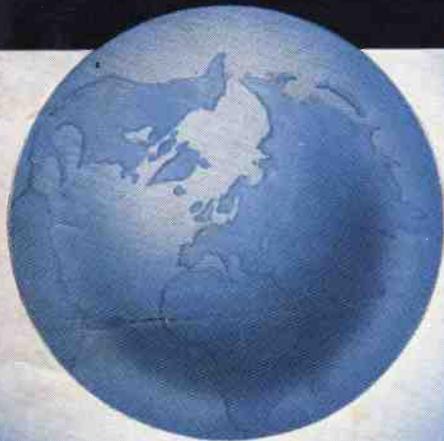


1/6

The
SHORTWAVE

Magazine



**EXCLUSIVELY FOR THE
RADIO EXPERIMENTER &
TRANSMITTING AMATEUR**

VOL. IV No. 10 DECEMBER 1946

WEBB'S RADIO

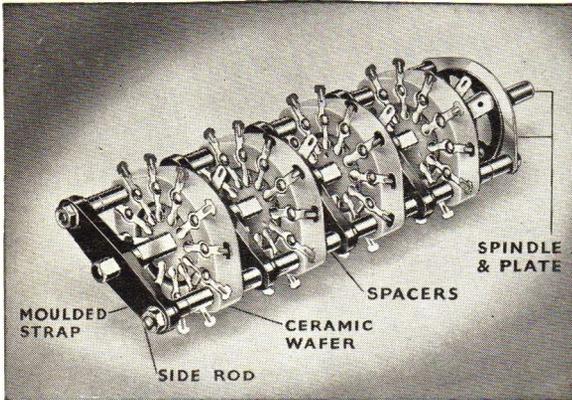
The Short-Wave Specialists—where you get the gear that gives the results

CERAMIC ROTARY SWITCHES for OWN CONSTRUCTION

A long-felt want is met by the WEARITE ceramic rotary switches, supplied in individual wafers and components. You assemble any desired combination of contacts to make the finest low-loss switch yet devised. Ideal for the super-efficient receiver and high-grade

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- 1-pole 12-way (use index type 12A)
- 2-pole 6-way (use index type 6A)
- 4-pole 3-way (use index type 3A)



- Ceramic wafer . . . 7s. 0d.
 - 6 in. spindle with Index 4s. 0d.
 - Side Rod, 2 1/4 in. long 3d.
 - Side Rod, 3 1/2 in. long 4d.
 - Side Rod, 6 in. long . . 6d.
 - Spacers, 1/8 in. long . . 1 1/2 d.
 - Spacers, 3/8 in. long . . 1 1/2 d.
 - Spacers, 2 in. long . . 4d.
 - Moulded Straps . . . 8d.
 - Nuts . . . per dozen 3d.
- One moulded strap is required for each wafer used. The 6 in. spindle supplied with the three types of Index can be readily cut down to required length.

EXAMPLE OF COSTING

Complete ceramic 2-wafer switch, each wafer 1-pole 12-way £1 1s. 10d.

TEST INSTRUMENTS

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Webb's 600 ohms Feeder, something new. Ready built in lengths of 50 and 35 feet. Spacing 3 1/2 in. with 18-gauge wire. Polythene spreaders securely moulded into wire every 20 ins., light and rigid construction. Supplied on drums ready for winding off, and immediate use.

- Per 50 ft. drum £1 17s. 6d.
 - Per 35 ft. drum £1 6s. 3d.
- (Packing and despatch 2/6 extra)

Co-axial Cable, impedance 80 ohms, outside diameter 1/8 in. Any length supplied Polythene internal insulation, weather-proof rubber outer covering.

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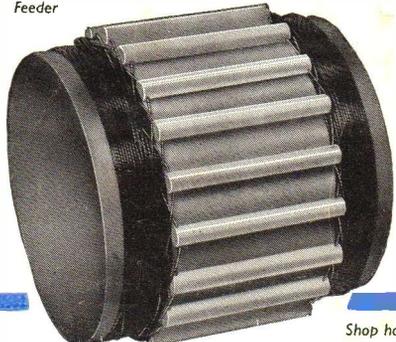
Per length with plugs and sockets, 15s. 0d.

SCREENING CABINETS

Webb's steel cabinets substantially built and well finished in black crackle, smooth black inside. In three sizes, each fitted with hinged lid, internal chassis and removable front panel. These sizes cover most requirements for the construction of receivers, amplifiers, wavemeters and instruments in general.

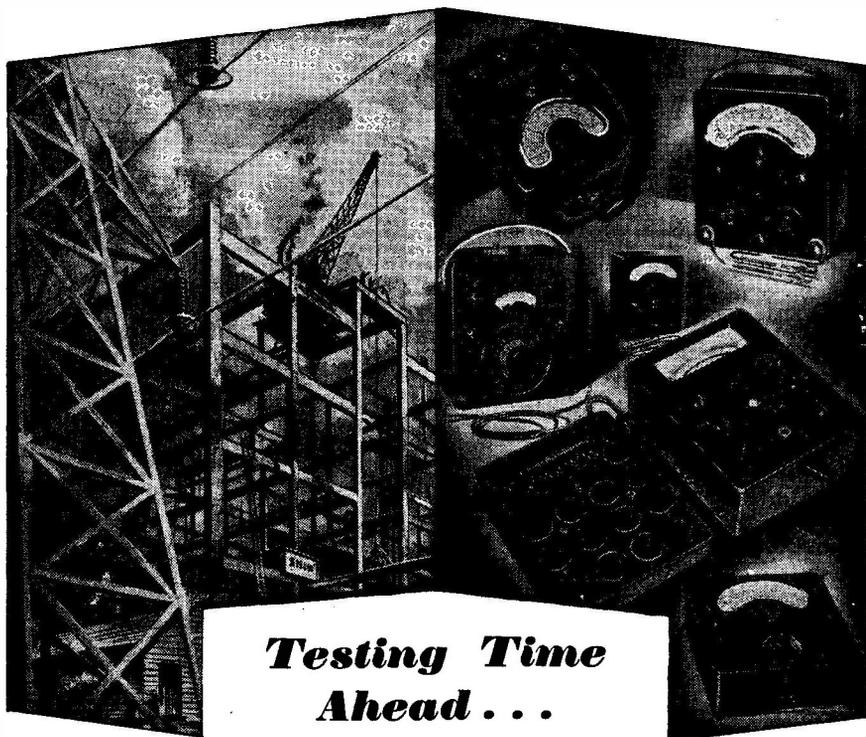
- No. 1033. 8 3/4 in. wide, 9 3/4 in. deep, 9 7/8 in. high £2 2s. 6d.
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- No. 1061. 6 1/2 in. wide, 6 in. deep, 7 in. high £1 10s. 0d.

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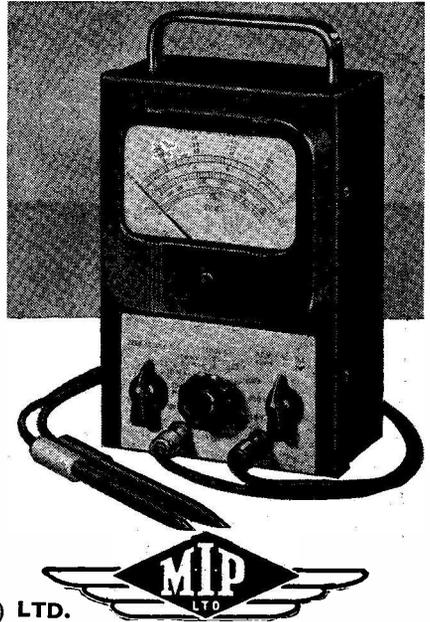
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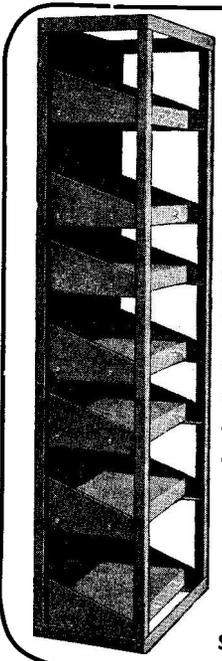
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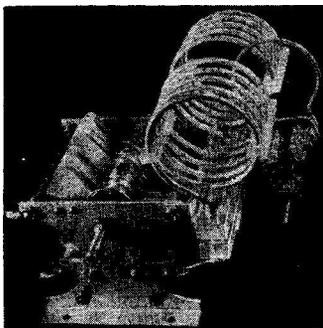
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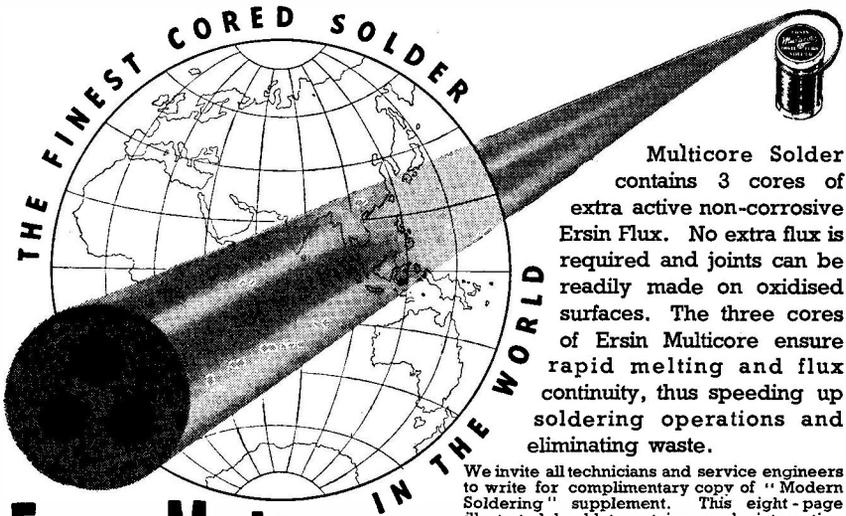
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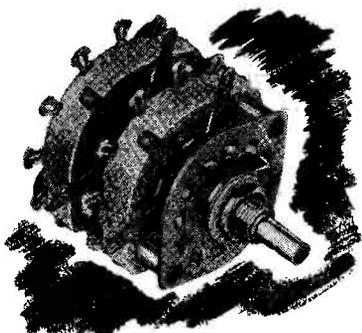
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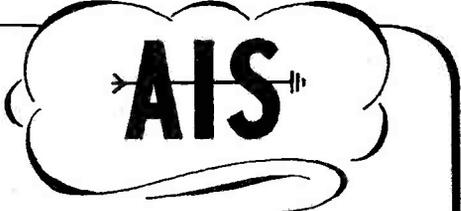
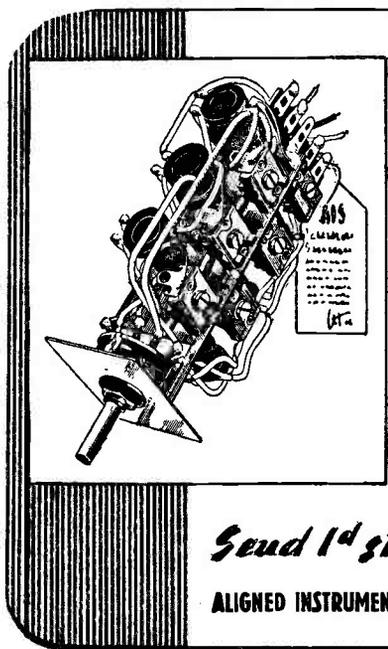
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5"	P5T	3.0	¾"	10,500	32,000	3 W
6½"	P6Q	3.0	¾"	8,500	26,000	4 W
6½"	P6T	3.0	¾"	10,500	32,000	4 W
8"	P8D	2.3	1"	6,200	24,000	5 W
8"	P8M	2.3	1"	8,000	31,000	5 W
8"	P8G	2.3	1"	10,000	39,000	6 W
10"	P10M	2.3	1"	8,000	31,000	6 W
10"	P10G	2.3	1"	10,000	39,000	8 W
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SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR AND AMATEUR RADIO

Vol. IV.

DECEMBER 1946

No. 10

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THE SHORT WAVE LISTENER ASSOCIATED WITH THIS
MAGAZINE IS SPECIALLY FOR THE RECEIVING ENTHUSIAST

These

days—

when the best replacements are still difficult to obtain, it is doubly important when buying *Radio Valves* to try to get MARCONI—the *real* thing

EDITORIAL

Goodwill

This is the season for it, and this is the space in which to take the opportunity of reminding those who may read these lines that much of what is best in Amateur Radio depends upon it.

As those of us who have had some years of experience know, the spirit of Amateur Radio is built upon the central theme of mutual co-operation. This in turn covers a very wide range of detail do's and don't's, from consideration for the other fellow to a sense of responsibility in one's behaviour both off and on the air.

 * TO ALL OUR READERS, at home and *
 * abroad, the Editor, Management and Staff *
 * of The Short Wave Magazine send their *
 * good wishes for a Happy Christmas and a *
 * Prosperous New Year. *

The spirit of Amateur Radio, like the spirit of Christmas, is a happy one. There is no need to be solemn, pedantic or priggish. But it is a good thing to regard the possession of a transmitting licence, with all the opportunities that it confers, as a privilege not to be abused. We pay for our licences, but the cost is as nothing compared with the huge enjoyment and satisfaction to be derived from Amateur Radio.

The point is that these benefits depend very largely upon someone else's goodwill, and therefore cannot be bought.

Austin Ford 12-66

Five Metres

*Contest Note—G/GM QSO—G5BY/G6LK
Record 100 Contacts over 156 Miles—
Activity Well Maintained*

By A. J. DEVON

WE go to press with this just as the Contest opens. All the signs point to a useful and interesting event, with plenty of activity, so we are greatly looking forward to seeing the results.

Please do not fail to meet the final date for sending them in—December 17. This is important because we want to be able to print a preliminary survey of the Contest in the January issue. If you look at dates, you will see that there is little enough time for even a short comment to be prepared on the results. The full story will appear in February "Five Metres."

The other point to which to draw attention now is Rule (8)—the manner in which results should be set out. If in all cases this is done in the form as laid down, it will help us greatly in making that first quick appreciation. And if you have any good photographs of the gear, please include them with your story. And please send in your log even if your scoring is low. All entries will be credited in the analysis tables.

Listeners are invited to enter their results, using Rule (6) as the basis for scoring, but claiming half-points if only a CQ call or one side of a contact is heard.

G/GM Working

In this column last month, we mentioned that G3BW (Whitehaven, Cumberland) had been heard by GM3OL (Dumfries). When GM3OL saw the article "First Steps on Five" in the November issue, he knocked up that RK34 push-push doubler just as described by G5UM and at the first time of trying, at 1900 on November 18,

he and G3BW had a solid QSO lasting 1½ hours. It shows what can be done with a little perseverance and we hope that this unadorned statement of the facts will inspire others. Though the distance Whitehaven—Dumfries is only 36 miles, the ice is broken and we now have a centre of activity in a new DX direction for the majority of the regular operators.

Anyway, well done both, and congratulations from the 58 mc fraternity on making what is according to our records the first G/GM QSO on the 5-metre band. It is certainly the first *post-war* contact, but before entering it as the first ever made, we had better ask for pre-war claims.

G3BW is on 58872 kc, with 25 watts to a CO-FD-FD-FD, and was Q5S7 on CW and 'phone at GM3OL, using a long-wire aerial; he planned to have a 3-element rotary up in time for the Contest, and may well have worked South ere you read this. Receiver is a National 1-10. He is there every evening except Tuesdays and Saturdays, and would welcome schedules with southerly stations.

GM3OL is on 59200 kc and uses an RME DM36 with an Eddystone 504; he was RST559 at G3BW when they made their first contact.

Five-Metre Firsts

While on the subject of first contacts, we now have the corroborating evidence from G2IC that the first G/F QSO was between G2FA and F8NW at 1150 on March 29, 1936. So it is duly entered in the panel which appears with this article, recording the dates on which these important events occurred.

It might just interest readers to know

that Amateur Radio publications all over the world now quote freely from this column, and we have seen our news items (and the "Five-Metre Firsts") repeated back to us in English, French, Dutch and German! Sometimes acknowledgment is made, but more often it is not—though in accordance with the usual decencies in these matters, we ourselves make a particular point of acknowledging the source when quoting from other publications. In this respect, a special word of thanks to W1HDQ, VHF Editor of *QST*.

Conditions—October/November

The best periods since the last report are generally quoted as October 22-23, October 29-30, November 4-8, November 10 and November 16. G2XC finds that none of these periods have come up to the exceptionally good spell in early October. The best of them was probably November 4-8, when G5BY and G8UZ had 100 per cent. contacts again on the 5th and 6th, and G5BD/G5LL (Mablethorpe) worked the Birmingham stations G2AK, G5JU and G5LJ for the first time. Also on the 4th and 5th, some of the South London stations were getting into Mablethorpe.

G3IS (Rugby) found conditions fairly satisfactory for inter-G working, and between October 10 and November 12 made 59 contacts with 15 new stations, in all directions, and all in the GDY category. This is very good going and there is no doubt that G3IS has now established himself as one of the "dependables" in the Midlands.

G8GX (Pinner, Middx.) found November 10-11 the best period in a rather poor month, and is still having difficulty in getting out to the North. In following the G5MA/G6YU schedule—now an established feature of 58 mc activity in the South—G8GX finds inexplicable variations in G6YU's signals when G5MA is giving Coventry S7. On November 10, G8GX worked G2AK (Birmingham) for an S7 'phone QSO, and has also brought G5BY into the log, so in spite of conditions he can feel well pleased with his indoor three-

FLASH—W HEARD ON 6 METRES!

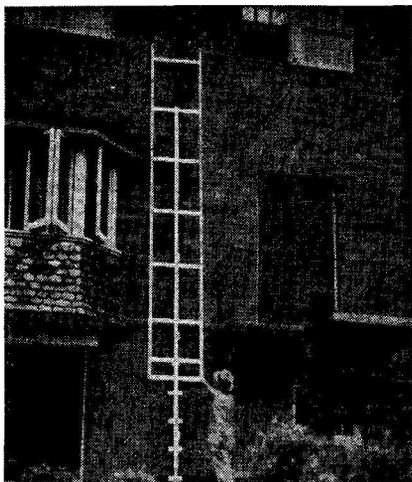
Between 1617 and 1720 on Sunday, November 24, G5BY and G6DH were receiving Trans-Atlantic signals from W1HDQ, West Hartford, Conn., on 50-003 mc. Cross-band QSO's were effected, with the two G's on 28 mc. W1HDQ made check transmissions for identification, correctly recorded by both G5BY and G6DH. He faded out at G6DH by 1700 but was still audible at G5BY at 1721. Peak strengths were S9 plus at G5BY and S8 at G6DH. 'Phone and CW reception were obtained. The MUF was high during the afternoon of November 24, and had been watched by G6DH for several hours. G5BY used a 4-element 51 mc beam for reception and G6DH a long-wire aerial.

Congratulations from us all to W1HDQ, G5BY and G6DH on this historic achievement.

element beam; an outdoor job, fed with 400-ohm line, is in hand. G8GX now has 61 stations worked.

G8LY (Nr. Basingstoke) has become a regular performer and is putting round a very good signal with simple gear, in spite of serious power supply difficulties—see note in Calls Heard this month. After frantically calling G5BY, she discovered from G2BMZ that with him her frequency is under a BBC harmonic! G8LY is another with an outside beam in prospect, rotatable from the operating position. At the moment, she has to run up two flights of stairs and climb out on to the roof when a rotation is required! Never mind, Constance, it's nice to hear you on the band.

G6YU (Coventry) found conditions generally good, especially on November 4, when nine contacts were made, including four new ones. The schedule with G5BD, each Saturday and Sunday at 2230, has so far failed to produce a QSO, though G5BD has been heard once under a BBC harmonic. They seem to get everywhere, these harmonics! G6YU's schedules with G2XC (0700) and G5MA (2215) are giving consistent results, over 122 and 93 miles respectively. During the period October 15-November 14,



Close-up of VK2EM's 50-54 mc pitchfork, before hoisting.

G6YU made 110 QSO's with 23 stations, eight of them being new contacts; his total of stations worked is now 44.

For G5BY (Thurlestone, S. Devon) it has been a very good month. Hilton remarks that on November 8 he and G6LK made their 100th contact—no mean achievement when it is remembered that the distance is 156 miles; by November 12, G5BY/G6LK had worked one another on 100 different days since April 20. By November 19, G5BY had logged no less than 212 inter-G contacts at distances greater than 150 miles! As W1HDQ remarked when comparing 6-metre (50 mc) results in the States with what is being done over here, the G5BY/G6LK link is better for *consistency* than anything they have yet been able to achieve in America. Greater *distances* have certainly been obtained, but W1HDQ's own best schedule is about 125 miles.

The evening of November 5 was outstanding at G5BY—his best night since July 23—and six 150-mile *plus* QSO's were obtained. When he worked G8UZ, neither of them could hear any other signals on the band! The peak time for conditions down there seems to be 1800-1930, and G5BY laments

the lack of activity during this period. As he says, if people would only come on earlier, it would help a lot in encouraging activity.

G5BY rightly contends that there is much yet to be learnt about the mechanics of 58 mc propagation. Night after night, irrespective of weather or other conditions, G6LK pounds in like a local, and G5MA and G6VX can be heard any time they shoot their beams his way. The puzzling thing is that while these stations are being so well received, others from the same localities are hardly if ever heard at the same time, unless conditions are exceptionally good.

