THE T. & R. BULLETIN

OFFICIAL ORGAN OF THE INCORPORATED

RADIO SOCIETY OF GREAT BRITAIN

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CONTENTS

EDITORIALS

WE include in this issue the rules for our Eighth Annual B.E.R.U. Contest which will take place next February.

In general the rules follow along similar lines to those in force during the 1937 Contest, and the few changes which have been made are based on the result of past experience.

Due to political changes, Egypt and Iraq can no longer be regarded as parts of the British Empire. We regret very much that British members living in these countries will be debarred from entering, because in the past they have fully supported the Contests and have often given home stations hard-earned points.

In an attempt to stimulate interest in some of those Zones where activity has hitherto been rather disappointing (we refer in particular to Canada), it has been decided to award a second Zone certificate in each Zone provided ten or more entries are received from that Zone, in each section of the Contest.

In the past, a good deal of confusion has been caused by entrants for both sections of the Transmitting Contests submitting their log on one sheet. A rule has been introduced calling for separate entry forms for both Senior and Junior events. Home members may apply to Headquarters for extra forms, whilst overseas amateurs may obtain additional copies from their local representative.

The Prefix Zones have been revised and slightly modified. It has been felt in past years, mainly due to geographical reasons, and also to the large number of active competitors, that the rules have tended to favour British Isles, Australian, and New Zealand entrants. An experiment is being tried this time in regard to New Zealand, which will count as one Zone only to British Isles, Irish Free State, Australian and New Zealand entrants, and two Zones for all other competitors. Provision has been made for this arrangement in the Prefix Zone and Analysis section of the entry form.

Recent International Contests have resulted in a regrettable increase in off-frequency operation. To counteract this tendency and in fairness to the large majority who adhere to their licence, the Society are appointing a number of observers who will keep a careful watch on the edges of the amateur bands. These observers will be non-competitors and they will be using apparatus of a high degree of accuracy. Any station reported off-frequency by two or more of the observing stations will be disqualified without appeal.

Users of Electron Coupled or Master Oscillators are urged to take every reasonable precaution to avoid off-frequency operation. A small number of careless amateurs may jeopardise our position in directions known to us all.

[*Continued on next page*

One last word. May we ask those who normally use telephony on the DX bands to keep their transmissions to a minimum during Contest hours ? Last year a good deal of interference was caused by telephony stations working "locals" on 14 Mc. during periods when DX was also coming into Great Britain. A similar appeal has always resulted in a generous response during the local R.S.G.B. 1.7 Mc. Contest, and we feel sure that the DX 'phone operators will be no less willing to co-operate in this world-wide event.

May we hope for good conditions, plenty of entrants and—need we say it ?—tidy logs !

* * * * *

Whilst on the subject of Contests, we desire to draw attention to the details given in this issue of an International 56 Mc. Contest, which we intend to run next year. The popularity of 28 Mc. can be attributed in no small measure to the foresight of the R.S.G.B. in organising International Contests during 1935 and 1936. The new Contest should serve a similar purpose on 56 Mc.

Even if no real DX is worked, we, and other interested parties, will have the satisfaction of knowing that efficient gear and competent operators have maintained a regular watch on the band for a period of one year. Data, even if mostly negative, will prove informative and invaluable. Let's get going !

* * * * *

The advent of a high-definition television service working on frequencies around 45 Mc., with a service area wider than originally planned, brings to light the possibility of interference being caused to viewers by third harmonic signals from nearby radio amateurs working in the 14 Mc. band. So far difficulties have been reported from but one centre, and there only because the field strength of the vision signals is low. Immediately attention was drawn to the danger, the amateurs concerned commenced experiments aimed at the suppression of the harmonics.

Realising the desirability of placing before our members practical advice on this subject, Mr. H. A. M. Clark (G6OT), working in collaboration with Mr. F. Charman (G6CJ) and others, has prepared an authoritative article dealing with suppression devices. We trust that those who have experienced trouble will experiment along the lines indicated, and that they will not hesitate to give us such additional data as they may possess or collect.

To close down an amateur station during television hours because of third harmonic interference is to seek trouble later, when the hours may be extended. The problem should be faced now and experience pooled, as it has been in the past when similar difficulties have arisen.

The columns of this Journal are always open to members desirous of contributing information or suggestions on this or any other point of technical interest.

Our remarks on third harmonic radiation from 14 Mc. transmitters prompt us to enquire whether any of our 1.75 Mc. stations are being heard in the 5.3 Mc. band. Once or twice recently our attention has been drawn to the fact that amateur signals have been heard around 56 metres. If this information is correct, we consider it time to offer a word of warning, especially if, as we have been advised, the harmonics are being heard up to distances of 200 miles.

J. C.

I.E.E. Meeting

At the November meeting to be held on the 26th of that month, Mr. de Grouchy, of *Messrs. Everett, Edgecumbe & Co., Ltd.*, will lecture on "Measuring Devices as applied to the Radio Field." Friends of members and in particular those connected with the Radio Trade, will be cordially welcomed at this meeting. Tea will be served free of charge from 6 p.m., and the lecture will commence at 6.45 p.m. For the convenience of members the I.E.E. will be open from 5 p.m. for informal discussions.

The 1.7 Mc. Band

Attention is drawn to the fact that the frequencies 1786 and 1837 kc. should be avoided by amateurs using the 1.7 Mc. band as there are fixed Government stations working with ships on these two spot frequencies.

We would remind members who use this band that they are not allowed by the terms of their licence to work ships. It is our understanding that in the event of serious emergency an amateur station would, of course, be justified in replying to a call from a ship requiring assistance.

Editorial Assistance

It frequently happens that useful technical or topical articles are submitted by members which are not sufficiently well written to permit of publication until re-written. Headquarters will be pleased to receive offers of help in connection with this work, but it is essential that those offering their services possess a typewriter and have a little journalistic knowledge.

The Reduction of Interference Due to Radiation of Third Harmonics

By H. A. M. Clark (G6OT).

THE interference which a transmitter may cause with the operation of another station may be divided into three general classes :—

(i) When the transmitter is working in the same frequency band as the receiving station ;

(ii) When the receiving station operates near a harmonic (and hence higher) frequency of the transmitter ;

(iii) When the receiver works on a frequency which is much lower and has no particular relationship to that of the transmitter.

Difficulties arising out of cases (i) and (iii) have received full attention in the Bulletin and elsewhere. Although trouble has arisen in the past from case (ii), it has recently become of much greater importance.

14 Mc. Third Harmonics.

The third harmonic of a transmitter in the 14 Mc. band must fall between 42.0 and 43.2 Mc. The frequencies allotted for the London Television Station are 41.5 Mc. for the sound and 45 Mc. for the vision carrier frequency. Owing to the wide modulation frequency band width required, the vision signals occupy approximately from 42 to 48 Mc. A commercial television receiver should be capable of receiving signals say between 43 and 47 Mc. when normally tuned to 45 Mc.

There is thus every probability that the strong harmonic of a nearby 14 Mc. transmitter may cause serious interference with picture reception. Moreover, as the quality of commercial television receivers improves the chances of interference will increase.

The difference between this form of interference and that of case (iii) will at once be apparent. In the latter case, unless the transmitter is over-modulated or suffering from serious key-clicks, etc., it is radiating on its licensed frequency only : any interference is strictly due to insufficient selectivity in the medium or long-wave receiver. In spite of this it will generally be good policy for the operator of the transmitter to do all he can to alleviate the trouble with rejector circuits, etc., in the receiver.

In the case cited above, with regard to third harmonic radiation from a 14 Mc. station, however, the circumstances are very different. Here the station is radiating energy in an unlicensed band, and, moreover, the receiver is operating in a normal manner, essential for efficient television reception. Thus, there is no doubt whatsoever that all 14 Mc. stations should take every possible precaution against such radiation, particularly where situated in heavily-populated areas, e.g. within a 50-mile radius of London and possibly other cities in the future.

Reduction of Third Harmonic Radiation.

Now, how can the radiation of third harmonics be prevented ? It must be recognised that if any form of R.F. power amplifier is to be worked efficiently, a very large amount of harmonic energy must necessarily be produced in the anode circuit. The use of push-pull final stages will reduce the even harmonics considerably, but not, unfortunately, those which fall outside the amateur bands, i.e. the odd harmonics, in particular the third. It is true that a linear Class B final stage will probably produce less third harmonic than an efficient, well-driven Class C amplifier, but even so there will always be sufficient harmonic energy to cause trouble if it is radiated.

Two further difficulties stand in our way. First, the P.A. anode circuit is generally made with a high L/C ratio for efficiency. This allows more harmonic current to pass into the load than would a low L/C circuit. Second, most forms of short-wave aerial systems will radiate quite efficiently on a frequency three times that for which they were intended ! All told, it would appear that the more efficient a station is designed the worse offender will it be.

But there is no need to take too gloomy a view and to jettison the whole of the 14 Mc. gear in the station, however much Uncle Tom would welcome the extra elbow room so produced. Although the *generation* of third harmonics may be a sign of an efficient final stage, there is no reason why we should *radiate* them. Indeed, the latter would be a sign of inefficiency, quite apart from the question of QRM.

Several schemes for the reduction of third harmonic radiation are presented herewith, one of which should be successful in eliminating the difficulty no matter what type of 14 Mc. gear is in use.

The simplest method of attack seems to be the prevention of any 43 Mc. current from reaching the aerial itself. It is doubtful, except possibly in the immediate vicinity of the transmitter, whether enough energy would be radiated from the circuits themselves to cause serious interference. If this was the case, then nothing short of very effective screening of the complete transmitter would be of much use.

If we can reduce the load on the P.A. at these frequencies as well as prevent the harmonic current from reaching the aerial so much the better.

The following devices will be described :

(*a*) Filters in the feeder.
(*b*) Resonant stubs on the feeder ;
(*c*) Modifications to the aerial coupling circuits.

Filters for Harmonic Reduction.

Feeders found in amateur stations are generally of either approximately 600 ohms impedance or 80 to 100 ohms.

In the former class are the balanced feeder with 16 s.w.g. conductors spaced about 5 ins. apart, matched into the aerial with a Y connection and the Windom, which is a single wire or unbalanced

type. The commonest example of the lower impedance feeder is the twisted pair type connected directly in the centre of the aerial (commonly called the doublet aerial).

With any of these three aerial arrangements a filter can be constructed which will attenuate the third harmonic very severely, while giving practically no loss of the fundamental. At the same time quite a useful reduction of second harmonic will also be achieved. Several types of filter are possible, but the ones shown are easiest to build in practice. The basic circuit is shown in Fig 1, together with the approximate shape of the transmission characteristic. Such a filter can be converted for use in a

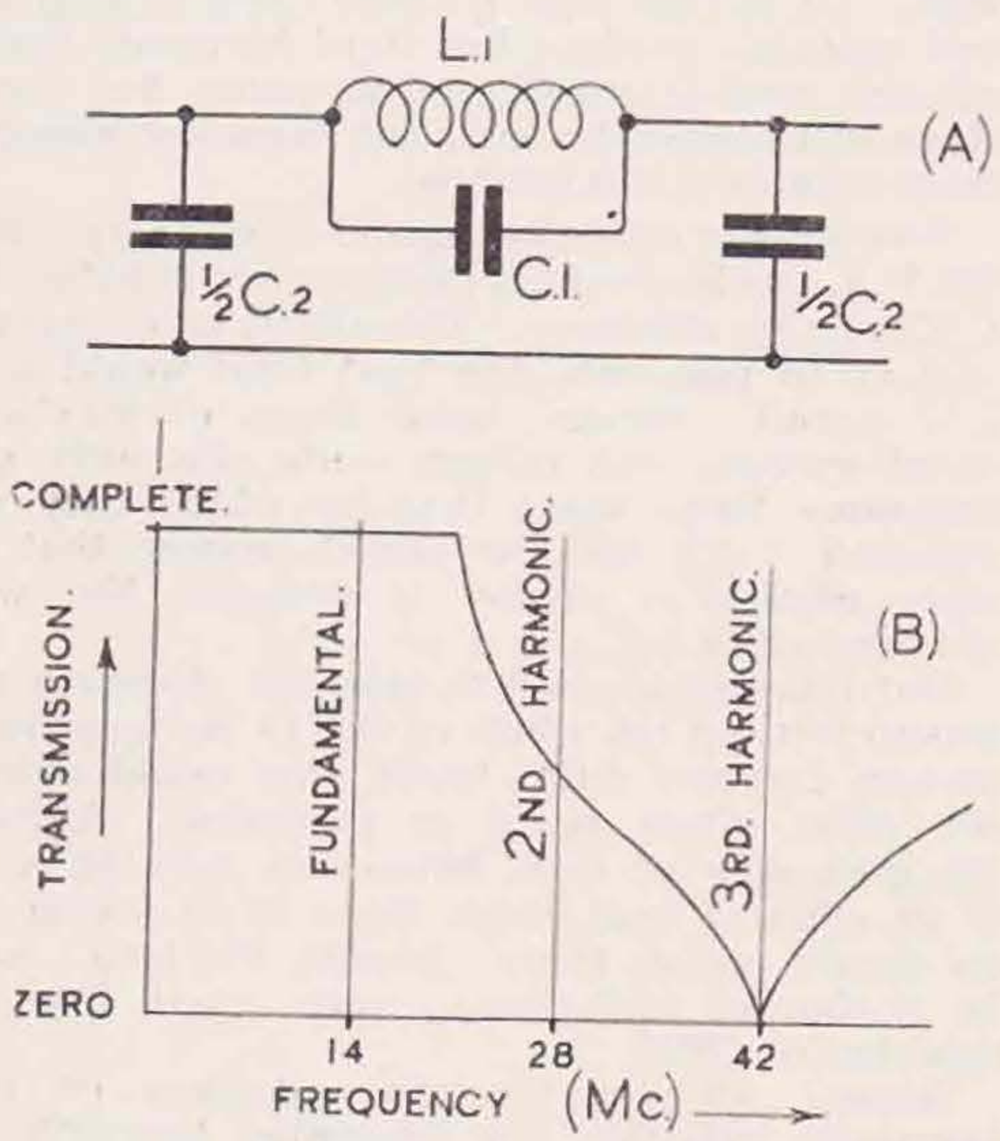


Fig. 1.—Filter circuit showing transmission characteristic.

balanced circuit as shown in Fig. 2. The values of L_1, C_1 and C_2 are the same in each case, but it will be seen that the series arm has been divided so that one half of it is put in each line.

Two filters have been designed, one for 600 ohm circuits and the other for 80 ohms. The values of the components are given in Fig. 3A for a 600 ohm balanced feeder. It has a cut-off frequency of 22.5 Mc. with a loss at 28.4 Mc. of 15.6 db, i.e., a current reduction of about 6 to 1, while its attenuation is a maximum at 42.6 Mc. The actual loss

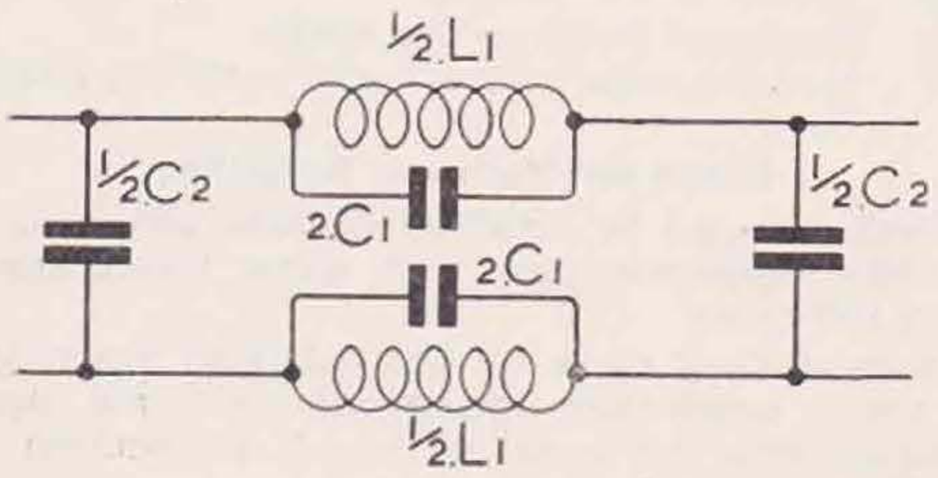


Fig. 2.—Filter for use in balanced circuit.

at 42.6 Mc. will depend upon the Q of L_1 and C_1, and should be well over 100 to 1, using the coils described, at the third harmonic of any frequency in the 14 Mc. band.

If means are available it is advisable to measure the values of the condensers before assembling the circuit. Small condensers of 2.5 $\mu\mu$F capacity are available in Ceramic dielectric types from BULLETIN advertisers. The resonant circuits in the series arms should tune to 42.6 Mc. If a simple receiver is available on which the London Television Station can be received, these can be checked by noting where the circuit absorbs energy when it is held near the receiver coils.

If necessary, vary the spacing of the turns on the coil slightly until the coil and condensers by themselves resonate about half way between the vision and sound carriers. The complete filter can be inserted in the feeder line at any convenient position, although if placed very near the transmitter take care that the coils are not too close to the tank circuit. If a single wire feeder is in use the two coils can be put in series as shown in Fig. 3B, using exactly the same components as for Fig. 3A. The earth returns of the shunt condensers must be kept short and connected to the chassis of the transmitter with heavy leads of copper tape. This is very important and makes it essential to put the filter right close to the tank circuit in cases where the feeder is tapped straight on. If the Windom is fed from a separate tuned circuit which

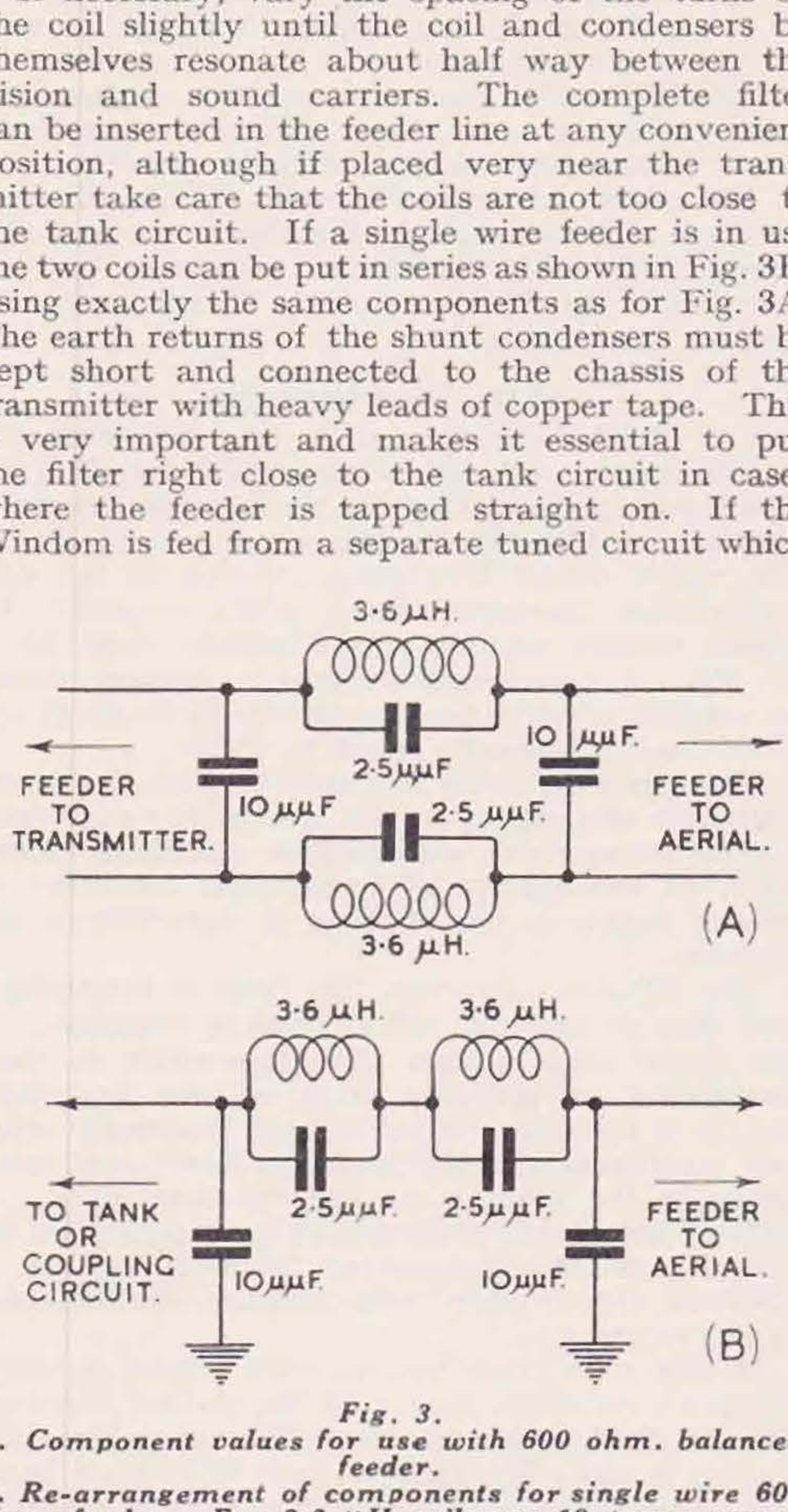


Fig. 3.
A. Component values for use with 600 ohm. balanced feeder.
B. Re-arrangement of components for single wire 600 ohm. feeder. For 3.6 µH coils use 18 turns spaced 18 S.W.G. wound on 1 in. dia. former occupying a length of 2 ins.

is link coupled to the transmitter, the earth returns should be taken to the earthy end of the condenser tuning this circuit. The two coils should not be placed immediately next to each other.

Fig. 4 illustrates a filter suitable for insertion in a twisted pair feeder or any other circuit of about 80 to 100 ohm impedance. Where a link coupling is used between the final P.A. and a tuned circuit

to which the feeder is connected, this type of filter will probably be quite satisfactory connected directly in the link line.

The cut-off frequency of this circuit is 18 Mc. Its exact value is immaterial, and in both cases an arbitrary cut-off has been chosen in order to give conveniently obtainable condenser values. Information on the design of such filters has appeared previously in the BULLETIN * but the calculation is included in an appendix at the end of this article.

In each case it is necessary to connect the condenser across the coil at its actual ends. Do not leave any length of lead on the coil. Also in the filter for the 80 ohm feeder keep the device as compact as possible, preferably soldering the condenser tags directly together without using any wire for connection. The feeder line can then be untwisted an inch or so only and connected directly across the 100 μμF. condenser. For the 600 ohm circuit it will be necessary to put the coils at a distance apart corresponding to the spacing of the line. The leads to the 10 μμF condenser should be straight, short lengths of stout wire or tape.

Harmonic Reduction Using Stub Lines on Feeder.

An alternative scheme to the use of a filter which is easier to make but takes up much more room is shown in Fig. 5.† It consists of two lengths of feeder (shown as an open wire feeder in the drawing), each connected across the main transmission line

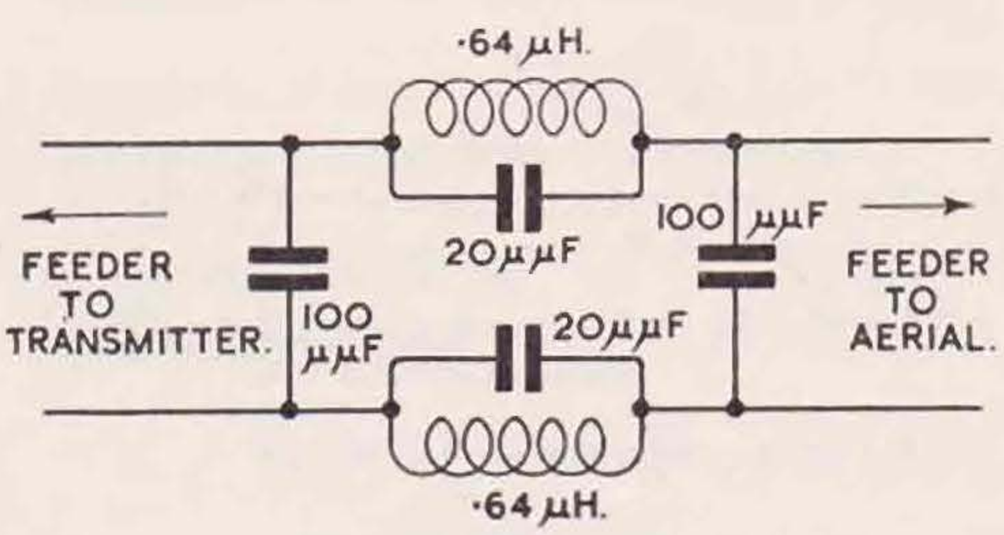


Fig. 4.—Components for use with 80 or 100 ohm. feeder. For .64 μH coils use 10 turns of 16 S.W.G. on a ½ in. former occupying a length of 1 in.

at the same point. One piece is made equal to λ/12 and is left open at the end. The other is twice this length, i.e., λ/6, and short-circuited. λ refers to the fundamental wavelength of the transmitter. In practice it will be advisable to shorten these lengths to .08λ and .16λ owing to the velocity of the waves in the wires being less than in free space.

The device can be applied to any form of feeder, provided that it is made in exactly the same way as the feeder to which it is connected. It will work most satisfactorily when used with a line on which there are no standing waves. In this case it is as well to connect it at a distance from the transmitter of $\frac{\lambda}{12}$, $\frac{3\lambda}{12}$, $\frac{5\lambda}{12}$, or $\frac{7\lambda}{12}$ etc., i.e., at some odd twelfth wavelength along the line, but this is not essential.

The operation is as follows. The open circuit length of λ/12 is actually λ/4 for the third harmonic. Now, if a quarter wave of line is left open at one end it will have a very low impedance indeed as measured at the other end. It will therefore shunt the main transmission line very heavily. Similarly the other portion, λ/6 long, will be a short-circuited half wavelength at the harmonic frequency. This also will put a very heavy shunt across the line, almost a short-circuit

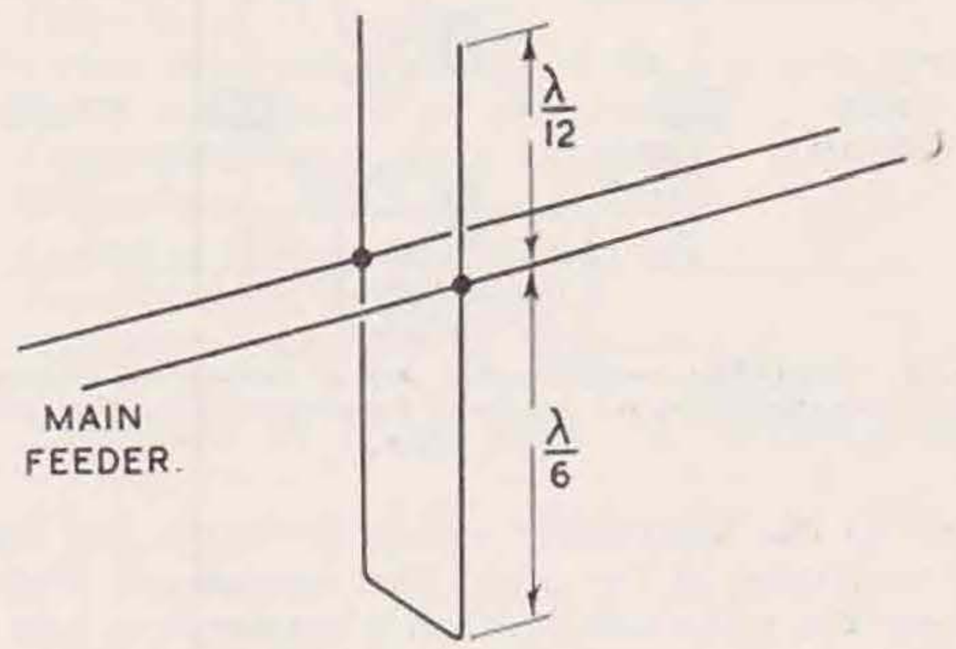


Fig. 5.—Stub for harmonic suppression. In practice cut the open and shorted lengths to 0.08 λ and 0.16 λ respectively.

in fact. Consequently the third harmonic current will not reach the aerial but flow into the stubs. An H.F. ammeter can be connected in the shorting bar with high power transmitters, and the bar moved up and down until maximum current is indicated.

