,040	W1XAL, BOSTON, 00.00-02.00.
31.21	9,612	HJ1AB, CAKTAGENA, between 12.00 and 03.30.	49.75	6,030	HP5B, PANAMA CITY, 22.00-03.00.
31.23	9,607	HP5J, PANAMA CITY, 17.00-18.30; 23.30-03.30.	49.75	6,030	OLR2B, PRAGUE, evenings.
31.23	9,606	ZRK, KLIPHEUVEL, 04.45-16.45.	49.83	6,020	DJC, ZEESEN, 15.40-04.00.
31.25	9,600	KW96, MOSCOW, evenings.	49.82	6,010	OLR2A, PRAGUE, evenings.
31.28	9,595	PCJ, HUIZEN, M. 00.00-01.00; T. 10.30-13.00, 19.00-20.30; Th. 00.00-02.30.	49.82	6,010	CJCN, SYDNEY, between 12.00-01.30.
31.28	9,595	YK2ME, SYDNEY, S. 06.00-08.00, 10.00-16.00.	49.82	6,010	PRA8, PERNAMBUCO, from 21.00.
31.28	9,595	YK6ME, PERTH, w'days 09.00-11.00.	49.82	6,010	COCO, HAVANA, 22.00-05.00.
31.32	9,580	W3XAU, PHILADELPHIA, 17.00-01.00.	49.94	6,007	ZRH, ROBERTS HEIGHTS, 15.00-21.00.
31.32	9,580	VLR, LYNHURST, w'days 02.35-13.30; S. 08.00-12.30.	49.96	6,005	CXA2, MONTEVIDEO, 21.00-24.00.
31.32	9,580	G8C, DAVENTRY, 02.20-04.20, 17.30-01.30.	49.96	6,005	CFXC, MONTREAL, 12.45-06.00.
			50.00	6,000	XEBT, MEXICO CITY, 15.00-05.00.
			50.00	6,000	VZSP5, MOSCOW, 20.00-24.00.
			50.17	5,980	CS2WD, LISBON, from 21.00.
			50.60	5,930	VY1RL, MARACAIBO, 23.00-03.00.
			50.90	5,893	VY3RA, BARQUISIMETO, between 17.00-03.00.
			51.28	5,850	VY1RB, MARACAIBO, between 15.30-03.30.
			51.72	5,800	VY5RC, CARACAS, between 15.45-02.45.

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