As a matter of interest, we might remark at this point that the *Short Wave Magazine* will shortly be publishing a paper which makes an entirely new approach to the whole question of the propagation of waves at these frequencies.

Finally, a letter from G4DN (Battersea, London) who draws attention to the effect of noise generally and cosmic noise (from outer space) in particular on the performance of wide-band receiver and aerial systems; this applies especially to RF stages that have a wide acceptance—like a grounded-grid amplifier with untuned input circuit—and to the simpler types of receiving aerial, such as the open-wire or two-element beam. He suggests that due to variations in manufacture and this factor of noise, the actual sensitivity gain of a receiver using a grounded-grid RF stage may not be as high as expected.

In regard to cosmic noise, G4DN states that observations show this to be greatest when the constellation of Sagittarius, in the Milky Way, is in the ascendant. G4DN makes a special study of these cosmic phenomena as affecting the 30-60 mc range of frequencies.

Though he is relatively a newcomer to 58 mc operation, we are glad to record that G4DN makes a point that we have often hoped one of our correspondents would mention—that on five metres one can recapture the old spirit

of Amateur Radio, with everyone anxious to be friendly and out to help. If a bit of luck comes one's way in the shape of some unusual DX, metaphorically speaking everyone crowds round to offer their congratulations; if someone wants a new contact in a particular direction, a station will always be found ready to go to endless pains in assisting the QSO. Newcomers are welcomed with open arms, and even in the relatively crowded centres of activity, the regulars will line up to work a new call. We spend many hours listening on five, and are glad that G4DN triggered us off on this.

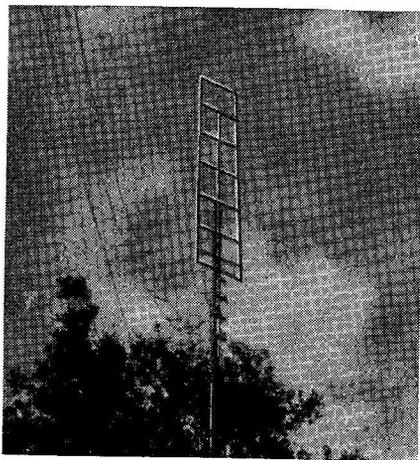
Shorts

From November *QST*, we see that WILLL is the first W1 to work all American call areas, a remarkable achievement on 50 mc by an *East Coaster*. . . . They have had very similar conditions in the States in respect of sporadic-E and temperature inversions, steady for long periods, as we have had over here. . . . The OK's still keep at it, but have heard no G's since our last report in October. . . . G3APY (Sutton-in-Ashfield), like G8TV (Romford) is "five metres only."

Reports January

Closing date for the January issue is December 14; please write or wire A. J. Devon, c/o *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1. (ABBey 2384).

May I end on a brief personal note—a very happy Christmas to the readers of "Five Metres" and my grateful



VK2EM's pitchfork aerial in position. The Australian band is 50-54 mc.

thanks for your consistent support and the kind remarks you so often make about this column. May we all look forward to a successful 1947.

W1AW—AUTOMATIC ON 50 mc

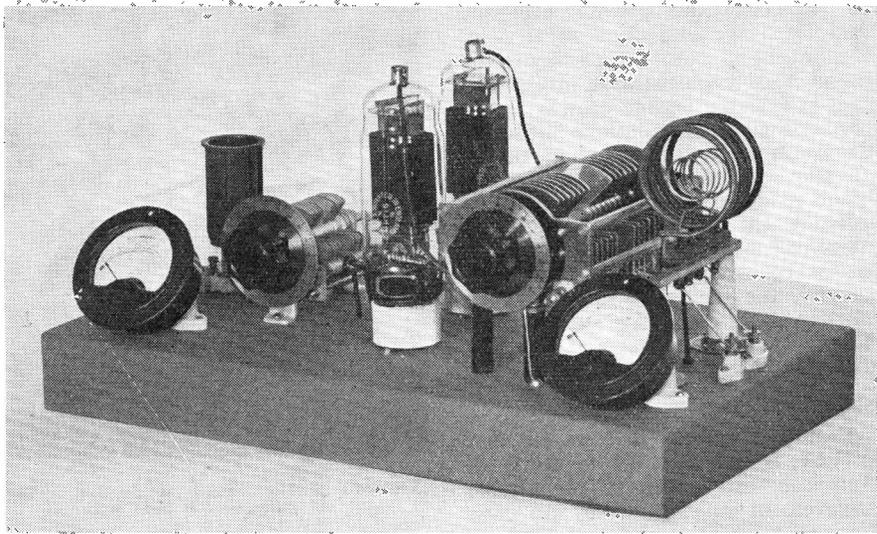
Consequent upon the reception of W1HDQ's 6-metre signals in this country, W1AW will transmit automatic CW on 50 mc, coded for identification, daily from 1300 GMT. Listen for him when the American 40 mc FM stations are audible, and report reception to *The Short Wave Magazine*.

R.C.M.F. TECHNICAL BULLETIN

A useful and informative publication, to appear quarterly, is now being issued by the Radio Component Manufacturers' Federation. The aim of the *Bulletin* is to make known to all interested in or concerned with the radio industry the decisions on standardisation and similar technical matters reached by the various Technical Panels and Executive Committees dealing with such subjects for the industry as a whole. At the moment, the R.C.M.F. has no less than sixteen panels considering various radio design and standardisation problems. The work is correlated with the B.S.I. and other bodies connected with the radio and electrical industries.

FIVE-METRE FIRSTS

France :	G2FA/F8NW, March 29, 1936.
Italy :	G5MQ/I1IRA, July 2, 1938.
Holland :	G2AO/PAØPN, August 17, 1939.
North Africa :	G5BY/FA8B, June 24, 1938.
Switzerland :	G5BY/HB9CD, August 22, 1946.



150 Watts Push-Pull

Using PT15's in a 14/28 mc PA

By L. H. THOMAS, M.B.E. (G6QB), *Assistant Editor*

THERE are two ways of looking at a final PA. Some amateurs build a semi-permanent exciter unit and spend a lot of time playing with different PA arrangements, while others hold that a PA is a PA anyway, and so long as its efficiency is reasonable and the input is right, there is not much more to be done about it. The writer belongs to the latter school, and feels that when one has a stable RF amplifier which covers one's working frequencies, takes 150 watts input, and gives a reasonable output in exchange, there is not very much point in playing with it. So most of the experimental work is carried out with exciter units, modulators, aeriels and control systems.

The PA described herewith is intended to be one of these reliable pieces of apparatus that can be in-

stalled on the bench, with its power supply, and practically forgotten thereafter. There is nothing "clever" about its design or construction; its circuit is straight and simple; but it is claimed that it is efficient and thoroughly trouble-free and, most important of all, that it does actually perform well.

Choice of Valves

Tetrodes and pentodes have become very attractive propositions since the war, on account of their availability, low price, and small requirements in the way of drive. They have their disadvantages in the matter of "touchiness," but that is usually traceable to layout and general handling; once they have been put together in a stable piece of equipment they can usually be

left alone without further trouble.

For this PA the PT15 pentode was chosen; first, because a pair of them with 1,000 volts HT will just run to 150 watts nicely, and secondly because quite a lot of amateurs who would cheerfully run 150 watts of CW look rather askance at the modulation equipment necessary for 150 watts of telephony. With the two PT15's in push-pull one can use 150 watts of telephony (with anode-and-screen modulation) or one can use suppressor-grid modulation at lower powers with practically no audio equipment at all.

Construction

When the PA was first on the stocks some experimental layouts were tried to see how much screening would be necessary, taking 28 mc as the highest frequency that would be used. PT15's rather ask for a horizontal layout with a vertical screen, but this makes the chassis a rather long affair and wastes a lot of space underneath the valves themselves. The vertical layout was therefore tried, with and without screening, and was found to work just as well either way. Provided that the grid and anode circuits are kept as far apart as they are in this layout, there is no interaction, and there is a certain advantage over the horizontal layout, in that the grid and anode circuits do at any rate start on opposite sides of the chassis.

So the pentodes were mounted vertically, and the anode coil and tuning condenser were lifted somewhat, to meet the anodes. The grid circuit components were kept down on the chassis, the grid coil being right out at one end with the anode coil at the opposite end.

This arrangement does give perfect stability and no screening whatever appears to be necessary.

It is also rather a nice layout on the grounds of accessibility, as the only components underneath the chassis are the two RF chokes (one at each end), the screen by-pass condenser C3, and the screen resistors R1 and R2. The meters (grid and HT) have also been mounted at the ends of the

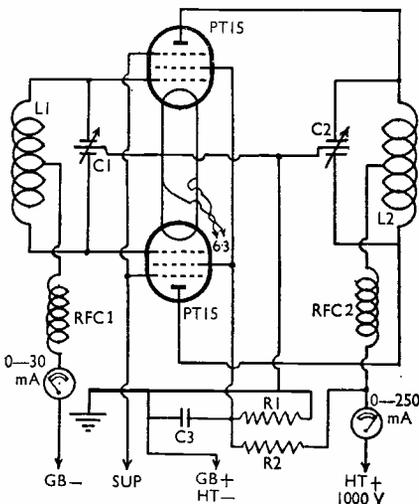


Fig. 1. Circuit of the amplifier, which uses a pair of PT15's. About 10-12 mA grid drive will produce 100 watts RF output (at 1,000 volts on the plates) on 14 and 28 mc. An amplifier of this type should never be run unloaded at full drive and plate voltage.

Table of Values

150-Watt Push-Pull Amplifier

L1	28 mc: 4 turns No. 16 SWG, spaced one diameter, 1 1/4-in. former.
	14 mc: 8 turns, No. 16 SWG, spaced one diameter, 1 1/4-in. former.
L2	28 mc: 4 turns 1/2-in. copper, 2 1/2-in. diameter, total length 2 1/2-in.
	14 mc: 6 turns 1/2-in. copper, 3 1/4-in. diameter, total length 4-in.
Aerial coupling: (for Windom)	28 mc.: 5 turns No. 14 SWG, 1-in. diameter.
	14 mc: 5 turns No. 14 SWG, 1 1/2-in. diameter.
C1	50 μμF, split stator.
C2	100 μμF, split stator.
C3	.01 μF, mica, 1,000 volt DC working.
R1	50,000 ohms, 10-watt.
R2	50,000 ohms, 10-watt, in parallel with 25,000 ohms, 20-watt.
RFC1, RFC2	RF chokes of reputable make, preferably dissimilar, but not critical.
Meters	0-30 mA, 0-250 mA.

chassis—not just to look pretty, but because those are the positions giving the shortest wiring. The former is in the lead from the centre-tap of the grid coil, and the latter in that from the centre-tap of the anode coil. Thus we have the two coils, the two RF chokes and the two meters symmetrically placed at the ends of the chassis, with the valves in the centre and the two tuning condensers between them and the associated coils.

Standard Circuit

So much for the layout. About the actual circuit there is very little to say. It is a perfectly straight push-pull arrangement using split-stator condensers for both circuits; the screens are in parallel, fed through a dropping resistor R2. The suppressor grids are also paralleled and brought out to a terminal so that suppressor-grid modulation may be used if desired.

The only constructional points needing comment are that the tank condenser is mounted two inches off the chassis and that the tank coil is similarly raised up on stand-off insulators. As the spacers for the condenser happen to be of insulating material, it has been earthed to the chassis by a wire at each end. Battery bias is used, so that grid-block keying of the crystal oscillator may be employed. The HT thus being left on the PA under “key-up” conditions, it is not feasible to use automatic bias.

Operating Data

For Class-C operation, the PT15's are run under the following conditions: Anode voltage, 1000; anode current (pair), 150 mA; grid voltage, -90; grid current 10-12mA; suppressor grid voltage, +40. The screen voltage has to be 300, and as the total screen current is nearly 50 mA, the screen dropping resistor R2 must have a value of about 15,000 ohms, and a rating of roughly 30 watts. Actually, two resistors were used in parallel—a 50,000 ohm, 10-watt, and a 25,000 ohm, 20-watt. These stand continuous working without any sign of overheating and give exactly the right screen voltage under operating conditions.

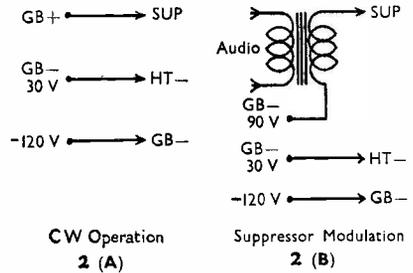


Fig. 2. Showing the bias connections for CW operation, 2(A), and suppressor-grid modulation, 2(B). In the latter condition, the carrier input would be about 70 watts.

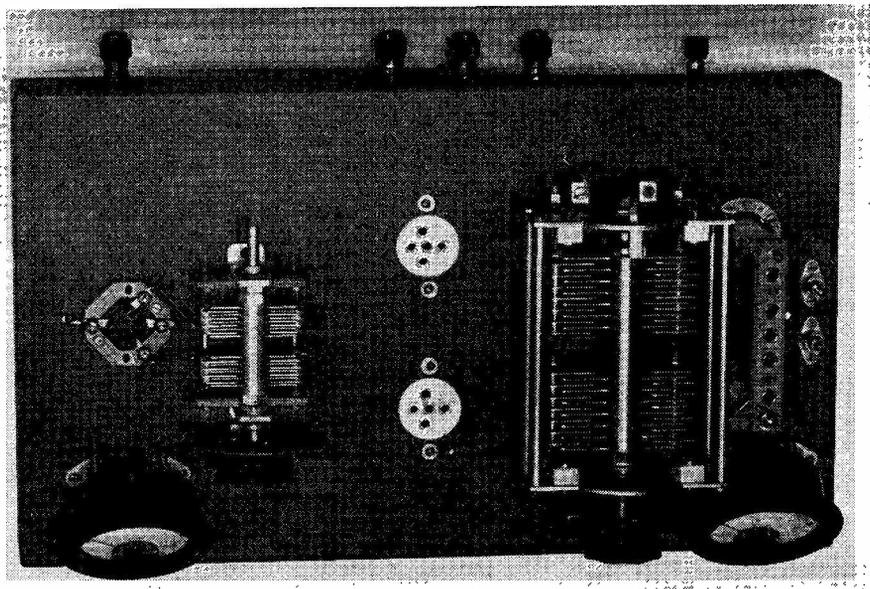
The reason for R1 should now be made clear. It is not part of a potential divider, although the circuit diagram might make it appear so. It is simply put in to prevent the screen volts from shooting right up to the full 1000 under “key-up” conditions. The PA is biased beyond cut-off, so that when grid-block keying of the CO is used, with the key up there is no anode current and no drive, and the screen voltage soars. But a 50,000 ohm resistor of 10-watt rating (R1) holds it down to a safe figure.

The necessary drive (giving a grid current of 10-12 mA) is easily derived from a 6L6 or 807 frequency-doubler preceding the PA; no buffer stage is used. Link coupling is employed, of course, with a single turn round the centre of the grid coil and a single turn at the other end, coupling to the tank coil of the doubler.

The grid coil, incidentally, is wound on a standard four-pin former. The ends are taken to the “filament” pins and the centre-tap to the “anode” pin. The anode coil is of $\frac{1}{4}$ -in. copper tube and is mounted on a base which accommodates not only the two ends and the centre-tap, but also the ends of an aerial coil mounted inside it.

Aerial Coupling

In the writer's own case it was desired to use a Windom type of aerial. One of the disadvantages of this is that it is never easy to couple it efficiently to a push-pull PA; obviously the



Vertical view of the chassis layout. Note the symmetrical arrangement of the parts.

feeder cannot be tapped on the tank coil, as it would unbalance the output circuit. Previous experiments with smaller transmitters, and particularly with a pair of 807's in push-pull, had shown, however, that a Windom could be fed very simply and efficiently by a small untuned coupling coil of the right size. Admittedly perfect symmetry cannot be obtained, since one end of the coupling coil will be at earth potential and the other will go to the feeder. By making the coil small physically, however, very effective coupling is obtained, and the PA does not appear to be pulled off-centre at all.

Many experiments in different coil sizes were made before the scheme worked perfectly, but eventually the values shown in the table were arrived at. It should be stressed that these are only suitable for a Windom arrangement, and that for feeding a dipole or other current-fed system the aerial coupling coils will have to be much smaller.

With regard to the Windom feed

used, it is obviously working as it should, because there is no "pull" of tank-circuit tuning when the aerial is connected. If the tank circuit is tuned to minimum "dip" with the aerial radiating, the aerial may then be removed, and the tune is right on the much sharper "dip" (20 mA) under no-load conditions. This is the only occasion on which the writer has been able to attain this ideal condition with a Windom aerial.

Other Coupling Methods

For other aerial arrangements readers must work out their own coupling data, but it seems probable that two turns for 28 mc and about four for 14 mc, of 1-in. diameter, tightly coupled inside the tank coil, will give the best results for current-feed aeri-als. Voltage-fed and Zepp systems will require different treatment, and are probably best dealt with by link-coupling out of this tank circuit to an aerial coupler situated near the actual lead-in. A Windom feeder can be brought six or eight feet into the station with impunity,

provided that it does not hug the walls or go round sharp corners; it is of lowish impedance and virtually non-radiating.

Tuning

There is nothing unusual about the tuning adjustments. With the drive applied, tune the grid circuit for maximum grid current, and adjust the coupling of the link at both ends to give the desired value—or about 50 per cent. more, as it will drop when HT is applied to the PA. Confirm that the PA is stable by swinging the tank condenser before applying the HT. There will, on 28 mc, be a slight "flick" of the grid current meter, but this does not affect the stability under working conditions. (Incidentally, do not try this without first coupling the aerial to the PA; it is not claimed that it is dead stable with no aerial loading!)

Next apply the HT, tune the tank circuit for minimum anode current, and confirm by thermo-ammeter or neon tube that this corresponds with maximum output. The PA should drive up to about 220 mA, dipping to 150 mA at optimum aerial coupling. Finally, confirm that when the key is up there is no RF in the tank circuit. The 0-250 milliammeter will give a small reading, because screen current and the current through the resistor chain read on this meter; but no tuning of either grid or anode circuit should alter this reading.

Modulation

At this stage we may be said to be on the air! Now it remains to modulate the PA, if telephony is wanted. Having 80 watts of audio output available, the writer uses anode-and-screen modulation, which of course implies no more than inserting the secondary of the modulation transformer between the HT+ terminal and the HT supply. For this method, by the way, the suppressor grids may be left at 40 volts positive, which may be derived from the same battery as the grid bias. In actual fact, for convenience a 120-volt battery was used, 90 volts being applied as grid bias and the

remaining 30 as positive voltage for the suppressors (Fig. 2A).

For suppressor modulation this connection must be changed over to 60 volts negative, which is applied in series with the secondary of a 1:1 transformer from the speech amplifier (Fig. 2B). About 6 watts of audio gives 100 per cent. modulation, but the input, of course, is now down to about 70/80 watts.

No startling claims are made for the PA's performance on the air, but it would appear to do justice to its 150 watts input, as its first try-out on 28 mc produced a series of S9 reports from West Coast Americans. Since then an S9 telephony WAC has been collected (in two days), also on 28 mc. The 14 mc band has been fully explored, and reports on this PA appear to be slightly better than on the previous one in use, which ran with 150 watts input to a single 813.

AMATEUR RADIO IN JAPAN

The Military Government (HQ American 8th Army) of Japan is issuing licences to Service personnel, British and American, who were either pre-war holders of amateur licences or can pass a Morse test and technical examination.

The frequency allocations are 7150-7300 (CW), 14100-14200 (CW), 14200-14300 ('Phone), 28000-297000 (CW), 28100-29500 ('Phone), 50-54 mc (CW/'Phone) and 144-148 mc (CW/'Phone). The power limitation is quite reasonable—just the one kilowatt!

Japan has been split into eight zones for licensing purposes, J2-J9, all British Occupation Force personnel being located in J4 (South Honshu and Shikoku). The latest information is that five J4's are active—4AAA, 4AAB, 4AAC, 4AAD and 4AAE. J4AAB uses 900 watts, J4AAC 200 watts and J4AAE 75 watts, all in the 14 mc band.

Major J. M. Drudge-Coates, J4AAC, reports that Europe is the most difficult of the Continents to contact, the others being heard and worked fairly consistently. A short list of G calls heard by him in Japan appears in the appropriate space.

Grounded-Grid Technique

Design for 58 mc RF Stage—Some Audio Applications

PART II

By R. KNOWLES, B.A. (G3AAT), Instr. Lieut., R.N.

(The first part of this article appeared in our November issue. Further practical material on the same subject is in preparation.—Ed.)

At the time of writing only the 60 mc band is available in the VHF spectrum, so that only circuits for this band will be described. The construction of an aperiodic RF stage will be dealt with first and then some miscellaneous applications.

The function of the suggested circuit for the RL37 (CV66) is to provide an increase in signal-to-noise ratio in an existing 60 mc receiver, or to perform the same service in receivers that readers may be contemplating designing. No selectivity gain will result from it and on no account should it be used to precede a detector stage.

In the last article, approximate figures were given for the RL37 and here they are again for reference. The input impedance is 150 ohms in parallel with $10\mu\mu\text{F}$ and the output impedance that can be expected with a ceramic valveholder is 10,000 ohms in parallel with $10\mu\mu\text{F}$.