Now at the fundamental frequency the short-circuited portion is λ/6 long, and will appear as an inductive reactance equal to $\sqrt{3}Z_0$ where Z_0 is the characteristic impedance of the line. (See Appendix II.) This would upset the operation of the line and produce reflections. But the λ/12 length which is connected to the same point appears as a capacitative reactance of the same value, i.e. $\sqrt{3}Z_0$. Since one is positive and the other negative, the two reactances will cancel each other. Thus at the fundamental frequency the stubs will have no effect on the transmission line at all. The object of connecting the stubs at the above mentioned distances from the transmitter is to make the impedance of the load in the transmitter at the harmonic frequency become high rather than low. This reduces the harmonic current in the anode circuit and tends to keep the anode cooler.

The disadvantages of the device are that the stubs should preferably be kept at right angles to the main line which may be inconvenient, and that unless the wire spacing is small the stubs themselves may radiate the third harmonic even although the aerial has been prevented from so doing.

Modifications to P.A. Output Circuits.

In some transmitters it may be possible to prevent the third harmonic from reaching the feeder at all. One way of doing this is to use a tank circuit in which the anode is tapped down the coil by a certain critical amount. In this way the third harmonic in the tank circuit can be reduced almost to zero. An article which explains

* T. & R. Bulletin, March, 1937.

†This device was described in QST—July, 1937.

this in detail appears in this month's issue of the BULLETIN.

In cases where a matching network (Collins coupler) is used, the circuit can be modified to form an arrangement similar to the filters already described. This is done by connecting a small variable condenser across the series coils to tune

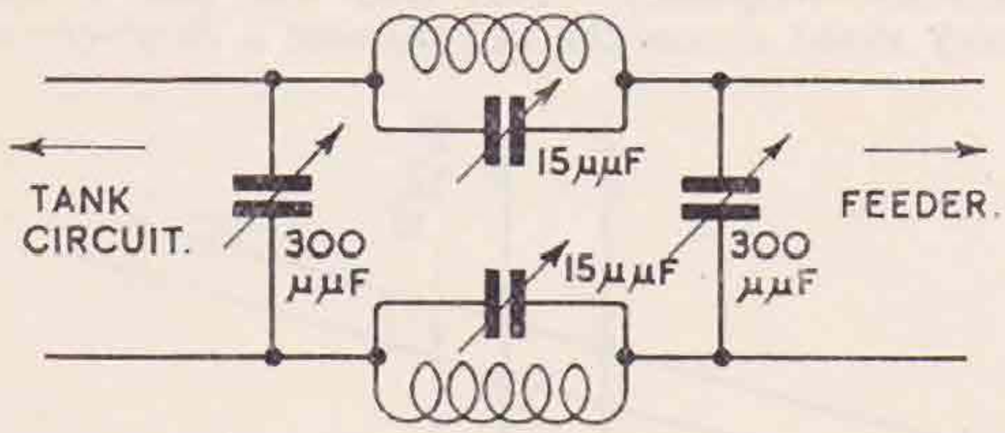


Fig. 6.—Suitable components for a matching network. Each inductance to be made of 5 turns of 2 in. dia. about 1 in. long.

them to the harmonic frequency. This will entail the re-setting of the other two condensers slightly. Where the optimum load on a transmitter and the feeder impedance are known the circuit values can be calculated (Appendix III), but where an existing coupler is already working it should not be difficult to find the correct adjustments by trial and error.

It is advisable to use coils with no short-circuited turns. Such coils should be somewhat smaller in value than are normally required for 14 Mc., or difficulty may be met in tuning them down to 42 Mc., in fact the self-capacity alone may be sufficient, in which case resonance can be obtained at the correct frequency by varying the turns.

Using the usual type of coil with about five turns on a 2-in. former, a condenser with a maximum value of 15 μμF should be suitable.

Unless measuring gear is available, the only satisfactory way of adjusting the circuit is to listen on a receiver tuned to the third harmonic, preferably at a distance of several hundred yards from the transmitter, and to adjust the small condensers until minimum harmonic is heard. Both condensers should be kept at about the same setting until the tuning position is obtained, when individual fine adjustment can be made.

The main condensers will now require slight readjustment to load the transmitter correctly, but this should not be large if the circuit is functioning correctly.

If an unbalanced network is used, the adjustment will be simpler, as there is only one small condenser to adjust. A 10 μμF maximum would probably be sufficient in this case as the coil will be about double the size used in the balanced variety.

APPENDIX I.

Design of 600-ohm Filter.

Image impedance = R = 600 ohms.
Cut-off frequency = f_c = 22.5 Mc.
Frequency of infinite attenuation = f_∞ = 42.6 Mc.

$$a = \frac{f_\infty}{f_c} = \frac{42.6}{22.5} = 1.9$$

$$m = \sqrt{1 - \frac{1}{a^2}}$$

$$= \sqrt{1 - \frac{1}{1.9^2}}$$

$$= 0.85$$

Let elements of constant—K section = L and. C.

$$L = \frac{R}{\pi f_c}$$

$$= \frac{600}{3.14 \times 22.5 \times 10^6}$$

$$= 8.48 \ \mu H$$

$$C = \frac{1}{\pi f_c R}$$

$$= \frac{1}{3.14 \times 22.5 \times 600 \times 10^6}$$

$$= 23.5 \ \mu\mu F$$

For a section with infinite attenuation at f_∞

$$L_1 = mL$$
$$= 0.85 \times 8.48$$
$$= 7.21 \ \mu H$$

$$C_1 = \frac{1 - m^2}{4m} C$$

$$= \frac{.276}{3.40} \times 23.5$$

$$= 1.91 \ \mu\mu F$$

$$C_2 = mC$$
$$= 0.85 \times 23.5$$
$$= 20 \ \mu\mu F$$

Each coil has inductance $= \frac{L_1}{2} = 3.6 \ \mu H.$

$$2C_1 = 3.82 \ \mu\mu F.$$

Allowance for self-capacity, say, 1.3 μμF.

$\therefore$ Make $2C_1 = 2.5 \ \mu\mu F.$

Each shunt condenser $= \frac{C_2}{2} = 10 \ \mu\mu F.$

Design of 80-ohm Filter.

Make R = 80
f_c = 18 Mc.
f_∞ = 42.6 Mc.

$$a = \frac{f_\infty}{f_c} = \frac{42.6}{18} = 2.37$$

$$m = \sqrt{1 - \frac{1}{2.37^2}} = 0.905$$

$$L = \frac{R}{\pi f_c}$$

$$= \frac{80}{3.14 \times 18 \times 10^6}$$

$$= 1.41 \ \mu H.$$

$$C = \frac{1}{\pi f_c R}$$

$$= \frac{1}{3.14 \times 18 \times 80 \times 10^6}$$

$$= 221 \ \mu\mu F.$$

$$L_1 = mL$$
$$= 0.905 \times 1.41$$
$$= 1.28 \ \mu H$$

$$C_1 = \frac{1-m^2}{4m} C$$
$$= 0.0492 \times 221$$
$$= \underline{10.8\ \mu\mu F}$$

$$C_2 = mC$$
$$= 0.905 \times 221$$
$$= \underline{200\ \mu\mu F}$$

$\therefore$ Each coil has inductance $= \frac{L_1}{2} = 0.64\ \mu H$

$2C_1 = 21.6\ \mu\mu F$

Allowance for self-capacity, say, 1.6 $\mu\mu F$

$\therefore$ Make $2C_1 = \underline{20\ \mu\mu F}$

Each shunt condenser $= \frac{C_2}{2} = \underline{100\ \mu\mu F}$

APPENDIX II

Length of open stub $= 0.08\lambda$.

Wavelength at middle of 14 Mc. band $= \frac{300}{14.2}$ m.

$= 21.1$ m.

$\therefore\ 0.08\lambda = 0.08 \times 21.1$
$= 1.688$ m.
$= \underline{\underline{5 \text{ ft. } 4 \text{ ins.}}}$

Length of short-circuited stub $= 0.16\lambda$
$= 0.16 \times 21.1$
$= 3.376$ m.
$= \underline{\underline{10 \text{ ft. } 8 \text{ ins.}}}$

Impedance of an open line, $Z_{oc} = Z_o \coth j \frac{2\pi l}{\lambda}$

Impedance of short-circuited line $Z_{sc} = Z_o \tanh \frac{2\pi l}{\lambda}$

where Z_o = characteristic impedance.

At Fundamental Frequency.

Length of open line, $l = \frac{\lambda}{12}$

$$\therefore\ Z_{oc} = Z_o \coth j \frac{2\pi}{\lambda} \cdot \frac{\lambda}{12}$$
$$= Z_o \coth j \frac{\pi}{6}$$
$$= -j. Z_o \cot \frac{\pi}{6}$$
$$= \underline{-j.\ 1.732 Z_o}$$

Length of short-circuited line $= \frac{\lambda}{6}$

$$Z_{sc} = Z_o \tanh j. \frac{2\pi l}{\lambda}$$
$$= Z_o \tanh j. \frac{\pi}{3}$$
$$= j.\ Z_o \tan \frac{\pi}{3}$$
$$= \underline{j.\ 1.732\ Z_o}.$$

Thus impedances of stubs at fundamental frequency are equal to reactances of $+1.732Z_o$ and $-1.732Z_o$ respectively, and will have no effect on the line when both connected at the same point.

At Third Harmonic Frequency.

Length of open line now $= \frac{\lambda}{4}$

$$\therefore\ Z_{oc} = Z_o \coth j. \frac{\pi}{2}$$
$$= 0.$$

Length of short-circuited line $= \frac{\lambda}{2}$

$$\therefore\ Z_{sc} = Z_o \tanh j.\ \pi$$
$$= 0.$$

Thus, both stubs will short-circuit the line at the harmonic frequency.

APPENDIX III.

Design of Matching Network for Harmonic Reduction.

Impedance of load $= R_2$
Optimum load impedance for valve $= R_1$
Total inductance in series $= L$
Capacity across valve side $= C_1$
Capacity across load side $= C_2$
Capacity across inductance $= C_3$
Fundamental frequency $= f$
Harmonic required to suppress $= n$
$\omega = 2\pi f$
Reactance of series arms at fundamental $= X$

Select a value of X which must be less than $\sqrt{R_1 R_2}$

Then $C_1 = \frac{R_1 \pm \sqrt{R_1 R_2 - X^2}}{\omega X R_1}$

$$C_2 = \frac{R_2 \pm \sqrt{R_1 R_2 - X^2}}{\omega X R_2}$$

$$C_3 = \frac{1}{\omega(n^2-1)X}$$

$$L = \frac{(n^2-1)X}{n^2 \omega}$$

If R_1 and R_2 are in ohms the inductance will be in henries and the capacity in farads.

If the value of C_3 becomes too small to be practicable (say, 3 or 4 $\mu\mu F$) select a lower value for X and recalculate.

For an unbalanced circuit use the values as calculated. Where a balanced circuit is required use $\frac{1}{2}$ L in parallel with $2C_3$ in each arm.

Tristan da Cunha

We are officially informed that Tristan da Cunha is administered from the Colonial Office and not by the Government of the Union of South Africa, consequently the prefix to be used for amateur stations operating in the Island will be in the Group ZD9 and not ZU9 as previously stated. We have reason to believe that a station will shortly be operating from this remote "outpost of Empire."

Harmonic Suppression

By Bryan Groom (GM6RG).

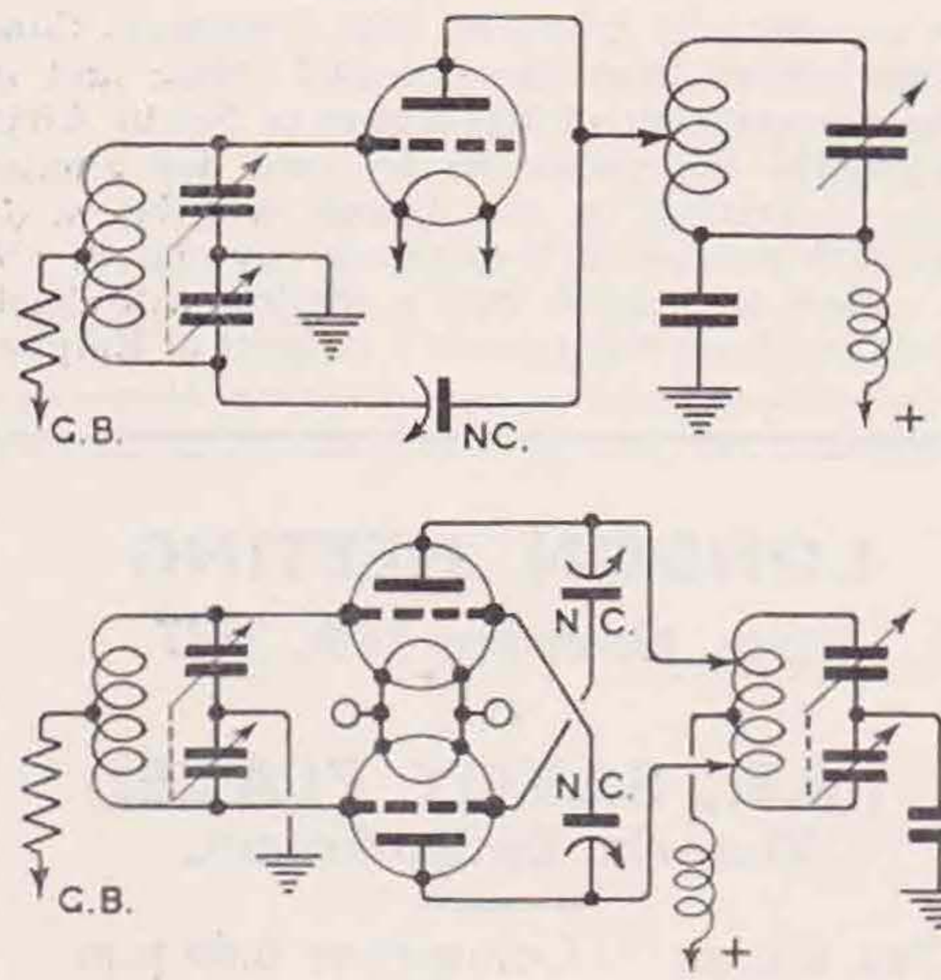
THE subject of harmonic suppression is becoming important for two reasons. Firstly, the increasing use of heavily-biased, heavily driven, class-C final stages which, by their very nature are prolific generators of harmonics; secondly, the greater use of high frequency channels for commercial and broadcasting services of various types.

Of these harmonics the even ones are generally unimportant, as they fall in the next higher amateur band, with the exception of the high frequency end of the three lower bands, the harmonics of each of which fall above the H.F. end of the next band higher.

The troublesome harmonic is the third, which, from fundamentals of 3.5, 7 and 14 Mc., fall around 28, 14 and 7 metres. Of these three, perhaps, the worst is the one which falls on 7 metres, as this is liable to cause interference to television broadcasts, and as time goes on, and the use of television becomes more widespread, the difficulty may increase.

Fortunately there are cures for this trouble, and the writer puts forward one method which eliminates the harmonics at the source. He has also tested the harmonic radiation of efficiently arranged link-coupling, and finds that although radiation of harmonics from the aerial is very considerably reduced by this form of coupling, there is still a fair degree of radiation from the actual final tank circuit itself, sufficient, with a powerful transmitter, to cause trouble up to, perhaps, 100 yards from the amateur station.

The arrangement used by the author is given in the accompanying diagrams, for (A) push-pull and (B) single-ended transmitters. Attention is drawn to the following points:—



Harmonic Suppression Arrangements discussed by the author. Top (A) a single ended circuit and Bottom (B) a push pull circuit. In the former arrangement grid neutralisation is essential. The method of adjusting the taps is described in this article.

In the single-ended arrangement and where neutralizing is used, *grid* neutralizing is absolutely necessary. Otherwise movement of the plate tap would alter neutralization. A small condenser across the "open" side of the grid coil, equal in capacity to the grid-filament capacity of the final valve, will help to keep the circuits in balance. It will be found that the circuit loads up more easily, and the signal strength reports are as good, *if not better*, with the same input, than with the more normal method of valve coupling.

Adjusting the circuit is a simple matter provided a single valve receiver or a field strength meter is available. With the plate of the transmitter coupled normally to the end of the coil, tune-in on the one-valve receiver to the third harmonic. Leave it set at this position, and after switching off the transmitter, move the plate connection about one-third of the way down the coil. Switch on the transmitter, re-tune its plate circuit and listen again. Repeat this procedure until a point is found where practically no signal is audible in the receiver. Remember that the driver stage or buffer also has a harmonic on the same frequency, but it is not so strong, and is therefore less dangerous, than the final. Do not be misled into thinking that, when this signal is heard, the arrangement is not working.

If a field strength meter is used, no such mistake can be made, as the meter would be standing fairly close to the final tank itself, and would not pick up much energy from the buffer stage.

In the case of a push-pull final stage, the taps are moved-in equally until harmonic suppression is obtained.

Further, a comment is desirable on balancing the push-pull stage. It will probably be found that one side runs hotter than the other, in which case bend out the end plates of *one side* of the split-stator condenser and then re-tune. If the balance is better, bend them out a little more until both valves are equally warm. If the first bend makes the out-of-balance worse, restore the plates to their original position, and work on the other side of the split-stator condenser.

It is necessary, of course, to be sure in the first instance that the centre tap on the coil is as near the centre as possible. The balance suggested above is only intended to deal with small discrepancies.

Possible Theories.

This method of eliminating harmonics was worked out on paper first, and grave doubt was expressed regarding its probable effectiveness in practice; it has, however, proved itself quite satisfactorily, and the following are two possible explanations, of how harmonic cancellation is obtained.

One suggestion is that the harmonic circulates round the tank circuit in two directions from the point at which the plate is tapped-on, thus cancelling itself out. The other is that a series resonant circuit is obtained between the tap point and the "hot" end of the coil.

The writer has what he considers to be satisfactory practical evidence that the "circulating" suggestion is the correct one. Tests conducted with a local amateur using an RK23 valve as a single-ended final, showed that for second harmonic cancellation the correct tap was 1½ turns down the coil. The coil comprises 6 turns, the fundamental frequency is around 14 Mc., and the harmonic being cancelled around 28 Mc. The writer does not believe that 1½ turns of a 3-in. coil under these circumstances would reach as low a frequency as 28 Mc. Furthermore, if the resonant-circuit explanation of the cancellation be the correct one, then the stage in which this is taking place would be under more stress than if running normally, and the valve would run much warmer. This does not happen, as the writer has tested this effect very carefully, and the following fairly conclusive evidence is given.

The 14 Mc. final at GM6RG runs at an input of about 440 watts, and at this value, with reasonable efficiency all through, the valves show some colour. With the plates tapped down between 1½ and 2 turns, third harmonic is practically eliminated, and also second harmonic (this latter as one would expect in any push-pull circuit), but the valves show no colour. The plate coil is 12-turn 3½ ins. in diameter.

No other means being available for measuring the difference, the writer adopted the obvious expedient of increasing power (using dummy load) until the plates showed the same colour as before, and found that the input was about 500 watts. This is considered to be adequate evidence that harmonic cancellation by balance gives increased efficiency at the fundamental, as well as other desirable advantages. On actual measurement, one transmitter in which the circuit was tested showed an output 20 per cent. greater, *for the same input*, when suppression was applied to the second harmonic.

In concluding this short description of some very interesting experimental work done at GM6RG, attention might be drawn to the fact that in tapping down the plate, or plates, as described, there is an increase in the circulating current in the tank circuit, at the fundamental frequency as well as at the harmonic frequency, and the effective load into which the valves are working is lower, so that if the circuit is already fairly "high-C," additional benefit will accrue if it is changed to higher "L."

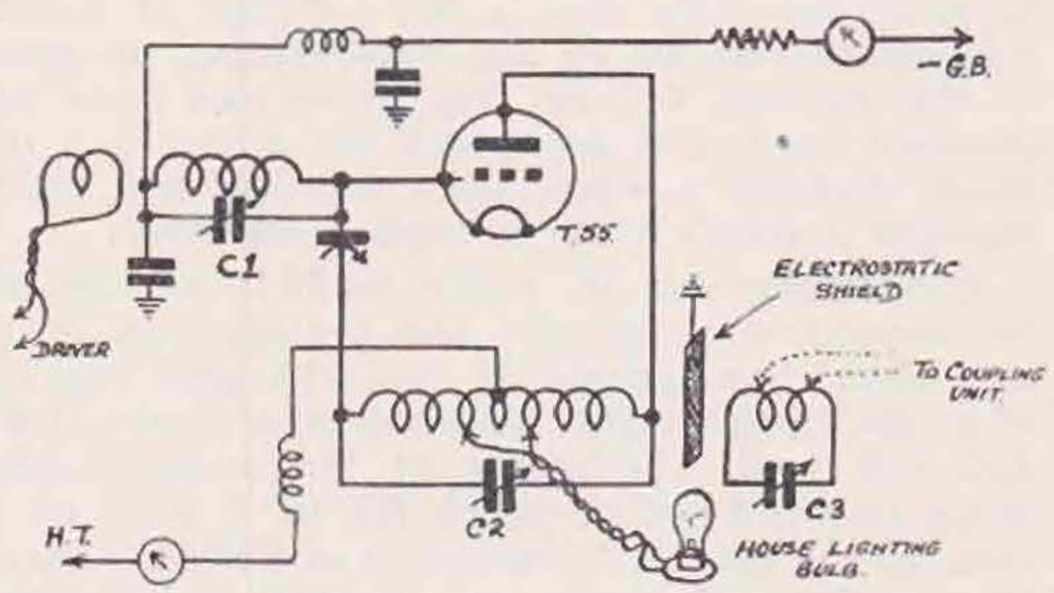
The Use of Artificial Aerials

By J. Butcher (G5XG).

REGULAR use of an artificial aerial load will reduce interference very considerably. Numerous tests can be made using such a device, and it is hoped that the few remarks which follow will serve to show how this can be achieved at little cost.

The artificial aerial used by the author is left permanently attached to the final stage of the transmitter, even when radiating, except that the house lighting bulb is removed.

The diagram shows the lay-out of the power amplifier. The P.A. should be link-coupled to the previous stage, as in most cases more drive and more flexibility can be obtained than with capacitive coupling. The use of grid meters is recommended, for unless the amount of grid current is known, the operator is unable to observe the conditions under which the valve is working. An 0-50 mA. moving iron meter is suitable for stations up to 25 watts input, and this can be obtained for a few shillings. Tuning is effected in the following manner: With C3 fully in, remove the house lighting bulb from its socket, leaving the flex attached to the P.A. tank, tune C2 to minimum dip and adjust drive by C1. When the house bulb is inserted (25-watt bulb for a 25-watt station, and so on), the P.A. will draw



The Artificial Aerial used and described by G5XG.

practically the normal amount of current as with the aerial circuit in tune. The operator may now whistle into his microphone to his heart's content, safe in the knowledge that no one outside his house is being affected. Quality can be checked and non-radiating data noted.

Now tune C3 to draw as much light as possible from the house bulb or current into the feeder meters, and then remove the bulb from its socket, when it will be found that the P.A. will draw the normal amount of current. Slight adjustment of C1 may be necessary.

To return to artificial load for testing purposes, simply insert the bulb and tune C3 to full capacity.

Bright Idea

Efficient spacers as used in Zepp feeder systems can be made cheaply and easily in the following manner: Procure a number of glass rods, each cut to the desired length (the length will be the space between the wires) from the local chemist. Next fit corks into each end of the glass rods, these being forced in flush with the edge of the glass. Screw into each cork a small eyelet screw (these can be obtained from any of the large stores). The feeder wire can then be easily slipped through the eyelets and fixed at the desired position by means of either some fine gauge wire or a wedge of wood forced into the eyelet with the wire next the glass side. If reasonable care is taken with the construction, the finished article is very efficient. Further, they will take considerable strain, provided a fairly thick glass is used.

2AJP.

The "GW" 56 Mc. Contest

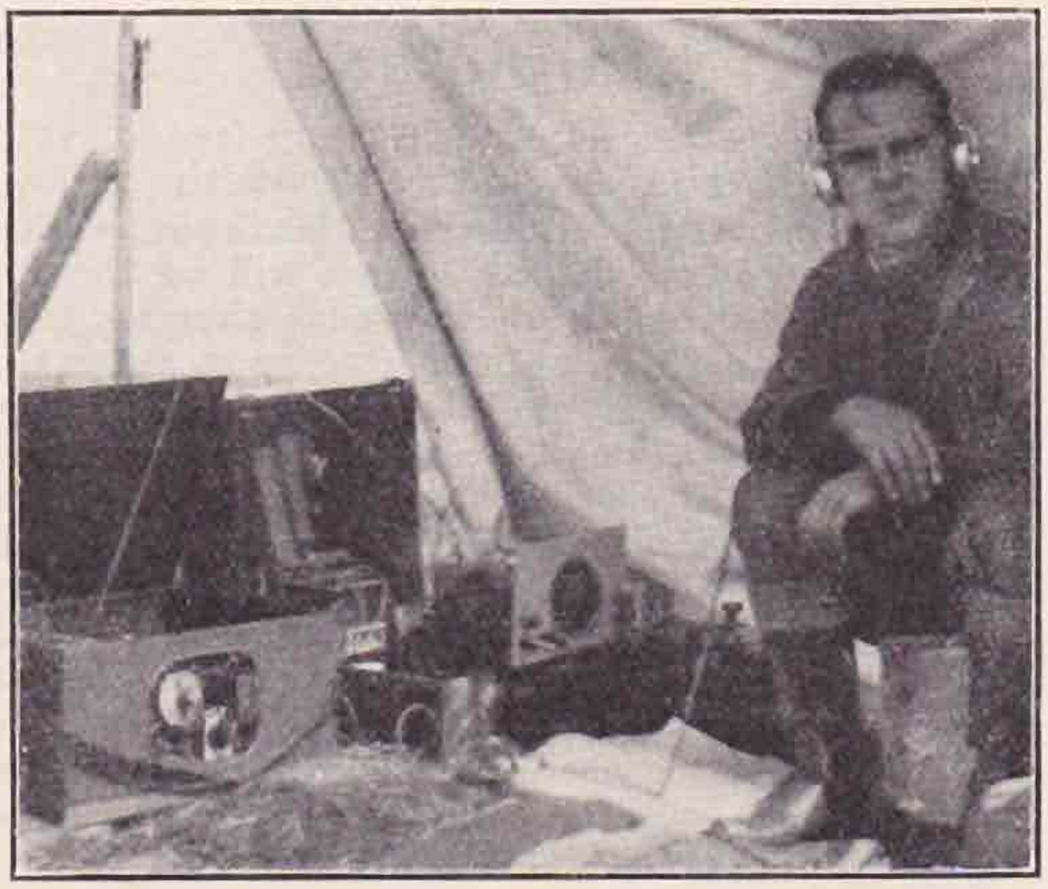
THIS event aroused considerable enthusiasm in the North, and many amateurs put themselves to a great deal of inconvenience in order to try and top the list. It is regrettable that greater interest was not shown in other parts of the country, and one would almost think that the impression must have been given that the contest was confined to Welsh amateurs. This, of course, was not the case. One report, from a listener near London, indicates that a fair amount of activity was evident on the 56 Mc. band during the period of the contest, but no logs or entries have been received from this area, and the writer can only think that the average score was low and no one thought it worth while to send in an entry.