The matching of the valve to the aerial and the subsequent stage is the immediate problem. Taking an 80-ohm cable as being the commonest in use and likely to be generally available, the impedance must be transformed to 150 ohms and the capacitive reactance cancelled out. This matching can best be done by a series resonant circuit, the input being applied across both C2 and L1, the valve being across the C element only. Fig. 5 puts this diagrammatically. It can be shown by calculation that total C2 is $16.5\mu\mu\text{F}$ and that L1 must be $.175\mu\text{H}$, at 60 mc. The valve provides $10\mu\mu\text{F}$ (Cin) of the 16.5, so that only $6.5\mu\mu\text{F}$ have to be added.

Unfortunately, $6.5\mu\mu\text{F}$ condensers are not made, so a trimmer will be used for C2 and it will allow for the inevitable stray capacities. The inductance L1 could consist of a straight piece of 20 gauge wire 12 inches long, but a coil would be easier to mount. The number of turns required is a matter for experiment, though empirical formulæ serve as guides for coil winding.

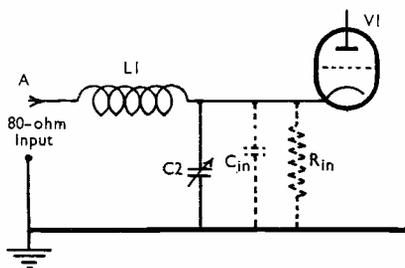


Fig. 5. The input side of the common grid amplifier. In this circuit, the input capacity Cin of the valve is $10\mu\mu\text{F}$, and its input impedance 150 ohms at 60 mc.

The band-width of this circuit has been shown to be about 100 mc (Part I), which precludes the necessity of variable tuning for it. It will require initial setting-up and this is done by adjusting the trimmer till the maximum noise output is obtained. The input must be correctly terminated for this adjustment.

The Output Circuit

The output circuit, Fig. 6, is straightforward, the inductance L2 resonating with the stray capacity of the anode.

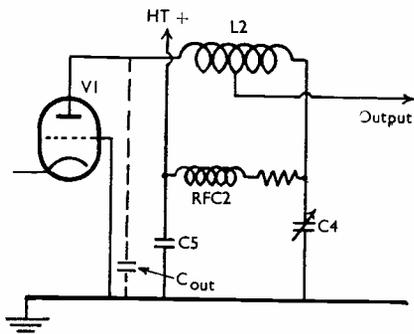


Fig. 6. The output side of the common grid RF amplifier. The output capacity C_{out} is $10 \mu\text{F}$.

The effective value of the inductance is varied by C_4 , which is in series. Allowing $10 \mu\text{F}$ for the anode capacity, the inductance L_2 will require to be $8 \mu\text{H}$; this will take care of possible variations in different layouts. The series condenser C_4 can well be an $150 \mu\text{F}$ trimmer. Its exact value is not critical but its maximum value must not lie below $75 \mu\text{F}$, or its effect on L_2 will be too drastic. As for C_2 , it is adjusted for maximum noise in the output.

A Practical Circuit

The band-width or acceptance of the circuit is just adequate to cover the 60 mc band if the anode stray capacity is kept at the value given above. C_1 (see Fig. 7) is a blocking condenser for the DC bias produced by the cathode current flowing through R_1 . The heater leads must be taken through RF chokes to maintain the input capacity at the required figure.

During some experiments conducted by the writer on 200 mc oscillator circuits, a resistor corresponding to R_2 was found to be necessary in order to prevent the RF choke in the anode circuit resonating with C_4 , the impedance of L_2 being very low at this frequency. The grid of the following stage is tapped on to the coil L_2 at a point which gives the best signal-to-noise ratio, again a matter of experiment. A Mullard RL7 as frequency changer is the valve recommended to follow the RL37, and if desired C_3 may

be used to vary the coupling to its grid.

Fig. 7 shows the complete circuit, the values for which are given or can be extracted from the table on p. 608 for the valve employed. It is advised that the grid be earthed at one of the grid pins and the anode circuit returned to the other. If this will involve long leads or other bad features of layout, then it is better that both grid pins should be earthed directly at the socket. For 200 mc use, the grid is earthed through a series resonant circuit, to avoid the effect of grid lead inductance. This practice is unnecessary at 60 mc.

Common Grid Triode Oscillator

By intentionally making the cathode-anode capacity appreciable, an oscillator can be designed which has uses at the higher frequencies. A simple way to understand the mode of operation is to remember that the input and output voltages are in phase; under these conditions coupling between the two can cause oscillation. Some triodes have this capacity as part of the electrode system. For example, the Standard 3A/147J, which is similar in appearance to the 3A/146J shown in Fig. 4. In order to make such a valve generate oscillations, the anode self-capacity is resonated with an inductance in the same circuit as the one in Fig. 6.

A normal triode such as the 6J5 can be used in this way at 60 mc, the writer having found that the cathode-anode capacity is adequate to maintain oscillation. Lower frequencies may be generated by using the normal tank circuit and adding an external capacity between the anode and the cathode. The smallest value of capacity which will maintain oscillation should be used, otherwise the low cathode-earth impedance will shunt the tuned circuit and the frequency stability will be poor. The cathode, and for VHF, both heater leads must be taken through RF chokes as the cathode must be free to "move" at RF. If the heater leads are earthy in an RF oscillator, unless DC heating of the cathode is used modulation of the output at mains frequency may occur. As RF chokes capable of carrying heater current and possessing

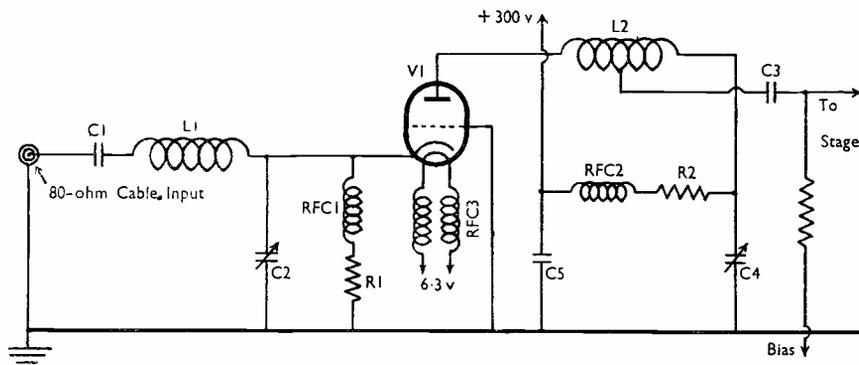


Fig. 7. Complete circuit for 60 mc RF amplifier. Values are given in the table and the valve used is a Mullard RL37—see table of valve characteristics.

adequate inductance are not easily obtainable, the circuit is not recommended for the lower frequencies.

Power Amplification

The common-grid triode circuit has been in vogue lately for use as a final stage on the amateur bands and also for decimetric waves. At lower frequencies the absence of need for neutralisation is the only point in its favour. There are difficulties to be encountered with the heater leads and it just asking for trouble to omit the choke or equivalent with valves having unipotential cathodes. The entire drive voltage would appear across the heater-cathode insulation, which was certainly not allowed for by the manufacturer and sooner or later the insulation will break down.

If, in spite of all these pitfalls, the reader decides to use this circuit at HF as distinct from VHF, there are one or two points of interest. One heater can be joined to the cathode and the two supply leads can be wound into the coupling inductance in the same way as should be done in the Dow ECO circuit. The other salient point to remember is that the drive must come from a low-impedance source, as the input impedance of the stage is low. This means a step-down transformation ratio from the anode of the previous valve.

Top cap anode valves are desirable to reduce the cathode-anode capacity ;

Table of Values—Fig. 7.

R1	= 150 ohms
R2	= 4,700 ohms
C1	= 200 $\mu\mu\text{F}$
C2	= 15 $\mu\mu\text{F}$
C3	= 50 $\mu\mu\text{F}$
C4	= 150 $\mu\mu\text{F}$
C5	= 100 $\mu\mu\text{F}$
L1	= 0.25 μH
L2	= 8.0 μH
RFC1 } RFC2 }	= 5-metre RF chokes
RFC3	= Double-wound low resistance choke.

some valves have so much capacity that neutralisation will be necessary. The 807 is not the ideal valve for this service, because the internal shielding and beam forming plates cause feedback. Linear modulation of the stage is difficult to obtain with anode modulation. Grid or cathode modulation can be tried, with an AF choke in the anode circuit between the decoupling condenser and the HT supply.

Audio Amplification

The circuit can be used for low level AF amplification and, with modifications, to replace an input transformer when matching to a moving coil microphone where noise begins to make itself felt.

If instead of making the grid "sit" at earth potential, another valve is used to make it "move" out of phase with the cathode, an enormous voltage gain

can be realised with corresponding reduction in input impedance. In the circuit of Fig. 8, V1 can be made an anode follower with a gain of say 10 times and if V2 has a mutual conductance of 10 mA/V, then the input impedance will be 10 ohms. The stage gain is approximately the ratio of the anode load of V2 to its input resistance, as the same current flows through both resistances. Again, an RL7 is recommended for the anode follower and V2 can well be another RL7 or EF50, triode or pentode connected (screen decoupled to cathode instead of earth). If V1 is not fed back, trouble in the way of microphony may

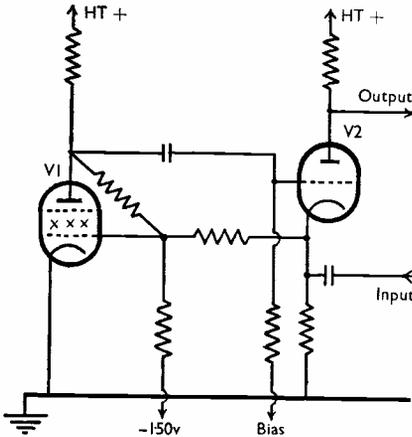


Fig. 8. Microphone matching circuit. The working of this arrangement, an audio amplifier giving a high voltage gain, is described in the text.

be encountered and linear operation of the circuit may be found difficult to obtain. A high slope valve should not be used in this position unless feedback is employed.

A source of -150 volts stabilised by a VR 150-30 voltage-stabiliser is to be desired wherever anode followers are used and is invaluable for all biasing purposes, especially for Fig. 8.

When the writer rebuilds (how often is this phrase heard!) the circuit of Fig. 8 will be used to match a moving-coil microphone to the amplifier, and it is hoped that all trace of hum usually

associated with low level transformers will go. The negative 150 will supply all stages of AF with bias, all possible cathodes being earthed to prevent hum from this source. It is advisable to earth V1 cathode even if later stages have cathode bias; V2 cathode cannot be earthed and DC might have to be used for the heater. As the cathode-earth impedance is so low the effect of capacitive hum transfer will not be serious, but magnetic hum pick-up is what is in mind, the gain being so great.

Since no phase-reversal occurs with the common grid circuit, it can be used in conjunction with the cathode follower for phase-splitting. Fig. 9 (A) shows how this is to be done using a double triode. With a pair of pentodes instead of the triodes, circuits useful for a multitude of purposes can be constructed. Suppressor switching is illustrated in Fig. 9(B). When V1 is cut off on its suppressor, the screen still takes current and cathode follower action still occurs, V2 giving output. If V2 is cut off on its suppressor, V1 acts as a straight amplifier, giving output in opposite phase. The anodes can be joined and electronic phase-reversal can be obtained. A square wave can be made to cause this reversal if it is applied to the suppressors and is of sufficient depth to cut the valves off on their suppressors. This has uses for cathode ray monitor oscillographs.

Suitable Valves

It is very probable that many readers will by now be in possession of odd-looking pieces of glassware, picked up as scrap, whose use may seem to be a little obscure. Some of these oddities may be common grid triodes and can be recognised in Fig. 10, which is a representative collection of such valves. Fig. 4 in the previous issue shows two more types.

On p. 608 is a table of the characteristics of commercial valves which are suitable for common grid working. The figures given are mean values and no responsibility can be admitted for their corresponding to the measured characteristics of valves possessed by readers. If care is taken with layout,



Fig. 10. Left to right—the CV273, RL37 (CV66), CV139 and E1368 (CV90). These are all grounded-grid types.

valves such as the 6J5 may be used, but not at VHF. The absence of phase reversal may result in the arrangement of a stage in this manner, saving a valve.

Conclusion

It has only been possible to touch very lightly on the subject of the Common Grid Amplifier or, as it is sometimes called, the Grounded Grid Amplifier. If the reader wishes for further information, he is advised to apply directly to the makers of the

valve he intends using and more complete data will be given.

Some of the circuits illustrating this article are covered by patents and therefore should not be used in apparatus which is intended for the market. This point will not affect the true amateur, but there are some concerns which make up circuits from amateur designs and market them.

I also wish to record my thanks to the firms and departments who have made this article possible by their whole-hearted co-operation, and with-

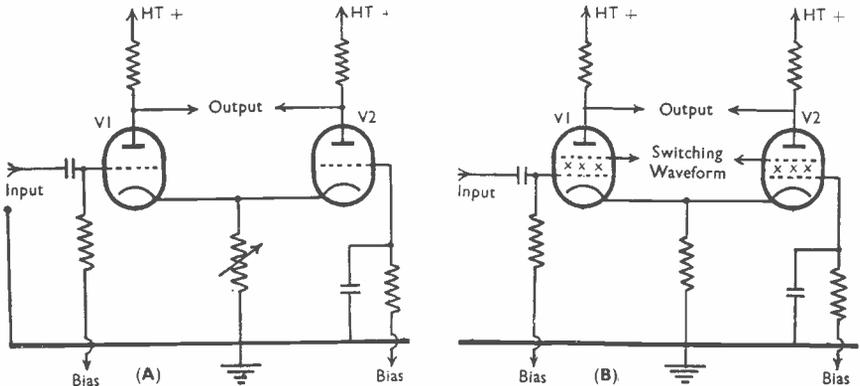


Fig. 9. Phase-splitting circuits using the grounded-grid technique. (B) can be applied to cathode ray monitor oscillographs.

out whose help much of the information included would not have been available. Messrs. Mullard Wireless Service Co. Ltd., advise that their type RL7 is available in small quantities

under the new designation of EF54. Whilst this is not a triode, it has been recommended here for some of the stages associated with the common grid triode.

Valve type	RL37	3A/145J (S25A)	3A/146J (S26A)	3A/147J (S27A)	3A/148J (S28A)	S30A	—	E1368	VX3018	—
Service Number	CV66	CV16	CV53	CV82	CV88	CV127	CV139	CV90	CV273	CV288
V_h	6.3	4.0	4.0	4.0	6.3	6.3	6.3	6.3	—	—
I_h	0.45	0.65	0.65	0.65	0.3	2.0	0.3	0.6	—	—
V_a max.	300	350	350	350	350	—	250	350	—	—
I_a max.	25	—	—	28	—	60	15	—	—	—
W_a max.	3.0	3.0	2.0	6.0	3.0	40	2.5	10	10	250
μ	98	100	100	34	100	23	100	35	—	—
g_m	9.0	5.0	5.0	6.0	5.0	3.0	9.0	5.0	6.0	—
V_{g1} R_k	1.5 150 Ω	150 Ω	150 Ω	$W_g = .5$	15 0 Ω	$I_g = 15$	1.5	—	—	—
V_a W_{kg}	250	250	250	—	—	$W_o = 15$	250	—	—	—
I_a Wkg	10	—	—	—	—	—	10	—	—	—
C_{gk}	9.8	4.0	4.0	4.0	4.0	6.0	5.1	2.25	—	—
C_{ag}	7.5	1.6	1.7	—	1.5	5.5	3.6	1.9	—	—
C_{ak}	0.12	.035	.035	—	.035	0.2	0.1	.065	—	—
Max. Freq. mc	250	600	450	750	600	600	250	—	3000	1000

EXPLANATION OF SYMBOLS

- V_h Heater or filament voltage.
 I_h Heater or filament current in amps.
 V_a Max. Maximum anode voltage.
 I_a Max. Maximum anode current in mA.
 W_a Max. Maximum continuous anode dissipation in watts, with cooling.
 μ Amplification factor.
 g_m Mutual conductance in mA/V.
 V_{g1} Grid bias in volts.
 R_k Cathode bias resistor in ohms.
 V_a Wkg Working anode voltage at which g_m is measured.
 I_a Wkg Working anode current in mA at which g_m is measured.
 C_{gk} Capacity between cathode and grid in $\mu\mu$ F.
 C_{ag} Capacity between anode and grid in $\mu\mu$ F.
 C_{ak} Capacity between anode and cathode in $\mu\mu$ F.
 Max. Freq. Makers' recommended maximum operating frequency in mc.
 I_g Grid current in mA.
 W_g Grid dissipation in watts.
 W_o Wattage output at a wavelength of 50 cm.

The Short Wave Magazine covers all current Amateur Radio Activity

More on the EF50 Receiver

Notes Arising from Correspondence

By J. HUM (G5UM)

(In the August issue, we featured a TRF receiver using EF50's in three stages. This is a design which has proved remarkably popular and has given rise to a good deal of correspondence. Our contributor discusses below the main points brought forward in readers' letters.—Ed.)

Had the writer been able to visualise the great interest that his article on the EF50 TRF receiver was to arouse when it appeared last August he might have gone into the subject in greater detail. For in those ensuing months he has been kept busy answering a large number of letters. The heavy mail to which the article has given rise shows, first, the need for an inexpensive and simple receiver of this kind; and secondly, the great enthusiasm and perspicacity of to-day's Amateur Radio constructor.

Out of all the mail came two questions more frequently than any others. They were:

What is the value of the resistor in the RF stage anode circuit? and

Could you give me a circuit of a simple audio stage?

The answer to the first question is to apologise for the omission and to add that since the resistor concerned is used for decoupling, its value is not critical and may be anything from 5,000 to 30,000 ohms.

Output Stage

The answer to the second will be found on page 610, where a simple output stage is shown. A 6V6G valve is specified as it gives "a lot for a little," is docile and, above all, is common with the EF50's used in the rest of the set by employing a 6.3 volt heater. The volume control shown is not essential since one is already incorporated ahead of the EF50 first audio stage. If the latter is used the output stage grid return resistor can be half-megohm fixed.

One correspondent remarked that the use of the EF50 as an audio valve represents "the waste of a really fine tube." It might therefore be explained that its employment in this service was recommended so that constructors need have only one replacement worry instead of three! If you use, say, 6J7, 6C5 and 6J5 valves that means three different types of which you have to carry spares. Now if you standardise on the EF50 you have but

one type to carry as spare—and it will cost you no more than American types (yet will work a lot better!).

It may be added here to intending constructors of an output stage that on all frequencies up to 15 mc the EF50 receiver will deliver as much power to a speaker as the average amateur station can stand—and that with only 150 volts HT. Therefore, try it without an output stage first, using as much HT as you have available. Then if you want still more noise button on that output stage.

Construction

Many correspondents have asked for constructional details for the receiver. Here one must assume a certain minimum standard of practical knowledge on the constructor's part; indeed, one cannot reiterate too often the advice to "work it out for yourself and don't stick too closely to rule of thumb."

Obvious pieces of advice on construction are: Use sub-assemblies where possible, or at least anchor resistors and condensers to soldering tags; do not suspend them in the wiring. To prevent interaction of RF and AF sections run all AF leads—that is those from detector anode onwards—in screened wiring, and earth the screening. Twist heater leads together and run them in the angle of the chassis, keeping them well away from other wiring.

If modulation hum is experienced on the higher frequencies try a .001 μ F fixed condenser from each heater lead to chassis right at the point where the heaters enter the set. Also connect a .001 μ F condenser in parallel with the HT by-pass condenser C11.

Mount the RF and detector stage coils and cans hard up against the appropriate sections of the gang condenser to keep leads therefrom short and symmetrical.

RF Cathode Resistor

Several correspondents have queried the use of the 32 ohm resistor specified for the RF stage. This value was advocated

because it appeared to minimise break-through of the BBC stations only four miles away from G5UM—an important factor on the 1.7 mc band.

To obtain maximum gain from the EF50 RF stage a much higher value of cathode resistor is preferable, a good average value being 250 ohms. Indeed G2YL has successfully used a value of 500 ohms in that position, with still further increased gain—which is another example of the desirability of “trying things for yourself”!

RF Chokes

Several correspondents have asked if standard 2.5 mH RF chokes can be used in place of the scramble-wound types specified. The answer is, of course, “Yes.” We advocated the other in the interests of economy!

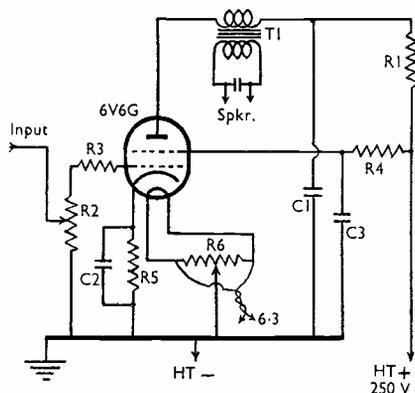
Here again one can only suggest “average values.” A painstaking constructor by winding a number of different sizes of RF choke and trying them in turn would probably improve the efficiency of this receiver still further. The great thing is to ensure that the combination of RF chokes in series presents the necessary impedance at all frequencies to be used. Obviously a broadcast-type choke will suit the bill for 160 metres but will act more as a capacity on 10 metres than as a barrier to RF energy. Hence the need to connect in series with it a good short wave choke such as can be constructed by winding 100 turns on a half-inch former. But, as we say, “experiment”!