The winner was H. Jones, G5ZTP, and he is to be congratulated on the fine performance he put up, when it is considered that the gear consisted of a small transceiver, powered by a single *Milne's* 120 volt unit, the power at the commencement being only 1.8 watts, which fell to .5 watt by the close of the contest. The secret of G5ZTP's success lies largely in the very fine situation of his station, on top of Parlike Pike, near Preston. The long (66 ft.) aerial used ran N-S, with the free end (north) 20 ft. high, and it would appear that signals were sprayed south and west at considerable strength.

The runner-up was GW6OKP, operating on top of Snowdon. This QRA is so good that stations within 30 miles came in at such strength that three or four stations could fill the entire band of 4,000 kc. This actually happened during the Sunday afternoon, and it was almost impossible to make fresh contacts. The power used was 5.4 watts, derived from 180 v. wet batteries. Various aerial systems were used, but greatest success was obtained from a long horizontal wire.

Third place was filled by G6MXP, operating on Snaefell, in the Isle of Man. To him and G2DCP goes the credit of the longest 56 Mc. QSO in this country, their contact over 124 miles beating the previous one of 120 miles between G2NF and GW6OK.

Other results are shown in the table, and it will be noticed that practically all stations were portable. Others known to be active included G6OM, 5MQ, 5ZI, 5ML, 5BM and 2GL, but no entries were received. Interesting reports were received from G6YL, 6YR, 6IH, 5SO and 2KI, 2AFW, 2CIL.



G5ZT operating during the GW Contest.

Gear Used.

It will probably be of interest to run over briefly the gear used at the various stations. British and American valves are well mixed. The winner used *Marconi* LP2 and PT2, G2DCP a pair of 45's in push-pull, whilst GW2KD and G6CWP obtained good results from 6A6's. Both G6CWP and G8JVP were equipped with driven transmitters, with 6L6 valves, and, being able to use straight C.W., they were disappointed that no C.W. stations were in operation. Reverse keying had to be resorted to, to make their signals readable on a quench receiver. G2JL, listening on a straight receiver, heard a station sending peculiar Morse, and it may well be that it was the reverse C.W. of one of these stations. G8JVP's aerial was on top of a 36 ft. mast made of four bamboo poles lashed together, and it stood up for 24 hours!

"GW" 56 Mc. Contest

SEPTEMBER 18-19, 1937.

Position	Call	Watts Input	QRA	No. of Contacts	Points
1	G5ZTP	1.8	Parlike Peak	15	276
2	GW6OKP	5.4	Snowdon	9	240
3	G6MXP	10	Snaefell	7	230
4	G2DCP	10	Cat and Fiddle, near Buxton	11	217
5	G6CWP	10	Nr. Leek	8	123
6	G8JVP	10	Nr. Leek	8	108
7	GW2KDP	10	Prestatyn Mtn.	6	95
8	G6GL	10	West Kirby	6	72
9	G2WSP	5	Nr. Buxton	5	37
10	G5JUP	4	Hawkesbury Upton	3	12
11	G6QZ	25	Norwich	1	1

It is very noticeable that the majority of the stations were equipped with receivers incorporating optional quench. G6YL succeeded in contacting G5QY, 27 miles away, on straight C.W. for the first time, using an LS5B valve in a long lines transmitter. The intervening country is very hilly, and rules out the direct ground wave getting through. Both stations use long aerials, and find that contact is not possible until after 14.00 G.M.T. G5QY heard several stations, but could not identify them. Both G2KI and G6QZ listened for long periods, but each only heard one station.

The majority of the aerials were vertical, but many stations found it necessary to vary the plane in order to reach various other stations, and often the sending and receiving aerials were in opposite planes. G6MX obtained peculiar results with a horizontal aerial, probably due to directive properties.

Try C.W. on 56 Mc.

Conditions.

Conditions during daytime were good, and several stations report that signals were very steady throughout the period, although a slight improvement occurred after 15.00. It is difficult to say what conditions were like during the night, as although many kept watch during the 24 hours no signals were reported between 01.30 and 09.00. It would seem that no deterioration took place as signals were as loud at 01.30 as at any time.

The weather varied in different parts. Snowdon was continually enveloped in mist and clouds. Parlike Peak, after night mist, was bathed in warm sunshine on the Sunday, and most other parts experienced good weather. Snaefell was an exception, and G6MXP (GW6AA) and his friend were real heroes, as they occupied the deserted hut on the top, 2,034 feet above sea level, from Saturday until Monday morning, sleeping at night on the bare boards, whilst outside a gale raged!

Conclusions.

Everyone who took part thoroughly enjoyed the contest and many useful suggestions have resulted. QRM was at a high level, and in order to minimise this it will be a condition next year that frequency controlled transmitters must be used. More selective receivers are also necessary and the writer would like to see next year's contest restricted to C.W. only.

The 24-hour period appears unnecessary, as activity during the night is absent, and an event of this kind requires good weather if it is to be properly enjoyed. Next year, therefore, it is suggested that the contest be shortened to 12 hours, and be held during August.

It is also necessary to encourage more fixed stations to take part, and some alterations to the scoring system will be made.

Finally, the writer desires to thank GW6OK for the very fine silver trophy, which is being sent to the winner. Thanks are also recorded to all who sent in reports; we wish them good luck with their 56 Mc. operations.

J. N. W.

A Holiday in Dresden

By J. H. Cant (G6FU)

ONE day last June the writer left Victoria for a "ham" holiday in Dresden. The journey was by way of Dover to Ostend, thence by train *via* Brussels to the German Frontier station at Aachen, where a short stop was made for passport and customs inspection. On again *via* Koelin and Leipzig until, after a journey of 822 miles, Dresden was reached.

At the station were waiting D4LOM, QNM and LQM, who were quickly identified by call sign badges on their coats. Introductions over, 6FU was escorted to his hotel.

Together with four Dresden amateurs, G6FU visited the 1,000 years old Meissen Cathedral, stopping on the way at Moritzburg to inspect the famous Castle and lake. Returning to Dresden in the afternoon the writer was impressed with the Reichsautobahn, two-way roads divided in the centre by a narrow grass strip, each side being subdivided into two lanes, one for slow and the other for fast traffic.

One evening the world famous Dresden Opera House was visited, where the "Meistersinger von Nuernberg" was being conducted by Dr. Karl Boehm. Once seen, the inside of the Opera House will never be forgotten. The roof is decorated with paintings by great Masters and the walls hold many wonderful carvings, all the interior decorations being of shining gilt. The five hours' performance of Rudolf Boeckelmann as Hans Sachs with a cast of 300 was an experience to be remembered.

G6FU was invited to a Dresden meeting held in a popular café in Lochwitz, when twenty-five amateurs gathered in friendly atmosphere.

During the evening D4YUM gave an account of his experiences and showed photographs taken on a cruise when he visited CT, CT2, CT3, FA8 and CN8. He stressed particularly how amateur radio fostered a great friendship between experimenters, as he had been accorded hospitality everywhere.

Those present were amused by one of the members who gave an account of experiments conducted with a view to inventing a new type of soldering iron. A special mains transformer was wound with a 12 volts high amperage secondary, this in turn fed the iron which, however, had a carbon bit in place of the usual copper one. By using this iron in one side of the circuit and the chassis in the other, a very nice arc could be struck with which to solder. Unfortunately the enthusiast forgot that when the iron was "off" its potential increased! A few sudden shocks convinced him of the superiority of the older methods.

Stations Visited.

D4QNM, owned by Herr Ernst Bueltemann, operates under difficult conditions as there is much motor and X-ray QRM from the laboratory of a nearby University. The outstanding features of this station are the aerial systems. Aerial No. 1 runs E-W and is 60 metres long and 23 metres high, while aerial No. 2 runs N-S and is 50 metres long and 21 metres high. The receiver is an O-v-2, battery operated, whilst the transmitter is a Hartley working on 3.5 and 14 Mc. with inputs of 8 and 6 watts respectively.

D4LOM, a very compact station, holding only two persons at a time, is situated in the attic. Here the transmitter is a MO-FD-PA, 30-watt input, and the receiver an AC mains O-v-2. The aerial is a 14 Mc. Zepp.

D4LDM also suffers with QRM from local apparatus. A 7 Mc. aerial is employed with a Collins coupler. The transmitter is a 20-watt TP-TG and the receiver a 1-v-2.

D4YVM is a well laid out 50-watt station, the operator favouring long aerial systems, two of which are 50 and 70 metres long respectively. Here again an ECO-FD-PA is employed together

(*Continued on page* 290.)

GM6RG

By the Wanderer.

GM6RG is a call which has become very well known in many parts of the world during the past few months. The operator is, of course, no newcomer to amateur radio, for Mr. Bryan Groom commenced as general assistant to the original holder of the call G5JX around 1921, and the call G6RG was granted to him around 1926-27. Much work was done between this time and 1932, when commenced a period of inactivity which lasted until 1936. In 1936 a move was made to a new house and special provision for amateur radio was made during its building, a room being set aside for the purpose. After the removal to this house speedy preparations were made to stage a return to activity; however, a hitch took place when the new station was practically ready to go on the air, a fire almost completely destroying the entire outfit. Included in the loss were all the logs and records of past work, together with a much-valued file of *QST* dating back to 1925. No time was lost in setting out to repair the havoc and a new station rapidly rose from the ashes of the old, and it is this which forms the subject of the present article.

It is proposed to deal with the gear in sections, and a start will be made with the radio frequency stage of the transmitters. The heart of the whole R.F. section is a most interesting universal exciter unit, which is probably the most noteworthy item in the station. This unit will probably form the subject of a separate Bulletin article later, and in consequence will only be briefly described here. Three R.C.A. 807 beam tubes are employed in the unit, and drive is available from it to all amateur bands between 7 and 56 Mc. No coil changing is necessary when changing frequency, all the alterations necessary being made by means of rotary switches.

Following this section of the transmitters are two sub-amplifiers, one of which is devoted exclusively to 14 Mc., whilst the other may be used on either 28 or 56 Mc. Link coupling is used between the units and the exciter, and in turn the sub-amplifiers are link coupled to the power amplifiers. The valves used in the sub-amplifiers are *Taylor* T55.

The four power amplifier stages are quite independent, and on 7 Mc. an RK20 fills this rôle. This amplifier is used at inputs up to 100 watts and, when telephony is employed, is modulated by the combined anode and screen system.

Push-pull circuits are employed in the three remaining amplifiers, a pair of 150T *Eimac* valves being used on 14 Mc. and 100TH *Eimac* valves on both 28 and 56 Mc. All these stages may be run at inputs up to 500 watts.

Special precautions are taken with the lay-out of the power amplifiers to prevent any spurious oscillations; for example, care is taken to employ entirely different types of H.F. chokes in the grid and anode circuits. The tank and neutralising condensers are of *National* and *Cardwell* manufacture, except for the 56 Mc. stage, in which home-made condensers are used.

From the R.F. section we pass in turn to the audio, and the line-up is a crystal microphone feeding a single-stage resistance coupled to an amplifier based on a recently published circuit by *Osram* using their PX25A valves in low loading AB. This amplifier in turn drives a pair of *Ediswan* ES250 M valves in Class B. During our visit we were pleased to note that the transformers throughout the amplifiers were of British manufacture. Both the driver and output transformers of the class B unit were made by *B.S.R.*, of Birmingham, and an additional spare output transformer by *Parmeko* is available.

Three separate power packs supply the necessary power for the R.F. and class B modulator stage, the driver for the modulator embodying its own self-contained power supply. The first unit, which supplies the exciter valves, has a 400-0-400 V. 150 mA. transformer. The sub-amplifiers are fed from a unit which incorporates a 1000-0-1000 V. 250 mA. transformer, and GU5 rectifiers are used. Finally, the power amplifiers and class B modulator are fed from a power pack of most formidable proportions, a 2.5 kW. oil-cooled transformer of 2200-0-2200 V. rating, the output of which is rectified by a pair of *Ediswan* ESU150 rectifiers. Swinging choke input is used, and the filter comprises a choke and 10 μF. of *T.C.C.* condensers. Incidentally, the paper and mica condensers used throughout the station are of *T.C.C.* manufacture.

All circuits are thoroughly fused, and most lavish provision of meters is made, all anode and grid circuits having independent milliammeters, with the exception of the exciter, where the meters are in the anode and screen circuits. A very comprehensive switch and control panel is fitted, seven switches, three indicator lamps and three *Ferranti* electrostatic voltmeters being fitted to this unit. By means of this switchboard it is possible to select for C.W. or telephony operation and to decide which of the various power supplies will come on when a single switch is closed at the operating position. Keying is accomplished by means of keyer valves, which are in the negative lead of the 1,000 V. supply to the sub-amplifier.

The construction for the whole gear is on the rack and panel system,

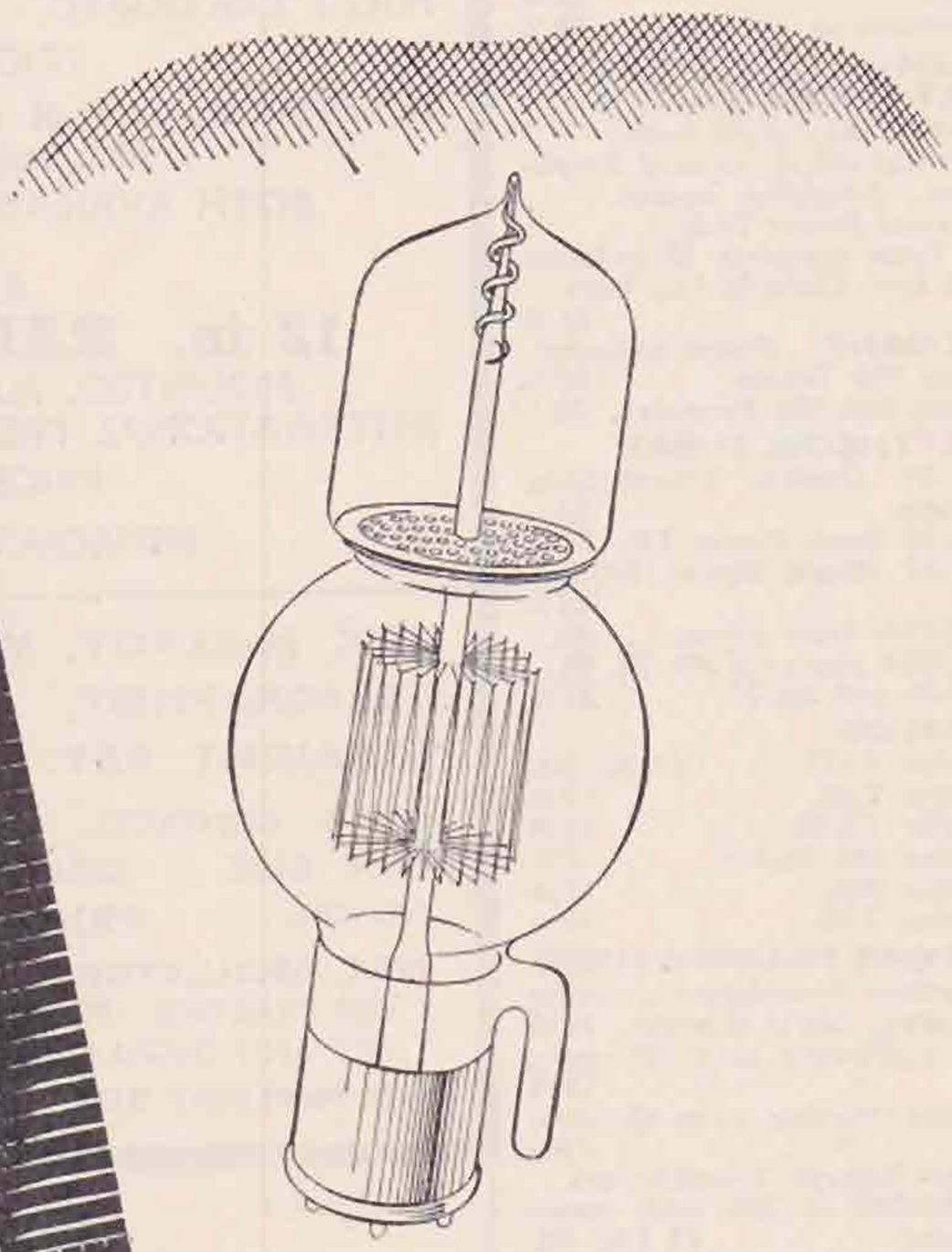
Receiving requirements are filled by two *National* receivers, an *H.R.O.*, and for 56 Mc. an *S.R.R.* is available.

Amongst the auxiliary gear in use is a 3-in. *National* oscilloscope.

We now come to a brief account of that part of the station on which much of the experimental work done is concentrated, viz., the aerial system. Numerous types of aerials have been used. At present two aerials are in use, a 172-ft. Zepp-fed, running east and west, and a diamond which is directional on the U.S.A., Eastern seaboard, and inland to W8. The diamond has been deliberately restricted in length in order to somewhat increase the width of the coverage obtained. As a result of many experiments, the best dimensions have been found to be as follows, each side 165 ft. long, total

LIEBEN-REISZ RELAY

One of the first amplifiers. First described in 1913, it soon made way for the De Forest thermionic valve. The Exide Battery, widely used for wireless even at that time, remains as the most widely used battery at the present day.



Exide

R.26

BATTERIES FOR RADIO

'Still keep going when the rest have stopped'

• *For dry batteries ask for* **Drydex**

Obtainable from any reputable dealer or Exide Service Station.

EXIDE BATTERIES, Exide Works, Clifton Junction, near Manchester. Also at London, Manchester, Birmingham, Bristol, Glasgow, Dublin and Belfast.

length of diamond 101 yards, and width 43 yards. The height varies between 40-45 ft. Under the circumstances prevailing at the site, where the aerial is on the side of a steep 1 in 6 hillside facing south, the above dimensions have proved the most suitable. As regards results, it has been found that a gain of S2/3 is obtained over the 172-ft. aerial and S4/5 over an ordinary half-wave. These figures relate to 14 Mc. On 28 Mc. the gain is considerably better than this, and contacts have been satisfactorily established and maintained when using the diamond for both receiving and transmitting, when both GM6RG and the other station have been inaudible when using more normal aerials. A further line of experiment has been to match the diamond into a vertical aerial instead of into the more usual terminating resistance, and actually a provisional patent has been applied for.

In order to obtain all the advantages of the Rhombic type of aerial, including high signal-to-noise ratio on reception and elimination of reception except from the desired direction, it has been found completely essential to terminate the aerial in a manner which is *really* non-inductive. Further, if, as at GM6RG, long untuned transmission line coupling is used between the transmitter and aerial, this line must be properly matched into the aerial. The transmission line at GM6RG is 400 yards long, but even so, now that the aerial has been lined up, there is surprisingly little picked up except from the desired direction.

The results obtained using the diamond aerial more than prove that this type of aerial, even when used under circumstances such as prevail at this site, are well worth while. It is usually stated that, for satisfactory results with a diamond aerial the site should be level and over marshy ground if possible. To give readers some idea of the location at GM6RG, it may be added that the mast on the lower side of the diamond is 81 ft. high and the mast on the top side is only about 40 ft. high. The diamond aerial is always used for receiving as well as transmitting and, to permit of this and speedy operation, an automatic switch is fitted which is operated by means of a relay actuated when the mains switch is closed or opened.

(*Editorial Note.*—An article from Mr. Groom dealing in detail with his Diamond Aerial experiments appeared in the September, 1937 issue.)

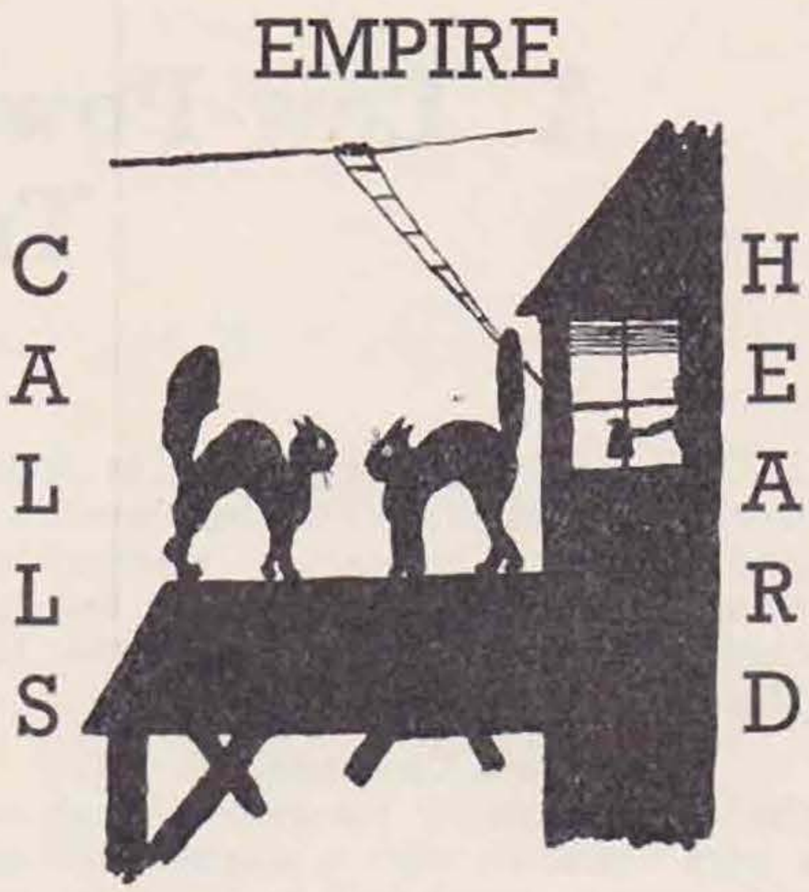
Reports Wanted

GM6JJ (Fortrose, Ross-shire), on his 7035, 14070 and 28140 kc. C.W. transmissions. All reports will be acknowledged.

G5BU (A. F. Bulgin, Ltd., Essex) on their 7012 kc. transmissions. Reports are wanted from BRS members and will be acknowledged.

Not So Bright

Messrs. Phillips inform us that the Convertor units mentioned in the Bright Idea paragraph published on page 227 of our last issue cannot be supplied by them.



Eric W. Trebilcock (*BERS*195), *Darwin, North Australia. August*, 1937.

7 Mc. 'phone: zs4h (55), 6am (56), zt5p (56).

7 Mc. C.W.: ei5f (44), g2mi (55), 2xy (33), 5jo (55), 5kx (44), 5xw (44), 8kp (33), gm2qu (54), 6bm (44), 6hz (55), 6ko (44), 8fb (44), ve5aap (55), 5ic (55), 5sr (44), vk8da (55), 9bb (58), vp6ln (44), vq3tom (56), 8ag (56), vu7fy (55), zl1ad (55), 1hq (56), 1kh (55), 2dv (45), 2iw (55), 3ah (56), 3jd (54), 3kx (57), 4ah (59), 4br (54), zs1az (55), 2e (44), 2c (44), 2f (55), 2x (56), 4a (45), 4h (43), 4q (55), 5ab (56), 5ag (55), 5ah (55), 5ak (44), 5al (54), 5t (56), 6ak (56), 6ay (55), 6w (44), 6j (56), 6am (56), zt2u (56), 5p (56), 5y (44), 6ah (54), 6at (53), 6s (55), zu1l (55), 2g (55), 2h (44), 2m (44), 5aq (54), 5l (56), 5q (56), 6ad (56), 6ah (56), 6ar (55).

September 1-15, 1937.

14 Mc. 'phone: g2ak (56), 6xr (55), gm5nw (55), ve4bd (56), vs1af (57), 2ai (55), 2ar (56), zu6af (55).

14 Mc. C.W.: ei6g (43), 8b (55), g2gc (56), 2it (54), 2mf (54), 2qn (55), 2qo (55), 2tr (45), 2vf (55), 2xd (54), 5dm (55), 5hz (44), 5jm (45), 5ka (54), 5kg (55), 5bj (54), 5li (54), 5ov (55), 5pp (33), 5qy (55), 5ri (55), 5so (43), 5vm (55), 6bq (56), 6dl (54), 6dx (54), 6ga (54), 6hl (55), 6hm (55), 6iy (54), 6jz (55), 6mk (55), 6pd (54), 6sn (55), 6ui (55), 6vp (55) 6vq (55), 6vx (54), 6xf (54), 6yu (53), 8aw (54), 8az (55), 8cp (55), 8cv (54), 8gb (54), 8il (45), 8kp (54), 8lp (55), 8pf (54), 8rg (54), gm6nx (55), 8hp (54), gw2ul (33), ve3au (54), vq8ae (55), 8as (56), vs1aa (56), 6ah (56), 6az (55), 7mb (56), 7gj (56), 7rf (55), vu2fx (55), xz2jb (44), ze1jg (55), 1ji (55), zs1ah (55), 1an (55), 1b (55), 2g (56), 3f (55), 4a (55), 4u (45), 5q (56), 6w (55), zt2v (56), 5j (44), 6az (54), 6y (56), zu1t (56), 2d (57), 5j (55), 6af (56), 6aj (55), 6b (55), 6l (55).

Sept. 15-30, 1937.

14 Mc.: ei9g (45), g2gc (55), 2hw (54), 2ma (44), 2na (55), 2qo (44), 2xd (45), 2xn (54), 5bj (44), 5dm (55), 5qn (44), 5us (55), 5zm (44), 6bq (54), 6gl (44), 6hv (55), 6jz (54), 8aw (55), 8dl (43), 8dt (55), 8gl (54), 8ha (54), 8ho (55), 8il (55), 8kp (55), 8pl (43), gi6tk (3 2-3), gm6nx (55), 6rv (55), ve2hg (55), 3ahn (55), 3au (54), 3jt (54), 3qh (54), 4gd (44), 4lx (55), vq8ae (56), 8as (55), vr4oc (58), vs1aa (56), 6ag (57), 6ao (56), 6az (58), 7gj (55), vu2fh (55), 2bg (55), yi2ba (56), zl1dv (56),1gi (56), iji (55), 1lz (56), 1mq (55), 2ci (55), 2gn (56), 2fx (55), 2ju (56), 2ky (56), 2lb (55), 2ou (56), 2qm (56),

(*Continued on page* 267.)