Another persistent one: “How do you get the all EF50 TRF receiver to work on 5 metres (we saw your list in ‘Calls Heard’)?” has already been answered by the article on this subject last month.

In Conclusion

It is hoped thus to have disposed of most of the queries our various correspondents have raised—and thereby to be left in peace for a while! In conclusion, the remarks of a successful user of the receiver, F. Ambrose, of Shaftesbury, are quoted—a constructor, incidentally, who obviously thinks things out for himself, as the following extracts from his letter will show:

“I’ve built a replica of your receiver in a black crackle steel box, and the power pack with 100 kc crystal oscillator in another box of similar type. I had to modify your circuit slightly owing to reaction and coupling difficulties between RF and detector. I’m using tuned transformer and these two circuits are not ganged. Except for that and the use of Eddystone six-pin coils in both stages the



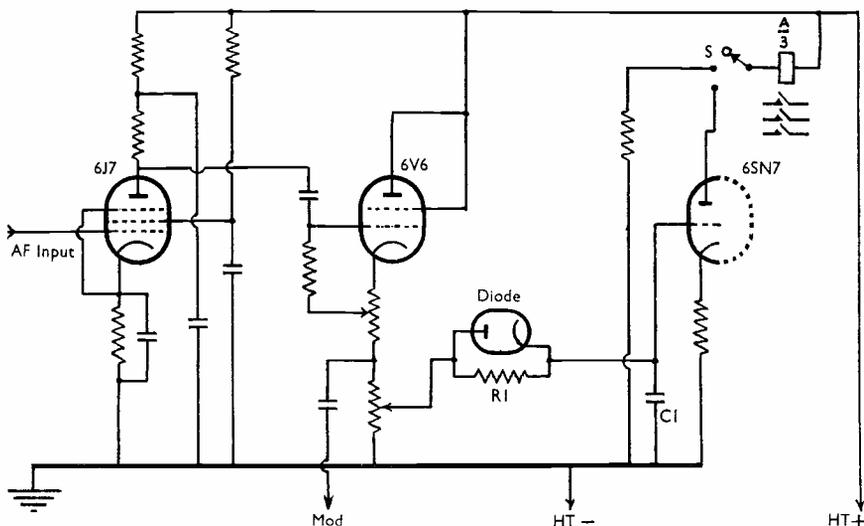
Circuit for an additional LF amplifier for the EF50 TRF receiver, described in the August issue. #R6 is to balance the heater to ground for hum elimination.

Table of Values

Audio Stage for EF50 Receiver

R1	5,000 ohm anode decoupling resistor.
R2	500,000 grid resistor (or potentiometer).
R3	5,000 ohm grid stopper.
R4	10,000 ohm screen decoupling resistor.
R5	250 ohm bias resistor.
R6	50 ohm wirewound humbucking resistor.
C1	Anode decoupling condenser (2 to 8 μ F.)
C2	Cathode by-pass condenser (25 μ F.)
C3	Screen decoupling condenser (2 to 8 μ F.)
C4	Tone corrector (about .01 μ F.)
T1	Output transformer, to match 5,000 ohms to impedance of speaker in use,

values and design are the same and a fine receiver, too. Very sensitive, very selective and marvellously quiet. Reaction smooth as velvet. Signals are terrific and on a lot a speaker can be used on full volume. Signals on 28 mc are very good but I have a radio beacon near here on 29.5 which is pretty flat and blots out part of the band. My reaction troubles may have been due to too much voltage. I’m using a 5Z4G rectifier rated at 350v and by inserting an additional resistance in the HT lead I use 300 on RF and audio stages and 250 on detector. Even now some signals seem to overload the detector and punch the phones like a superhet with the BFO out. I’ve built many TRF receivers, all battery, but this is the best job I’ve ever had.”



The network R1, 3 megohms, and C1 (0.25 μ F) controls the relay A, when it is switched to the plate of the 6SN7 for voice-controlled working. The latter valve could be replaced by any type capable of actuating the relay. The diode, which could be one half of a 6H6 or D63, is to increase the hold-on period of the relay. Switch S gives "off," "continuous transmit" or "voice control." The general arrangement could be applied to any modulation system, but values for R1 and C1 may require experiment.

Voice-Operated Send-Receive Switching

Circuit Devised by R. O'BRIEN

The main difficulty in designing a voice-operated send/receive relay circuit is to get the relay to close immediately one speaks, without opening between words and sentences. As none of the methods the writer has seen described seem completely to overcome this difficulty, the results of many sleepless nights are offered here, in the hope that it might interest other amateurs. To spare his blushes, some of the first circuits are *not* described, but only the last, which is working very well!

The output of a 6J7 pre-amplifier is fed to the grid of a 6V6 used as a cathode follower. This is the sub-modulator. The DC cathode voltage of the 6V6 will rise when an AF input is applied to the grid. This rise in cathode voltage is used to lift the bias on a valve, so that a relay in the anode circuit closes.

The Circuit

Following the circuit, it will be seen that the relay valve is cut off by a bleeder network on the cathode.

First, ignore the diode across R1. When the cathode voltage of the 6V6 rises due to

an AF signal, the condenser C1 slowly charges, allowing the relay valve grid to rise and the valve to conduct. This energises the relay. This slow charge of C1 causes a delay between the rise of the cathode voltage, and the energising of the relay. A similar delay occurs on the cessation of the AF signal and the fall of the cathode voltage, before the relay again de-energises. These delays prevent the relay from "chattering" between words. However, the first delay is not wanted, as one wishes to change straight to "transmit" as soon as one starts talking. That is where the diode comes in.

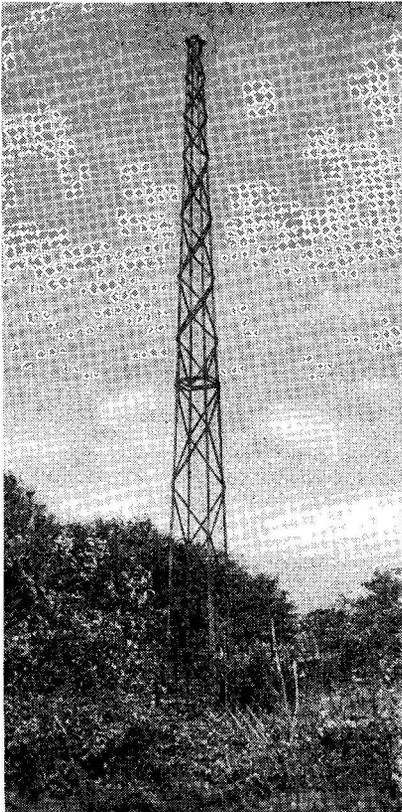
When the cathode of the 6V6 goes positive, the condenser charges rapidly through the diode. When the AF signal stops and the cathode voltage falls the diode no longer conducts as the diode's anode is now negative with respect to its cathode. The voltage on the grid must now leak away through the resistor R1. This preserves the delay in the opening of the relay, while it eliminates the delay in its energising. A single-pole three-way switch is used in the anode circuit of the relay valve, so that the relay can be switched manually.

Wooden Lattice Mast

Design for a 34 ft. Home- Constructed Tower

By

B. W. St. LEGER MONTAGUE,
(G2ANR)



IN reading descriptions of various amateur-built wooden masts (mostly of pre-war construction), it was noted that the size and quantity of the timber used seemed rather more than was really necessary for a mast of a given height. In view, therefore, of the cost and shortage of suitable timber, the writer set out to build a lattice mast with economy as a primary consideration, yet without unduly sacrificing strength.

The proposed height was governed by the lengths of timber available (a typically post-war method of tackling the problem), so that when eight lengths of deal were obtained, each $1\frac{1}{2}$ in. square by 17 ft. long, a height of 34 ft. seemed the obvious choice. For the cross-bracing, 200 ft. of 1 in. by $\frac{3}{4}$ in. deal tile-battening was used; this was found to be just enough for the job if care was exercised in the cutting to length. All the timber was given one good coat of creosote and left to dry.

The Lower Half

For the lower half of the mast, the two straightest lengths of $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. were selected and laid out on a flat piece of ground. At the same time, two remaining straight lengths were put aside for the top half. The reason for this will be seen later.

A horizontal cross member of 1 in. by $\frac{3}{4}$ in. was screwed in position 3 in. from the ends of the uprights, to give the required base spacing of 2 ft. 6 in.; similarly for the 1 ft. 6 in. member at the top of the lower half.

All cross members should be drilled $\frac{1}{8}$ in. for the wood screws, to avoid splitting the wood.

Before fitting the triangulating bracing, the frame was adjusted in square by equalising its diagonal dimensions. Each bracing member was screwed into position and cut off *in situ*, short lengths being put aside for the top half of the mast.

This left one side of the lower half, which was used as a template upon which to build the second side, the diagonals running the same way. By making the first side of each half

from the straightest pair of uprights, it was found possible to straighten up bends and kinks in the remaining uprights as each bracing member was fitted. The projecting pieces of bracing were then trimmed off flush with the uprights.

The pattern of the cross-bracing joining the two sides is similar, so the necessary lengths were all cut beforehand, again using one side as a template. The two sides were then joined top and bottom, the joining members (and subsequent bracing) being staggered 1 in. from the corresponding members on the sides in order to prevent the wood screws fouling each other. The bracing was then fitted, bends in the uprights being straightened as the work progressed, exactly as before. The completed lower half was then given two further coats of creosote.

Upper Half

The upper half is made in the same way as the lower, the top and bottom dimensions being nominally 1 ft. 6 in. and 6 in. respectively. It is important to note that, at the junction of the upper and lower halves, the *internal* dimensions must be identical and, as the wood is of purely nominal cross-section, the outside edges of the uprights may not necessarily be in line. The top horizontal members are of $1\frac{1}{2}$ in. square wood, overlapping each other as shown in the drawing, and screwed together to form a solid fixture for the top guy and pulley block.

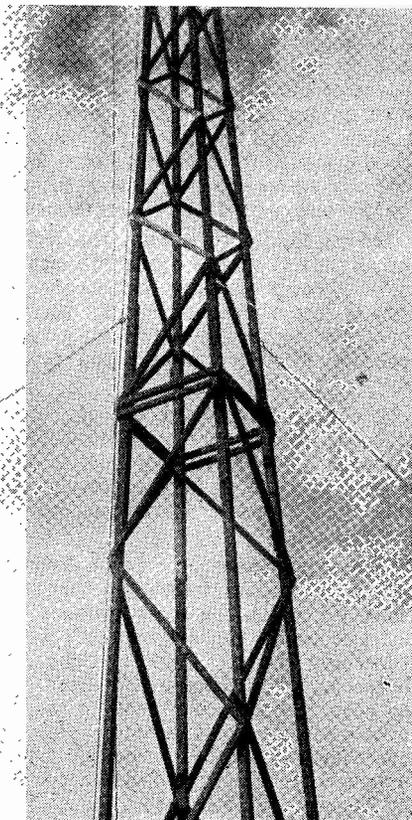
The Base

Whilst the creosote is drying the base may be prepared, and a suggested method is shown in the drawing. Each leg of the mast is "shod" with a strip of $\frac{1}{8}$ in. steel bolted as shown. Clearance holes for the supporting bolts are drilled right through the mast and "shoes," and four U-brackets made, from $\frac{1}{2}$ in. mild steel, to take the feet. The ideal method of fixing these brackets would be by grouting ragbolts into concrete blocks, but the writer made a very solid fixture with four logs about 4-5 in. in

diameter and 2 ft. long; these are buried vertically, the same distance apart as the feet of the mast and with the tops trimmed off with a plane, until they were quite level with each other and projecting just above ground. The U-brackets were secured each with one 6 in. spike. This is quite adequate, as most of the strain is vertically downward when the mast is in position.

When the base is prepared, the lower half of the mast, with a plumb line attached, is raised into position on the base. If the lower half is out of the vertical, adjustments can now be made. This can all be done single-handed, as the lower half of the mast is quite light.

Close-up of centre, showing joint between halves.



When all is satisfactory, the lower part can be taken down and laid end to end with the upper part. The two halves should then be packed up with blocks of wood and bricks until they are perfectly in line in both dimensions. This can be done quite accurately by eye.

Assembling the Halves

The sections are held together by four pieces of 3 ft. 6 in. angle-iron, bolted to the inner surfaces of the uprights. Each angle-iron is drilled $\frac{1}{4}$ in. clearance for six holes, alternating three on each face so that alternate bolts are at right angles to each other. Each angle is then held in position on the inside of the joint and equally between the top and bottom parts of the mast. Using the angle-irons as templates, clearance holes for the $\frac{1}{4}$ in. bolts are drilled in the uprights, care being taken to keep the two halves of the mast in line. The angle-irons are bolted into place, using large washers next to the wood and eyebolts for the top four. It will now be seen why it was so necessary to match up the two halves on the inside dimensions.

Before finally tightening the bolts, the alignment should again be checked and, if only slightly out, can be sprung into shape. All bolts should then be tightened thoroughly and locknuts fitted to prevent any possibility of trouble later.

The eyebolts for the top guy and halyard pulley may now be fitted, and the guys made up. These are broken every 6 ft. by egg insulators, making the guys non-resonant up to the 58 mc band.

The guy anchorages are 2-ft. lengths of 1 in. angle-iron driven into the solid chalk on which the mast stands. In districts where the soil is fairly soft, something rather firmer might be desirable. Turn-buckles are fitted to the guys, but are somewhat of a refinement and may be dispensed with. A continuous halyard is fitted, to make replacement easy; remember to fit the halyard before raising the mast!

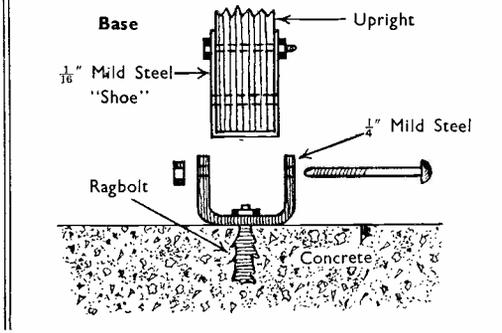
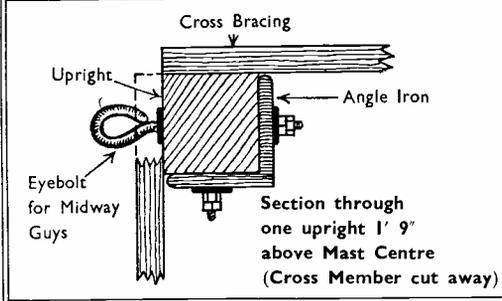
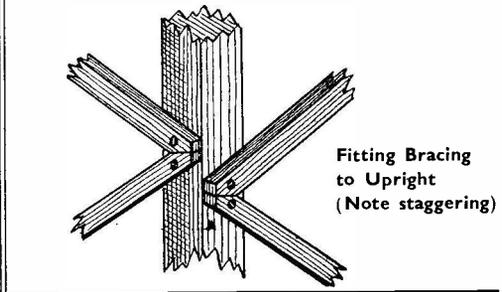
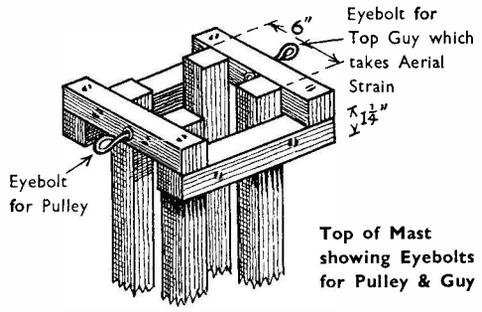
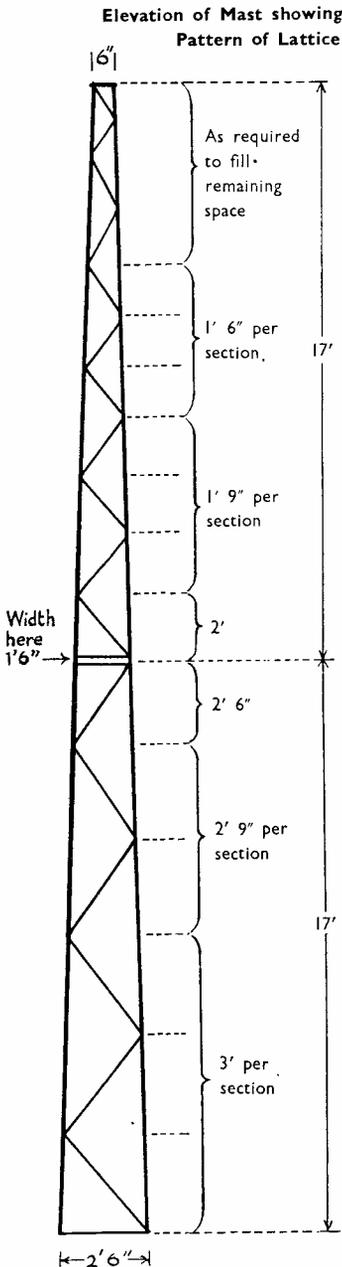
Erection

The mast was erected by three people, even in the writer's cramped location, although a fourth would have been helpful. Two feet were first secured by their bolts, and a rope lashing added as a safety measure, enough slack being left to allow the mast to be raised. A rope, tied to an upright near the bottom, was passed right up one side and over the top, being pulled from the other side by one person. The remaining two, one on each upright, "walked" the mast up high enough for the third to take an appreciable part of the weight, and, when nearing the vertical position, exert a steadying influence. No guys were manned during the raising operations, and indeed, on a calm day, the mast was quite steady on its feet, unsupported.

The whole job turned out to be much easier than the writer had anticipated. The design could probably be improved upon by those who may wish to build a larger mast.

Materials Used

- 8 lengths of deal, $1\frac{1}{2}$ in. \times $1\frac{1}{4}$ in. \times 17 ft.
 - 200 ft. $\frac{3}{4}$ in. \times 1 in. tile battening.
 - $1\frac{1}{2}$ gross $1\frac{3}{8}$ in. No. 10 counter-sunk wood screws.
 - 6 $\frac{1}{4}$ in. \times 3 in. eyebolts.
 - 28 $\frac{1}{4}$ in. \times 3 in. coachbolts.
 - 5 doz. $\frac{1}{4}$ in. nuts for above.
 - 5 doz. large washers for above.
 - 5 turn-buckles.
 - 200 ft. 7/20 galvanised wire.
 - 75 ft. weatherproofed halyard.
 - 1 pulley block.
 - 2 gallons of creosote.
 - 4 pieces angle iron, $1\frac{1}{2}$ in. \times $\frac{3}{16}$ in. \times 3 ft. 6 in.
 - 20 egg insulators.
 - Sundry pieces of wood and metal as required.
 - Total cost of materials, approximately, £4.
-



Constructional details of G2ANR'S mast. See text for discussion.

DX COMMENTARY

ON CALLS HEARD, WORKED & QSL'd

By L. H. THOMAS, M.B.E. (G6QB)

With bated breath and much trepidation we open the ball this month with a reference to 7 mc! We have discovered that nothing is quite so fierce as a 40-metre fan when he is roused. Which is all to the good, for we like to see Amateur Radio treated with such enthusiasm. Most of the letters we have received, though full of interest, are *not* concerned with DX, and so cannot be dealt with under the heading "7 mc DX," which appears later on.

The theme of these letters is "Why be rude to 7 mc—it's a lovely band for local 'phone." This, with due respect, we consider to miss the point, and not only because of the title of this feature. We entirely agree that there is no better band for inter-G 'phone work; there *is* no other band on which regular daily S9 contacts between North and South can be made. No, what we said was that 7 mc was virtually useless as a DX band; but now that we have the whole band back, it is a very different story. Disregarding the 7200-7300 kc broadcast area, we now have 200 kc (from 7000 to 7200) instead of the former 50, which is four times the previous effective space. 7 mc *is* a DX band when the local 'phone has faded out; South America and the USA can be worked with ease through the night, and by February VK and ZL contacts should be quite commonplace.

So why, one might ask, all the to-do? GC3GS, in a long and useful letter, says "Why should 7 mc be 'dignified' by the title of a DX band? Why all the craze for DX?" and goes on to say that British Service men all over Europe rely on 40 metres for their contacts with home. He also quotes a few sly bits of DX that have come his way, but when he says "I would suggest that most of your DX experts are not tough enough and their gear is not up to the standard required for 7 mc" we can almost hear the sizzling noises from Cornwall to Caithness. Up, Hounds, and at him!

But when he laments the poor operation that one hears on the band, we can all agree. And he raises a point by asking "If I work G2HB/P in the Hebrides on 10 watts, is that DX?" And "If a 150-

watt G works a W5 using 1 kW, is that DX?" Well, there is an article coming along entitled "What *is* DX?" so perhaps we shall see!

G5GK (Burnley) remarks that the true spirit of Amateur Radio still prevails as strongly as ever on 7 mc, and brings up the very sound point that it is an ideal band on which the newcomers can win their spurs and be sure of a welcome.

G4QC (Liverpool) laments that the band *is* open for real DX but is ruined by the "local 'phone merchants." Others complain that local low-power 'phone is spoilt by "high-power DX merchants grinding out CW."* And, with it all, there is no sign of a voluntary division of the band into 'phone and CW areas. Well-known old-timers have been heard on 'phone right down to the LF edge of the band.