A Low-Power Battery-Operated Transmitter

By S. Buckingham (G5QF) and J. Clarricoats (G6CL).

VISITORS to Olympia interested in short-wave work frequently ask to be shown a simple and efficient low-power transmitter. To meet this demand the set now to be described was constructed and displayed on the R.S.G.B. stand this year.

General Considerations.

In the early days of low-power work effective results were obtained with a single valve arranged in some form of reversed feed-back circuit, but these old-fashioned T.P.T.G. self-excited and resonant grid transmitters quickly lost favour with the introduction of crystal control and more efficient valves.

In considering the problem of designing a modern low-power transmitter two features presented themselves—first, how many valves should be used ; second, should the tritet arrangement be used in the crystal oscillator circuit.

Remembering that the transmitter was to be suitable for operation from dry batteries, it was decided to limit the valves to two in number, and by using the two-volt series both the H.T. and L.T. consumption is kept down to a reasonable figure.

Unfortunately, 2-volt valves do not lend themselves to tritet operation without recourse to semi-trick circuits.

The transmitter as described employs a 7 Mc. crystal which works into a 7 Mc. output stage.

Design Features.

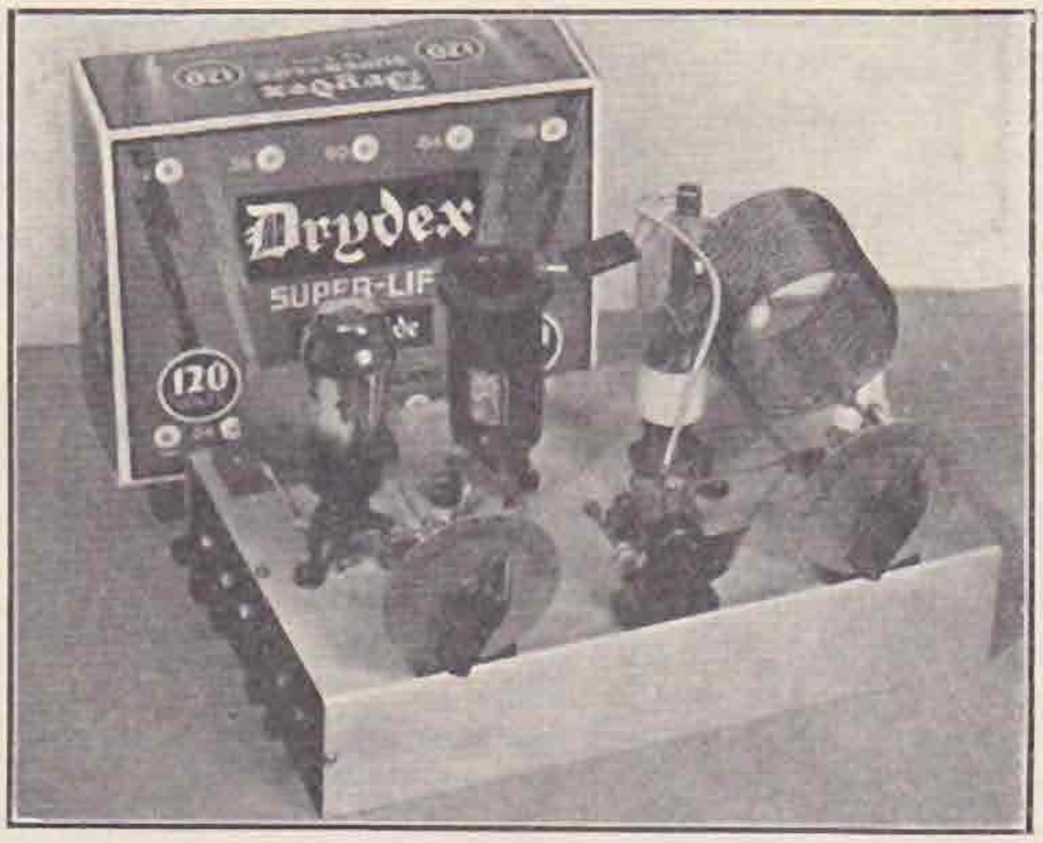
The circuit, shown in Fig. 1, is similar in most respects to many arrangements previously published in this Journal. The particular features to which attention is drawn are enumerated below :—

1. The design is compact, the complete transmitter measuring only 12 ins. by 7 ins., thus enabling it to be used, if required, for portable work.

2. Five-pin valve-holders are incorporated to allow mains-operated valves to be used if desired.

3. The neutralising condenser is not *physically* connected to the grid, because it was found that the inter-electrode capacity of the *Hivac* PX230SW was so low that the minimum capacity of the *Eddystone* 20 μμF condenser was too high to permit a satisfactory balance.

A 4½-in. length of 1 mm. systoflex sleeving carries a length of wire which is connected to the fixed vanes of the neutralising condenser. This wire and its associated covering is encased in a corresponding length of 2 mm. systoflex, which also carries the connecting wire from the grid to the R.F. choke located below the chassis.



A view of the Low-Power Battery-Operated Transmitter shown arranged for 7 Mc. operation. Note the method of neutralising the output valve.

Components.

Components have been chosen with considerable care, for in a transmitter of this type, where efficiency must be maintained at a high level, no component can be employed unless it can be guaranteed to give a satisfactory return for money. Component values in like manner have been selected with consideration to the work each is called upon to perform. Even as the speed of a battle fleet is controlled by the speed of the slowest ship, so is the efficiency of a transmitter controlled by the operation of its weakest link.

If judgment is used this transmitter should possess no weak link—every item used in its construction must be beyond reproach, and those who contemplate building a copy of this particular job would be well advised to follow the specification very closely.

Construction.

The photograph which accompanies this article gives a clear conception of the layout of the top panel. The under side of the chassis contains only nine components (two resistances, three R.F. chokes and four condensers) and their associated wiring.

Those desirous of constructing their own chassis should obtain a sheet of No. 16 S.W.G. aluminium 12 ins. by 12 ins. and bend it 2½ ins. from the top and bottom edges to form an inverted tray. No end plates are necessary, but, as will be seen from the photograph, a piece of ebonite, 7 ins. by 2½ ins. by ¼ in., with five terminals, is mounted at the left-hand side and held secure by three 6 B.A. screws.

The type 900/40 *Eddystone* condensers are mounted on their associated brackets 1½ ins. in from the sides and flush with the front. The open dials permit tuning indications to be made with ease.

The centre condenser is a type 900/20 made by *Eddystone*. No dial has been incorporated as this would tend to make neutralising more difficult (through hand capacity) due to the close proximity of the metal.

The closed type crystal holder of *Q.C.C.* manufacture is mounted near to the back left-hand corner, thus permitting short connections to be made to its associated valve.

The output coil is of the self-supporting type made by *R.V. Inductances*. In low-power circuits this form of coil is to be preferred to the large copper tube type. The coil is securely mounted on three pillar insulators.

Valves.

Care was taken in choosing the valves specified to see that the makers' specification allowed sufficient margin for possible overrunning. This may not be the academical method of choosing valves but it has at least the merit that it is a practice carried out mentally by every experimenter before he purchases a new valve.

The *Hivac* P220 was selected as the C.O. valve because it only requires 6 mA. at 150 volts to provide sufficient excitation to drive the output stage. The output valve is a *Hivac* PX230SW, selected because it has been designed for short-wave work. It has a low inter-electrode capacity, a fair slope, and requires very little drive.

Operation.

The transmitter is extremely simple to operate, provided attention is paid to the advice which follows. If the 7 Mc. crystal is purchased from *Q.C.C.* it will almost certainly be of the "thick cut" type, an advantage in this class of transmitter where a good output is desirable.

Power should be obtained from the largest size of dry battery financial considerations will permit. Assuming an H.T. supply of 200 volts is available, the set should be connected as indicated in Fig. 1. The C.O. stage should be adjusted for resonance, a 0-50 mA. meter being connected in the positive H.T. lead. Swinging the condenser C1, a point should be found where the plate current passing through the P220 is at a minimum. This value should be about 5 to 7 mA. Resonance may also be checked by the use of a 4-volt flashlamp bulb in series with a loop of wire 3 ins. in diameter. Having obtained resonance, the output stage must be neutralised.

The method of neutralising a final amplifier is fully described in *A Guide to Amateur Radio* and no useful purpose would be served by repeating the information here.

High tension can now be applied to the P.A. stage and the tuning condenser C2 adjusted until minimum current is shown on a milliammeter connected in the P.A. positive H.T. lead. The minimum current reading should be about 8 mA., sufficient to illuminate a flashlamp bulb held a few inches from the coil.

Choice of aerial coupling is left to the constructor, who is advised to study the approximate chapter in *A Guide to Amateur Radio*.

With an H.T. supply of 200 volts an input on load of about 6 watts should be obtained.

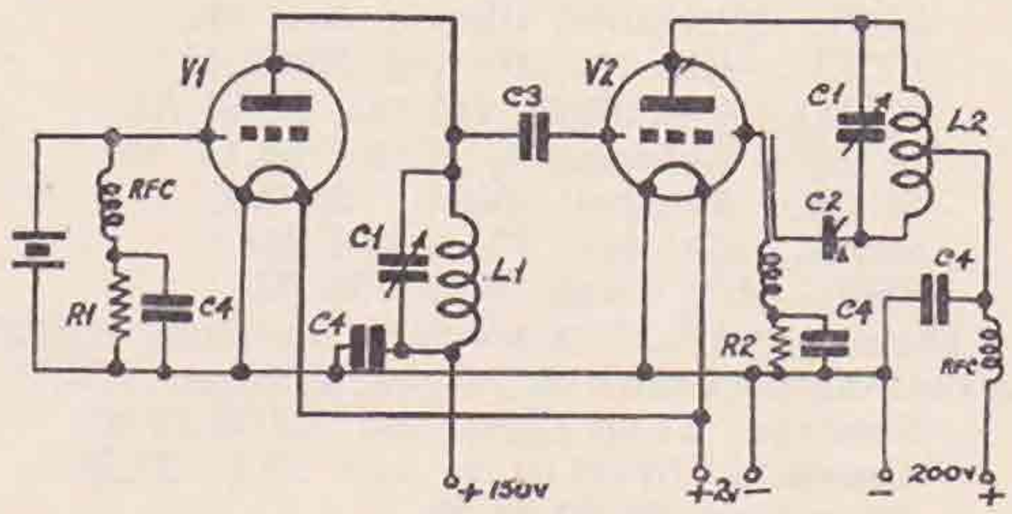


Fig. 1.
Circuit Diagram of Low-Power Battery-Operated Transmitter.

C1.—45 μμF variable type 900/40, Eddystone.
C2.—20 μμF variable type 900/20, Eddystone
C3.—300 μμF fixed type 690W, T.C.C.
C4.—.001 μF fixed type 690W, T.C.C.
R1.—25,000 ohms, 1 watt, type F, Dubilier
R2.—6,000 ohms, 1 watt, type F, Dubilier
RFC.—Short-wave chokes, type SW68, Bulgin
V1.—P220, Hivac
V2.—PX230 SW, Hivac

Other Components.

3 valve-holders, baseboard mounting, type V8, Clix
5 terminals: L.T.—, L.T.+, H.T.—, H.T.+, H.T.+ type R, Belling Lee
3 condenser brackets, B.T.S.
1 four-pin valve base coil former, B.T.S.
2 stand-off insulators, type 1029, Eddystone
1 stand-off insulator, type 1019, Eddystone
1 enclosed-type crystal holder, Q.C.C.
1 P.A. coil, 20 turns, 3 ins. dia., 16 S.W.G. enamel R.V.
3 pointer knobs and dials, type 1027, Eddystone
2 large capacity dry batteries (100 v. each), Drydex
1 60 A.H. 2-volt accumulator, Exide
1 sheet of aluminium 12 ins. by 12 ins., 16 S.W.G.
14 4B.A. brass nuts and bolts 1 in. long
12 6B.A. brass nuts and bolts ¾ in. long
1 piece of ebonite 7 ins. by 2½ ins. by ¼ in.

Coil Data and Power Supply.

The C.O. coil consists of 18 turns of No. 20 S.W.G. enamel, spaced one diameter, and the P.A. coil can consist of 20 turns of No. 16 S.W.G. enamel 3 ins. diameter.

It is essential with low-power transmitters of this type that the best possible source of supply be employed. The super capacity *Drydex* batteries will give long life and freedom from objectionable crackles which produce breaks in the carrier. The batteries should not be allowed to fall lower than 80 volts each before being replaced.

Conclusion.

A transmitter of this type will, under good radio conditions, prove extremely suitable for local and European work. No claim for DX operation is made, but it is an established fact that many amateurs have worked all continents with input around 6 watts.

Trade Review

We have received for test a 3.5 Mc. AT-cut crystal manufactured by 2BGG, of Newcastle-on-Tyne. The crystal is a good oscillator, approximately 1 inch square and agreed within 1 kc. of its nominal frequency, which is well within the guarantee of the accompanying certificate.

The temperature co-efficient was measured and found to be less than 2 parts per million. The temperature of the crystal was raised up to 50°C. and no jumps in frequency were experienced, indicating a freedom from subsidiary modes of oscillation.

These crystals represent excellent value and can be confidently recommended to our readers.

A. D. G.

THE 56 Mc. BAND.

By L. G. Blundell (G5LB).

REPORTS to hand this month are both numerous and varied. All indicate an apparent improvement in conditions as affecting QSO over distances of from 30 to about 150 miles.

G2LC started the ball rolling with reception on October 2 of ON4AP at 21.50 G.M.T. MCW signals were RS44/5 and C.C. When first heard, ON4AP was calling "CQ five," but was later heard working ON4ZA, and after a further CQ, PA0DO was contacted. 2LC says that the Belgian station was readable on both MCW and 'phone transmissions to the Dutch station. 2LC is in Leigh-on-Sea, Essex, and the distance to ON4AP is about 130 miles. In his report 2LC mentions that the Belgian station is active every evening except Thursday and Sunday on a frequency of 56,124 kc. He adds that G6FL and 2HG are frequently good signals, the latter being raised with a L.L. transmitter using an RK.34. Recent reports indicate that this type of transmitter can put out very fine signals—note generally being reported as T9.

G6YL and 5QY still maintain regular schedules in order to check up on a curious fade-out which occurs consistently between the hours of 12.00 and 13.30 G.M.T. All other tests arranged at times other than that are successful and usually show an increase of QRK in each direction as darkness falls. At periods of full moon a further increase of signal has been noticed. On one occasion 6YL was listening round the band at 04.00 for scheduled transmissions from 5QY and at 04.20 heard an R1 signal on his frequency. 6YL called him "on spec" and on changing over was surprised to find that his signal had improved somewhat, and QSO was then possible. Throughout the contact, which lasted for 40 minutes, QRK was noticed to gradually and steadily increase.

G8JV, in Nottingham, has been testing a new aerial in the shape of a half-wave dipole at a height of 58 ft. On this he has heard signals which are, in his own words, astonishing. On October 18, at 21.32 G.M.T., he heard "CQ DX de SU1FT" at 449, and at 21.45 G2NP at 439. On the 21st, at 20.51, G2NP was again heard at 539, and at 20.59 SU1FT made another appearance at 549. The 23rd brought in 2NP again at 329 and at 19.14 a 228 signal was made out to be calling "CQ de D3ADI." 8JV says that, as far as he is aware, there is no local "beat" effect, but would appreciate information from any station working on one of the lower frequency bands as to whether the Egyptian or German was heard at those times.

G6DH continues his daily observations and reports that the upper frequency limit for DX signals has been in the region of 42 to 44 Mc. during the last month. On September 30 he had a test with W2JCY at 13.00, each station calling for five minutes. 6DH heard nothing, but during a check-up on 28 Mc. later, W2JCY said that he had heard a T7 signal on 56.2 Mc. sending "Test," but could not get call owing to QSB. 6DH further mentions that the third harmonic of RIS is coming in with surprising regularity in the mornings, often reaching R8. Other signals logged are PPX, SPW and LSE on 41 Mc., and conditions seem to show that the frequency limit is gradually going up.

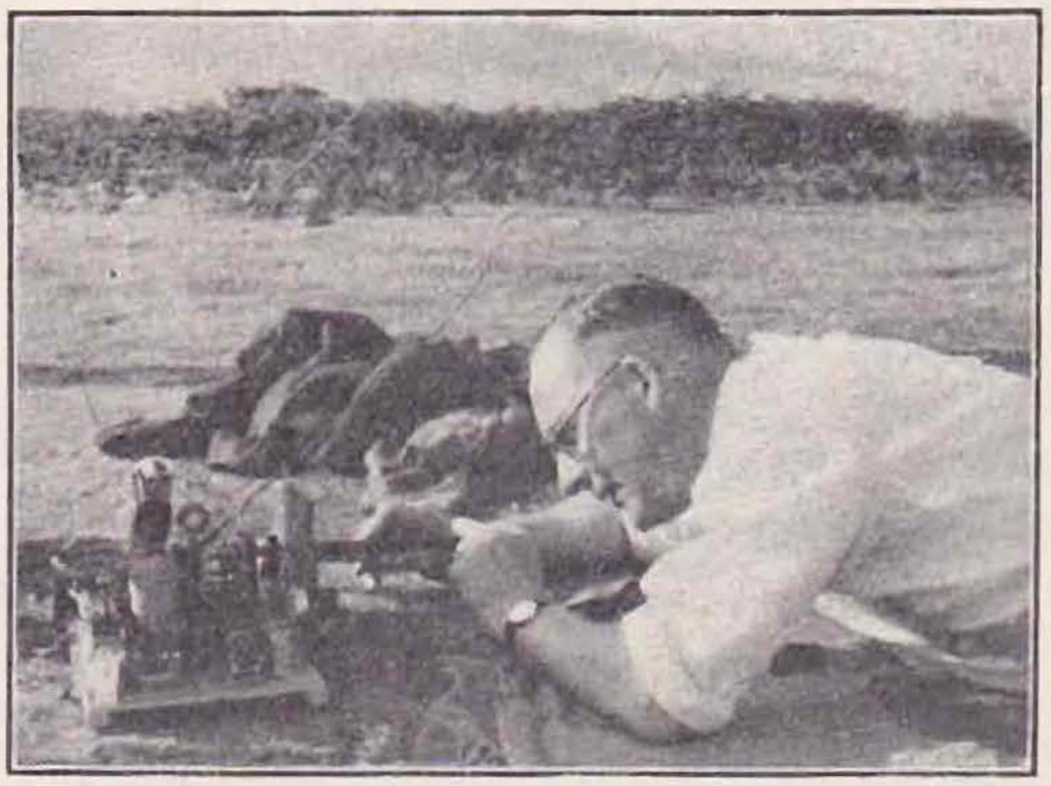
G2HG reports hearing on October 17, at about 14.45 G.M.T., a signal calling a GM station and signing OH5NK. The signal is thought to have been a harmonic, but confirmation has been requested. The schedule with G6FL has shown better signal strengths recently, QRK of R7/8 being noted at times. On the 20th conditions deteriorated badly, however, and on this and the following day maximum strength was R4, with fading. No signals have been heard from the last date up to time of report (26th). G2LC, of Leigh-on-Sea has been worked several times and signals have shown variation in strength from time to time. Signals are normally S6 each way, but on the 22nd they were down to S3/4—rather a surprising drop considering the short distance involved (about 30 miles).

G2HG kindly passes on some information regarding recent happenings in the States. This is to the effect that several contacts were made by various W8 and W9 stations over distances of up to about 350 miles. Conditions were, however, very much poorer, and several calls were open to error. It has at last (!) been generally realised that by using receivers that can "hold" plain C.W., contacts are very much improved under the existing poor conditions. For all interested, a list of regularly active C.C. transmitters follows:—

W6OFU.—Jerome, Arizona, 56.8 Mc.
3EZM.—Langhorne, Pa., 58.32 Mc.
9CLH.—Elgin, Illinois, 56.58 Mc.
9DN.—(Portable) Illinois, 56.7 Mc.
9TXU.—Chicago, Illinois, 56.92 Mc.
9UAQ.—Oak Park, Illinois, 56.58 Mc.
8CVQ.—Kalamazoo, Mich., 58.15 Mc.
8CVR.—Marshall, Mich., 58 Mc.
9ZBX.—Chicago, Ill., 56.01 Mc.
9SO.—Milwaukee, Wis., 56 Mc.

There is now C.W. activity in Scotland. GM2OX is running a schedule as follows, all times G.M.T.:—

Sundays, 11.00-12.00 and 22.00-23.00.
Tuesdays, 07.00-07.30 and 23.00-23.30.
Thursdays, 23.00-23.30.
Fridays, 13.30-14.00.
Saturdays, 14.00-14.30.



H. A. Musgrave, G2JM, of Bridgwater, Somerset, making the Contact which won for him the G2CI-56 Mc Cup for 1937.

Watch For DX on 56 Mc.

● *General specification* . . . . . .
Features—Four wavebands :
(1) 11.3—35 metres. (2) 35—100 metres.
(3) 195—580 „ (4) 725—2,000 „
Circuit.—8 valves. R.F. Amp.—mixer—oscillator—I.F. Amp.—twin diodes—L.F. stage — output stage — rectifier. Separate bass and treble controls. Electronic tuning indicator—Undistorted output 5 watts.

● *Controls layout* . . . . . .
1. Brilliance and two-position selectivity.
2. Wavechange switch.
3. (centre) Two-speed tuner.
4. Volume control and on-off switch.
5. Bass control.

The wavechange switch operates the wavescale indicator located in the top left-hand corner of the scale by means of a spring-loaded chain. In the opposite corner is found the electronic tuning indicator which has a variable-mu characteristic to avoid overlap.
The field winding of the electromagnetic loud-speaker is used for smoothing purposes in conjunction with an additional choke and three electrolytic condensers. These latter items are heat-insulated from the speaker frame.

● *Signal frequency amplifier* . . .
The signal-frequency ampliner, W63, amplifies the incoming transmission at its original frequency and this stage is provided to ensure a good signal noise ratio, some degree of selectivity, and freedom from self-generated whistles.
The aerial is coupled to this valve by means of the series-connected aerial coils which are wound adjacent to their respective tuned circuits. The fact that these aerial windings are connected in series whilst the tuned circuits are not, has no particular significance as it was done to effect certain economies in switching. Tappings are brought out from the tuned circuits and taken to the anti-static aerial socket so that line matching is effected without the use of a separate transformer.
The signal-frequency amplifier is coupled to the frequency-changer, X.64, by the conventional tuned-anode method which enables maximum gain to be obtained from this stage with much simplification of coil assemblies and switching. Even so, the coils tend to become complicated when as many as four bands are wound on the same former.

● *Frequency changer & oscillator* .
As its name implies, the frequency-changer, X.64, serves the purpose of converting the signal frequency into that of the intermediate frequency, namely, 465 KC/S, and a separate oscillator, Z.63, tuned by this amount above the signal frequency is coupled to the oscillator grid of the X.64.
This system of using a separate oscillator is fast becoming standard practice in the better type of receiver, as it is usually easier to obtain the relatively large voltage output, minimises interaction between signal and oscillator circuits (pulling) and permits the use of circuit arrangements giving great frequency stability—a point of importance when going down as low as 11.3 metres.

● *I.F. amplifier & variable sclectivity* . . . . . .
Signals of intermediate frequency appearing in the anode circuit of the X64 are passed on to the grid of the I.F. amplifier, W.63 via one of the new iron dust-cored transformers and thence, after amplification to one diode of a twin diode valve, D63, for detection.
These I.F. transformers provide genuine variable selectivity which has no deleterious effect in the Selective position and affords a nicely flat-topped resonance curve in the Quality position.
The variable selectivity is actuated by the Brilliance control and is, in fact, a D.P.D.T. switch arranged so that maximum fidelity is obtained when this knob is turned fully anti-clockwise. A small movement in the other direction operates the switch and gives high selectivity. Further rotation in the same direction results in an increasing cut of the higher audio frequencies.

● *A.V.C.* . . . . . .
The signal and A.V.C. diodes are used in a conventional manner, care being taken, however, to proportion the AC/DC load of the former correctly to avoid all distortion of deeply modulated passages.
The AVC diode is fed from the same I.F. coil tapping through a small condenser, and its load is split so that the I.F. valve can be provided with half the available voltage drop; it must be remembered that this valve handles a considerable voltage swing particularly when receiving local stations which is where the backing-off voltage is greatest, and a large amount of distortion can easily be introduced if the valve is not working on a relatively straight part of its characteristic.

● *L.F. stage & audio tone controls* .
A Z63 with its anode and screen grid strapped is used in the L.F. or driver stage, the result being a medium-impedance triode.
The bass-cutting control consists of a small condenser in series with a larger one whereby the effect of the former is varied. Variation in top response is obtained by controlling the effective capacity across the L.F. transformer secondary.

Unfortunately, no frequency has been given, but as the transmissions are in all cases C.C., it is assumed they will occupy the lower frequency portion of the band. The aerial in use is a vertical beam directed South. Actual times of transmission are for five minutes commencing from the time given above, followed by five-minute periods of listening. This order is maintained throughout the scheduled activity. Reports should be sent direct to GM2OX at 12, Woodburn Avenue, Aberdeen, or to G5JU, Bristol.

Other Scottish C.W. signals are shortly to be heard. These will be from GM6ZV and GM6RG, both these stations reporting preparatory work in progress.

Correction.

In the review of the 56 Mc. N.F.D. in last month's issue, G5ML was said to have been frequently heard by 2HG in South London. This is incorrect. G6FL is the station frequently heard and worked by 2HG.

The 28 Mc. Band

By Nelly Corry (G2YL).

TWO years have now elapsed since VK and W signals first broke through on "Ten," and it is remarkable that, taking into consideration the enormous increase in activity, conditions during the past month were not very appreciably superior to those of October, 1935. Signals were heard from 47 countries in all continents, and plenty of DX was worked, particularly at week-ends, but there was usually very little to be heard before 11.00 or after 19.30 G.M.T., and on a few days conditions were definitely poor.

Nineteen Australians in VK2, 3, 4, and 5 were reported, the greatest number being active at week-ends during the VK/ZL Contest period. G2XC heard them at times from 07.30 to 14.30 G.M.T., and on September 9 worked four stations in 35 minutes. VK5KO, in the course of an hour's ragchew with G6YL on October 15, said he had had 130 European QSO's since September 12, and over 1,000 W. QSO's this year. G6DH laments the absence of ZL signals, which is presumably due to inactivity, as they were heard well at this time last year.

VU2AU was the most consistent Asiatic station, and had many G QSO's on phone and c.w. Others worked were J3FJ, U9AV, U9AW, U9MI, U9ML, VU2AN, and VU2CQ. G2DH reports hearing "HS1BC," S8 at 18.00 G.M.T. on September 28, but probably this was a bogus call. VS1AA reported on October 8 that he had worked D, G, GM, PA, VK2, 3, 5, VS7, VU, W2, 3, ZE, ZS1 and 6 between September 19 and October 3, since when conditions had fallen off somewhat, only an occasional signal being heard. VS2AK is also active now, and has worked VK and K6.

Over 20 different African stations were heard, in CN, FA, FQ8, SU, ZE, and ZS1, 2, 3, 5, and 6, and G6YL made first contact with ST2CM/2LR on October 28. Of the South Africans ZS1AH was the most often heard, and there were five Southern Rhodesians audible on the band, viz., ZE1JJ, 1JN, IJU, 1JR, and 1JY, the two last using telephony.

North American signals were heard from all W and VE districts, and VO4C, and innumerable West Coast stations worked G on 'phone and c.w. The only South Americans reported were LU3DH, LU5AN, LU7AZ, PY1BR, PY2AC, and HI7G, who had worked on 'phone by G6DH. Signals from Central America and the West Indies included HR4AF, K4EIL, K4EJG, K5AC, K5AG, K5AY, TI2FG, VP2AT, and VP6YB. G2TK made the first contact with HR4AF, who is a genuine but unlicensed Honduras station, on October 6, and G6DH had a 'phone QSO with TI2FG.

Stations in 23 European countries were logged during the month, and a good many G's added to their totals of "Countries worked on Ten" by contacts with CT1KH, ES5D, or TF5C. G6DH answered the "Seekewten mittafone" of U3FB, and had what is believed to be the first 'phone QSO with a Russian on this band. G2XC logged 37 different G's and stations in all parts of the country reported hearing "distant" G's regularly.

Many thanks to G2DH, 2PL, 2XC, 6DH, 6XL, 6YL, BRS1561, and VS1AA for their reports.

OLD TIMERS

Whether the phrase "Old Timers" originated in the States or at home doesn't very much matter, because everyone who *is* an old-timer is proud to style himself thus although there may be some of the old school tie type who like to regard themselves as "veterans of the Amateur Movement!"

For the sake of providing a dividing line we propose defining an Old Timer as a person who has held a radiating amateur transmitting licence for an unbroken period of ten years.

During our last Convention our President drank to the health of the Old Timers, and those who were present on that occasion must have been surprised at the smallness of the number who rose to the toast.

We have been thinking over this matter and have come to the conclusion that the Convention response to that toast gave very little indication of the strength of the Old Timers, and to prove our contention we propose organising a dinner in London within the next few months for the benefit of these "old gentlemen" of Amateur Radio!

Going back over 10 years our minds instinctively turn to such well-known personages as Gerry Marcuse, E. D. Simmonds, Jack Partridge, Ralph Royle, Cecil Goyder, Jack Wyllie, George Price, Maurice Child, Leslie McMichael, Gerry Jeapes, Freddy Miles and countless others who will forgive us for omitting them by name.

Our object in organising this dinner is to get together as many as possible of the men who placed British Amateur Radio on the map.

May we appeal, therefore, to every member who was licensed on or before January 1, 1928, to send a postcard to Headquarters before December 1, stating which day in the week will be most suitable. (Our preference is for a Saturday, to enable the Provincial members to attend.)

Informal dress will be worn, as we believe this would be the wish of the majority. The price will not exceed 7s. 6d. per head.

A further announcement will be made in our next issue.

"Twelve Years Back"

By Uncle Tom.

Sentimental sighs from the old-timers, derisive sniggers from the young squirts may greet this feature, in which the happenings of twelve years ago are reviewed. But it doesn't seem as if the major problems of amateur radio have changed very much, after all.

NOW then, you young squirts, stand back for a few minutes while we talk of the days when men were men, and when a communications receiver was a "low-loss detector and one-step." But I hope that this new feature will be equally interesting to everyone—and I can certainly promise that it will often be very funny, without any effort on *my* part.

Look at this—from the T. & R. Bulletin for November, 1925: "All those members who have not yet communicated with New Zealand or Australia need not be afraid of trying on 10 watts—such communication is quite possible on a good morning, so don't be afraid of getting out of bed at 06.30 and calling NZ's or A's (*sic*) on 45 metres. They will reply on 35-38 metres (!) if they hear you. Two-way communication has been established by G5SI and Z2AE on 14 watts. Now then, who can beat this record?"

This QRP DX feat in 1925 wouldn't be considered such a bad performance to-day, would it? But not on 45 metres, please! Side-line on the above in an Editorial note: "All members are specially requested to make sure that their wavemeters are accurately calibrated, so that there may be no possible chance of transmitting on illegal wavelengths." Remember that the only "legal" wavelength in that part of the spectrum was 45 metres *dead*, and note that nice word "requested."

The Bull. for November, 1925, by the way, was a 20-page affair, including a title-page and seven pages of Ads. And *what* ads.! One for a well-known make of transmitting valve, "completely re-designed to enable it to be operated successfully on wavelengths as low as 15 metres." Another, from a rival firm, announcing "New Wireless Record"—to wit the first two-way communication between Britain and South Africa, by our friend G2LZ.

Extract from "Southern Notes": "Several more British stations have come on the 45-metre wave, and there has been quite a considerable amount of interference." What would the writer have said if he could have had a foretaste of those calm Sabbath morns on 7 Mc.? Also a note about DX worked by G2SZ (Goyder of "lock" fame): New Zealanders, 11; Australians, 5; South Americans, 5. Also WAP and WNP at the North Pole, and NRRL, which was the station operated by Fred Schnell of the A.R.R.L. demonstrating short waves to the U.S. Naval Reserve. Seems as if Goyder lock worked all right then!

Nice article by G2SZ on the Hertz aerial, which wasn't then in any sort of use, so far as I can remember. "The aerial itself is a single wire 22½ metres in length (for 45-metre work). This is fed from a radio-frequency feeder, which may be connected on to the aerial at any convenient spot." Shades of Windom! Those "inconvenient spots" hadn't then been discovered.

There's also an article by G5YM on hand generators. Says he: "With an energetic performer at the handle, such as a schoolboy home for the holidays, it will deliver up to 30 watts." Later on: "The only difficulty is the before-mentioned one of keeping the speed of revolution independent of the speed of keying. Probably the best thing is to find a speed of keying that matches a decent input and stick to it. Personally I find that about 12 words per minute goes well with a handle speed that delivers eight watts. Therefore I am quite deaf to QRQ's." Funny thing, but in the old days QRQ and QRO went together. Now they go in opposite directions!

Dope on the receiver by G6LJ, the receiving wizard of the time: "The next point is the elimination of mush. Now mush is a nuisance, and mush will always exist as long as certain commercial stations are allowed to operate. If there is much mush it is well-nigh impossible to copy weak signals of any character, from D.C.C.W. to raw 25-cycle goat-on-the-tin-roof noise. To get rid of this mush, either tell all the commercials to QRT or put a resistance across the transformer secondary, or the phones, or something." Also a hint (which, I remember, was acted upon with great results by your Uncle) that raising the set off the table on a couple of valve-boxes decreased the minimum wavelength to which it would tune by several metres!

As a commentary on the above, there's an ad. for "Two-valve, short-wave, long-range Receiver." Wave-range, 15-200 metres; three interchangeable coils; no dead-end losses (never 'eard of 'em!). All wiring done with bare tinned copper wire. Can be supplied for using the V24 or pin-type valves. Price (Ha! Ha!) £9 10s. And that was pretty cheap, those days. To-day, that receiver would probably receive W2XAD all over the 14 Mc. band, and 7 Mc. spitch would spread all over the whole works.

Now let's turn to *QST*, November, 1925. Editorial: Tirade against untruthful reports, with the comment that everyone seems to be "Vy QSA OM." Same thing goes for tone, they say, or QSB, as it was then. "Vy FB DC OM sounds great," they say, "but the experimenter doesn't want flattery. What does he think of you when he has just disconnected his filter and knows darned well that the note can't be good? Don't hesitate to tell him "Rotten RAC es lotsa hum" if that is what it sound like. And that's what it *did* sound like, nine times out of ten.

Two articles in same issue on "Crystal Control," just starting to find favour with amateurs. So what with CC and Hertz aerials, we weren't all that backward in those days. A list of Calls Heard from New Zealand gives the following G's: 2DX, 2KF, 2LZ, 2NM, 2OD, 2SZ, 2WJ, 5MO, 5NN, 6TM. I can only spot one there who's active to-day. No guesses allowed!

THE MONTH ON THE AIR—

October, 1937

By H. A. M. Whyte (G6WY).*

NORMAN JOLY, SV1RX, is rare DX to many ; in fact, if what he says is true, his is a signal much sought after by G's as well as other amateurs. SV1RX likes to work DX, so he calls " CQ DX," and to his disgust he counts about 30 G's replying. We all know that DX is a relative term. Undoubtedly G8 -- – , with 5 watts, considers him to be a DX contact, and therefore feels justified in calling him, but what of the man who called for DX, meaning " nothing in Europe " ; what can he do to remedy this state of affairs ? Well, we'll suggest to SV1RX and to any station situated as he is, in a country where hams are few and far between ; don't call " CQ DX," but listen for your man and then call him. Although this advice would correct the trouble, it is much better practice to respect a directional CQ. SV1RX worked OY1B and, having read our remarks about him, started to read the Riot Act. OY1B calmly informed 1RX that he had received the card sent by SV1AZ for a contact in June. Solution, OY1B *is* genuine. ZX2C was also worked and gave QRA as being " near Gibraltar," so this call would appear to emanate from a ship. The QRA of TA1N, reported last month as being the only known station in Turkey, is: Ing. Nejar T.C., Hava Okullari, K. Eskisehir, Turkiye. This was taken from his card by SV1KE for our benefit, and relayed *via* SV1KE and G5SR. Has anyone any details of XG6WA, who was worked by SV1RX and refused to give details of himself ?

Asia has shown up well during the month, and many interesting countries have been heard. Korea produced J8CF, J8CD and a new one, J8DZ. FI8AC has been working stations in a row on 14,300. His QRA is: R. Lebon, Box 13, Hanoi, Fr. Indo-China. G5HH has worked VQ3HJP, ZE1JI, UK8IA, HH3L, KA1SL, CE7AA, FI8AC, CX2BK and VK6FL and heard XE1AA and XE1AM.

Another feature of the month has been the Alaskan stations. G5YH, recently returned to the air after a long rest, worked K7FNE (HF 14), K7DNL and K7COI (LF 14) and heard K7KD, and it is rumoured that G6CL was quite excited when he raised K7COI for his first Alaskan. G5YH informs us that VE5LD gives his station address as being in an igloo in King William Land, N.W.T.

G5MY hopes that ZX3LI will turn out to be a real new country ; unfortunately he lost him in QRM when the QRA was being given. UPOL was worked at 08.45 G.M.T. by him, and K7COI completed a satisfactory month. Our regular, BRS1535, at Woking, raises again the question of authenticity of ZK1AA. He has heard him twice and sent him two reports, but so far no result. It has been reported that ZK1AA left Cook Is. two years ago. Another K7—K7FJC—was heard on 14,025 besides the above mentioned, and VP5AA appears to be a new Jamaican. RX1B was heard working traffic with W1FM, so we suppose this to be another ship. K6OVN in Guam on 14,125 and K6ILT on 14,385 were other " snips " for BRS1535.

G2RC, a great friend of G2TH, now in the Gold Coast, informs us that the latter reports hearing G8FZ, G8IL and G2IM. 2RC has " caught out " our old friend EP2RK. Firstly he says his fist is identical to that of TA2BS, and secondly he heard the following: " CQ de T—EP2RK." Other unusual signals for him were EA7AV and EA1BQ on 14 Mc. and XOZ3G, XNA5C and YV5AN on 7 Mc. He would like details of the two former 7 Mc. Stations.

An interesting letter arrived from OXVC, who is still tied up at Gibraltar. He tried signing OX4C on several occasions, but realised that everybody thought him to be in Greenland, so decided not to use this prefix again. Can anyone tell G2RC if KA1UP is *bona-fide* ? We cannot see any reason why he should not be.

G8IL appears to have more than a magic touch in his fist. Since March this year he has worked 38 out of the possible 40 DX Zones with a ten-watt licence. K7COI gave him his 38th. Other DX *worked* includes FI8AC, HS1BJ, UK8IA, VS7RA, VU2FV, VU2AN, PK1MF, PK1BO, KA1AN, VK6FL, VK6SA, CE7AA, OA4AQ, K6FAZ, VE5LD, VP5PZ and ZS's. His aerial system is two half-wave aerials which he can switch in and out of phase 75 ft. high. He has just obtained his 25-watt permit, so we cannot imagine what DX there is left to work with this increased power ticket. He has heard FG8BC, who worked G6HL and is reputed to be in Guadeloupe. He now wants K6TE and AC4YN, and requests details of any U0 station heard in Far Eastern Siberia for Zone 19.

G6WY, who uses as much power as his DET1 final will stand, to raise the rare country, has added some new countries to his list. FQ8A, FI8AC, VQ8AS, and ZS3F, the latter being two-way 'phone. It is believed that the QSO with VQ8AS was the first England-Chagos Is. contact. This was at 16.00 G.M.T. on October 9 (14 Mc.). Other DX worked includes XU8RL, KA1SL, CR7AU and K6FAZ. G2MI worked K6EO for his first Hawaiian. G2ZQ has heard VO6JQ in Labrador and understands from ZU6AF that there is a new station in Bechuanaland signing ZN1B, so here's another one to go for.

SU1WM is very anxious to know if AC4AA is genuine ; his QRA appears in the Egyptian notes in last month's Bulletin. We hope so, because Zone 23 is far too sparsely populated ! G6ZO has worked his first ZL1—ZL1KE and PK1BO on 14,100. He tells us that ZXY2J, alias F8ZD or F8SJ, is in North London as well as XZN3B ; maybe it's one and the same pirate. OOAFA is reputed to be a Belgian aeroplane, and was heard by ZO when on the ground at Gent. QSL *via* ON4DX.

BRS1711, of Devon, has a two-valve receiver and listens for 'phones. His best during the month

* 9, The Mead, Beckenham, Kent.

were : EA9AH, HC1JB, HK3JA, K6OQE, KA1ME, NY2AE, TF3P and many VK's and W6's. G8MX, a newcomer to this column, has worked on 'phone 8 VK's, FB8, YV, PY and VS2 with 25 watts. He says that YV5AA is looking for G's at 4 p.m. YV time, and BRS2917, another keen 'phone listener, logged VK6MU, PK1MX, VE4AW, CE4AO, YV7KP and VK's.

In answer to BRS2138, now GM6JJ, G6YL gives the QRA of UCA at Odessa, and the reception on 28 Mc. would be a harmonic. She also corrects G8DA as apparently GADUW is not the call of flying boat " Caledonia " but of " Castor." " Caledonia's " call is GADHM and G6YL listened to both the " Cambria " and the " Caledonia " whilst they were crossing the Atlantic.

G8DA is using 6 watts from dry batteries on 14 Mc. and worked W1WV. He heard NY1AE 14,270, OA4J 14,300, CX1CG 14,300, and HK3AL 14,280 on C.W. and HK1EP and HK3JA on LF end of 14 Mc. 'phone. He is another to report K6OQE's 'phone ; other C.W. signals were VO6L (Labrador), K6OKM, K6JLV, K6ILT, and XE2FC on 'phone.

Many amateurs may not realise that 350 volts represents a full 10 watts on a correctly adjusted transmitter which is fairly well loaded by its aerial ; therefore if any 10-watt licensees are using more than 350 v. under the above circumstances, it is doubtful whether their input is strictly in accordance with the terms of their licence. This comment is made for the benefit of the QRP man who is " kidding " himself that he is using ten watts. When you report that DX, we want to know your *exact* measured voltage on load, not your input —it's too elastic.

G6GH is another newcomer to this page. He has worked K6HOO 14,320, HS1BJ, HC1JW 14,400, CE7AA 14,310, HH3L 14,310, K6EO 14,390, K7RT 14,010, CN1CR 14,350 and VE5LD 14,000. He has also worked ZA3X (QRA given, Elbasan) and LZ1AA (QRA given, Varna), but has grave doubts. Does anybody know of YI7RB ? G6GH worked him in August, but has not yet had his card returned ! GH suggests we run a Roll of Honour after the List of Countries is published. Any against ? (Any for ?—Ed.)

Calls You Know
From left to right, SV1KE, SV1RX, SV1CA. Three well-known Greece station operators

G2SO, using a single 6L6 tri-tet with 350 volts—*ah !* has worked W6, VE4, SU, VK, ZS, ZE, FP8PX, TF3C, and U9ML, and heard EA7AV and TA3IA—what, another ? G5MN reports CE7AA, HH3L and HH4AS. There is another HH on the air, too, HH4SA, or is this the same station ? G5GH (ex VS6AX) reports that VS6AZ, mentioned last month, is a Chinese lad and his QRA is Luk Yui Kwong, Nathan Road, Kowloon, Hong Kong. His " kid " brother operates XU6LL in Canton.

G8KP supplies some information on RX1B. When worked he gave his position as Cape Palmas, Ivory Coast, but we think he must have missed out the word " off." OHKI was worked but said, " Pse no QRA—pse no QSL "—well, he's an honest pirate. KP was FI8AC's first contact with G, whilst other DX includes U9, ZS/U/T, FQ8AB, VU, ZE1JV, and has worked 61 countries and 25 zones since February with QRP. A new one for him is ZC6RP. CR7AU, CR7MB and PK1MF all helped to make him W.A.C. 11 times during the month.

G5PY supplies us with the news that he was QSO CN1CR, CE7AA, PK1BO and VK and ZL, while our old friend 2ATI, ever fresh for new DX, heard K7FNE, ZC6RP, FF8AH, K6ILT, FI8AC, VQ8AG and OY1B. ZU6M and ZS1B were received on 'phone. He received a card from UPOL and also a copy of the *Moscow News*, giving details of this station. UPOL's power is only 70 watts.

Eric Trebilcock, BERS195, gives us some interesting news this month. He has never heard VK4KC in Papua, although heard many stations calling him. Skip may account for this. He has heard 50 G8's already, and will QSL anyone who sends him a card requesting one. (See Calls Heard.) He reports that there are no active VK8 stations now, VK8KM having returned to Adelaide. The last VK8 he heard was 8DA, whom he believes was attached to an expedition in the Southern portion of North Australia. This was on 7 Mc. last August. VK2ACX has just come to Darwin, so he may start up. FI8AC puts a good signal into his district and PK6WF heard on 'phone is attached to a mining expedition in the central jungle of Dutch New Guinea. XZ1S gives QRA as Tsingtao, China, but seems to have muddled prefixes ; anyway, he promises to QSL. OH3NQP was a good " catch " for BERS195, as he was in The Baltic when heard. VR4OC is returning to Sydney at the end of the year, and will QSL all contacts then. Trebilcock is the only one to report ZN1B in Bechuanaland and XU1CY.

Another overseas reporter is BERS311, of Ambala, India (one of the ex-operators of ex-VS1AJ) ; the other operator is now VS1AL. His transmitter is ready waiting his call, and he will use only 200 volts on 14 and 28 Mc. His " plums " were XE1AM, K6SO, OA4J and PY2DO. ZN4DM is a new call to him and to us, and no QRA is known. Really good quality 'phone has been heard from ZU6N, ZT2G, VS1AF, VS1AI, XZ2DY, G5OV, G8MA, G2TR and SU1WM.

(*Continued on page* 290)

The Technical Information Bureau Results to Date

By Austin Forsyth, G6FO.

THE T.I.B. is a service which, so far as the writer is concerned, is given free of charge and in his spare time. That there is both some appreciation of what has been done and a solid demand for the T.I.B. is shown by the correspondence and volume of work arising from it since its inception.

Queries have ranged from the design of a directional aerial system for Service operation to requests for further constructional information on apparatus sponsored by the commercial radio Press! It might well be supposed that such demands for assistance are quite outside the scope of the T.I.B., but they have been dealt with because the queriests happened to be members of the R.S.G.B. While the writer is prepared to do all in his power to help these correspondents, such queries—as they do not strictly concern Amateur Radio—must in future be taken on their merits, *i.e.*, the right to refuse to handle them is reserved, for one thing, and for another, no guarantee of quick return can be given unless the file happens to be clear of other material when they come in.

A large proportion of the queries relate to aerial systems, and for the most part, correspondents give all the information regarding bands, space available, disposition of the site and so forth, which is obviously necessary for working out a design.

Not so with some of the others. A not unusual request is for a "two-valve transmitter," no details being mentioned; direct correspondence is then needed to find out about the bands required, power supply system used, 'phone or C.W. operation, etc., time being wasted and much unnecessary writing being involved thereby. Again, in spite of the rules—which make it clear that questions must be concise and that each should deal with one point only—a generalised query covering a very wide range is sent in with a request for full information. This may be on how to tune a 'phone transmitter, without any details being given of current readings, methods used or symptoms. In fact, most members using the T.I.B. appear to imagine that the writer is fully acquainted with their own particular problems, ideas and apparatus, and that it is only a matter of mentioning very briefly their difficulty for it to be solved immediately.

In future, therefore, it is asked that all members using the T.I.B. read the rules carefully and, when framing their query, give all the information possible. When dealing with transmitters or transmitter design, mention the power supply available in terms of voltage and current, the bands to be used, the aerial system, meters on hand, whether the bulk of the work is to be on 'phone or C.W., together with any preferences as regards particular apparatus or parts already in use or in stock. It is a sheer waste of time to say "Design me a transmitter," or "What is the best aerial I can use," or "My R.F. output is low on 14 Mc.," without giving all the relevant details as completely as possible.

Remember also that while the service is operated as expeditiously as circumstances allow, it has become necessary in many cases to exceed the seven days' guarantee previously given. The reason for this is that the average query involves three pages of typescript and two circuit diagrams or other drawings, the whole taking about 1½ hours' work. Carbon copies are also kept, and each problem is carefully dealt with in as complete a manner as possible; in some cases, a certain amount of reading up is necessary, which means that they have to be put aside for a few days. As has been said before, the writer does not and cannot claim to know everything, but he will find the right answer if there is one! In every reply, the dates of receipt and completion of the query are given, together with a reference number, which should be quoted in any further correspondence.

A word now with regard to the other type of enquiry—that from the correspondent who writes direct, without putting it through the T.I.B. In the past, these questions have been handled in the same way as the others, but after this notice appears they will be sent back. Members who do this sort of thing, while they are without doubt acting thoughtlessly and in ignorance, not only involve the writer in postage expenses which should be covered by the service, but also side-track the original idea of the T.I.B., which is that it should be an impersonal service for members generally. These remarks apply only to technical queries requiring an answer, and not to general correspondence arising from "The Helping Hand."

Finally, the writer wishes to acknowledge the courtesy of those members who, having made use of the service, have written thanking him for the trouble taken. As the T.I.B. is a labour of love, like "The Helping Hand," these expressions of individual appreciation are gratifying, more especially when the suggestions made to meet a particular case have proved to be successful.

Strays

Miss D. Hall, W2IXY, has recently been appointed Official Phone Station by the A.R.R.L. Official A.R.R.L. information will be transmitted on Wednesdays at 2130 G.M.T., and Fridays at 1100 G.M.T. on a frequency of 14,244 kc.

W. N. Short, W9EF, of Illinois, tells us that out of 103 different British Isles stations worked since January last, only 39 have QSL'd. Each station worked by W9EF has received his card, and he complains that the 64 defaulters failed to keep their promise to QSL.

R.S.G.B. SALES DEPT.

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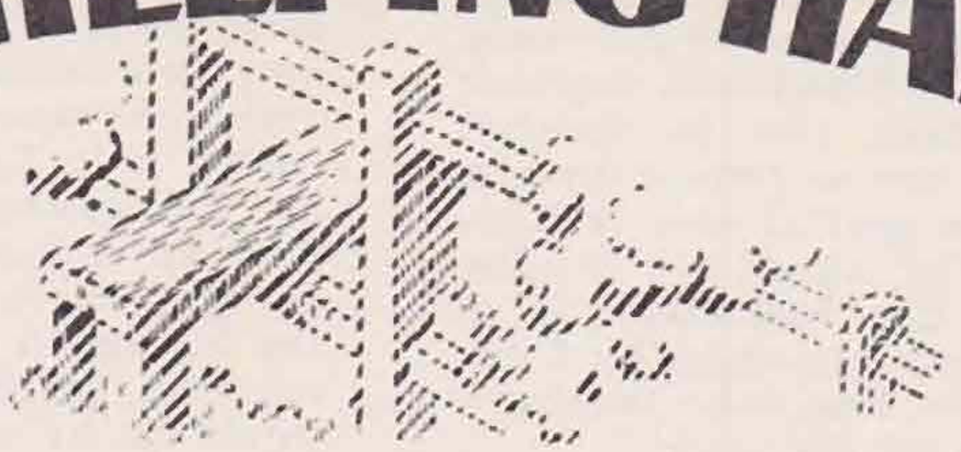
THE HELPING HAND



By Austin Forsyth (G6FO).

PART IX.—THE CONSTRUCTION OF TRANSMITTERS

THE heading has been suggested by more correspondence from readers who are either using transmitters which have grown from a single oscillator stage or who contemplate building one to suit their own particular requirements from general information obtained and no particular design. In other words, they ask, in different ways: What is the best form of construction to adopt?

The answer is, of course, that there is no best constructional method. It depends upon individual circumstances, knowledge and requirements, in the same way that the best type of aerial (another very frequent query!) is dictated by such factors as space available, frequency ranges used, desired directional effects, and so forth. Putting all this another way, we can only say that the "best method" is the one which has the greatest advantages in the individual case.

This month, we therefore propose to discuss the various points which arise in deciding upon the question of construction, in order that readers may apply what we can suggest to their own personal needs.

In the first place, because George at the other end of the town, who has held a licence for some years and is regarded as the local expert, favours rack-and-panel construction and obtains the much-desired "commercial" appearance, it does not necessarily mean that G8—newly licensed and thirsting for DX—will also get the best results with a rack-and-panel rig. For him, and for the AA man, the problem is quite different. Where it is probable that much chopping and changing and experimental work in general will have to be done before the final transmitter arrangement is evolved, it is obviously going to be better to build in some way which enables changes and circuit adjustments to be easily carried out. Admittedly, advanced rack-and-panel designs allow this, but if the shell is home-built, a fair degree of mechanical and tool-using ability is necessary to get a clean appearance and a solid job which yet allows one unit to be easily withdrawn for alterations. A purchased standard rack-and-panel assembly is, on the other hand, quite expensive, even if built locally to one's own specification.

Breadboard Construction

Our own experience with the problems of beginners in amateur transmission suggests that where cheapness, ease of accessibility and the convenience of adjustment are involved—as in the case of the AA man or G8 with a new licence—baseboard or "breadboard" layout is preferable at the start. This form of construction enables the gear to be easily and quickly assembled, while it is always a simple matter to make circuit changes or tests with different parts; further, the circuit can be conveniently arranged for the insertion of the limited number of meters with which the QRP station is usually provided at the beginning.

Most of us like our gear to look as neat and as efficient as possible, even though the striving for appearance often means a loss of electrical efficiency, generally unrealised. One of the main objections to baseboard construction is that the station looks too amateurish compared with the photographs one usually sees of super-American outfits. Apart from commercially built rigs, however, the construction and layout *behind* these rack-and-panel transmitters is often of such a low standard from the electrical point of view that one realises that the striving for appearance has its drawbacks. Before you admire old So-and-So's rack-and-panel job too much and decide you must have something similar, have a look round the back and see if your breadboard rig is any less well laid out.