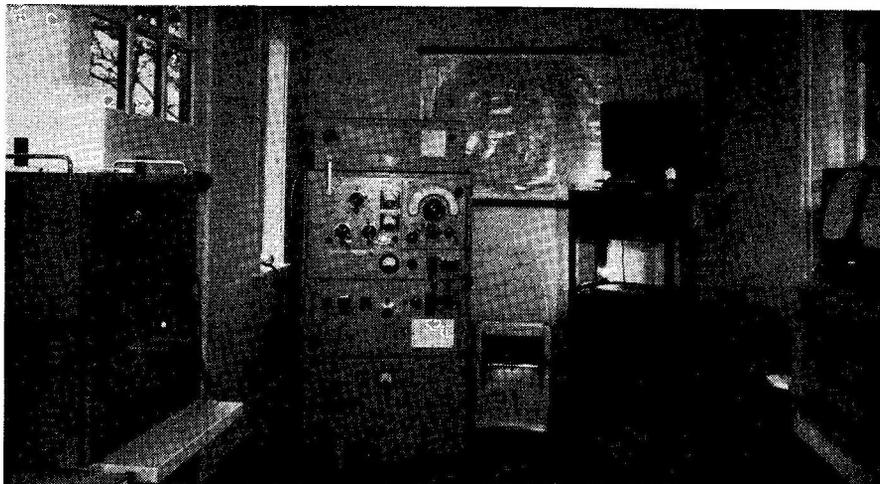
So, summing all this up, the way we look at it is this: 7 mc is a local 'phone band from 1000-2000 hrs. and a DX band for the rest of the time. During the period 1000-2000 the DX chasers will find much better opportunities on 14 and 28 mc, where they had better repair and leave 7 mc safe for local 'phone. Does that sound reasonable? We hope it does.

Suggestions Department

We have no grouses and grievances this month, except the foregoing remarks about 7 mc, but we can think of a few suggestions. Once there were two quite useful but unofficial "Q" signals in use: QSLL, meaning "Pse QSL and I will do the same," which you generally hear in full nowadays; and QRAR, meaning "My address is OK in the Call Book." The latter might become QTHR these days.

D2GQ (Lubeck) wants to see more D2 calls in the lists published. (Incidentally, we can assure him we do not cut any out!) He feels that many British amateurs have the idea that the prefix "D" implies that

*All this in accord with the good old spirit of 40-metre controversy, which started about 1928.—E.I.



One end of the room at G3NQ, Whitstable, Kent. The transmitter, left background, is a modified Type 53, with two paralleled 813's in the final, modulated by an EF39. On the near left is the modulation equipment and in the right background, the recording and playback gear. An extended description of G3NQ will appear in the "Other Man's Station" series in an early issue.

the owner is using a BC-610 scrounged from the US Army, or a 2 kW German transmitter. The truth is that many D2's use 20 watts or less, and more than a few of them think quite a lot of (here it comes) 7 mc. So look out for our D's and give them some home QSO's.

1.7 mc DX

This band is looking up, particularly round about midnight, and G3CJ/A (Farnborough, Hants) reports a good contact with G2QN (Manchester) with an input of 0.8 watts to a battery-operated CO. G3CJ also reminds us that he heard and obtained confirmation from K4EPO on the band just before the war. So far the USA is not using it, of course, but we feel that some spectacular DX might well come up this winter.

3.5 mc DX

This is already with us. Look at G6AG's log (from Bexley, Kent) for October 30: Worked, on 'phone—VE1CI, VE1DY, VE1DZ, VE1GW, VE1MA, VE1NZ, VE1QF, VO1A, VO1I, VO1J, VO1Y, VO2N. All were between 3800 and 3840 kc; G6AG was on 3600 kc; time, 0030-0210 GMT. G5UM (St. Albans) worked W3BJU, W3QV and W8HMJ with 50 watts, and suggests that it makes a nice change for those who are sated with 28 mc DX. D2GQ (Lubeck) wants a bouquet handed to VO1I for his

consistent 'phone on 3800 kc, and also to G5JO for his consistent QSO's with him.

OK1AW (see Calls Heard lists) has not heard any G's on 1.7 this month but puts in a nice little list for 3.5. G6ZN (Horbury, Yorks) has had 400 QSO's over most of Europe with 3 watts input to a battery CO—nice going.

7 mc DX

Yes, DX! G5GK (Burnley) has worked YR5V (Bucharest) and VO2T, and thinks they might be first contacts since the war. Any challenge? G4QC (Liverpool) has worked 85 W's plus CM, HH, YV and VE with 30 watts, and remarks that he does not stay up all night to do it. GM6JJ (Burntisland, Fife) reports a real pearl in the shape of VE8NW (Baffin). Using 22 watts, 'JJ made contact at 0335 and yarned for 65 minutes with him. VE8NW's QTH is in the list, but his next boat leaves in September, 1947. It was VE8NW's first post-war contact, by the way. D2GQ also makes observations on this band—he has had pleasant QSO's with W and VE, and his friend ON4ZQ has just had a report from VK7 on his 7 mc signals. G5FA (London, N. 11) has always been a 7 mc stalwart, and reports that since the beginning of August he has had 1,109 QSO's on the band. He has been hearing W6 and W7 in the mornings up to about 0700, and comments on the good signals

from ZL2BV, CM2CT and lots of stations in various parts of the USSR, including Siberia, many of whom he has worked. YU3ZX and ZA2LA both promised QSL's, but they have not yet arrived! We shall see whether they are genuine or phoney. PA1's are genuine, by the way. G6QB (Bexhill) has been doing a bit of Jekyll-and-Hyde work on the band, too. He has been working local 'phone but has heard VK, ZL, KH6 and W6.

14 mc DX

Now we are on safe ground again, and have many letters reporting new or unusual DX work. G8KP (Wakefield) has worked VQ5JTW (14126), UB5AB (14083), G3AHY/VS9, VQ3HJP (14098) and many less rare ones, and has heard ZD4AB, FT4AI, VS7MB and 7IS, VP4TD and 4TR, TI2FG and VQ8AD. G2VV (Hampton-on-Thames) is operating from his new address, on 14 only at present, and has been working ZL, VK, TF3A and VE8NG, the most northerly station in Canada.

G8UA (Burnley) reports OY3IGO in the Faroes (full QTH in list). 'UA is in what must be the unique position of having to put up with QRM from his father (G8DC) who lives a hundred yards away. Father uses 150 watts 'phone and son 150 watts CW—but apparently the family is not breaking up yet!

G5LH (Horbury, Yorks) comments on the now famous XUA1R, still supposed to be in Yakutsk but now assumed to be phoney. Also he mentions OP2C, who never gives a QTH. New ones heard or worked include HZ1AB (see list), VP8AD, UA1KBA (YL operator but T7 note), ZS6DO (now on a ship in the Med.), UA9DP (Sverdlovsk, Urals). G5LH mentions that G5YV (Morley) recently had 18 contacts in an afternoon, with all

continents except South America, all on 'phone.

G3AAR (London, W. 10) comments on UN1AO (Petrozavodsk, Lake Onega) and UQ2AB (Riga, Latvia), both worked on 14. G12HLT has worked XUA1R, and is mystified by the Russian call-signs. We really must try to penetrate the Iron Curtain and get the prefixes and numbers straightened out, because there were many separate countries back there in the pre-war list. We know, so far, that the following used to count as individual countries: Siberia (U9, U0); Turkomen and Uzbekistan (U8); Transcaucasia (U6); Ukraine (U5); White Russia (U2); and the group comprising U1, 3, 4 and 7. But where are we now? So far we have heard of the following: Latvia (UQ2); Leningrad district (UA1); Moscow district (UA3); Rostov-on-Don (UA6); Azerbaijan (UD6); Ukraine (UB5); Tashkent (UI8); Siberia (UA9); Dixon Island (UA0). The numbers seem more or less right except for that UQ2 in Latvia, but when shall we get the alphabet straightened out? Offers gratefully received.

G8PL (London, W.C.1) has worked XUA1R many times, but still has doubts. He also mentions ZX2B (said to be ship in Central Mediterranean), OE4WN (described as "black" station in Vienna) and SP1MA in Krakow. G2PL (Wallington, Surrey) has been relaxing a bit, but has now reached 115 countries (post-war) and has been working more 'phone than CW. Much of this has been on 28 mc.

28 mc DX

G2PL's log indicates PZ1A, ZE1JB, VO6H (Labrador), VP9F, XZ2YT, VR2AB, VQ3EDD, TI2RC, VS9AB and ZB1AB—mostly 'phone. He uses 75 watts to a pair of 807's for 28 mc. G6YR

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- (1) Use of the Bureau is open only to readers who obtain either the *Short Wave Listener* or the *Short Wave Magazine* from us on direct subscription.
- (2) The Bureau can only handle cards for amateur stations and is prepared to accept them for amateurs throughout the world.
- (3) Cards should be forwarded to us in fully stamped envelopes addressed QSL Bureau, *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1. The words "QSL Bureau" must appear in the address.
- (4) When sending the first batch of cards, enclose three stamped self-addressed envelopes of a suitable size for return QSL's.
- (5) All such return envelopes must be marked "QSL Bureau" in the top left-hand corner.
- (6) No communications of any kind, other than the cards, return envelopes and certain printed forms that will be supplied to users, should be contained in packets addressed to the QSL Bureau.
- (7) Cards inwards to the Bureau can be forwarded as frequently as may be desired. Cards outwards to Bureau users will be cleared fortnightly.

DX FORECAST FOR DECEMBER 1946 (All times GMT)

	14 mc	28 mc
NORTH AMERICA :		
East and Central USA, Canada, Newfoundland, etc.	1400-0930	1100-1700
West Coast	1500-1800	1500-1800
CENTRAL AND SOUTH AMERICA :	2100-0700	1100-2100
AFRICA :		
North of Cancer	All day	0900-1600
South of Cancer	1500-2200	0900-2000
ASIA :		
West of 75° E.	All day	0800-1900
East of 75° E.	1000-1800	1000-1600
OCEANIA :		
Australia and New Zealand	{ 1000-1300 1700-2100	0930-1200
Dutch East Indies, Malaya, Philippines, Guam, etc	1300-1800	0900-1300
NOTE.—The times given above are the most likely periods during which signals may be expected from the parts of the world indicated. Under unusual conditions, signals may be heard outside these times.		

(Southport) has collected KP4KD, CR9AG, VE8AW and VR5BY on 28 mc CW. We are told, though, that the latter is *not* genuine.

G5CP (Manchester) continues his marathon with ZS1AX and ZS1T. In the race for 100 contacts ZS1AX was leading with 94 against ZS1T's 89, but doubtless one or both of them have made it by now. 'CP has had a special drawing made to present to the winner. His other outstanding contacts have been the VE7's (7AIE, 7AJN, 7AJU), KH6's (6AR and 6FD), PK1AW, many VK's and ZL's, and a 67-minute contact with W6LIP.

Conditions on 28 have not been quite up to the "freak" standard of the previous month, but have remained consistently good. VK's and ZL's peak rather late in the morning, and one never knows whether it is going to be best for one or the other. When the ZL's are outstanding there is a distinct chance that the Fiji stations, especially VR2AB, will be heard. The best 'phones have been ZL1GI, 1HY and 3LB, although many others come in consistently. W6's and 7's and VE7's are there most days from 1500 onwards, and occasionally the W's fade out by about 1800, leaving an interesting selection of Central Americans behind them, including HH, TI, TG, CO and KP4. Funnily

enough, the other West Indies representatives—such as VP4TK (Trinidad), VP3LF (British Guiana), VP6YB (Barbados) and VP9F (Bermuda)—can often be heard in the mornings but seldom in the evenings after the USA fade-out.

G6AW (Marlow) comments on the remarks last month about incorrect bearings on beams, and says he does not think signals are going right round, but merely

CALLS HEARD

The Calls Heard page is now of particular interest to transmitters, in that it lists mainly G's heard overseas on the DX bands, as well as on 1.7 and 58 mc at shorter ranges. Overseas readers are invited to send in such lists, covering reception of G's on all amateur bands.

"scattered back" from some ionised patch somewhere. As he says, it is only the stations with efficient beams that seem prone to this, and only those putting out very strong signals at that. We have, however, had several genuine cases of real DX lately in the mornings. On many occasions G stations working VK and ZL have had a distinct "extra dot" at the end of their calls—the one-seventh of a second

DX QTH's	
CN8MA	P.O. Box 50, Casablanca, French Morocco.
CR9AG	J. J. Alvares, GPO, Macao, Asia.
"Dreamboat"	W3QR, 4418 N. 15th St., Philadelphia, Pa., U.S.A.
HH3L	Roger Lanoix, RCA, Port-au-Prince, Haiti.
HZ1AB	J. P. Anderson, APO 788, P'master, NYC, U.S.A. (Station at Dhahran, Hedjaz).
KP4AJ	Base Signals Officer, APO 845, P'master, Miami, Fla., U.S.A.
OX1BC	AP0 55, P'master, NYC, U.S.A.
OY3IGO	Ingvar Olsen, c/o Ing. F. Willejus, Thorshavn, Faroes.
VE8AW	Box 76, Whitehorse, Yukon, Canada.
VE8NW	East Arctic Patrol, Ottawa, Ont. (Stn. at Clyde River, Baffin).
VO6L	c/o P'master, Goose Bay, Labrador.
VP4TK	74 Duke Street, Port of Spain, Trinidad, B.W.I.
VP5HN	British Army HQ, Jamaica, B.W.I.
VQ3EDD	PO Box 166, Dar-es-Salaam, Tanganyika.
VQ3TOM	PO Box 457, Dar-es-Salaam, Tanganyika.
VQ6GH	c/o BM/CXND, London.
VQ8AB	Box 155, Fort Louis, Mauritius.
VS9AR	Aden Command Sigs. MELF.
VU2AF	c/o Post Office, Jealgora, India.
VU2AP	Lt. R. S. Craig, 10th Gurkha Rifles, Alhilar Camp, Kangra Valley, Punjab, India Command.
VU2AR	RAF Yelahanka, Bangalore, India Command.
VU2FQ	c/o S. P. Wireless, Sitapur, U.P., India.
VU2OK	c/o Inspector Adams, Head Police Office, Bombay, India.
W9BNB/KL7	AP0 729, Seattle, Washington, U.S.A. (Stn. in Aleutian Is.)
W9VIP/J2	Lt. P. A. Rockwood, 329 Q.M.Bn., APO 181, P'master, San Francisco, U.S.A.
YR5X	Box 326, Bucharest.
ZB1AB	Port Radar Centre, HM Dockyard, Malta. (ex-ZB1A).
ZCIAR/ZC6	Box 360, Cairo, Egypt.
ZC6AN	Accra Radio Club, 6th Airborne Div., MELF.
ZC6FP	RAF Aqir, Palestine, MELF.

echo that spells an extra 25,000 miles! And on other, but fewer, occasions, the VK's themselves have had it. G6QB had to give up one QSO with VK2OE, both ends being unreadable with a really long-drawn-out echo. Signals were RST 089. Whichever way you look at it, this is DX of the order of 37,500 miles and therefore interesting, if annoying.

Regarding last month's comment on "Worked all States" (WAS), a welcome line from G5BY (Thurlestone, S. Devon), who reports that he has made WAS on 28 mc 'phone—he doesn't spend all his time on 58 mc. The 10-metre aerial at G5BY is a rhombic with 300 ft in each leg!

Miscellany

Congratulations to our old friend Bob Craig, that faithful sender of Calls Heard, who is now VU2AP. We have printed his entire list this month, to show what sort of things are to be heard in India. Some of those calls will whip the DX-chasers into a frenzy. We have had a letter and QSL from ZCIAR/ZC6 ("under cover near Jerusalem") which settles the uncertainty regarding the station. It was operated by three Service chaps and was located near Jerusalem, but has now closed down. The ZCI call was used for camouflage purposes, but was unsuccessful—hence the QRT. His QSL address is in the list of QTH's. ZCIAR tells us that "JX" calls are shortly to be issued to Service personnel in Palestine. They will have no figure but will be similar to the XA series; 50 watts on 28, 56 and 112 mc.

G6PJ (Sheffield) particularly asks for reports from Asia—will our VU readers please note? He is on 14150 and 14050, 0700-0800 and 1900-2300 GMT.

Transmitting readers are invited to send items for DX Commentary to L. H. Thomas, G6QB, "The Short Wave Magazine," 49 Victoria Street, London, S.W.1., to reach him as early as possible in the month. SWL reports are only included in DX Commentary if they are of direct interest to transmitters.

G2DP (Thornton Heath, Surrey) has been heard by OK1AW on 1.7, and has received cards for 7 mc. Unfortunately he only operates on 28 and 14, so it seems that a pirate is at work. All clues welcomed.

VU2AD (Mhow) sends us some new VU QTH's and says there is a whole crop of pirates out there, most of whom are only in the over-anxious class. Activity is mostly on 14 mc, but G's have been looked for on 7 and 3.5 without results so far. 'AD says

QSL BUREAUX ADDRESSES

Use these addresses only if the QTH of the distant station is unknown. Send cards to individual stations direct whenever possible. The Short Wave Magazine QSL Bureau handles cards for amateur stations throughout the world. Use it if you are in doubt.

Keep this List for reference.

Alaska :	J. W. McKinley, Box 1533, Juneau.
Antigua :	A. Tibbits, 27 St. Mary's Street, St. Johns.
Argentina :	Radio Club Argentino, Av. Alvear 2750, Buenos Aires.
Australia :	W.I.A., Box 2611 W, G.P.O., Melbourne.
Belgium :	U.B.A., Postbox 634, Brussels.
Brazil :	L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro.
Br. Honduras :	D. Hunter, Box 178, Belize.
Chile :	L. M. Desmaras, Casilla 761, Santiago.
China :	K. L. Koo, P.O. Box 409, Shanghai.
Colombia :	L.C.R.A., P.O. Box 1266, Bogota.
Costa Rica :	F. Gonzalez, Box 365, San Jose.
Cuba :	J. D. Bourne, Lealtad 660, Habana.
Czechoslovakia :	C.A.V., Vaeclavska Nam 3, Prague II.
Denmark :	E.D.R., Box 79, Copenhagen, K.
Eire :	R. Mooney, Aughnacloy, Killiney, Co. Dublin.
Finland :	T. Kolehmainen, Kasarminkatu 25.C.12, Helsinki.
France :	R.E.F., 1 Rue des Tanneries, Paris 13.
Germany :	(DZ's only) Capt. J. T. Blackwood, D2TG, P & T Team, R.P.D., 609 Mil. Govt. HQ, Hamburg, B.A.O.R. (American Zone D4) Signals Division, HQ, USFET, APO 757, c/o Postmaster, New York, N.Y.
Great Britain :	QSL Bureau, <i>Short Wave Magazine</i> , 49 Victoria Street, London, S.W.1.
Greece :	C. Tavanotis, 17a Bucharest Street, Athens.
Guam :	Box 30, Staff Com. Marianas, c/o FPO, San Francisco.
Guatemala :	W. P. Boycer, c/o P.A.A. Communications, Guatemala City.
Holland :	V.E.R.O.N., Postbox 400, Rotterdam.
Italy :	A.R.I., Viale Bianca Maria 24, Milan.
Japan :	(J2-J6 Zones) Major J. M. Drudge-Coates, J4AAC, Brindiv Signals, British Commonwealth Occupation Force, Japan.
Luxembourg :	W. Berger, 20 Louvigny Street, Luxembourg.
Mexico :	L.M.R.E., Av. Juarez 104-22, Mexico, D.F.
Morocco :	C. Grangier, Box 50, Casablanca.
Newfoundland :	N.A.R.A., Box 660, St. Johns.
New Zealand :	N.Z.A.R.T., P.O. Box 489, Wellington C-1.
Nicaragua :	R. Argenal, P.O. Box 78, Managua.
Norway :	N.R.R.L., P.O. Box 898, Oslo.
Panama :	R. D. Prescott, P.O. Box 32, Panama City.
Panama Canal Zone :	Signal Officer, KZ5AA, Quarry Heights.
Paraguay :	R.C.P., Palma 310, Ascuncion.
Peru :	Radio Club Peruano, Box 538, Lima.
Philippine Islands :	G. L. Rickard, 48 Ortega, San Juan, Rizal.
Porto Rico :	E. W. Mayer, P.O. Box 1061, San Juan.
Salvador :	J. F. Mejia, 7a Calle Poniente 76, San Salvador.
South Africa :	S.A.R.R.L., P.O. Box 7028, Johannesburg.
Soviet Russia :	Central Radio Club, Box N-88, Moscow.
Sweden :	S.S.A., Stockholm, 8.
Switzerland :	U.S.K.A., Postbox 196, Berne-Transit.
Uruguay :	R.C.U., Casilla 37, Montevideo.
Venezuela :	R.C.V., Apartado 1247, Caracas.

Acknowledgments to November "QST" for many of these addresses.

VU2AR, 2EG and 2KP are working some very nice DX, and VU2AJ has worked Peru (OA2BF) for his 46th country on 28 mc 'phone with a pair of 807's and grid modulation. One of the best 28 mc signals out there is OZ4HF, using 8 watts 'phone. VS1AA has now become VS1AE.

ZB2A (Gibraltar) sent a long letter which unfortunately just missed the boat last month and is therefore rather out of date. We have since heard the boys out from their new location on the other side of the Rock, and very nice, too—on 28 mc,

of course. By now they should also be active on 14240, having acquired another crystal! ZB2B has also been heard several times. The chaps certainly do their stuff from the outposts of Empire, and it must be grand to have a DX call sign.

Reports, suggestions and brickbats for next month by December 13 *latest*, please. And acknowledgments to all those mentioned in this article and in Calls Heard; also to G3MI (Chesham) who supplied some QTH's. And now we are going on 7 mc to work some DX. 102!

CALLS HEARD

Please arrange all logs strictly in the form given here, in numerical and alphabetical order and on separate sheets under appropriate headings, with call sign and address on each sheet.

OVERSEAS

28 mc

Roger Legge, 20 Beethoven Street, Binghamton, N.Y., U.S.A.

'Phone: G2ADA, 2A1S, 2AJ, 2AME, 2AMG, 2AMJ, 2ART, 2AV, 2BB, 2BOK, 2BY, 2CDI, 2CG, 2DP, 2DU, 2DZT, 2FMDU, 2FOS, 2HCL, 2HK, 2IG, 2IQ, 2IY, 2MI, 2PL, 2QL, 2TR, 2WI, 2XV, 2ZB, 3AP, 3BK, 3BM, 3BN, 3FH, 3HM, 3II, 3IY, 3MI, 3MR, 3OK, 3TC, 3VR, 3XC, 3XP, 3YM, 3YN, 3ZI, 4AJ, 4AV, 4CS, 4QB, 4DN, 4HV, 4JY, 4LS, 4FC, 5BM, 5BY, 5CP, 5DF, 5DZ, 5FJ, 5FO, 5JR, 5JY, 5LB, 5LI, 5NN, 5OO, 5PP, 5SL, 5SD, 5TN, 5TP, 5VM, 5VU, 5WP, 5XA, 5XY, 5ZJ, 6BW, 6DT, 6GF, 6HC, 6JK, 6LX, 6OR, 6OU, 6OX, 6PD, 6RK, 6SC, 6SS, 6TD, 6WO, 6WU, 6WX, 6WY, 6XP, 8AJ, 8AL, 8AX, 8ON, 8JB, 8MX, 8QH, 8RN, 8SY, 8TD, 8TY, 8VZ, 8WL, 8YZ, 8M5KQ, 6BI, 6MS, 8MN, GW3AX, 3UO, 4CC, 5XN, (All on October 19-20).

Harold Owen, B.Sc., West African Cacao Research Institute, Tafo, Gold Coast Colony.

CW and 'Phone: EI3J (55), G2AJ (56), 2BGU (54), 2CV (446), 2FAO (54), 2LB (32), 2LU (43), 2PN (548), 2ZB (55), 3AAK (54), 3VA (54), 4CP (33), 4HV (34), 5OB (558), 5QU (54), 5VB (448), 5WW (42), 6BW (44), 6CW (548), 6DP (43), 6GM (44), 6KS (32), 6NG (54), 6QB (32), 6SP (33), 6SS (43), 6UT (54), 8FW (44), 8GP (54), 8II (44), 8JJ (21), 8QY (43), 8QZ (438), 8RL (53), 8SB (35), 8UY (54), 8VB (567), GISUR (54), GM4KU (43). Oct. 1-13. (RS values in brackets—Receiver, 0-r-1).

3.5 mc

Alois Weirauch, OK1AW, Mestec Kralove c.9, Czecho-Slovakia.

CW: G2HN, 2YU/A, 3AAF, 3AWF, 3FM, 5DU, 5FI, 5KT, 5TZ, 5XW, 8AX, 8TK, GM3AHQ, 3AWF. (October 19-November 8.)

14 mc

Lt. R. Stewart Craig, VU2AP, 10th Gurkha Rifles, Alhail Camp, Kangra Valley, Punjab, India Command.

'Phone: C3WY, 5AY, 6CW, 8YR, CE1AR, CX2AC, EL4A, F8BR, G2DU, 2FN, 2MF, 3MK, 4FB, 4JV, 4KC, 4XY, 6BC, 6XR, 8AO, 8LP, HB9FE, HK3BI, HS1SS, I1LQ, INQ, 1SR, 1WC, J2AAE, 2AAG, 5AAA, 9AAL, 9AAC, 9AAP, 9ABF, KA1AW, CB, 1HA, 1LR, 1RC, ISS, LU4BH, 6HA, ON4DD, PAØMZ, PK6GH, SU1KE, VKZANE/Marine, 2XG, 6KW, 6WS, WS1BE/J3, 6OCA/J3, 6SPQ/J8, 8VHW/KG6, 9BNB/KL7, 9V1P/J2, 9WBP/CI, XAAN, DW, 4J, ZS1BJ, 2X, 2BJ, 2CI, 2DA, 4E, 5IG, 5Q, 5ZY, 6BV, 6EU, 6GV, 6HA.

Harold Owen, B.Sc., West African Cacao Research Institute, Tafo, Gold Coast Colony.

CW and 'Phone: EI9N (55), G2AJ (56), 2AKQ (44), 2BQC (55), 2DD (44), 2DM (43), 2FGX (44), 2FLC (33), 2FM (54), 2FXQ (56), 2HAO (54), 2HNO (54), 2HOJ (548), 2HX (55), 2HM (548), 2IO (558), 2KM (43), 2KU (557), 2MD (55), 2PL (55), 2TA (55), 2UV (44), 2YF (54), 2ZA (546), 2ZB (55), 3AAK (557), 3BU (44), 3DO (54), 3HK (44), 3LB (44), 3LR (328), 3PZ (54), 3QD (55), 3SR (54), 3VO (548), 3XP (33), 3YT (44), 4CP (54), 4DR (54), 4HG (55), 4HJ (458), 4LA (43), 4PR (54), 5BJ (56), 5DZ (55), 5LI (56), 5OI (54), 5OO (54), 5SS (43), 5TP (46), 5VB (55), 5VM (56), 5XV (547), 5YV (568), 6AG (56), 6AH (44), 6BB (43), 6BK (55), 6BQ (55), 6CL (558), 6DL (55), 6HB (558), 6JP (56), 6KI (55), 6LV (54), 6ZA (44), 8IG (55), 8IM (446), 8OJ (54), 8ON (54), 8PO (44), 8QY (55), 8QZ (54), 8RL (56), 8TC (55), 8TP (55), 8UT (54), 8VG (43), 8WV (55), G16TK (55), GM2FXN (55), 2UÜ (55), 3PK (448), 3RL (548), 5SC (56), 6UC (557). (Oct. 1-Oct. 31.) (RS values in brackets—Receiver: 0-r-1).

Major J. M. Drudge-Coates, J4AAC, Brindiv Signals, British Commonwealth Occupation Force, Japan.

G2FT, 2PN, 2QO, 4FM, 5BJ, 6GS, 6QB, 8PO, 8PB, (1400-5100 and 2200-2300 GMT.)

FIVE METRES

G8GX, 40 Tolcarne Drive, Northwood Hills, Pinner, Middx.

Worked: G2AK (89), 2XC (60), 3IS (67), 4AJ (39), 5BY (177), 6YU (75). Heard: G5IG (50), 5LJ (90), 6LK (32), 6DH (67), plus 22 locals under 30 miles. (Tx: CO-FD-FD-807-RK20. Rx: National 101X with converter, and S27. Aerial: Indoor 3-element.)

G5BD, The Elms, Church Road, Maplethorpe, Lincs.

Worked: G2AK (106), 5JU (106), 5LJ (103), 5MA (140), 6DH (116), 6YQ (136), 8JV (70), 8UZ (70). Heard: G3APY (70), 6VX (130), 6YU (100).

G8LY, North Waltham Rectory, Nr. Basingstoke, Hants.

Worked: G2MR (42), 2MV (48), 2XC (26), 2YL (44), 3PW (30), 4AJ (8), 5AS (42), 5MA (38), 6FO (34), 6KB (28), 6LK (32), 6OH (26), 6VX (56). Heard: G2AK (92), 2WS (54), 4GB (42), 5BY (128), 5RD (52), 6YU (84). (October 23-November 13. Tx: 6L6-6N7. Rx: Acorn/EF50 converter with HRO. Aerial: 3-element beam. Power: Generator with batteries.)

G6YU, 14 Bourne Road, Copsewood, Coventry, Warks.

Worked: G2FT, 2MR, 2MV, 2XC, 2YL, 3ABA, 3BY, 3IS, 3PW, 4AJ, 4DN, 4OS, 5JU, 5LJ, 5MA, 5RD, 6FO, 6LK, 6VA, 6VX, 8GX, 8UZ, 8VN. Heard: G5BD. (All between October 15-November 14.)

G8UZ, 29 Columbia Avenue, Sutton-in-Ashfield, Notts.

Worked: G3APY, 2IS, 5BD, 5BY, 5LL, 6CW, 6MN, 6VX, 6YU, 8JV. Heard: G2JT, 2MV, 6DP. (All October 17-November 17.)

CALLS HEARD

We invite lists, from readers overseas, of G Calls heard on the DX bands for inclusion in this section. As a general rule, we do not print lists of non-G stations heard overseas.

First Class Operators' Club

Progress Report

Since the announcement on page 562 of the November issue of the *Short Wave Magazine*, correspondence regarding F.O.C. membership has been received not only from those more recently licensed, but also from a number of members of the old F.O.C. ; and going back even further, the R.C.C.

This is all to the good and shows that the new First Class Operators' Club is going to be a live organisation playing a useful part in the post-war development of Amateur Radio.

At the same time, all the good operators are not necessarily the old ones. Many of the three-letter calls heard round the bands

to-day set a high standard in the finer points of good operating. If you feel you can meet F.O.C. requirements as set out in the rules appearing herewith, get in touch.

The first members—it is hoped that a list will appear here next month—are now being enrolled, and will shortly be active, signing F.O.C. after their calls. Look out for them. They want to help you if you are interested in F.O.C. ideals and standards.

In the meantime, if you wish to become an active F.O.C. member, write Capt. A. M. H. Fergus, G2ZC, 89 West Street, Farnham, Surrey, honorary secretary-treasurer of the First Class Operators' Club.

THE FIRST CLASS OPERATORS' CLUB

Rules

- (1) The Club will be known as the First Class Operators' Club (F.O.C.). Its aim will be to foster and encourage a high standard of operating ability and behaviour on all amateur bands.
- (2) The F.O.C. will be managed by a small committee elected by the membership. The Editor of the *Short Wave Magazine* (or his representative) will be an ex-officio member of this committee.
- (3) Membership of the F.O.C. will be limited to those who
 - (a) Can send and receive Morse at not less than 18 w.p.m.
 - (b) Can work break-in on at least three amateur bands, with ability to QSY as necessary. Break-in *single-channel* working with VFO is desirable but not obligatory.
 - (c) Are prepared over the air to assist and advise newcomers to Amateur Radio.
 - (d) Agree strictly to observe all conditions of the licence.
- (4) Operators will be elected to membership on the recommendations of at least three sponsors, who are themselves already F.O.C. members and have been in contact with the applicant over the air.
- (5) The F.O.C. "club wave" will be the 3500-3635 kc section of the 3.5 mc amateur band.
- (6) Club periods each week will be as under :
 - (a) Tuesdays and Fridays, 1800-2000 hrs.
 - (b) Sundays, 1100-1300 and 1500-1700 hrs.
- (7) F.O.C. members operating on this band during these periods should always sign "FOC" after the call. This will identify them and enable prospective members to QSO with a view to obtaining a recommendation for election. In the general interests of the Club, the use of "FOC" after the call is always desirable on any band.
- (8) Upon election, a subscription of 3s. will be payable. Elections to membership will be notified periodically in the *Short Wave Magazine*, and no claim to membership will be valid unless so notified.

The Editor Wants

- ★ Photographs with Notes for the "Other Man's Station" series.
- ★ Photographs of Equipment of Amateur Radio interest, home and overseas.
- ★ Photographs of Club Meetings.

All material accepted for publication is paid for on appearance. Photographs must be clear and sharp, but can be any size, and either print or negative.

Plastics and Amateur Radio

An Interesting Note

By C. GRANT DIXON, M.A.

FAR from being a dissertation on radio sets in plastic cabinets, the following remarks are concerned with plastics which have come to be used in radio on account of their electrical properties.

Before the war the amateur was becoming more and more familiar with polystyrene ("Distrene"), which was used for HF and UHF apparatus, where it had attractive possibilities for the construction of low-loss components. The war, and the advent of radar, has expanded the production of distrene, and it is quite evident that it will be used in peace-time as a general moulding material as well as in the manufacture of radio components.

The illustration shows a cruet set which has already come on the market at a low price and which offers possibilities to the ingenious amateur. It would make quite a good coil former as it stands (1 in. diam.), and its use as an HF bushing for conveying a Tx aerial lead through a metal panel is suggested in the photograph.

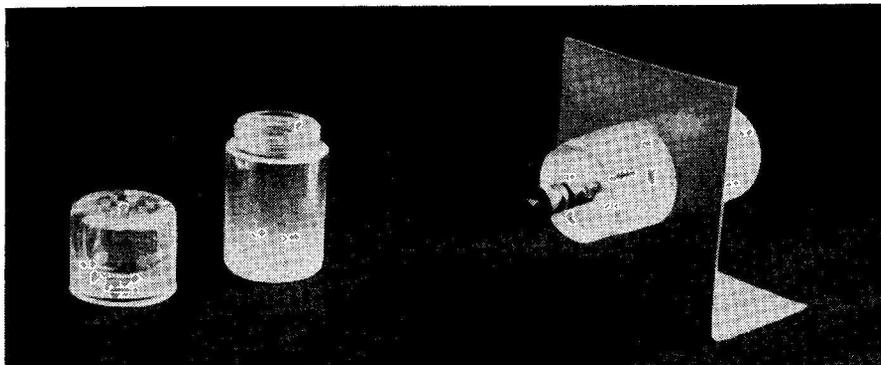
But how is one to recognise distrene and distinguish it from other transparent plastics which have inferior electrical properties? There is a simple test which is not widely known; when a piece of distrene is dropped on to a hard surface it emits a peculiar high-pitched "clink" which is very characteristic and quite different from the "thud" produced by other plastics. In addition, it has a density of 1.05, which means that it sinks only slowly in water; this compares with a figure of 1.4-1.6 for bakelite and 2.7 for aluminium.

Other Plastic Insulators

The other plastic used in radio for

RF insulation is polyethylene (Alkathene). This resembles hard paraffin wax in appearance; it is much softer than most plastics and can be scratched with the finger nail, but a block of the material must be cut with a saw. The chief use of this plastic is as the solid dielectric in a coaxial cable, where its slight flexibility is useful. The writer has seen one or two small everyday articles made of alkathene—a golf tee, an anti-splash tap nozzle, and buttons—and it seems likely that this plastic also will come into general use. Alkathene is easily recognised by its waxy appearance and feel, also by the fact that it will float on water, as its density is only 0.92. It melts at a temperature of 115° C. (239° F.) and it is possible to reclaim odd chips by placing them in a test tube and putting it in the oven at a suitable temperature. In the course of time the mass will melt to a transparent viscous fluid; more chips are added until the tube is nearly full. On cooling, some contraction takes place, but quite a useful length of alkathene rod is obtainable by this method. This rod may be used as stand-off insulators, coil formers, etc.

Another plastic is the well-known PVC, which is used for the "plastic coated" wires now to be obtained. It is also marketed in the form of rain-coats, sponge bags, belts and so on; so it is quite a versatile material. It resembles rubber, but is much easier to cut with a knife or scissors, so a length of belting will provide the amateur with a source for all those odd washers which are always useful but never readily to hand. Another point that is worth noting is that it is possible to weld PVC by using a hot knife or a *cool* soldering iron. Joints with quite a reasonable mechani-



A common object, made of the plastic distrene which has excellent RF properties, is adapted for the amateur station. A salt-cellar as a low-loss bushing or lead-through insulator.

ELECTRICAL PROPERTIES OF SOME PLASTICS				
Plastic	Volume Resistivity	Surface Resistivity	Power Factor	Dielectric Constant
Distrene ..	10^{17}	10^{16}	.0002 at 1 mc .0001 at 40 mc	2.2-2.3
Alkathene	3×10^{17}	10^{14}	.0002-.00035 at 20 mc	2.3
PVC ..	4×10^{12}	—	0.12 at 50 cycles	—

cal strength can be produced in this way.

Plastics under Heat

As the soldering iron has been mentioned, it is as well to remember that most plastics (except the bakelite type) soften under the action of heat ; if a wire is overheated when soldering a joint its plastic covering may soften and distort ; the pins of a distrene coil base will loosen and move from their correct position if too much heat is conveyed to them in the soldering operation.

Much more information on plastics and their uses is available in the text-books and reviews on the subject, and the writer would like to urge fellow amateurs to take an interest in the electrical properties of the more important plastics and thus place themselves in a better position to pass judgment on components and apparatus.

THE AMATEUR BANDS

Following are the bands now open for amateur operation :

- 1715-2000 kc 10 watts (A) and (B)
- 3500-3635 kc } 25 watts (A),
- 3685-3800 kc } 150 watts (B)
- 7000-7300 kc 25 watts (A), 150 watts (B)
- 14000-14400 kc 25 watts (A), 150 watts (B)
- 28000-30000 kc 25 watts (A), 150 watts (B)
- 58500-60000 kc 25 watts (A) and (B)
- 460.5 mc 5 watts (for radio control of models and only by special application)
- 2300-2450 mc 25 watts (A) and (B). FM permitted.

"A" licences are all three-letter calls issued post-war, and are for CW operation only; licensees in this category are not normally allowed the use of telephony and full power till they have had twelve months' experience. Class "B" licensees are holders of reissued pre-war two-letter call signs, and are allowed the unrestricted use of CW, MCW and 'Phone with power as given above.

READERS' *half-guinea* IDEAS

Carbon Bit Soldering Iron—Lettering Panels— Automatic Bias Protection—Movable Lighting —Soldering Iron Protection

(Here are some more practical ideas from readers. We pay 10s. 6d. for all ideas published. Let us see yours.—Ed.)

Soldering Iron Cut-out

This device was prompted by the idea which appeared as Fig. 2 in "Half-Guinea Ideas" in the September issue. It not only holds the iron safely, but automatically brings in the lamp resistance when the iron is laid on the holder, thus ensuring that it is kept at working temperature without over-heating.

The sketch (Fig. 1) is self-explanatory. The lower contact is a screw through a strip of bakelite, the length of the latter being determined by the weight of the iron. The upper contact is a leaf taken from an old jack.

In use, the contacts are held together by the spring action of the jack leaf on the screw head in the bakelite strip; when they are opened by the weight of the iron, the series lamp resistance is brought into the circuit.—From R. F. Stevens, G2BVN, 43 Pettits Lane, Romford, Essex.

Lettering Made Easy

When finishing off radio equipment, especially test gear, it is necessary to devise a method of lettering or numbering.

Most people do not possess letter punches, and hand work is not very neat without a great deal of practice. The idea put forward here does, however, give a lasting and "professional" finish, and is easy to apply.

In model aircraft shops, "waterslide" transfers in sets of numbers and in different sizes of the alphabet can be purchased, and are ideal for panel marking. The $\frac{1}{4}$ -in. size

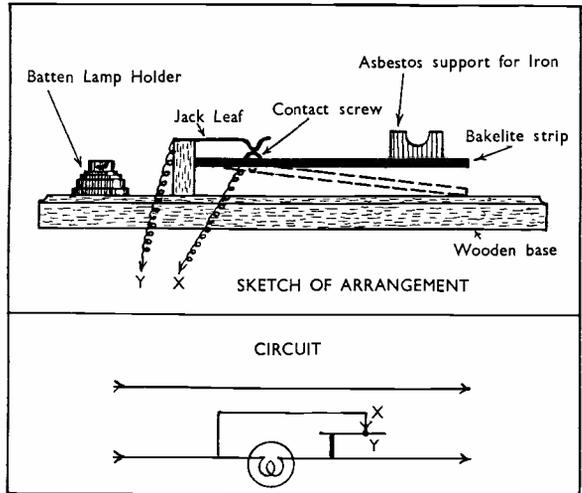


Fig. 1. G2BVN's idea for protecting the iron. When it is rested upon the asbestos support, its weight bends down the bakelite strip and breaks the connection X-Y. This is arranged to bring the lamp into circuit, thus reducing heating current while the iron is not in immediate use. (See Fig. 2, p. 432, September issue.)

is the best for the purpose, and recommended colours are red for black panels and black lettering for grey. Transfers in grey, blue and yellow are also to be had.

To use the transfers, the required letter or number is cut from the sheet and then soaked face upwards in a saucer of water for a few minutes. It can then be slid off its paper backing into the desired position. After placing exactly with a wet camel-hair brush, the transfer should be pressed down with a piece of clean blotting paper. These transfers will adhere firmly to either a painted surface, bare

aluminium or to a crackle finish panel.—From E. J. King, 632 Green Lanes, London, N.8.

Using Lamps for Automatic Bias Protection

No doubt many people have lost transmitting valves due to a sudden overload. The arrangement suggested here—which is not entirely original, as it was first given in an American publication—is worthy of more general use to prevent heavy anode current ruining a valve.