We always have to cover ourselves, of course, and obviously we do not suggest for one moment that *all* rack-and-panel transmitters are less efficient than baseboard ones, but the point is that, generally speaking, it is not too easy for the average amateur to attain good electrical efficiency with the former type, and the problem is much simpler with a baseboard layout.

The simplest transmitter arrangement using a breadboard consists of nothing more than a piece of plywood long enough and wide enough to carry the various components, with runners about 2 ins. deep to provide sub-space for low-potential wiring, fixed condensers, and so on. Admittedly, this can never be a very beautiful layout, since the wood is generally unpainted and the whole thing presents a somewhat unfinished appearance, though the RF efficiency may be quite good.

A better form of baseboard construction is to build the transmitter in unit form, section by section, each stage on its own shell. The appearance can be considerably enhanced by making all

the shells, or baseboard and sub-panel assemblies, uniform. A standard baseboard size is chosen, say, 15 ins. by 9 ins., with runners 3 ins. deep, and a sub-panel, closing the front of the shell, 15 ins. long by 3 ins. wide. Five-ply wood can be used for the baseboard and sub-panel, and inch-board for the runners. If the wood is carefully cut—only four separate pieces are required and held together with wood screws—the edges can be finished off with sandpaper and the box so formed given a coat of varnish stain. The general idea is illustrated in Fig. 1. Incidentally, a good way of using sandpaper, for those who may not know, is to wrap it round a piece of wood 1 in. thick by 2 ins. wide and about 6 ins. or 7 ins. long, thus forming a convenient tool for cleaning off the work.

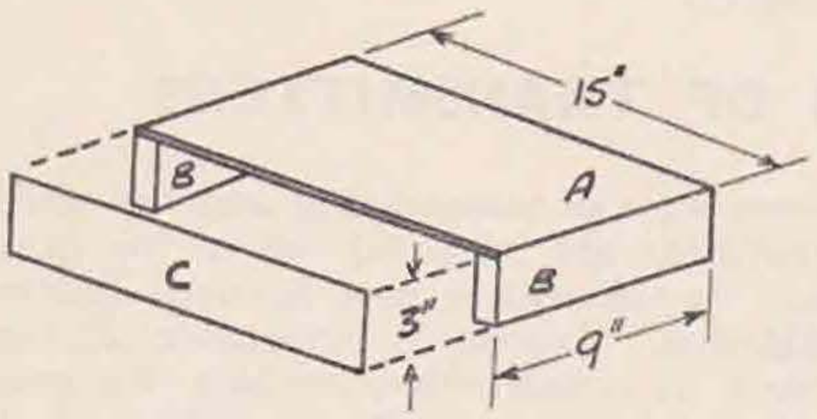


Fig. 1.

Construction of shells for "breadboard" lay-out. A is the 5-ply baseboard, 15 in. x 9 in.; B, B, runners 3 in. deep x 9 in. long; C the front sub-panel, 15 in. long and deep enough to cover the front end of the box. Meter jacks and switches can be mounted on C.

Anybody who can use a saw, a square, a screwdriver and a paint brush can turn out quite nice-looking wooden shells for transmitters and other apparatus along these lines, and the result is a satisfactory appearance within the limits of baseboard construction. A sub-space 3 ins. deep leaves ample room for chokes, fixed condensers and the low-potential wiring, while the narrow sub-panel on the front can be used for mounting switches and meter jacks. Inter-connection of the various units is by means of a row of terminals on an ebonite strip fixed along the back of each shell, this strip being mounted so that it is opposite the front sub-panel and below the level of the baseboard. All the R.F. part of the circuit, such as variable condensers, coils, and valve-holders, are fixed on the baseboard and, if necessary, small wooden or ebonite panels can be used to carry condensers or extension controls.

Two such units of the size suggested give ample room for a three-stage transmitter with all its associated circuits, the PA being built on one and the buffer-doubler stage on the other.

The obvious disadvantage of this general arrangement is that rather a lot of bench space is required, about 3 ft. by 1 ft., though it is safe to say that at the majority of stations at least that much room is available for the transmitter itself. Under very confined conditions, the two shells could be mounted one above the other with wooden supports, when the space required would be only 17 ins. by 10 ins.

Where the various units of the transmitter, modulator, speech amplifier, etc., are laid out along the bench, the appearance and accessibility are all that can be desired, and if the space is available, some such arrangement is strongly advised for the beginner.

Simple Rack-and-Panel Construction

For those who are set on a rack-and-panel job, a wooden shell can be made fairly easily by using 2-in. by 1-in. battens as uprights, 64 ins. high, set 19 ins. apart on feet 24 ft. wide. This would give seven panels 9 ins. deep by 19 ins. wide, with corresponding baseboards 12 ins. deep by 17 ins. long, to accommodate respectively the power pack, switch and meter panel, speech amplifier, modulator, exciter unit, PA stage and aerial coupling circuit, and the construction could be so arranged that each panel or unit could be withdrawn separately.

Fig. 2 shows the suggested form of construction, the baseboard depth being made less or more as required. Interconnection of the various units would be by means of terminal strips as regards leads at low potentials from the R.F. point of view, and by link coupling on the R.F. side. Withdrawal of a unit or stage would therefore involve disconnection of the terminals of that stage and removal of the four or five fixing screws holding it in position on the framework, the panel and baseboard then coming out as one. It would obviously not be practicable to rely on these fixing screws alone, as apart from the fact that the baseboard attached to each panel would need support, the framework as a whole would have to be braced. These points are taken care of in the manner shown in the drawings. We cannot, by the way, guarantee that this assembly will be entirely satisfactory as regards stability, as it is at the moment only a paper design offered as a suggestion for those who wish to "roll their own" and require a basis from which to start.

The panels could be either of plywood or building board, such as "Masonite," obtainable from any builder or builder's merchant. This material is a composition which has good electrical properties, is cheap and takes an excellent finish, either by hand or with a spray-gun. It also works easily, but for those who cannot guarantee to get a good straight saw-cut and are also not able to finish off the edges, it would be better to have the panels cut to size.

There are various other types of similar material, known by different trade-names, which can be used in exactly the same way.

In constructing such a rack-and-panel assembly, it is essential to get the whole thing in square and provide a good base. A width of 24 ins. in the feet should be ample to ensure this if the floor is quite level, while the fact that the power-pack, the heaviest part of the equipment, is placed at the bottom also assists stability.

Box-Frame Construction

This is a non-standard type of assembly which is something between breadboard and rack and panel. Four uprights carry shelves, the sizes and number of which depend on the amount of gear which is to be mounted and the type of transmitter used. A typical case would be a framework 4 ft. high by 3 ft. square, carrying four or five shelves each approximately 3 ft. square. All the power supply equipment would go on the bottom shelf, the modulating and speech amplifier section on the next, with the R.F. units on the third and aerial circuit on the fourth. The sides are left open all round, except where strip panels are required to carry meters or tuning controls.

This form of construction is convenient in many

ways, as it makes the station compact—though not to the same degree as rack and panel—and each section is kept separate from the others but is not divided into units, i.e., the whole of the modulator and speech amplifier section is built on one shelf and the complete R.F. side of the transmitter on another. All the equipment is easily accessible and can be protected from dust by glass. In the case of a 25-watt station, the complete outfit, including receiver and monitor-frequency meter, can be included within a framework 2½ ft. all three ways, though this involves sub-shelves and panels and a certain amount of ingenuity as regards layout and shielding.

The advantage of this method of building is that the station as a whole is transportable, all that is required for operation being a power-point and aerial-earth system. For those faced with not infrequent changes in QRA, it is a simple matter to have a lined and padded crate made which takes the whole framework complete, and the station can then be moved bodily at very short notice and with the minimum of trouble.

We ourselves at one time used box-frame construction in just the manner suggested here, but as a large transmitter and much auxiliary apparatus had to be accommodated in the framework, its final size was 6 ft. 6 ins. all three ways, and it could not be called transportable, particularly as the uprights had to be braced to the floor and wall. We could, however, crawl about inside when care and maintenance was called for, and all the transmitting gear was kept fairly compact.

Electrical Considerations

As transmitter construction does not only include the matters of which we have spoken briefly above, we might with advantage conclude this short article by discussing the electrical aspect of the question. Electrical efficiency should *never* be sacrificed for appearance, as obviously what we are concerned with chiefly is the generation of the

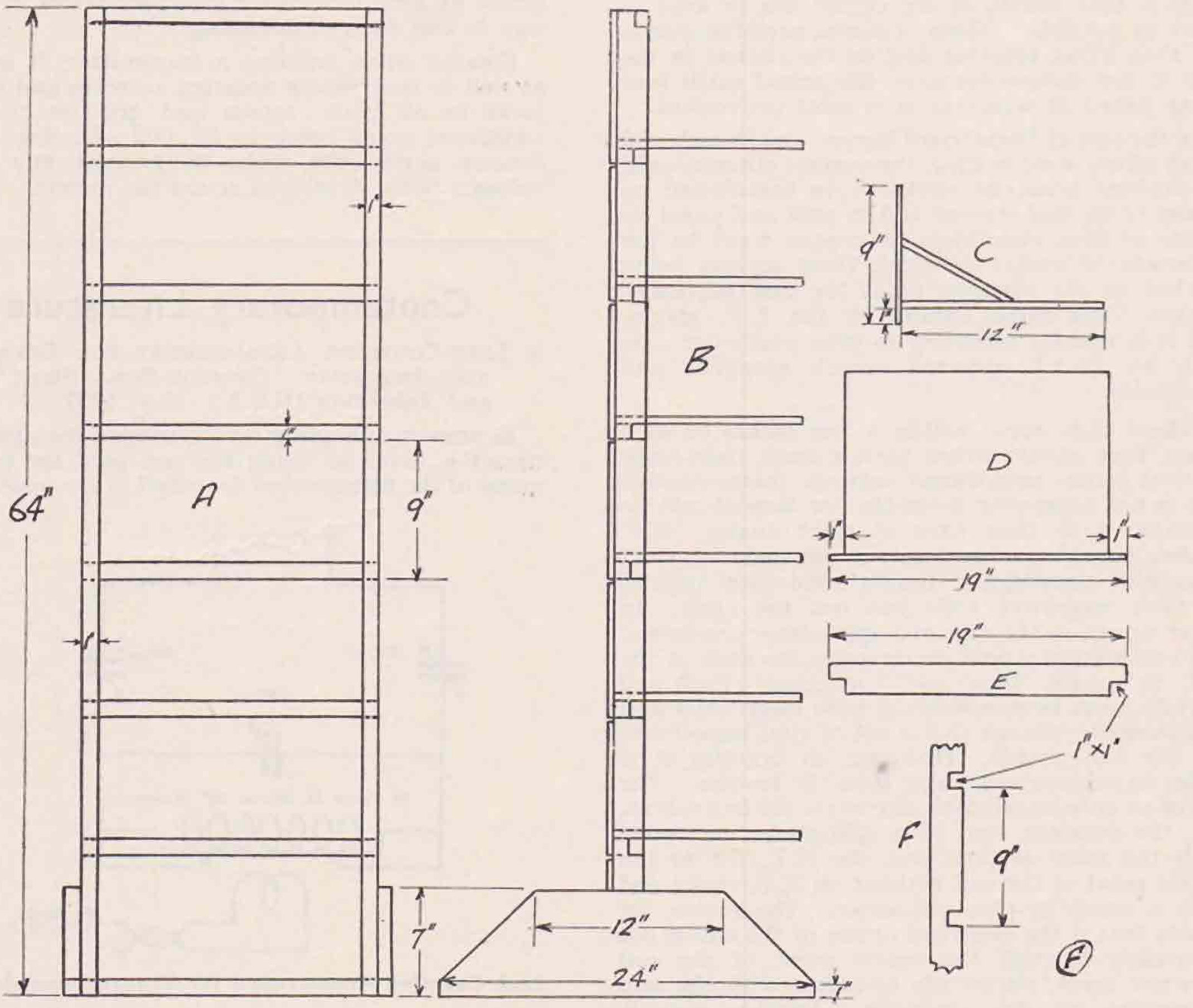


Fig. 2.

Scale drawing showing suggested construction of wooden rack-and-panel assembly. A is the frame; B side view with panels and baseboards in position; C the detail of the panel and baseboard arrangement (brackets not shown in B) and D the plan view of C; E is the shape of the cross-pieces for the frame; F shows the notching in the uprights.

Quantities Required:

2 in. x 1 in. Battens: 2 pieces 64 in. long, 8 pieces 19 in. long.
Feet: 2 pieces 1 in. board, 24 in. x 7 in., shaped as shown in B.
Baseboards: 5-ply wood, 7 pieces 17 in. x 12 in.
Panels: Masonite, ebonite or plywood, 7 pieces 19 in. x 8⅞ in.
Brackets: 14, at least 4 in. x 7 in.

maximum amount of R.F. at the tank of the final amplifier with the minimum amount of apparatus and expenditure of power. Convenience as regards band-changing is another, though secondary, consideration, and is sometimes the reason for putting in one or two more buffer-doublers than are actually required. But this, again, is a matter for the individual to decide.

Generally speaking, each unit of the circuit—considering the CO, BA/FD and PA as separate units—should be constructed and regarded as a complete section. The R.F. leads should be kept short and direct, well apart, and in the case of baseboard construction, all above the surface. H.T. and L.T. wiring can be run as may be most convenient after the R.F. leads have been settled. It is a mistake to earth to the chassis—where metal is used—or to a common busbar with wooden construction. The earth connections for each unit should be taken to a common *point*—which might be a large terminal—placed so that the earthing leads in that section of the circuit can be kept as short as possible. These common earthing points are then wired together and to the chassis in the case of the various sections, the actual earth lead being joined in wherever it is most convenient.

In the case of breadboard layout, and in rack and panel where wood is used, the various stages should be shielded from one another; in breadboard by means of vertical screens and in rack and panel by sheets of thin aluminium or copper fixed to the underside of each baseboard, these screens being earthed to the common point for that particular section. The same applies to the L.F. stages, and it is usually necessary to take particular care with an all-A.C.-operated speech amplifier and modulator.

Where coils come within a few inches of each other, they should either have a small right-angle earthed screen equidistant between them—though this is not altogether desirable—or they should be mounted with their axes at right angles. R.F. chokes should be kept out of the field of their associated circuits, and tuning condensers parallel to their respective coils but not too close. In other words, in the case of a split-stator condenser, the two stators should be opposite the ends of the coil to which they are connected. Push-pull circuits must be symmetrical both electrically and mechanically, though this is not of vital importance on the L.F. bands. However, in practice it is easier to achieve symmetry than the reverse. The use of an unbalanced tank circuit should be avoided, i.e., the common case of a split-stator condenser with the rotor earthed and the H.T. fed to the centre point of the coil without an R.F. choke and with a small by-pass condenser. The reason for this is that if the electrical centre of the coil is not accurately located, the centre point of the coil does not agree, electrically speaking, with the zero connection on the condenser. Another possible snag in the case of split-stator condensers is that if they have been home-constructed or adapted from a BCL type of component, the two halves may not be an accurate match. When using the split condenser with the rotor earthed, H.T. should be fed to the coil through a good R.F. choke suitable for the frequencies involved, and the tap made as near the centre of the coil as possible. If the choke is a really good one, it does not matter if the exact centre of the coil is not found.

Tank coils, specified as being suitable for a certain input power with a given parallel capacity, should be connected to the tuning condenser with leads at least as heavy as the wire or copper tube used for making the coil. The reason here is the obvious one that both the condenser and the tank leads have to carry whatever current is circulating in the tank circuit as a whole.

Since transmitter tuning condensers do not normally require variation in the same sense as do the receiver tuning capacities, slow-motion dials are unnecessary, and it is better to use a plain dial either with a scale or working against one. An exception to this is the case of a specialised transmitter operation on 28 or 56 Mc., where slow-motion and extension controls are definitely useful.

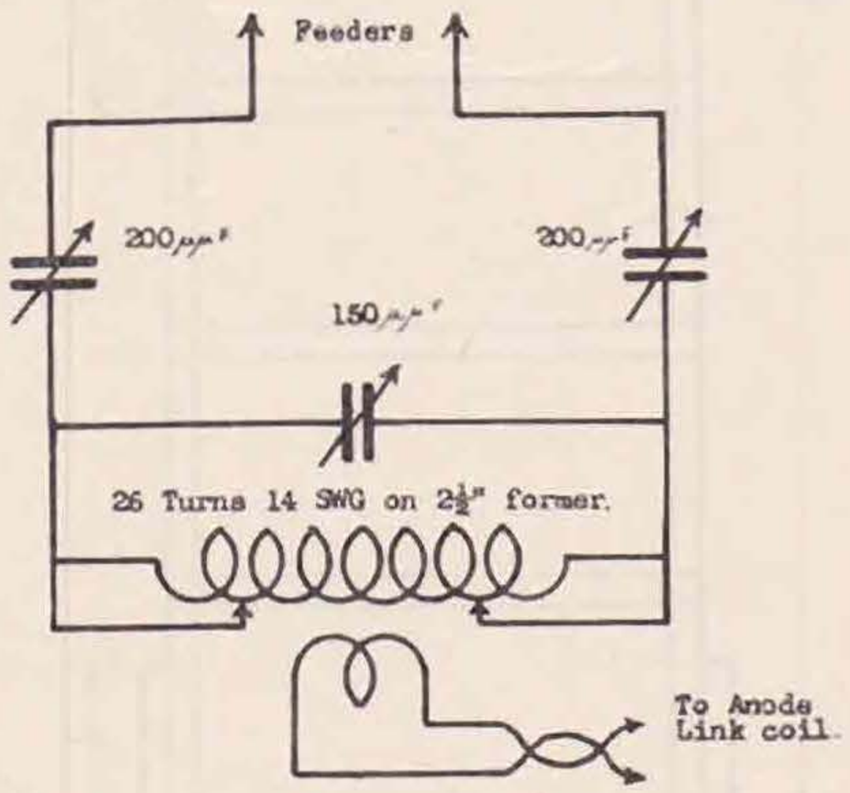
Transmitter variable condensers are best mounted by means of midget stand-off insulators, and practically all such condensers lend themselves in some way to this form of mounting.

Finally, when building a transmitter, it is just as well to incorporate isolating switches and meter jacks in all plate, screen and grid circuits, an additional point being to fit .002 μfd. fixed condensers across the jacks to prevent any R.F. voltages being developed across the meters.

Contemporary Literature

A Link-Coupling Arrangement for Transmitting Antennas. Question-Box. Short Wave and Television (U.S.A.), May, 1937.

In answer to a query on the subject the attached circuit is given as being the one used for testing many of the transmitters described in the magazine.



Link Coupling Arrangement for Transmitting Aerials.

The circuit is Link-coupled to the transmitter and the three tuning condensers permit proper adjustment under almost any feeder condition.

G6SO (Scarborough), on his 7,012 and 14,024 kc. telephony and C.W. transmissions. All reports will be acknowledged, and should be as detailed as possible.

BOOK REVIEWS

PARTRIDGE P.A. MANUAL. By N. Partridge, B.Sc., A.M.I.E.E. 38 pages, 23 illustrations and five tables. Published by the author at King's Buildings, Dean Stanley Street, London, S.W.1 Price 2s. 6d. post paid (to members of R.S.G.B. the price is 1s. post paid).

The author is known in the P.A. field as a specialist and manufacturer, and in this little paper-backed booklet the reader is given much practical information on the subject as well as being regularly informed of the merits of " Partridge " apparatus.

A section of electro-acoustics deals with the power represented by various sounds, decibels, frequency range, intensity and tone balance, and equips the reader with a good understanding of the problem. Various methods of operation of the final stage, with particular reference to Class A-B, are described ; a table is given showing operating conditions for many American and British valves in Class A, Class B, and Class A-B.

The Partridge Control Circuit for maintaining the screen voltage constant under working conditions of high-efficiency circuits is explained, and then the penultimate stage is covered. Mains equipment requires special attention when high-efficiency circuits are used, and the design of suitable circuits for filtering while maintaining a good regulation is usefully treated.

One of the most interesting sections of the booklet explains how hum may be eliminated, and the steps which should be taken to locate the seat of the trouble. Input circuits and mixing circuits receive practical treatment, and the use of special transformers for varying loads, such as would arise with additional speakers, is fully explained.

An interesting pre-amplifier circuit is given, and the effect of various lengths of connecting cable on the quality is shown by three curves.

Three appendices conclude the book ; one gives the prices and outputs of fourteen different microphones.

The booklet is attractively printed, and should be of interest to members.

T. P. A.

TRADE REVIEWS

We have received for test a new production of *British Mechanical Products Ltd.*, in the shape of a Clix " Acorn " Ceramic Valve holder.

The base, of Frequentite, is fitted with strong nickel-silver contacts, and is provided with patent metal inserts for bolts or rivets.

The valve holder was put into use in a 56 Mc receiver incorporating an HA1 Valve, with very satisfactory results, indicating good contact to the valve pins and negligible losses.

It is made in two models, one for English and one for American valves, and at the price of 2s. it can be highly recommended to all interested in ultra-high frequency work.

J. N. W.

1938 1.7 Mc. Transmitting Contest

It has been decided to again organise a 1.7 Mc. Transmitting Contest in view of the interest shown in last year's event.

The rules are exactly as before, except that the hours of operation have been modified.

The rules are as follows :

1. The Contest will commence at 0001 G.M.T., Sunday, January 9, 1938, and will conclude at 1200 G.M.T. the same day.

2. Entrants must be fully paid-up members of the Society, and be resident within the British Isles.

3. The British Isles, for the purposes of this contest, includes England, Scotland, Wales, Northern Ireland, the Irish Free State, and the Channel Islands.

4. Entries will only be accepted on official log sheets which can be obtained free of charge from Headquarters prior to the commencement of the contest. Entry forms must be returned within 14 days of the conclusion of the contest.

5. Entry forms, unless completely filled in, will be disqualified.

6. The declaration at the foot of the entry form must be signed by the operator.

7. Proof of contact may be required.

8. Contacts with or calls from ship or unlicensed stations will not be permitted to count for points.

9. Only one person will be permitted to operate a specific station during the contest.

10. Leading stations will be granted certificates of merit, whilst a trophy may be awarded at the discretion of Council.

11. An exchange of reports (readability, signal strength and tone) will be required before points for a contact can be claimed.

12. Only one contact with a specific station will be permitted to count for points during the contest.

13. One point will be scored for Inter-British Isles and European contacts, and five points for contacts outside Europe.

14. The input to the final amplifier must not exceed 10 watts, nor may this figure be exceeded on any previous stage.

15. Council have the right to amend or alter the rules at any time prior to the commencement of the contest, and their decision will be final in all cases of dispute.

International 1.7 Mc. Tests

We are pleased to give publicity to the following communication which has been received from Mr. S. S. Perry (W1BB) :—

" For all amateurs interested in working DX on 1.7 Mc., the tests which have been conducted for the past five years will be repeated again this season under a slightly different schedule.

Two tests will be held each week-end for the two months of December, 1937, and January, 1938.

First Test each Saturday morning. 0430-0730 G.M.T. (11.30 p.m. Friday to 2.30 a.m. Saturday, E.S.T.). Divided into ten-minute transmitting and receiving periods, as follows :—

(*a*) All W/VE stations call ' CQ DX ' (Signing call frequently), starting at 0430, stopping at 0440. Listen for DX stations 0440-0450. Transmit 0450-0500, listen 0500-0510. Transmit ' CQ DX ' 0510-

0520. Listen 0520-0530, etc., repeating this same schedule sequence each hour until 0730.

(*b*) All 'DX' stations (other than W/VE) will listen during W/VE transmitting periods, and transmit 'TEST DX' (signing call frequently) during W/VE listening periods, i.e., listen 0430-0440, transmit 0440-0450, listen 0450-0500, transmit 0500-0510, listen 0510-0520, transmit 0520-0530, etc., repeating this same schedule sequence each hour until 0730.

DX and W/VE stations may work each other, instead of calling 'CQ DX' or 'TEST DX' during their respective transmitting periods. This is one of the main objectives of the tests, *but* transmitting and receiving *must* be confined accurately and without fail to the specific periods allocated. This will insure success of the tests and fairness to all, especially the low-power stations.

Be sure to set your clock accurately during the Friday evening before the tests, and adhere carefully to the schedule.

Second Test each Sunday morning. 0430-0730 G.M.T. (11.30 p.m. Saturday, to 2.30 a.m. Sunday, E.S.T.).

This will be a 'free for all' three-hour period to call and work DX as one chooses without the fixed ten-minute schedules of the previous evening.

Stations who 'contacted' on Saturday can, of course, make schedules to 'work' each other on Sunday.

General.—The reason for dividing the week-end into two distinctly different types of 'periods' is because experience has shown that on any given week-end on 1.7 Mc., if conditions are good on Saturday, they will also be good on Sunday, and conversely if bad on Saturday also bad on Sunday. Therefore, if conditions are bad on Saturday it is no use losing sleep on Sunday to keep a useless schedule, and if conditions are good on Saturday the 'free for all' period will afford opportunity to enjoy the DX work unhampered by fixed short transmitting and receiving periods.

The first test is absolutely necessary if the weaker W/VE and DX stations are to be logged as being heard.

DX CW stations are advised that the best portion of the band to be heard and worked by W/VE is between 1725 and 1775 kc. (1715-1800 will be scanned carefully by W/VE CW listeners, however.)

Previously, participants in these tests have been 100 per cent. CW. 'Phone amateurs are welcome, however, and should work on exactly the same schedule as announced above for CW.

Comments, suggestions, criticism of the tests, and whether or not they are desired again for next year, are also requested."

* * *

British Isles entrants should send their logs to Mr. P. Pennell (G2PL), 52, Gilbert Road, Cambridge, who has agreed to tabulate their results for early publication in this Journal.

It will be noted that during a portion of the "free for all" period of these tests the R.S.G.B. 1.7 Mc. Transmitting Contest will be in progress.

British Isles entrants should remember that their licensed power must not be exceeded.

Call Books

We would remind members that we can still supply the Autumn issue of the Call Book.

First International 56 Mc. Transmitting Contest

FOLLOWING on our successful 28 Mc. International Contests of 1935 and 1936, which did much to popularise operation on this band of frequencies, we are pleased to announce the first 56 Mc. International Contest.

The rules are as follows :—

1. The Contest will commence on January 1, 1938, and conclude on December 31, 1938.
2. The Contest will be open to any radio amateur who is licensed to operate his station in the 56 Mc. band.
3. The winner of the Contest will be the operator of the station scoring the most points based on the following system :—

   1 Point for each contact over a distance between 200 and 1,000 miles.
   5 Points between 1,001 and 2,000 miles.
   10 Points between 2,001 and 3,000 miles.
   15 Points between 3,001 and 4,000 miles.
   20 Points between 4,001 and 5,000 miles.
   and so on, at the rate of 5 extra points for each additional 1,000 miles or part thereof.

   All distances to be calculated by Great Circle.