The normal bias resistor is replaced by an ordinary electric lamp. Action is simple.

With normal cathode current the lamp filament scarcely heats, and therefore has a low resistance, giving very little bias effect. (See Fig. 2.)

If an overload occurs, the increased current causes the lamp filament to heat, thus increasing the resistance and biasing the valve back. A standard 230-volt 40-watt lamp will give full protection for an 807.—From T. H. Streeter, GSCM, Cottesmore, Gordon Avenue, Bognor Regis, Sussex.

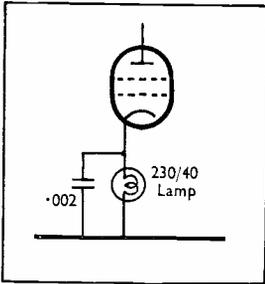


Fig. 2. GSCM's overload protection for his 807. An ordinary 230-volt 40-watt electric lamp will prevent excessive cathode current. At normal cathode currents, very little bias effect is given. Devices of this kind depend upon the fact that electric lamps have a resistance gradient which rises on heating of the filament.

Low-Tension Iron

This is a description of a carbon bit soldering iron which has been found very useful when working away from the bench.

A short length of copper tube with an internal diameter of $\frac{1}{4}$ in. or so has fitted into one end a piece of carbon rod such as can be obtained from an old 1½-volt dry cell. Into the other end of the copper tube the bared end of a length of flex is secured, either by clamping or by means of a grub screw.

A file handle is now drilled with a hole large enough to take the flex and at the other end, where the file tang normally fits, the hole is enlarged to make the copper tube a tight fit. The flex is brought through the hole at the back of the handle. (See Fig. 3.)

All that is now needed is a 6-volt accumulator capable of giving about 5 amps. on intermittent load. The flex on the iron is connected to one side of the supply and a second piece of wire taken from the work to the other side. On the carbon bit touching the metal intense heat is generated and soldering becomes an easy matter.—From A. Dickinson, GADP, 27 Ash Grove, South Elmsall, Yorks.

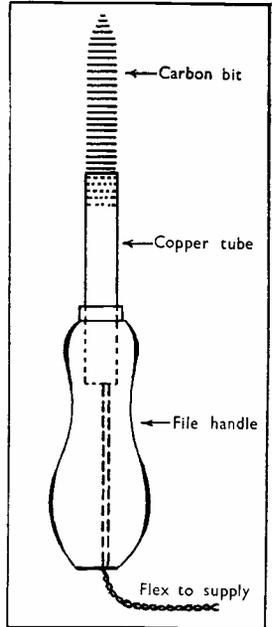
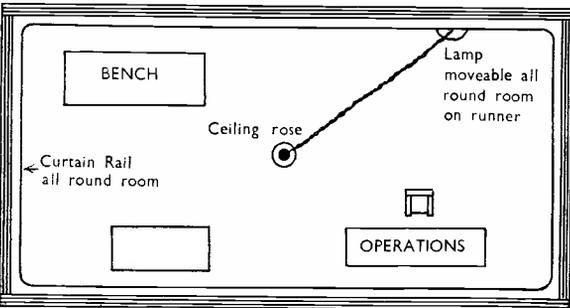
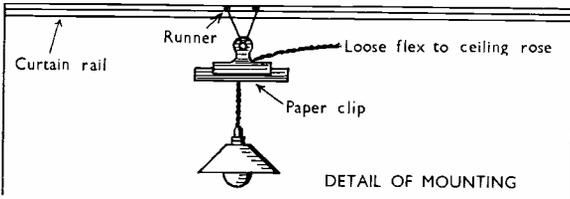


Fig. 3. GADP's home-made portable iron, with a low-tension carbon bit. A source giving about 5 amps. at 6 volts is needed to energise it.



ROUGH PLAN OF RADIO ROOM

Movable Light for the Radio Room

Running right round the room are fixed lengths of brass curtain rail from Woolworth's. Hanging from a pair of rollers running on the rail is a large paper clip, which holds the flex of a 100-watt lamp. (See Fig. 4.) The lamp can thus be moved right round the room and brought over any job, saving time and current. If the ceiling rose is not in the centre of the room, the length of loose flex will have to be adjusted to suit the longest reach.—From J. Taylor, 41 Sandown Road, Lake, Sandown, Isle of Wight.

Fig. 4. Arranging direct lighting round the radio room. The lamp is carried on a curtain rail runner, enabling it to be moved round as required.

NEW QTH's

Only those which have changed since the appearance of the September, 1939, issue of the Call Book or were not included in it for fully licensed operation, or are now licensed for the first time, can be published here. All that do appear in this column will automatically be included in the next Call Book, now in preparation. The number of QTH's we can print each month depends upon space available. QTH's are inserted as they are received, up to the limit of the space allowance. Please write clearly and address to QTH Section.

- | | | | |
|--------|---|--------|--|
| G2ABV | L. Hobson, 21 Cumberland Road, Edmonton, London, N.9. | G3AKU | R. A. Harding, 16 Tenterleas Road, St. Ives, Hunts. |
| G2ACK | M. J. Aitken, 71 Broad Road, Lower Willingdon, Eastbourne, Sussex. | G3ALG | P/O G. S. Starling, 44 Devonshire Way, Croydon, Surrey. |
| G2AOK | H. Heath, Church Street, Stow-on-the-Wold, Cheltenham, Glos. | G3AOT | T. Pattinson, 11 Tyne Gardens, Washington, Co. Durham. |
| G2AQH | J. R. Griffiths, 39 Glenwood Road, Chellaston, Nr. Derby. | G3APF | R. S. MacQueen, Holly Cottage, Pant, Oswestry, Salop. |
| G2AUA | W. Bigley, 29 Hill Street, Wellingborough, Northants. | G3APL | J. Russon, 28 Elm Road, The Priory, Dudley, Worcs. |
| G2BHY | R. G. Bonner, 29 Hillcrest Road, Orpington, Kent. | G3APY | J. Spragg, 38 Laxton Avenue, Sutton-in-Ashfield, Notts. |
| G2BON | T. Burton, 147 Clements Road, Yardley, B'ham 25 | G3AQN | J. S. Goodworth, 68 Upper Church Street, Oswestry, Salop. |
| G2BXP | W. J. Prestidge, 177 McKean Road, Oldbury, B'ham. | G3ARB | W. F. Brittle, 154 Alcester Road South, King's Heath, B'ham 14. |
| GC2CNC | E. Banks, B.Sc., Fort Rock, Tabor Lane, Route des Genets, St. Brelade, Jersey, C.I. | G3ARC | G. A. Cooksey, 60 Courtfield Rise, West Wickham, Kent. |
| G2CZM | A. G. Pruden, 25 Germain Street, Chesham, Bucks. | G3ARJ | C. J. Ellett, 2 Fillydye Road, Meppershall, Shefford, Beds. |
| G2DAT | H. Walls, 83 Langdale Road, Liverpool, 15. | GW3ARP | E. W. Nield, 6 Hazel Road, Uplands, Swansea, Glam. |
| G2DRB | G. H. Heppel, HM Coastguard, Newhaven, Sussex. | G3ARU | H. J. Smith, 69 Lord Avenue, Ilford, Essex. |
| G2FSR | J. A. Hunt (ex-VS4JH), 2 Parkhill Road, Chingford, London, E.4. | G3ARV | D. Walker, 118 Glebe Avenue, Ickenham, Uxbridge, Middx. |
| G2HOX | F. J. T. Tuckfield, 13 Quaves Road, Slough, Bucks. (Correction) | G3ARX | C. E. Wilkinson, Jasmine House, Anderby, Skegness, Lincs. |
| G3ABK | F. Burns, 31 Edge Fold Road, Walkden, Manchester. | G3ARZ | C. L. Waywell, 10 The Slade, Clophill, Beds. |
| G3ACM | H. G. Martin, 184 Kirby Road, North End, Portsmouth, Hants. | G3ASA | J. G. Young, 40 Dorothy Road, London, S.W.11. |
| G3ADJ | G. L. Fish, 81 Park Street, Hull, Yorks. | G3ASE | H. S. King, 34 Raydean Road, Barnet, Herts. |
| G3AEE | C. G. Wells, 7 Clifton Road, Birkenhead, Ches. | G3ASL | F. E. Godward, 40 Beaufort Street, Southchurch. (Tel.: Southchurch 62854.) |
| G3AEP | R. P. Mackrell, 36 Market Street, Whittlesey, Peterborough, Northants. | G3ASP | S. Gould (ex-W9AVO), 22 Somerset Road, Swindon, Wilts. |
| G3AEU | H. S. Young, Bishopgarth, Heathside Road, Woking, Surrey. (Tel.: Woking 1839). | G3ASQ | P. C. W. Ives, 137, Thorpe Road, Norwich, Norfolk. |
| GM3AFB | D. A. G. Tait, 20 Kirk Crescent, Old Kilpatrick, Glasgow. (Tel.: Bowling 179.) | G3ATF | R. W. Pinfold, The Round House, Seaton, Hull, Yorks. |
| G3AFW | E. A. Babbs, 23 Highfield Road, Purley, Surrey. | G3ATL | D. I. Wiggins, Dunster Lea, Rochdale, Lancs. |
| G3AHB | L. G. Coote, 46 Salt Hill Drive, Slough, Bucks. (Tel.: Slough 21751.) | G3ATM | D. Nasey, 41 Town Terrace, Leeds Road, Huddersfield, Yorks. |
| G3AHF | P/O W. Howarth, 146 Sqdn., A.T.C., Dock Road, Northwich, Ches. | G3ATP | H. Greenwood, 45 St. Margarets Road, Bradford, Yorks. |
| G3AIP | F/L H. W. Hodges, Officers' Mess, RAF Cranwell, Lincs. | G3ATQ | G. F. Heath, Torre, Stourbridge Road, Bromsgrove, Worcs. |

G3AUC	J. R. Plumbley, 63 Golborne Dale Road, Newton-le-Willows, Lancs.	G4OV	A. R. Osborne, 55 East Street, Bridport, Dorset. (Tel.: Bridport 614.)
GM3AUE	A. McGhie, 68 George Street, Whithorn, Wigtownshire.	GM4PW	D. A. MacQueen, Sunnybank, 3 Ayr Road, Prestwick, Ayrshire. (Tel.: Prestwick 78375.)
G3AUH	E. Ailmore, Junction House, Ironville, Notts.	G5NN	J. H. D. Ridley, Brownstacks, Beeches Close, Kingswood, Surrey.
G3AUT	I. T. Haynes, B.Sc., Hill View, Bilton Hill, Bilton, Rugby, Warks. (Tel.: Rugby 4029.)	G5XV	R. Y. Parry, Halcombe, Malmesbury, Wilts.
G3AVG	V. E. Hughes, Abbots-Haye, Cheadle, Stoke-on-Trent	G5WG	G. F. Wakefield, Dnalwen, Welley Road, Wraysbury, Staines, Middx.
GM3AWF	D. F. Craig, The Manse, Fortrose, Ross-shire.	G6RF	D. E. Herbert, 11 Torland Road, Hartley, Plymouth, Devon.
G3AWR	C. D. Hammett, 37 Torrington Road, Greenford, Middx.	G6VS	W. H. G. Metcalfe (ex-VU2EU), 11, Cortsway, Greasby, Wirral, Ches.
G3AWQ	D. R. Hill, 81 Rye Hill Park, Peckham Rye, London, S.E.15.	G8OG	H. Dobson, 6 Grand Arcade, Leeds 1, Yorks.
G3AWZ	G. P. Pearson, 10 Westbourne Grove, Ripon, Yorks.	G8QB	G. H. Wheatley, Gardenia Cottage, Millead Road, Margate, Kent.
G3BFR	F. R. Rogers, 11 Springfield Road, Smallford, St. Albans, Herts.	G8TS	J. St. C. T. Ruddock, 1 Woodland Grove, Farnborough, Hants.
G3JS	W. L. Baillie, Greystones, Greet, Winchcombe, Glos.	G8VQ	F/L W. N. Greasley, 109 Hindes Road, Harrow, Middx.
G4AY	R. Pluck, 9 Prospect Road, Southborough, Tunbridge Wells, Kent.	G8WS	F. E. Stallworthy, 276 Elgin Avenue, London, W.9.
G4HJ	H. A. W. Jones, 99 Stanstead Road, Hoddesdon, Herts.		

CONTRAST

Listening round on 3.5 mc the other evening, we heard a pre-war G3 in QSO with a G8—both on 'phone. The G8 was describing the "rig here". He had a 6V6 arcillator into a 6L6 buffer driving a pair of 35T's in PUSHpull, with a lot more about the modulator and ribbon volarcity mike. His ANtenna was a Dubbelya 3EDP and his receiver a Hellicrefter something-or-other. Altogether, very impressive, particularly the accent.

The G3 came back, rather modestly, to say *his* outfit was LS5B-PX4-PX4, with a pair of PX4's modulating and a carbon microphone. The aerial was a Marconi and the receiver a 1-V-2.

We recorded both transmissions and one day will hook this G8 and play the whole thing back to him. He will probably be impressed by the excellent quality of the G3 in comparison with his own speech transmission.

SWEDISH ALLOCATIONS

Following are the conditions under which the SM's are now operating :

3500-3635 kc	CW only
3685-3950 kc	'Phone and CW
7000-7100 kc	CW only
7100-7300 kc	'Phone and CW
14000-14100 kc	CW only
14100-14250 kc	'Phone and CW
14250-14400 kc	CW only
28000-28200 kc	CW only
28200-30000 kc	'Phone and CW

The VHF bands are 58.5-60, 112-120, 235-240 and 420-430 mc. The maximum power for all purposes on all bands is 50 watts.

The foregoing is one of the best regulated band allocations we have yet seen, and is also very generous in the VHF region, where we are so urgently in need of territory.

Mention the Magazine when writing to Advertisers—It Helps You, Helps Them and Helps Us.



Illustrated here is a fine example of modern amateur station design—G5CP, owned and operated by C. R. Plant, 33 Manley Road, Sale, Manchester.

The transmitter is of post-war construction, for the 7, 14 and 28 mc bands, the valve line being 6L6 tritet, 6L6 doubler, 807 buffer, into a pair of RK20's in push-pull final. This PA is suppressor-grid modulated by a speech amplifier-modulator using AC/HL-AC/HL-PX4, the microphone being a Philips transverse-current. The coupling between modulator and RF amplifier is by means of a "Varimatch" transformer.

A separate bias pack ensures that bias is available immediately the transmitter is switched on, and potentiometers control the bias voltage to the different stages. Variostat control on the main power



The other man's station

G5CP

supply allows an HT variation of 0-2000 volts on the plates of the RK20's.

Aerials are a half-wave Zepp with quarter-wave feeders for 7 and 14 mc, and a 3-element rotary beam for 28 mc. The latter is arranged to connect to the receiver in use, so as to enable focusing on the distant station for transmission.

Receivers are a Hallicrafters S21 for 28 mc and an HRO for the other bands. Send-recv switching is by push-button, eight circuits being controlled in the one change-over operation.

As to results, in the post-war period G5CP has WAC on CW and 'Phone, and WBE on CW; as well as this, much of the Pacific DX has been worked on 28 mc 'phone. Altogether, a station and a record of which G5CP may well be very proud.

MORE NEWS FROM BURMA

The authorities have now started reissuing amateur licences, under the direction of the Divisional Engineer, Wireless Division, Telecommunications Department, Government of Burma.

No fees are charged, and two grades of permit are granted: Class-A, to professional radio operators who wish to work in the amateur bands, and Class-B, to amateurs proper. Bands are 7150-7300 kc and 14100-14300 kc (150 watts), 28-30 mc (50 watts) and 58-60 mc (25 watts).

Amateurs licensed as at September 13

were XZ2AD (Rangoon), XZ2AM (Tharawaddy), XZ2EZ (Rangoon) and XZ2ST (Rangoon). These calls are owned by Burmese nationals who served the British Government in various ways during the war: XZ2EZ and ZX2ST were both Lt./Cdrs. in the Navy, and XZ2AD and XZSAM are in Government departments.

In addition to the post-war Service personnel who have been issued with XZ calls and are already operating, several British residents who had licences before the war are becoming active again.

Here and There

QSL Bureau

To allay possible misgivings and to dispel any doubts, we should explain that all cards for G's received from overseas by our QSL Bureau will be accepted for delivery. This is irrespective of whether the addressee is a direct subscriber to our publications.

Delivery will be made direct by post if the QTH is in the latest lists; if not, the address will be requested through the *Magazine*. Cards will not be cleared through any other QSL Bureau in this country.

Rule (1)—see "QSL Bureau Rules," page 618 this issue—therefore applies only to originators of cards from within the United Kingdom; in other words, the only G's who can use the Bureau *both ways* are those known to us as readers, i.e., direct subscribers. In the circumstances, a not unreasonable stipulation.

Cards are, however, accepted from all other (non-G) operators without regard to whether they are subscribers. This is to ensure a free flow inwards of cards from overseas and to guard against any possible loss of cards from foreign stations.

Any G operator, whether a direct subscriber or not, may therefore safely give us as a QSL address—QSL Bureau, *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. But he can only send us his own cards for distribution if he is on our direct subscription lists.

Twenty and Forty

With the opening to the full width of 7 mc (7000-7300 kc) and 14 mc (14000-14400 kc), we now have virtually all our pre-war frequency allocations restored. The exceptions are certain VHF allocations above 60 mc, the cutting of five metres by 2500 kc (58.5-60 instead of 56-60 mc), and the hole in the middle of the 80-metre band. Great credit is due to all concerned for having obtained these restorations.

Word of Warning

On August 1, 1946, W51QU was killed by electrocution while operating his 'phone transmitter. It was a metal rack-and-panel assembly, and a defective power transformer had gone down to the core.

The shielded microphone cable was the immediate cause of the fatality, and only because neither it nor the transmitter frame were *earthed*.

Take care—it could happen to you just as easily. Proper earthing all round, and fuses of the correct ratings in the right places, will make the whole station safe against such accidents.

Do You Know That

Valve failures are often due to over-driving, which results in the burning up of the grid? The advice, frequently given, to "drive triodes as hard as possible" will result sooner or later in failures for this reason. Apart from makers' recommendations on the matter of grid drive, this should always be adjusted such that it is not more than is necessary to give the required plate output under efficient load conditions.

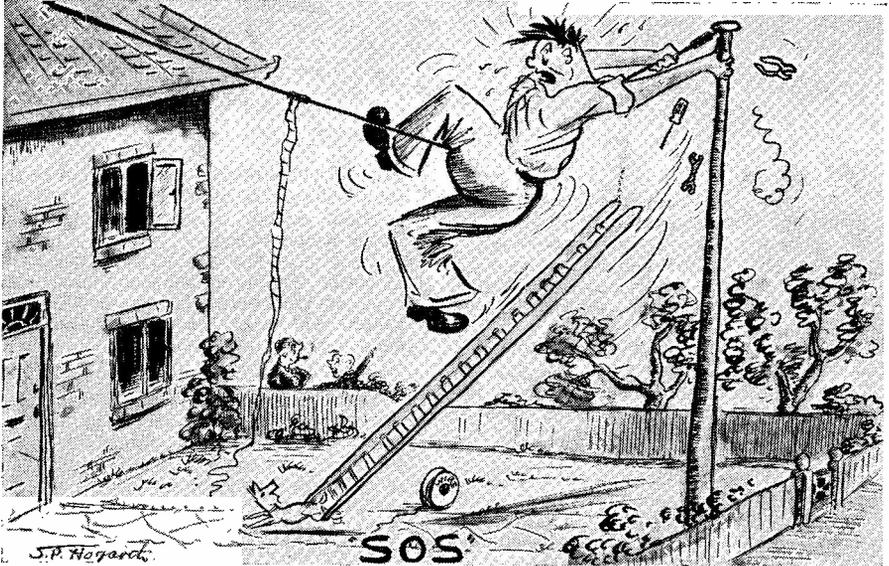
Staff Note

With immediate effect, C. W. Andrews, M.C. (G2TP) joins us as full-time Staff Assistant. Licensed many years ago—his is one of the real old-timer call-signs—G2TP left the Army in July, 1945, having held rank as Lieut.-Colonel, Royal Signals, and until recently has been works manager for the Decca Radio & Television Co. Before the war, he was in the family business of R. Andrews & Sons, of London, printers.

As an active amateur, G2TP's immediate interest is 14 mc DX 'phone. His responsibilities in the *Short Wave Magazine* organisation will be many and varied, and such as will enable us to extend our facilities and improve our services for readers of our publications.

World Telecommunications Conference

An international delegate conference of supreme importance to amateurs the world over takes place in America about next April, probably in Chicago. This conference, among other matters, will settle the frequency allocations for all countries and services. This might result in changes in our bands—whether for better or for worse, it is not possible to say at this stage. A preliminary agenda conference of the five Great Powers has already taken place in Moscow.



G9BF Calling

(It's your own fault for encouraging the fellow.—Ed.)

Due clamour for more information my DX experiences (three anonymous post-cards, one letter Editor burnt privately in bucket specially bought for purpose, and QSL's from TE4TU, GW8MFD and station signing SUSIE) have decided describe further operations with auto-key at famous station KZ7LX. This of course is me G9BF.