   To count for points the Readability, Strength and Tone (both incoming and outgoing), must be logged, together with Date, Time and Call Sign.
4. In addition, and in order to collect current data, each contestant must send to the Radio Society of Great Britain, a monthly report of stations heard and/or worked, together with notes concerning conditions, power used for contacts, etc.
5. The Radio Society of Great Britain will present a suitable Trophy to the winner of the Contest, whilst certificates of merit will be awarded to the leading station or stations in each country.
6. No entrant may employ Interrupted Continuous Waves, Modulated Continuous Waves, Telephony, or any other form of modulated carrier, for contacts claimed in this Contest.
7. At the time of a contact both stations must be operating on 56 Mc. from their fixed station addresses.
8. Only one contact with a specific station may count for points in any 7 Day period.
9. Entrants must adhere to the terms of their licence.
10. Final entries must be received by R.S.G.B., 53, Victoria Street, S.W.1, not later than February 28, 1939.
11. The decision of the Council of the R.S.G.B. shall be final in all matters relating to the Contest.

Note.—In the above rules the term 56 Mc. refers to the amateur frequency band, 56 to 60 Mc.

First International 56 Mc. Reception Contest

IN conjunction with the International 56 Mc. Transmitting Contest, and in order to encourage non-transmitting amateurs to collect and tabulate phenomena relative to the 56 Mc. amateur band, we have decided, provided sufficient entries are received, to offer a suitable Trophy to the non-transmitter whose log covering the period January 1

to December 31, 1938, is considered by the Council of that body, to contain the most valuable information.

Certificates of merit will be awarded to those submitting the most valuable information at the conclusion of the Contest, irrespective of the number of entries received.

Logs must be received by R.S.G.B. not later than February 28, 1939.

Note.—For the purpose of this Contest a non-transmitter shall be regarded as a person who did not hold a radiating permit on January 1, 1938.

EMPIRE CALLS HEARD

(*Continued from page* 247)

2sf (55), 3ja (55), 3jr (56), 3kb (58), 3kg (54), 4af (56), 4bq (55), 4ck (45), 4gg (57), 4gm (56), 4gn (56), zs1ac (55), 1ah (55), 1av (56), 1g (55), 2j (55), 3f (54), 4u (55), 5t (56), 6au (55), zt1z (44), 2v (56), 5p (44), 6al (54), 6at (55), 6y (56), zu1t (54), 2b (43), 2g (55), 4u (55), 5d (55), 6ad (55), 6an (56), 6m (55), 6n (56), 5j (58).

* * *

*BERS*311, *A. R. Gilding, R.A.F. Ambala, India.*
14 Mc. :—

September 26 *and* 27 (16.20-17.00 G.M.T.) : g6lj (569), zu5y (559,) 6b (559), ze1je (459).

September 28 (16.50-17.20 G.M.T.) : vk2el (579), 2nb (559), 2hp (579), 3jk (568), 3xu (569), 4ty (459), 5jt (559), vs7rf (599).

September 29 (10.00 G.M.T.) : vu2an (599).

September 30 (15.40 G.M.T.) : g2tr (CW-599. Phone S5/4), 2gc (579), 5ov (559), zu5aq (559), ze1jg (559), 1ji (559), su1wm (CW-568. Phone S6/4), zn4dm (589).

October 2 (14.05 G.M.T.) : g2pl (559). (15.10 G.M.T.) : g6wy (579).

October 4 (17.15 G.M.T.) : C.W., g6vp (599), 5pp (579), 2pl (599), 2nn (589), gi6tk (569), zu6ac (589), vu2an (569), 2am (569), 2fs (599)

Phone : zu6n (S5), zt2g (S9), g8ma (S5), vs1ai (S5), vu2hq (S6).

October 7 (16.45 G.M.T.) : g2xd (589), zs1z (569), 5z (569).

October 11 (10.30 G.M.T.) : vs1af (phone S6). (14.50 G.M.T.), vs1ai (phone S8), 1af (phone S8), g5ov (S5/6), and xz2dy (phone S9).

* * *

*BRS*2339 (*South Devonshire*), *during September.*
14 Mc. C.W. : vq3far (578), 5klb (575), 8af (576), 8ae (579), vk2ly (459), 2ix (459), 2hp (559), 2zc (579), 2px (569), 2adg (568), 2eaz (569), 2el (567), 2cw (456), 3gp (569), 3gu (569), 3xq (578), 3vf (569), 3wy (559), 3ar (578), 3zr (568), 3ht (559), 3ph (569), 3qk (459), 4el (569), 4ry (569), 4lx (559), 5wk (559), 5ju (459), vu2fh (569), 2fx (559), 2db (576), 2ba (579), zl1hy (579), 2pm (568), 2mm (559), 2lb (569), 2fx (458), 2go (568), 2bi (568), 3ja (458), 3fh (559), 4ac (568), 4af (569), 4fr (569), 4gn (569), ve4ro (589), zb1p (568), 1h (599).

14 Mc. Phone : vk2xu (57), vs2ak (57), ze1ja (47), yi2ba (58).

28 Mc. C.W. : vk2gu (559), 5ko (559), vu2cq (599), vs7mb (568), zb1c (579), 1l (578), zs6ah (569), ze1ju (559), 1jn (568).

October 3 *to* 26.

14 Mc. C.W. : vk2hf (559), 2tf (559), 2ade (459), 2zc (559), 2eg (569), 2dg (556), 2xh (568), 2fm (569), 2un (559), 2rb (458), 2ny (459), 2hv (569), 2qe (568), 2er (558), 2aha (559), 3mr (559), 3eg (568), 3zb (559), 3kx (569), 3xq (559), 3hg (559), 3zr (449), 3gp (459), 4rf (459), 4ul (459), 5fm (589), 5rx (559), 5fl (569), 7lz (559), 7yl (559), 7ab (559), 7kr (559), 7cm (559), zw1dv (456), 1bc (569), 2gn (559), 2fi (551), 2ci (559), 2hi (569), 2sr (449), 2qa (566), 3az (568), 4gm (559), 4br (559), 4gn (559), 4af (579), vu2au (559), 2hs (569), zc6rp (566), st2cm (579), zu2b (558), 6n (578), 6ac (559), zs1b (558), 1z (569), 1ae (569), 1ah (569), 5t (578), 6n (576), 6j (569), ze1ju (559), 1ji (569), 1jj (569), 1jz (578), vs1ra (588), 7mb (579).

14 Mc. Phone : vq4kta (56), 4cre (57), zu6n (56). Receiver : O-v-Pen.

* * *

J. A. G. Bowhay (BRS2338), Dartmouth, South Devon. October 1 to 31. 28 Mc. Phone : Vu2cq (58), ve1ct (56), 1dr (58), ve2kx (58), ve3fy (57), vp9r (56).

28 Mc. C.W. : Zu1ju (56), zs1b (44), vk2gu (57), 2ud (55), x4bb (55), x5ko (57), 5fm (56), 5hg (57), zb1c (56), zl3as (55), ve2id (57), ka (57), ks (58), 3fb (56), 3ty (57), 3kf (57), 4jv (57), 4kx (56), ve5hr (56), 5kc (54).

Sloping-Top Aerials

By R. G. Shears (G8KW).

For some months experiments have been conducted from G8KW (New Barnet, Herts), using different angles of slope for a standard 66-ft. Zepp. aerial with 16½-ft. feeders. The general direction of the aerial is E. to W., with the free end, east, 35 ft. high and the house end variable height.

Interesting results have been obtained and these can now be recorded.

From the outset of open aerial activities difficulty was experienced in contacting U.S.A. stations with a normal horizontal wire. The west end was therefore lowered so that the top was sloping at an angle of 68° to the mast, i.e., 22° from horizontal top. With this arrangement good signals were received in the U.S.A., and in particular the West Coast. This angle was also found best for South America.

Further tests were then conducted at a more acute angle, a figure of 60° to the mast being selected. This produced very good signals in the Eastern Districts of U.S.A. and in Australasia over the Pacific route.

The next tests were made with the wire in a horizontal plane and it was found then that South Africa and Asia could be worked fairly easily. This same arrangement should be good for Siberia and Hong Kong.

It is interesting to record that no apparent difference in signal strength occurred when working European stations, irrespective of aerial angle.

The transmitter in use consists of a 6L6G working as a tritet into a TZ05-20 as final amplifier. The input has not exceeded 10 watts derived from a 320-volt power pack.

The writer is anxious to devise a simple method of varying the slope from the shack without having to go outdoors to alter the near end. Suggestions or advice will be appreciated.

To The Editor

SOUND-RECORDING ASSOCIATION

To the Editor, T. & R. Bulletin.

Dear Sir,—At the 1936 Radio Exhibition I was very kindly given permission to display a notice on the R.S.G.B. stand requesting any persons, especially R.S.G.B. members, interested in direct sound recording or so-called home recording to leave their names and addresses, and they would later receive particulars of a Society that was then in process of formation.

Since then the British Sound-Recording Association has come into existence. The primary object of this body is to unite amateurs and professionals engaged or interested in the art and science of sound recording in all its branches. The response to the publication in various periodicals of the aims and activities of the Association has been very gratifying. Recently a party of our members toured the B.B.C.'s Recording Department at Maida Vale and among visits arranged for the future is one to a commercial recording studio and another to a film studio. The first number of our journal (including two main articles and complete lecture summaries) has just been issued and is available to non-members for 1s. post paid.

I know that many of my fellow-members of the R.S.G.B. are interested in this subject, for recording on direct or instantaneous play-back blanks has a number of uses for amateurs, *e.g.*, test call repetitions, modulation checking and recording signals. If any member has suggestions as to how recording can be usefully employed in amateur radio and/or would like to receive details of the Association, please write to me at the B.S.R.A. Headquarters, 44, Valley Road, Shortlands, Kent.

Finally, may I refer to a booklet on the "Simplat" sound-recording disc that I prepared a few months ago? Although this booklet was written with special reference to the "Simplat" blank, it contains much general information on direct recording and might well serve as a brief introduction to the work for beginners. Copies of this booklet are obtainable from the *V.G. Manufacturing Co., Ltd.*, Gorst Road, Park Royal, N.W.10, price 6d., but it will be sent free to potential purchasers of the "Simplat" blank.

Yours faithfully,
Donald W. Aldous (BRS1006)
(Founder-Member and Asst. Hon. Sec. B.S.R.A.)

APPRECIATIONS

To the Editor, T. & R. Bulletin.

Dear Sir,—I don't know whether your readers ever write in to speak their appreciation of the articles in The T. & R. Bulletin, but here's one who is going to say that articles by G2WD are *always* "the goods."

This indefatigable amateur seems to spend all his spare time, and surely all his spare cash, being a workshop for the rest of us—trying out new rigs and giving us first-rate articles on them. Always something fresh and always essentially practical—right down to the details of operating voltages and currents.

I think all of us ought to remember that The T. & R. Bulletin doesn't just "grow" into being, like Topsy. Amateurs like G2WD and G6FO have to spend their own time writing up the stuff that is such a treat to us every month.

So—whenever we think an article's good or interesting or helpful, let's up and drop a QSL to the author and *say* so! Otherwise we're just like a lot of hungry children who wolf their dinners without a thought as to where they came from!

Yours with 73's,
E. Hayter Simmonds (G8QH).

THEN AND NOW

To the Editor, T. & R. Bulletin.

Sir,—I cannot claim to be an "old timer," for my transmitting licence only dates from April, 1929, but I have been in the game long enough to remember the halcyon days when "20 meters" was the DX band, and when genuine QRP (in my case six watts from dry batteries) could, and did, provide its owner with the opportunity of conducting experiments "across the pond," at any rate.

We have progressed since those days—even the writer must admit to 25 watts of mains origin—but the band is DX no longer. My operating time is limited, and recently has been largely wasted owing to the "cluttering up" of 14 Mc. with telephony stations all over the band, working local European and even inter-G contacts. On three successive days I have had the "pleasure," owing to vagaries of skip, of hearing: (*a*) Two Frenchmen broadly tuned at the L.F. end working *Duplex*; (*b*) a G station, not a G.8, conducting a long 'phone QSO with a Frenchman of the spitch variety; and (*c*) a gentleman whose sole occupation consisted of whistling into his microphone like a dejected peewit, disappearing at intervals, only to return and repeat his amazing performance.

Are we too late to save this useful band, or a portion thereof, for the serious C.W. experimenter? There is no doubt that the Americans are on the right track with their limitation of 'phone to one part of the band. Is it too much to hope for an international ruling on these lines?

Yours faithfully,
H. A. Savage (G2SA).

TWIN FLEX FEEDERS

To the Editor, T. & R. Bulletin.

Dear Sir,—On looking through the new Guide, I notice that twin flex feed to half-wave aerials has been dismissed in a rather summary fashion. I have used ordinary 3/.029 cab tyre flex for some time, and have found it to be quite as efficient as a 600 ohm feeder, and there is, of course, no comparison in the convenience of flex over twin feeders with spreaders. I should imagine that cab tyre is quite as good, for low or medium power working, as the special cables marketed, since the three stranded conductor has a considerably larger area than the conductors in these cables. The splaying

at the aerial end of the feed has not been found to be at all critical, between about a 4-in. and 10 in. triangle. Various lengths of feeder up to 50 feet have been used, and no difference in strength has been noticed when the feeder is wet or dry.

May I take this opportunity of exploding the idea that a half-wave aerial sends no energy in the direction of the wire. It has been my experience with a half-wave aerial, half-wave high, that while definitely radiating a maximum at right angles, it sends quite a fair signal off the ends. My present horizontal aerial runs N.N.W.—S.S.E., but I am able to put S5 consistently into South Africa, using low power.

I know many amateurs, particularly those who use matched impedance aerials, have found the same.—Yours faithfully,

J. H. Emmerson (G8HA).

IN REPLY

There is not room in "The Guide" in its present form to go into great detail; it is, in fact, a "guide," and not a "manual," and so it is necessary to be brief with anything not fundamentally important.

Nevertheless, we believe that the information given on p. 77 of the 5th Edition indicates what to expect in the matter of flexible feeders, namely, that in short lengths, say up to 50 feet, cab tyre or twin flex will be found satisfactory, but in longer lengths trouble may be expected. We have within our experience a case where 100 feet of twin flex appeared to be perfectly matched, until it was found that its loss was so great that the reflected wave from the far end was too small to matter (*i.e.*, no standing waves could exist on this length), and another case where ice on the line caused a complete change-over from a current maximum to a voltage maximum at the transmitting end. It should be noted that water has a S.I.C. of about 80, so that a small percentage can completely upset the characteristics of the line, particularly in the case of lighting flex, where the water can get in between the conductors, *i.e.*, in the electrostatic field.

Cab tyre is better than stranded flex in this way, but still contains a poor dielectric, and often also has a string worming inside. Some of the high frequency line materials on the market contain a dielectric which is extremely good, having been specially designed for the purpose.

Area of conductor is not by itself a criterion; if increase of conductor causes a reduction in characteristic impedance, then it must carry more current for the same power, but it does in this way help the dielectric loss, since the voltage simultaneously drops.

Regarding radiation "off the end" of a half-wave aerial, this is well known, but is complicated by local factors. The subject has been mentioned in connection with the Great Circle Map in the Guide, and also on p. 301 of the T. & R. Bulletin, January, 1937 (note here that Figs. 5 and 2 have been transplanted by error). Since the aerial wire itself sends no energy "end on," anything which is sent this way must go by either ground reflection or reflection from some local object. It should be remembered that a slope in the ground may have a profound influence on the direction of the reflection; it is much like sloping the aerial wire itself. It is thus not possible to give any hard-and-fast rules for the end-radiation, owing to its complexity. G6CJ.

"A CLASS 'B' MODULATOR"

To the Editor, T. & R. Bulletin.

Dear Sir,—I read with much interest the contribution, "A Class 'B' Modulator," in the September issue, and waited for others to state their views, but as these are not forthcoming, I will give mine. Firstly, the title seems incorrect.

If one examines any reference guide to radio terms, they will, I think, find that a class "B" output stage is one in which the valves are driven into grid current, and that there is little or no bias on the grids of the output valves. Assuming, therefore, that the modulator was designed for Class "B" working (and as there is a 2 : 1 step-down driver transformer and a driver valve, this was presumbly intended), the resistance network in the grid circuit of the two final PX4's is wrong. Where grid current is to be permitted, the resistance of the circuit must be kept as low as possible. To prevent parasitic oscillation, condensers are generally connected between the grids and the secondary centre-tap on the driver transformer, as series resisters, however small, absorb power and have a bad effect on the quality.

Further, the output PX4's are biased to about twice the normal value for this class of valve. In this condition it is not likely that grid current will flow (and it appears that every volt possible would be required to load up this stage), yet the authors employ a step-down transformer. It seems that what they really use is a much mutilated form of Class AB amplification. In this case a smaller valve of the ML4 type could replace the PX4 driver and a step-up transformer of a fairly high ratio could replace the driver transformer. The use of battery bias also seems unnecessary, as a small power unit will supply bias and give less trouble than batteries.

The general description of the method of matching the amplifier is also rather obscure, whilst no details are given of the mains equipment.

I should like to say in conclusion that I do not doubt that the amplifier works, but I shall be interested to hear the views of others on the contribution.

Yours faithfully,

K. Davin (BRS2854).

IN REPLY

To the Editor, T. & R. Bulletin.

Dear Sir,—The writers of the article described above are indebted to Mr. Davin for bringing to their notice the errors in the circuit and regret that they had the temerity to submit for publication such an article with so many discrepancies.

Mr. Davin suggests that the title is wrong, since the output stage requires bias much in excess of normal value, by which it is presumed that he means Class A working, and also infers that in a Class B stage no bias is required. This absence of bias may be true in the case of valves specifically designed for such work, but if Mr. Davin operates his PX4's in a Class B stage with no bias or even normal bias, and the stage is driven as a Class B stage, Mr. Davin will speak into his microphone, but once, as his solitary utterance will have stripped the filaments!

Obviously, Mr. Davin in the perusal of his textbooks has not noticed that valves working in Class B operate from the bottom of the valve curve, and the only possible method of obtaining this condition with a PX4 is by applying a substantial bias. The voltage applied to the grids by the driver then increases the anode current each half-cycle, when such voltage is positive, since it substracts from the high negative bias on the grids.

The stage could be biassed normally and driven with a ML4 through a high-gain transformer, but the result would be an output of about 6 watts against that of 15 to 20 watts, which can be had if the valves are operated as described.

It is admitted that the grid stoppers will absorb some power, and that the prevention of parasitic oscillation could have been done otherwise, but the quality while it may not be of the finest, is of a very reasonable standard.

It may interest Mr. Davin to know that the grid current passed by the PX4's when used as the writers described is on peaks about 5 mA.

When simplicity was the main consideration of the article, the writers did not see any reason for the inclusion of a power unit to supply grid bias. Furthermore, unless the voltage of the unit was the exact figure for class B working, such a figure would have to be gained by the use of a potentiometer across the output, and since the grid current flowing through the resistance would in turn develop a fluctuating voltage, a steady D.C. potential would not be maintained on the grids.

Mr. Davin in his textbooks, particularly the A.R.R.L. Handbook, will, without a doubt, find ample information regarding impedance matching which would be out of the question to repeat here.

In conclusion, the writers would like to add that such a modulator is in use at each station and can modulate 25 watt carriers without much difficulty, and would, in turn, suggest to Mr. Davin that he build the modulator and see for himself that it can work remarkably well in spite of its shortcomings.

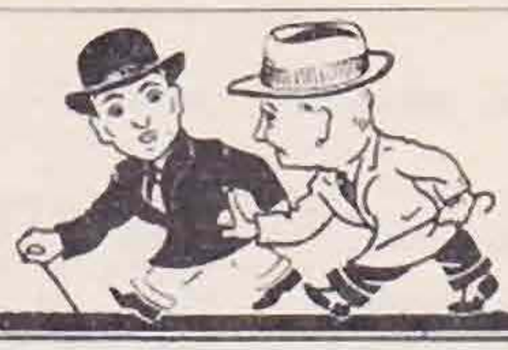
Yours faithfully,
JAMES R. ADAMS (GM5KF).
DAVID J. McDONALD (GM6KH).

Flash

W1KH will be transmitting C.W. on 56.2 megacycles from 1600 to 1615 G.M.T. every Sunday for the next four months. He will listen for C.W. replies from 1615 to 1630.

Reports Wanted

G2TK is anxious to receive reports from listeners on ground wave reception of his 28,224 kc. transmission. Details of RST and weather should be given and, if possible, temperature, humidity and barometric pressure. Transmissions Sundays 08.00 to 20.00 G.M.T.

BETWEEN  OURSELVES

QSL Postage Rates

We think it desirable to point out once more that the rates of postage for postcards in the Imperial and Foreign post are as follows :—

To the British Empire generally, Territories under British Mandate (except Trans-Jordan), the United States of America, Egypt and the British Postal Agencies in Morocco, 1d. To all other places, 1½d.

No card may exceed 5⅞ inches in length by 4⅛ inches in width, or be less than 4 inches in length by 2¾ inches in width.

Members have on occasions sent QSL cards at the ½d. rate which is contrary to G.P.O. regulations.

Particular attention should be given to the size of QSL cards.

3.5 Mc. Contest

In view of the fact that only four members expressed an interest in either a local or international 3.5 Mc. contest, the Awards Committee have reluctantly decided to make no arrangements to organise a contest during the 1937-8 season.

The Braaten Trophy

We are pleased to announce that Mr. A. D. Gay, G6NF, is the first holder of the new Braaten Trophy, presented to the leading British Isles amateur station in the Annual DX Telegraphy Contest organised by the A.R.R.L. The rules governing this trophy were published in the August BULLETIN.

The trophy will be presented to Mr. Gay at the Annual General Meeting.

Oxfordshire

In order to meet the wishes of members living in Oxfordshire, Council have agreed to include this county in District No. 7. Members living in this county should communicate with Mr. Dedman on all matters relative to high power and 25-watt permits, and 3.5 Mc. applications.

Index Volume 12

We wish to record our appreciations to Mr. R. E. Griffin (G5UH), of Bristol, who prepared at short notice the Index for the 12th Volume of this Journal. We trust that the information which has been compiled will prove of use to many of our members.

W.B.E. and H.B.E. Certificates

The following certificates have been issued :—

	W.B.E.	1937
A. E. Scarlett ...	W2CC	August 13
J. Thorpe ...	G5TO	,, 30
T. B. Wimbush	SU2TW	September 10
L. Heyerdahl ...	LA6A	,, 10
H. Caunce ...	G6KS	,, 10
G. C. Proctor ...	G5PR	,, 20
W. O. Wright ...	G6FQ	,, 20
L. A. Carter ...	G5AQ	,, 29
D. J. McDonald	GM6KH	October 7
P. Graham ...	ON4XX	,, 11
C. E. de Silva ...	VP2CD	,, 11
J. R. Letts ...	G8IL	,, 11
E. W. Ormerod	ZU6AD	,, 19
H. J. Chater ...	G2LU	,, 20
L. Hill	G5WI	,, 20
S. E. Petersson...	SM6QN	,, 21
J. Regnaud ...	VQ8AA	,, 23
J. D. Cameron ...	GM8CN	,, 23
C. Gregg ...	G5CG	,, 26
W. W. Field ...	G2GC	,, 26
A. H. Ridley ...	ZE1JV	,, 27
	28 Mc.	
J. Lees	G2IO	July 7
A. S. Andrews ...	ZE1JU	August 6
F. A. Robb ...	GI6TK	September 10
A. H. MacKenzie	VK4GK	,, 20
J. Clarricoats ...	G6CL	October 21
	Telephony.	
O H. Relly ...	G2AO	August 10
D. Walters ...	G5CV	,, 21
V. N. Desmond	G5VM	,, 30
J. Clarricoats ...	G6CL	,, 30
V. D. Morse ...	G8IK	,, 30
L. A. Moxon ...	G6XN	October 11
C. E. de Silva *	VP2CD	,, 11
Capt. Wallich ...	G6BW	,, 12
D. P. Wilkes *	OA4AB	,, 23
M. W. Simonsen *	PY2GY	,, 23
R. T. Dealey ...	G6DT	,, 26
	H.B.E.	
P. Malvern ...	2AUS G8DA	August 10
L. F. Viney ...	BRS1186 2BKN G2VD	,, 16
Madeline Mackenzie	VK4YL	
A. Anderson ...	BRS2205 2CXC	September 20 ,, 24
R. W. Rogers ...	G6YR	October 11

* First awards.

QRA Section

Manager : H. A. M. WHYTE (G6WY).

NEW QRA'S

G2CT.—R. W. PEEL, 19, Water Street, Todmorden, Lancs.
G2DN.—N. E. N. GUY, 1, Byron Avenue, Coulsdon, Surrey.
G2ID.—E. S. FIRTH, Elmfield House, Bickington, Barnstable, Devon.
G2IX.—J. FAIRLEY, 19, Francis Avenue, Narborough Road, Leicester.
G2JK.—E. C. ILOTT, 36, Montana Road, Upper Tooting, London, S.W.17.
G2KG.—A. G. HILL, "Manton," Sandford Road, Chelmsford, Essex.
G2MU.—E. J. BAYLISS, 117, Albion Street, Kenilworth, Warks.
G2QS.—S. WARD, 20, Oxford Crescent, New Malden, Surrey.
G2QX.—A. E. GROOM, "Beechwood," 19, Woodland Avenue, Luton, Beds.
G2SJ.—K. N. FRANKLIN, 21, Walden Road, Welwyn Garden City, Herts.
G2WK.—W. A. HAYES, "Moyallon," 89, Woodstock Road, Moseley, Birmingham.
G5AX.—H. B. SUMNER, Balmoral House, Moss Lane, Leyland, Lancs.