Can recommend system described last month with utmost confidence to all beginners as sure-fire for QSO's. With plenty volts stacked on neck my T20, and auto-key putting out rare calls HF end band, will guarantee bring back any operator wanting DX. No writer ever before been able to make such claim. Note must be DX in character, of course; no use having T9 signal, though most reports say "FB CC OM".

Am now working on important variation my auto-key. While sending different rare callsign at each txm, am designing PA to radiate several different frequencies at once. By simple calculation (too difficult for most amateurs) can show that calls on two frequencies simultaneously would produce $4\frac{1}{2}$ times replies. Have therefore

decided Tx must radiate *three* frequencies, giving 13 times replies.

Due unusual characteristics my PA—no noticeable change plate current over wide variation tank condenser—this technique only a matter of feeding required three freqs to PA grid. T20 will then sort out and deliver to aerial as specified.

To obtain different freqs into PA have designed special hush-job mixer-plusser-subtractor-oscillator beating plus and minus xtal freq. Unable explain fully now as Editor very jealous this outstanding technical achievement and angling special article of course.

Next step will be to re-arrange auto-key to send different rare callsign on each of three frequencies radiated at once. By selecting frequencies at top, middle and bottom any DX band and by careful choice rare callsigns reckon I will have no more difficulty raising European DX. Will ignore G's, as am only interested working foreigners with good notes like F's and I's. Next month will describe results new system.

(We shall see about that.—Ed.)

THE MONTH WITH THE CLUBS

FROM REPORTS

At the moment of writing, the Club Contest is in full swing and the 1.7 mc band has been lively with "CQ MCC." We have had the pleasure of working many of the participants, and fast snappy QSO's have been the rule.

The final total of Clubs entered was 23, a most encouraging response and a sign of healthy interest in Amateur Radio activities.

We hope that, in accordance with Rule 11, all results will have reached us by the time this is in your hands. The Contest Report will appear here in our next (January) issue.

January Closing Date

Copy date for Club reports for the January issue is December 12. Address "Club Secretary," *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1, and please note that we simply *cannot* insert reports received after that date. Each month we receive some up to a week late (with profuse apologies!) but due to the special setting that these pages require it is quite impossible to do anything but hold late reports over until the following month. So please acquire the habit of "catching the post"—preferably with some days to spare if possible. We make the date as late as we can, of course, but once the printers have the copy, it is too late to make additions.

This month there are 31 reports, including many newly-formed Clubs. Secretaries' names and addresses in the panel.

Southampton Radio Club.—Yet another newcomer, with a temporary club room available and two receivers already at the Club's disposal. A library is also being started, and a transmitter is being built, of which the modulator section is now completed. Membership is open to all radio amateurs, SWL's and beginners, who should contact the Secretary, Mr. A. Ward.

Bournemouth & District Amateur Radio Club.—This Club has at last found a "home" in the shape of a wooden hut and some ground on which to put it, and elaborate plans are now afoot. Future visitors to Bournemouth will, they hope, be entertained in the finest Amateur Radio Club Room in the country, and will be able to see the proposed superstation in action.

Wrekin Amateur Radio Society.—And another! Fortnightly meetings are held in the Pavilion on the Miners' Welfare Recreation Ground Donnington Wood; interesting discussions have been taking place, Morse classes are run by G3XV, and visits to places of interest are also being arranged.

Coventry Amateur Radio Society.—A steady flow of new members continues to attend the fortnightly meetings—some from as far afield as Nuneaton and Leamington. The joint contest with MARS (see Midland notes) is the big forthcoming event, and CARS enters a transmitting team of eight. Prizes include cups and a voucher for £5 worth of gear, presented by the President, G6WX.

Cheadle & District Amateur Radio Society.—This is another new Society, with G3UB as Chairman and G3AVG as Secretary. Negotiations are in hand for premises and 16 members have already been enrolled, including several licensed amateurs and a number of professional radio officers. Training for the Radio Amateur Examination is to be a strong point with the Club. The first Annual General Meeting is to be convened shortly, and a committee will then be elected.

Midland Amateur Radio Society.—Activities and attendances are still increasing—there were 72 at the October meeting, when G2BOZ gave an interesting talk on his recent visit to the USA. The "MARS/CARS Contest"—a local Derby—takes place on December 8, 0700-2000 GMT and the next meeting is on December 17 at the Imperial Hotel.

Altrincham & District Radio Society.—Yet another new Club, whose first meeting attracted some 40 members. G6GD is Chairman and G3AOS Secretary. Club premises are being sought, and a programme of lectures, displays, films and Morse classes is being arranged. Meetings will take place at least twice a week.

North West Kent Amateur Radio Society.—The inaugural meeting of this Society was held at the end of October. The Chairman is G8DN, Vice-Chairman G2MI and Secretary G2AVI. Meetings are to be held on the last Friday of each month, and a strong programme of technical talks, etc., is being arranged. All amateurs in the North West Kent area will be heartily welcomed if they will get in touch with the Secretary.

York & District Short Wave Club.—A welcome to this new Club, which held its first meeting on November 10. Meetings and Morse classes are being arranged, and there are three transmitting members already. Enquiries from prospective members are welcomed.

Stoke-on-Trent & District Amateur Radio Society.—Attendances continue to be good, and membership has passed the 50 mark. Three sections have been formed—Tx, Rx and Auxiliaries. Each section will construct its own unit for the Club Station. Two recent lectures have been by Mr. A. Hackney on LF Amplifiers and by Mr. Scorey on Klystrons. New calls among the members are G8IX and G3AQW.

Reading & District Amateur Radio Society.—The October meeting consisted of a talk and demonstration on Amplifiers by G2DIO. Meetings are held twice monthly at Palmer Hall, West Street, Reading.

Watford & District Radio & Television Society.—Future meetings will be held on the first and third Tuesdays in each month. The first Tuesday will be devoted to "ragchews," junk sales and so on, and the third Tuesday to lectures and demonstrations. Forthcoming events are talks by G6GR on Quartz Crystal Filters, G3ABR on Frequency Measuring Instruments, and O. S. Puckle on Time-Bases. The meeting place is The Carlton Tea Rooms, 77a Queens Road, and visitors and prospective members are cordially invited to turn up.

Grafton Radio Society.—No report has been received this month, but the new publication, "QTH Grafton," is full of interest and humour, and it is obvious that the society is flourishing. The TRF Receiver Section has started on its first production, which will be tested at each stage of its construction from 28 to 1.7 mc. The description of the Grafton canteen—tea, buns and 807's—gives a good idea of the happy atmosphere pervading the club.

Oxford & District Amateur Radio Society.—Another newcomer! The Club has no transmitting licence as yet, but has entered G6VD for the Club Contest. Secretary's name in panel.

Grays & District Amateur Radio Club.—The last two meetings have been very well attended, and it has been decided that members should bring up their own outstanding problems for discussion in future. Morse practices are held regularly, and four new members have been welcomed. G2YH is lecturing at the next meeting on Output Transformers.

South Bank & District Amateur Radio Society.—And another welcome! This Club has just been formed, and meets at the Secretary's home on Monday nights at 7 p.m. until a suitable room has been found. All members are out for the Amateur Licence exam.; new members, with or without licences, will be welcomed.

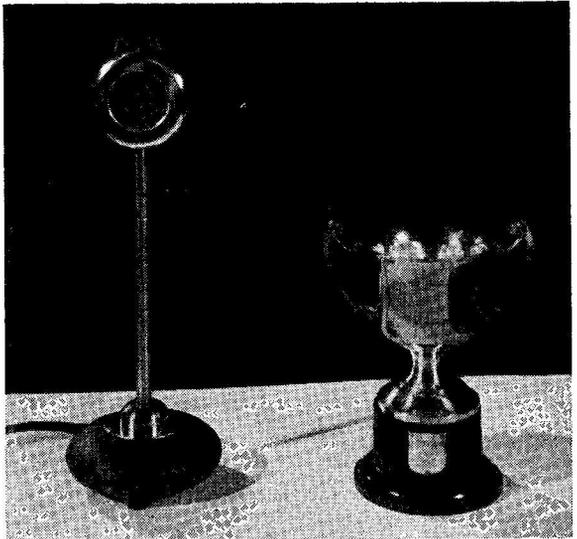
Neath, Port Talbot & District Short Wave Club.—Welcome to another new recruit! At the November meeting Mr. D. Davies lectured on the alignment of superhets with the aid of the oscilloscope. A good programme of lectures has been arranged, and meetings will be held at the Dock Hotel, Villiers Street, Briton Ferrv.

Surrey Radio Contact Club.—Forty-five members attended the November meeting to hear a talk on Micro-Wave Technique, by Mr. Castles. The next meeting is to be held on December 10 and will be a combined junk sale and "ragchew." A Christmas party has also been arranged for December 17—YL's and XYL's invited.

Hi-Q Club, Giffnock.—Talks by members continue to maintain a high standard. GM2KP recently lectured on "Remotely Controlled Transmitters," GM2FZT on an "807 Utility Unit" he has built, which is taking the air for the Club Contest. A good deal of friendly rivalry on "VFO versus CC" continues.

Leeds Radio Society.—This club is progressing, and several more members have been enrolled, among them G3ATI. A club call-sign is in the offing. Members recently visited the Bradford Short Wave Club and report being impressed.

West Bromwich & District Radio Society.—This club reports for the first time; meetings are held fortnightly



G6KB won Reading's Lewis Cup for the best piece of home-constructed apparatus made from junk box material. His winning entry was a crystal microphone.



A photograph from Edgware. *Left to right in front are G3GI, G5LI, G6ZO, G5FG, G4KD (Chairman), G2IM (Vice-President), G2AI (President) and G3HT (Treasurer). G3VW (Secretary) is third from the right.*

at the Gough Arms Hotel, Jowetts Lane. The Secretary, G2BJY, and a member, G8PR, both send slow Morse exercises on the 1.7 mc band, and would welcome reports on these transmissions.

Kingston & District Amateur Radio Society.—At the last general meeting a junk sale was held. Gear provided by members was auctioned by G2LP, who also provided some German radar equipment. A committee meeting was also held in November, and the December meeting has been fixed as an open discussion on "Methods of Reporting." The society is now flourishing and a further big increase in membership is hoped for.

Stourbridge & District Radio Society.—Some 30 members attended the November meeting, when Mr. G. F. Peirson, Chief Engineer of Midland Electric, gave a lecture, touching on problems of Power Generation and Distribution, and showed a film on Water Power. Membership is still growing and is now in the region of 45. Meetings take place on the first Tuesday of each month at 8 p.m. in King Edward's Grammar School (Science Block), Stourbridge.

Edgware & District Radio Society.—The Secretary has moved again (see panel), but to a QTH vacated by G6PM, who has left his aerials behind, thereby saving much trouble! Membership is now 83. In November an aerial talk was given by G2AI and G6ZO, and the monthly junk sale was also held. Another interesting discussion was on the subject of SWL reports—how they should and should not be made. Construction of the club transmitter (G3ASR) is in progress—it should be finished by now and should, in fact, have been active in the Contest. Membership of this club now includes 25 licensed transmitters.

Halifax Experimental Radio Society.—Members were recently the guests of Bradford Amateur Radio Society for a talk by G6BX on Cathode Ray Oscillographs. At the November meeting Mr. W. H. Hutchins of Doncaster lectured on Communications Receivers for AM and FM, and Morse classes also commenced. A service has been opened whereby members requiring technical information, circuits, etc., for building their equipment may obtain it from the society.

Yeovil Amateur Radio Club.—Another newcomer, which holds weekly meetings with a small but increasing membership. The Secretary (see panel) is anxious to get into touch with all interested readers in the district.

Slade Radio.—The last meeting took the form of a joint discussion with the Birmingham Model Aero Club on "Radio Control of Model Aircraft," at which it was generally agreed that the allotted frequency of 460.5 mc was unsuitable. The next meeting is the AGM and closes the first year of post-war activity. Please note the Secretary's change of address.

Bradford Amateur Radio Society.—This society was recently formed, and the membership includes many well-known local amateurs, some members of the former Bradford Radio Society, former Naval and RAF signals officers, members of TRE and so on. Meetings are held fortnightly at Cambridge House, 66 Little Horton Lane, and a monthly syllabus of lectures has been arranged. Workshop facilities are also available, and Morse classes are being held. The society particularly wishes to contact former members of

the signals branches of the Forces. The President is Sir Edward Appleton, G.B.E., K.C.B., F.R.S.

Southend & District Radio & Scientific Society.—At the October meeting Mr. L. G. Pugh gave an interesting talk on the History of the Technical Development of Radio, and G6CT followed with a short description of the parallel development of Amateur Radio. G2YH was the November

lecturer, on the subject of Voice-Control and Break-In. The new Secretary is K. F. Crispin, G6MH.

Bradford Short Wave Club.—Membership is now 60, and the club transmitter is on the air every Monday evening. On December 16 G8OK is to lecture on "An Amateur's Memories," with 250 lantern slides; future lectures include G2QM on "Aerials," and Mr. Shaw, a Bradford radio engineer, on "An Acoustic

Experiment," followed by a talk on radar.

Radio Society of Harrow.—Membership continues to increase, and fortnightly meetings are held at The Northwick Tea Rooms, 206/208 Kenton Road. G4GB recently gave an interesting talk on "Jungle Radio." A constructional competition has been arranged, and entries will be judged in March. The membership target is 100— all comers welcomed!

Following are the names and addresses of the secretaries of the clubs mentioned this month. They will be pleased to give every assistance to prospective members.

ALTRINCHAM. J. G. Barnes, G3AOS, 4 Victoria Road, Hale, Cheshire. (Tel.: *Altrincham* 4464).
BOURNEMOUTH. J. F. Squires, M.B.E., G2DBF, 80 Victoria Road, Bournemouth.
BRADFORD. (Amateur Radio Society): J. H. Macdonald, G4GJ, Cambridge House, 66 Little Horton Lane, Bradford.
BRADFORD. (Short Wave Club): V. W. Sowen, G2BYC, Rushwood, Grange Park Drive, Cottingley, Bingley, Yorks.
CHEADLE. V. E. Hughes, G3AVG, Abbots-Haye, Cheadle, Stoke-on-Trent.
COVENTRY. J. W. Swinnerton, G2YS, 188 Moor Street, Coventry. (Tel.: *Coventry* 4578).
EDGWARE. R. H. C. Jewland, G3YW, 3 Albany Court, Montrose Avenue, Edgware.
GRAFTON. W. H. C. Jennings, G2AIB, 82 Craven Park Road, London, N.15. (Tel.: *Stamford Hill* 3891).
GRAYS. R. F. Read, 26 Hillside, Little Thurrock, Grays, Essex.
HALIFAX. L. Blagbrough, 39 Fountain Street, Sowerby Bridge, Yorks.
HARROW. J. F. A. Lavender, G2KA, 29 Crofts Road, Harrow, Middx.
H.F.O. J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4.
KINGSTON. J. Hughes, 12 Hillingdon Avenue, Ashford, Middx.
LEEDS. F. Stork, 1 Brudwell View, Leeds 6.
MIDLAND. W. J. Vincent, G4OI, 342 Warwick Road, Solihull, B'ham. (Tel.: *Solihull* 0413).
NEATH. S. Roberts, GW4NZ, 29 Chestnut Road, Cimla, Neath, Glam.
NORTH WEST KENT. L. Gregory, G2AVI, 18 Upper Park Road, Bromley, Kent.
OXFORD. R. H. Farmery, 99 Stanway Road, Headington, Oxford. (Tel.: *Oxford* 61175).
READING. L. A. Hensford, B.E.M., G2BBS, 30 Boston Avenue, Reading. (Tel.: *Reading* 60744).
SLADE. L. A. Griffiths, 34 Florence Road, Sutton Coldfield, B'ham.
SOUTHAMPTON. A. Ward, 50 Onibury Road, Bitterne, Southampton.
SOUTH BANK. H. Stubbings, 11 Station Road, South Bank, Middlesbrough.
SOUTHEND. K. F. Crispin, G6MH, 27 Thurston Avenue, Southend-on-Sea. (Tel.: *Marine* 67297).
STOKE-ON-TRENT. D. Poole, 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent, Staffs.
STOURBRIDGE. D. Rock, G8PR, Flat 1, Block 1, Worcester Road, Summerfield, near Kidderminster.
SURREY. L. Blanchard, 122 St. Andrews Road, Coulsdon, Surrey. (Tel.: *Uplands* 3765).
WATFORD. J. C. Warren, 29 Market Street, Watford, Herts. (Tel.: *Watford* 5988).
WEST BROMWICH. G. Johnson, G2BJY, 22 Lynton Avenue, West Bromwich, Staffs.
WREKIN. T. L. Stevens, G3XV, Sunny Cottage, Donnington Wood, Wellington, Salop.
YEAVIL. D. Hover, 57 Everton Road, Yeovil, Som.
YORK. G. W. Kelley, G5KC, 146 Melrosegate, York.

LEADING HIM ON

Readers will be as astonished as we were when they hear that one of the Clubs invited G9BF to lecture at the next meeting. There is no doubt he would have had "no hesitation" in accepting this unexpected invitation, but in the interests of all concerned, we felt compelled to decline.

This, combined with the growing volume of his correspondence with new friends like GW8MFD, FC2IF and TE4TU, is making G9BF quite unbearable about the office just now.

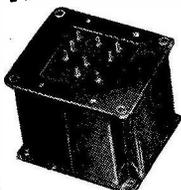
AMERICAN CONTEST

During the periods November 16-18 and 23-25, the ARRL ran their "Sweepstakes Contest," which is a very popular annual inter-W event. It is based upon the central idea of working as many stations as possible in the different ARRL sections. Points are allotted for each contact and the final score is the points total multiplied by the number of different sections worked. It is in fact a QSO Party on a large scale, and for a successful performance calls for a high standard of operating ability.

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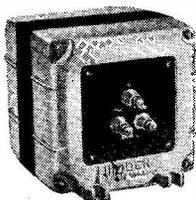


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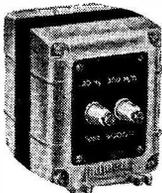
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D.T.M.15. 500-0-500 150 m/a	64/5	D.T.M.20. 2000-0-2000 350 m/a	211/2

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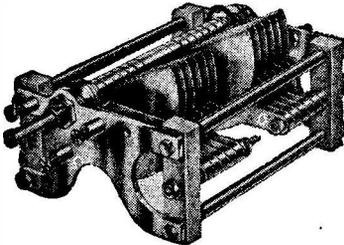
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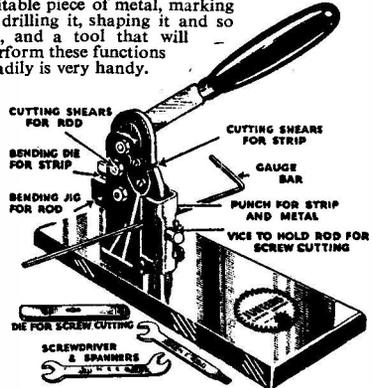
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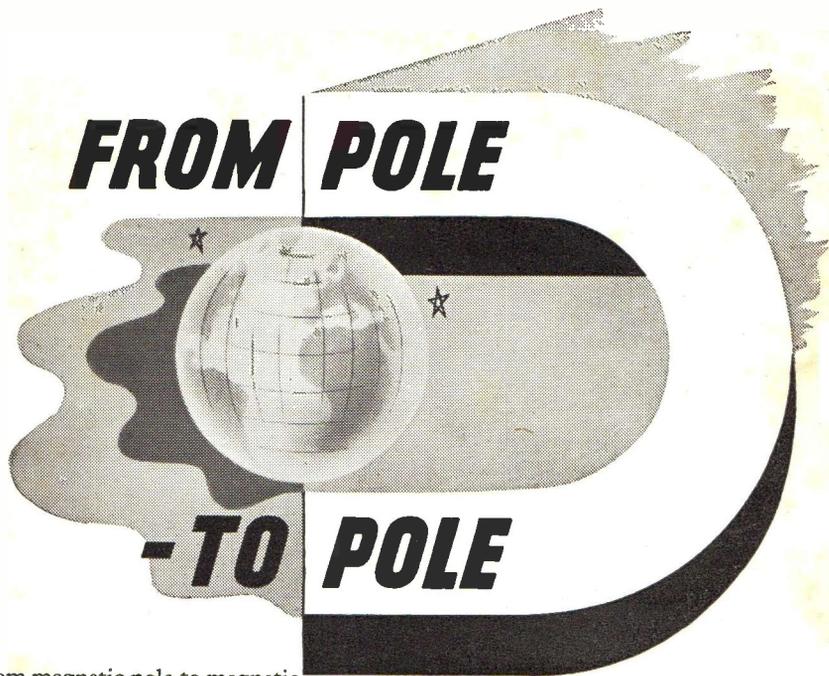


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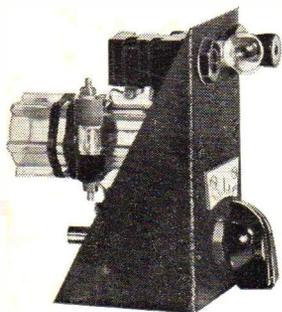
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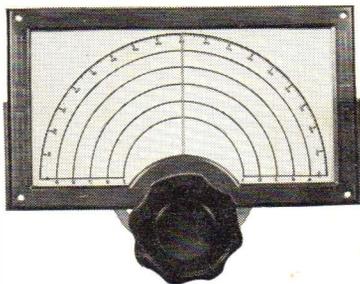
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