G5BQ.—S. J. Granfield, St. Luke's, 47, Warren Road, Milton Road, Cambridge.
G5BW.—Send cards via R.S.G.B.
G5DQ.—P. J. Broom, 54, Gilbert Road, Cambridge.
G5FD.—F. D. Clough, 42, Roxburgh Terrace, Whitley Bay, Northumberland.
G5IJ.—I. J. P. James, Eaton House, 47, Eaton Rise, Ealing, London, W.5.
GM5KQ.—J. Fraser, Dalknock, Crieff, Perthshire.
G5LR.—Dr. W. P. Cargill, 3, Rising Lane, Oldham, Lancs.
G5MO.—R. S. Page, "Sabareng," 114, Derbyshire Lane, Stretford, Manchester.
G5NA.—R. L. Clark, 120, Nether Street, North Finchley, London, N.12.
GW5OD.—A. Ogden, "Rocklyn," Marine Road, Penrhyn Road, Llandudno, Caernarvonshire.
G5PF.—L. Frost, Mikado, Station Road, Bognor Regis, Sussex.
GW5TC.—J. H. Tickle, "Moel," Overlea Avenue, Deganwy, N. Wales.
G5TN.—W. C. Holley, "Grafton," Locking Road East, Weston-super-Mare, Som.
G5UH.—R. E. Griffin, 4, Nailsea Close, Bedminster Down, Bristol 3.
G6BP.—H. G. G. Chandler, "Hayward House," Flats, Blackwater, near Camberley, Surrey.
G6IH.—L. H. Mansell, "Woodfield," Madresfield Road, Malvern, Worcs.
GM6JJ.—W. N. Craig, The Manse, Fortrose, Ross-shire, Scotland.
G6JP.—G. R. Jessop, 36, North View, Eastcote, Middlesex.
G6JQ.—W. W. Storer, Manor House, Ratcliffe, near Leicester.
G6KL.—C. E. Alleway, "Hilderic," Shaggy Calf Lane, Slough, Bucks.
G6KM.—S. Kember, 21, The Chase, Clapham Common, London, S.W.4.
G6SO.—S. Davison, 10, Sydney Street, Scarborough, Yorks.
G6US.—N. E. Read, 24, Church Street, Oswestry, Shropshire.
G6XF.—H. L. Wise, 13, Charles Road, West, St. Leonards-on-Sea, Sussex.
G8IF.—F. Boad, 93, Frederick Street, S. Shields, Durham.
G8JC.—J. Morris Casey, 1, School Road, Coalbrookdale, Ironbridge, Salop.
G8OJ.—G. Clifford Eyre, 46, Warbeck Road, New Moston, Manchester.
G8PF.—H. P. Bennett, "B" 6 Flight, "B" (Apps) Squadron No. 2, Wing, E. & W. School, R.A.F. Cranwell, Lincs.
G8PI.—P. Halligey, Hut 124, "M" Squadron, No. 3 Wing, R.A.F. Cranwell, Lincs.
G8QK.—J. J. Parkes, "Ryecroft," New House Park, St. Albans, Herts.
G8RG.—G. S. Dee, "Alderclose," Egham Hill, Egham, Surrey.
G8RP.—Wm. Clegg, 37, Randlesham Street, Heaton Park, Manchester.
G8RX.—G. M. Thompson, B.Sc., 118, Lyminster Road, Wadsley Bridge, Sheffield, Yorks.
G8SY.—K. R. Custerson, 23, Orchard Estate, Cherryhinton, Cambs.
GI8TS.—J. St. C. T. Ruddock, Broomhedge, Rectory, Maze, Lisburn, Co. Antrim, N.I.
G8UC.—D. W. Carr, 244, Upper Fant Road, Maidstone, Kent.
G8UG.—J. K. Coomber, 61, High Street, Knaphill, Woking, Surrey.
G8UJ.—T. C. Whimster, The Priory, Pontefract, Yorks.
G8UK.—J. Turnbull, 12, The Avenue, Monkseaton, Northants.
G8VF.—A. A. H. Moss, 29, Forrest Avenue, Marsh, Huddersfield, Yorks.
G8VH.—F. M. Trier, "Fairlawn," West Horsley, Surrey.
GM8VL.—J. I. M. Sinclair, 50, Ralston Avenue, Crookston, Glasgow, S.W.2.
G8VP.—A. Wheeler, The Gardens, Newton House, near Faringdon, Berks.
G8VR.—K. Willis, "Pine Lodge," 33, Westergate Road, Abbey Wood, London, S.E.2.
G8VW.—C. C. White, Heathfield House, Ipswich Road, Norwich, Norfolk.
G8VY.—E. K. Williams, 1, De Villiers Avenue, Crosby, Liverpool 23.
G8VZ.—J. Redrup, "Lyndale," Longwick Road, Princes Risborough, Bucks.
GM8WK.—G. M. McKillop, 3, Turnberry Road, Hyndland, Glasgow, W.1.
G8WW.—(ex. EI7J) F. W. Warren, 152, Bishop Road, Bristol 7.
2ACL.—F. C. E. Tate, 45, Bonsall Road, Erdington, Birmingham.
2AIX.—F. E. Atkins, 14, Smith Street, Guernsey, C.I.
2AOP.—E. A. Topham, Market Place, Thirsk, Yorks.
2AVI.—L. Gregory, 75, High Street, Bromley, Kent.
2BCX.—H. J. Barlow, 8, Harton Avenue, Gorton, Manchester.
2BFB.—D. W. Greenwood, Pendlehurst, Lancaster Gate, Nelson, Lancs.
2BGZ.—W. J. G. Gibson, 7, Doncaster Street, Glasgow, N.W.
2BHO.—R. G. B. Batt, 40, The Grove, Palmers Green, London, N.13.
2BIH.—F. E. Gay, 32, Maycroft Avenue, Little Thurrock, Grays, Essex.
2BJL.—David Joseph, 26, Blinkbonny Road, Edinburgh 4, Scotland.
2BKW.—L. McGlade, 20, Poolsbrook Road, Duckmanton, near Chesterfield, Derbys.
2BLR.—M. Ridgway, The Gable, 12, Byway Road, Leicester.
2BPD.—H. Benford, 120, Berners Street, Leicester.
2BPH.—M. P. Bayliss, 2, Albion Street, Kenilworth, Warks.
2BSD.—T. J. Parker, 24a, Victoria Crescent, London, S.E.19.
2BUP.—H. L. Gibson, 50, Oundle Avenue, Bushey, Herts.
2BXU.—Wm. H. Baker, 16a, Linden Terrace, Newton Abbot, Devon.
2BXX.—T. Court, Boyers Dock, Stockley, near Yiewsley, Middlesex.
2BYX.—Wm. Grant, 55, High Street, Turriff, Aberdeenshire.
2CCH.—A. J. Stephens, Wheaton House, Warrender Way, Eastcote Road, Ruislip, Middlesex.
2CFU.—Owen McCusker, 20, Sighthill Park, Edinburgh 11, Scotland.
2CGI.—L. M. Spalter, Hilary Mount, Poplar Road, Douglas, I.O.M.
2CYZ.—Ian Murfitt, Sutherland House, London Road, Deal, Kent.
2CZR.—J. Judson, 48, Green Road, Meanwood, Leeds 6, Yorks.
2CZW.—H. Parnfield, 7, Hurst Lea Road, New Mills, near Stockport, Ches.

Cancelled: G2DX, G2VS, G2YZ, G5BH, G5YM, G6CV, G6HC, G6TH, G6UG, 2AAR, 2ABU, 2ACI, 2ACZ, 2ADY, 2AFB, 2AJX, 2ALM, 2ANH, 2APN, 2ARN, 2ARU, 2ASH, 2AVP, 2BAB, 2BDC, 2BGH, 2BKG, 2BKL, 2BMD, 2BVQ, 2BXC, 2BYT, 2CAF, 2CFG, 2CGO, 2CHI, 2CIY, 2CJT, 2CJY, 2COA, 2CPI, 2CQT.

NEW MEMBERS.

Home Corporates.

L. H. Peplar (G2JD), 162, Sidegate Lane, Ipswich, Suffolk.
J. Fraser (GM5KQ), Dalknock, Crieff, Perthshire.
T. C. R. Littlemore (G8AX), The Gables, Mattishall, Dereham, Norfolk.
W. R. Worden (G8PJ), 2, Dulverton Avenue, Coventry, Warwicks.
J. F. Barlow (G8SN), 24, Sandriggs, Cockerton, Darlington.
A. Garnock-Jones (G8TJ), "Brentwood," Sandfield Park, Liverpool, 12.
T. R. White (G8TX), 49, Lawrence Avenue, New Malden, Surrey.
H. Beadle (G8UO), 13, Chandos Street, Keighley, Yorks.
A. J. Marriott (G8UZ), 29, Columbia Avenue, Sutton-in-Ashfield, Notts.
A. J. Martin (G8VA), 11, Batten Street, Aylestone, Leicester.
D. G. Blair (G8VU), 349, Wilbraham Road, Manchester, 16.
Lt. R. C. B. Stuart (E15M), R. A. Mess, Spike Island, Queenstown, Co. Cork, I.F.S.
H. Ratcliffe (2AOO), 78, Henry Road, West Bridgford, Notts.
F. S. Close (2ACT), 7, Tennyson Place, Otley Road, Bradford, Yorks.
A. R. Yates (2ATZ), 22, Brooklawn Drive, Withington, Manchester, 20, Lancs.
L. Gregory (2AUI), 75, High Street, Bromley Kent.
C. Brent (2BFI), 55, Clevedon Road, Weston-super-Mare, Somerset.
N. T. Warren (2BLB), Silkstead Cottage, Shawford, near Winchester, Hants.
M. J. Bright (2BRM), Lampitts House, Woodlands, near Southampton, Hants.
R. Dougan (2CKK), 212, Gourlay Street, Glasgow.
C. Bowtell (2CKW), 49, Beaumont Avenue, Hinckley, Leics.
S. Duckworth (2CMC), "Bantock" Howarth Crescent, Poulton-le-Fylde, Lancs.
T. P. Douglas (2CNI), c/o, Henderson, 10, Marchmont Street, Edinburgh 10.
C. C. Harris (2COX), 43, Albert Street, Fleet, Hants.
A. Staples (2CRA), 9, King's Avenue, Rawtenstall, Rossendale, Lancs.
V. Delnevo (2CSV), 17, Corn Street, Witney, Oxon.
R. Pettigrew (2CUM), 164, Princes Gardens, West Acton, London, W.3.
K. R. Wilkinson (2CWP), 88, Talbot Road, Roundhay, Leeds, 8, Yorks.
S. A. W. Pavitt (BRS3061), 14, Pulteney Street, London, N.1.
R. D. P. Triefus (BRS3062), 14, Chesterford Gardens, Hampstead, N.W.3.
S. C. Shaw (BRS3063), 18, Leyland Grove, Shipley, Yorks.
G. R. Martin (BRS3064), 113, Shepherds Lane, Dartford, Kent.
H. C. Bailey (BRS3065), 88, Falcondale Road, Westbury-on-Trym.
D. F. Davies (BRS3066), 51, Theresa Avenue, Bishopston, Bristol, Glos.
E. Wolstenholme (BRS3067), 5, Well Street, Leeds Road, Dewsbury, Yorks.
R. A. Eke (BRS3068), 3, Westville Road, Barnsley, Yorks.
S. Little (BRS3069), Wiston Mill, Biggar, Lanarkshire.
W. F. Jones (BRS3070), 14, Aylesbury Road, New Brighton, Cheshire.
G. S. Woollatt (BRS3071), 252, South Lane, New Malden, Surrey.

L. Baker (BRS3072), Lafrowda Cottage, Prince of Wales Road, Exeter, Devon.
H. J. Duce (BRS3073), 18, Darland Avenue, Gillingham, Kent.
H. H. Lee (BRS3074), 14, Long Drive, East Acton, W.3.
S. S. Jeffs (BRS3075), 19, Corbyn Road, Bordesley Green, E. Birmingham.
R. Purvis (BRS3076), 1, Charborough Road, Filton, Bristol.
W. T. Thompson (BRS3077), Flat 1, Fire Station, Paradise Street, West Bromwich.
Miss A. K. Lake (BRS3078), 16-17, Leinster Gardens, London, W.2.
W. Sinclair (BRS3079), 2, Mount Pleasant Street, Greenock, Scotland.
P. Snape (BRS3080), The College, Buxton, Derbys.
A. E. Cornish (BRS3081), 1, Halsdon Road, Torrington, N. Devon.
A. E. Royal (BRS3082), 23, Mornington Road, Chingford, E. 4.
G. V. Catt (BRS3083), 47, Church Street, Old Town, Eastbourne, Sussex.
D. Sutton (BRS3084), 31, Oxford Street, Weston-Super-Mare, Somerset.
R. A. Nice (BRS 3085), 42, Oakwood Road, Rayleigh, Surrey.
J. F. Hudson (BRS3086), 1073, Warwick Road, Acocks Green, Birmingham.
F. Inchley (BRS3087), The Elms, Castle Bromwich, Birmingham.
R. Harle (BRS3088), Ainsdale, The Avenue, Birtley, Co. Durham.
K. Clayton (BRS3089), 2, Shaftesbury Avenue, Cheadle Hulme, Cheshire.
G. G. Sutton (BRS3090), Elmhurst, High Road, S. Woodford, London, E.18.
J. I. Warrington (BRS3091), Knossington, Oakham, Rutland.
M. N. McNeill (BRS3092), 4, Auld House Road, East Kilbride, Glasgow.
W. H. C. Wheeler (BRS3093), Trelawny, Binscombe Lane, Farncombe, Surrey.
B. B. Fulton (BRS3094), 3, Anderson Street, Bonnybridge, Stirlingshire.
E. H. Cox (BRS3095), R.A. Mess, Woolwich, London, S.E.18.
P. Vickery (BRS3096), 33, Holyoake Street, Wellington Somerset.
A. K. McAuslan (BRS3097), 10, Ancaster Drive, Glasgow, W.3, Scotland.
G. Troy (BRS3098), 8, Elizabeth Street, Ibrox, Glasgow, S.W.1.
S. Payton (BRS3099), 8, Bettysfield, Beacon Lane, Exeter, Devon.
W. Tatham (BRS3100), The Retreat House, Newbold Road, Rugby, Warwicks.
J. Cymerman (BRS3101), 11, St. George's Road, Golders Green, N.W.11.

Dominion and Foreign.

C. Becker (LA3J), Hounedirektoren, Oslo, Norway.
D. P. Wilkes (OA4AB), c/o, Cerro de Pasco Copper Corp., Oroya, Peru, Sth. America.
S. A. Pegrume (VQ4CRE) P.O. Box 1093, Nairobi, Kenya Colony.
W. Rawlings (VQ4KTF), Supply & Transport Corps, King's African Rifles, Kitale, Kenya Colony.
W. E. Smith (VQ4WES), Box 581, Nairobi, Kenya Colony.
H. R. Hulbert (BERS413), P.O. Box 21, El Obeid, Anglo-Egyptian, Sudan.
C. G. Atkinson (BERS414), Cecil Pharmacy, Margate, Natal, S. Africa.
H. E. du Preez (BERS415), P.O. Box 4432, Johannesburg, S. Africa.

CALIBRATION SERVICE

Crystals should be sent direct to the Calibration Manager enclosed in a small tin, and securely packed to avoid loss in transit. The Society cannot be responsible for any loss that might occur in sending crystals through the post.

Return postage must be enclosed as postage stamps, and not attached to the Postal Order.

Calibration fees: 1.7, 3.5 and 7 Mc. crystals, 1s. 6d.; 100 kc. crystals, 2s. 6d.

All communications should be addressed to:—

Mr. A. D. Gay (G6NF),
"Oak Dene,"
156, Devonshire Way,
Shirley,
Croydon,
Surrey.

See *A Guide to Amateur Radio* for particulars of frequency meters, etc.

R.S.G.B. Slow Morse Practices

Details will be found below of the slow Morse practices organised by the Society for those members wishing to learn or improve their code. As usual, test matter will be taken from recent issues of the T. & R. Bulletin. The page number and month of issue will be given at the end of each test—by telephony. A telephony announcement will also be given at the commencement of each test to assist those interested in tuning to the sending station. It is emphasised that reports will be appreciated and are desired, in order to ascertain useful range of transmission and numbers utilising the service. If, however, a reply is desired, a stamp should be sent. Will stations in areas not at present served offer their services to Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4 (Telephone: Silverthorn 2285)?

Schedule of Slow Morse Transmissions

			G.M.T.	kc.	Stations
Nov.	21	Sunday ...	0945	7155	Gi5UR
,,	21	Sunday ...	1000	7260	G5JL
,,	21	Sunday ...	1015	1920	G6VC
,,	22	Monday ...	2315	1741	Gi6XS
,,	23	Tuesday ...	2200	7184	G6UA
,,	24	Wednesday...	2315	1741	Gi6XS
,,	25	Thursday ...	2200	7184	G6UA
,,	27	Saturday ...	2300	7145	Gi5QX
,,	28	Sunday ...	0945	7155	Gi5UR
,,	28	Sunday ...	1000	7260	G5JL
,,	28	Sunday ...	1015	1920	G6VC
,,	29	Monday ...	2315	1741	Gi6XS
,,	30	Tuesday ...	2200	7184	G6UA
Dec.	1	Wednesday...	2315	1741	Gi6XS
,,	2	Thursday ...	2200	7184	G6UA
,,	4	Saturday ...	2300	7145	Gi5QX
,,	5	Sunday ...	0945	7155	Gi5UR
,,	5	Sunday ...	1000	7260	G5JL
,,	5	Sunday ...	1015	1920	G6VC
,,	6	Monday ...	2315	1741	Gi6XS
,,	7	Tuesday ...	2200	7184	G6UA
,,	8	Wednesday...	2315	1741	Gi6XS
,,	9	Thursday ...	2200	7184	G6UA
,,	11	Saturday ...	2300	7145	Gi5QX
,,	12	Sunday ...	0945	7155	Gi5UR
,,	12	Sunday ...	1000	7260	G5JL
,,	12	Sunday ...	1015	1920	G6VC
,,	13	Monday ...	2315	1741	Gi6XS
,,	14	Tuesday ...	2200	7184	G6UA
,,	15	Wednesday...	2315	1741	Gi6XS
,,	16	Thursday ...	2200	7184	G6UA
,,	18	Saturday ...	2300	7145	Gi5QX

Empire Calls Heard

By BERS311, A. R. Gilding, R.A.F., Ambala, India. 28 *Mc.*:—

October 3, 08.00/12.00 *G.M.T.*—g2pl (559) 6ir (569), 5hb (559), 6gh (559), gm5kf (559), ei5f (559), ze1js (559), vk2ud (568), 3bq (559), 3dp (559), 3kh (559), 3tu (559), 3yp (569), 5fm (559), 5ko (569-599), 6sa (559).

October 10, 08.50/10.20 *G.M.T.*—g2it (459), 2xc (459), 6cl (559), 6cw (458), 6dh (459), 6hl (559), 6pk (559), 6rb (559), 6xn (559), 8qc (559), vk3bq (348), 3yp (339), 4bb (459), 5ko (559-599).

12.40 *G.M.T.*—g6?h (239), First time 28 Mc. sigs. heard after dark here.

NOTES and NEWS from the BRITISH ISLES

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western).
(Cumberland, Westmorland, Cheshire, Lancashire.)
Mr. J. Noden (G6TW), Fern Villa, Coppice Road, Willaston, near Nantwich, Cheshire.

DISTRICT 2 (North-Eastern).
Yorkshire (West Riding, and part of North Riding).
Mr. L. W. Parry (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

DISTRICT 3 (West Midlands).
(Warwick, Worcester, Staffordshire, Shropshire.)
Mr. V. M. Desmond (G5VM), 199, Russell Road, Moseley, Birmingham.

DISTRICT 4 (East Midlands).
(Derby, Leicester, Northants, Notts.)
Mr. G. W. Slack (G5KG), "Inglenook," Racecourse Road, Mansfield, Notts.

DISTRICT 5 (Western).
(Hereford, Wiltshire, Gloucester.)
Mr. J. N. Walker (G5JU), 4, Frenchay Road, Downend, Bristol.

DISTRICT 6 (South-Western).
(Cornwall, Devon, Dorset, Somerset.)
Mr. W. B. Sydenham (G5SY), "Sherrington," Cleveland Road, Torquay.

DISTRICT 7 (Southern).
(Oxfordshire, Berkshire, Hampshire, Surrey.)
Mr. E. A. Dedman (G2NH), 75, Woodlands Avenue, Coombe, New Malden, Surrey.

DISTRICT 8 (Home Counties).
(Beds., Cambs., Hunts. and the town of Peterborough.)
Mr. G. Jeapes (G2XV), 89, Perne Road, Cambridge.

DISTRICT 9 (East Anglia).
(Norfolk and Suffolk.)
Mr. H. W. Sadler (G2XS), "The Warren Farm," South Wootton, King's Lynn, Norfolk.

DISTRICT 10 (South Wales and Monmouth).
Capt. G. C. Price (GW2OP), The Mount, Pembroke Dock.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)
Mr. D. S. Mitchell (GW6MX), "The Flagstaff," Colwyn Bay, Denbighshire.

DISTRICT 12 (London North and Hertford).
(North London Postal Districts and Hertford, together with the area known as North Middlesex.)
Mr. S. Buckingham (G5QF), 41, Brunswick Park Road, New Southgate, N.11.

DISTRICT 13 (London South).
Mr. J. B. Kershaw (G2WV), 13, Montpelier Row, Blackheath, S.E.3.

DISTRICT 14 (Eastern)
(East London and Essex.)
Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West).
(West London Postal Districts, Bucks, and that part of Middlesex not included in District 12.)
Mr. H. V. Wilkins (G6WN), 81, Studland Road, Hanwell, W.7.

DISTRICT 16 (South-Eastern).
(Kent and Sussex).
Mr. W. H. Allen (G2UJ), 32, Earls Road, Tunbridge Wells.

DISTRICT 17 (Mid East).
(Lincolnshire and Rutland.)
Mr. W. Grieve (G5GS), "Summerford," New Waltham, Lincs.

DISTRICT 18 (East Yorkshire).
(East Riding and part of North Riding.)
Mr. W. A. Clark (G5FV), "Lynton," Hull Road, Keyingham, E. Yorks.

DISTRICT 19 (Northern).
(Northumberland, Durham, and North Yorks.)
Mr. H. C. D. Hornsby (G5QY), "Newlands," 105, Kenton Lane, Newcastle-on-Tyne, 3.

SCOTLAND.
Mr. James Hunter (GM6ZV), Records Office, 51, Camphill Avenue, Langside, Glasgow.

NORTHERN IRELAND.
Mr. T. P. Allen (GI6YW), 62, Balmoral Avenue, Belfast.

New Members are cordially invited to write to their local District Representative.

DISTRICT 1 (North-Western).

AT the last Liverpool meeting a proposal was made concerning the representation of Provincial D.R.s on Council, but before giving publicity to the suggestions, it has been deemed wise to submit them to Council for their prior consideration.

Interest in Radio and R.S.G.B. matters seems to be increasing at a steady pace in the District, no doubt due in a great extent to the remarkable sales of the Guide. It would be interesting to have the membership total published each month, rather on the lines of the "nett sales" information published by certain newspapers, as an inducement to members to increase the monthly figures by securing new members. (Nett membership figures are supplied to D.R.s each month and this information is available from them or from Headquarters on request. We also give detailed information in our Annual Report. It is unusual for an organisation such as our own to publish this information monthly.—Ed.)

Liverpool.—The meeting at which the above-mentioned proposals were made was attended by 26 members, including quite a few "old timers" whose faces were good to see.

The T.R. (G2OA) read a letter from the D.R. reporting general R.S.G.B. business. It was agreed to make immediate application for the N.F.D. films. Mr. Davies explained that he would be unable to continue as T.R. after the end of the year owing to many other demands on his time, but he promised to give such assistance as he could. He asked members to nominate a successor and attention is again drawn to this necessity.

As a token of appreciation of his many services to the District, Mr. Russell Lee (G6GL) presented a T20 valve to Mr. Drudge Coates (G2DC) on the occasion of his impending departure from the District. In making an appropriate reply, G2DC explained that his departure had been deferred for a month or two, with the result that it will be possible to hold at least one further meeting at 38, Mason Street. It is hoped, however, that with

the assistance of G2QB members will be able to continue to use this excellent QRA for meetings.

Burnley.—The star station this month is G2RB, who has worked all W districts on 14 Mc., using ECO-Pa with 9 watts input to a 15/400 Tunsgram ; 8TD is back again on 7 Mc. after a spell of telephony on 14 Mc. ; 5ZN is getting out well on 7 and 14 Mc. with the RFP15 ; 8UA is busy with a Hartley transmitter ; 2CVI has rebuilt and now using 6L6-210, and hopes to have full ticket soon ; BRS2951 is back at college ; 8FI is suffering from bad local QRM ; BRS2221 is now 2BFB G8TD, 2RB and 5ZN are all using the W3EDP aerial.

Rochdale.—G6QA, 8DJ and BRS1152 report active. 6QA finds that the 3.5 Mc. band is a workable proposition since he installed a " Collins Coupler " and has received very good reports using only 7 watts input on 'phone. He would like to know if any South Coast stations use this band before 10.00 G.M.T., as a regular schedule is required. 8DJ is building the DX Two transmitter and hopes to be on the air with it shortly.

Birkenhead and District.—The Wirral Amateur Transmitting and Short Wave Club now holds two meetings per month, on the second and last Wednesdays in each month respectively. It is proposed to exhibit at each meeting a list of members of Uncle Tom's " Puddle-Brained Goof Operators Club," and transmitting members have agreed to boycott these stations. Other meetings might follow suit.

Individual reports are as follows :—G8OC has a Windom aerial working very well ; 8AA is rebuilding for Hi-Q ; 8PG has joined R.N.W.A.R. and is starting up on 1.7 Mc. ; 8NH is having his call pirated ; and 6HQ is building a transmitter for 1.7 Mc. Other active stations include 2FZ, 6GL, and 2AHG.

Members would like to associate themselves with the remarks published in last month's Liverpool notes *re* G2DC and will be very sorry to lose him.

DISTRICT 2 (North-Eastern)

Barnsley.—G5KM is active on 28 Mc., and has received some good reports from W, 8NM would appreciate reports on his 56 Mc. transmissions. We welcome a new member, BRS3068, Mr. R. Eke. Reports from other stations are nil.

Sheffield.—Meetings are once again being held fortnightly at the Angel Hotel, the next being on November 25. At the last meeting, an interesting demonstration on valve characteristics and oscillators was given by BRS2293. This was a great success, and with the help of the members it is hoped to arrange similar items during the season. The usual dinner is being arranged. Active stations are : G2LT testing plate modulation on 14 Mc. 8NN building RFP15 PA. 2BXA busy with his station. 6LF rebuilding with a T20. 2AS testing aerials at his new QRA. 5TO on 28 Mc. phone. 8JP has built a field strength meter, and is testing transmitter couplings. 8RX testing microphones and on 14 Mc. 2JY rebuilding, 5HK on 14 Mc. at last. 2CFA passed the P.O. test. 2CBQ helping 8NN. Others active include 2XH and 8KT, BRS2293 and 2282.

Leeds.—The T.R. is now back again in Leeds, and welcomes visits to his QRA. Thanks to Mr. Russell, who carried on during his absence. There has been a falling off of the reports, which should be in by the 20th. It is hoped to have a series of ragchews this winter, and all interested are asked to get in touch with the T.R. Congrats. to BRS2546, now 2CZK.

Bradford.—The meetings of the Radio Society are held each Tuesday evening, and the T.R. and local members will be pleased to welcome any new members or visitors. 6KU has completed his rebuild and would like to contact again all the locals whom he has missed lately. 6XL put up a good show in the VZ/ZL test, working 44 stations in 10 districts in the Senior, and scoring 3,570 points. In the Junior he worked 25 stations in the first week-end on QRP, and has WAC except Africa on 28 Mc. This is the result of a great deal of work which he has done on beam aerials, and merits our best congratulations. BRS1298 has been busy on 28 and 56 Mc., and hopes to have full licence soon.

Halifax.—G5QS, Lynn Cottage, Lightcliffe, near Halifax, has been appointed T.R., and welcomes anyone to the meetings of the local radio society, which holds meetings each Wednesday evening. Several fully licensed and AA members attend, and work is being done extensively on 56 Mc. On October 24 a 56 Mc. field day was held, and proved a great success. An exchange of visits between the Halifax and Bradford Societies is suggested if it is thought desirable.

DISTRICT 3 (West Midlands).

Coventry.—At the annual general meeting of the Coventry Amateur Radio Society, held during the month, it was revealed that the membership had been maintained, and that the club's finances are sound.

An interesting programme of lectures has been prepared for the winter months, and anyone interested in amateur radio who cares to drop in on a Tuesday night will be assured of a welcome. The meetings are held in the John Hough Mission, situated off the new Trinity Street.

The annual dinner of the Coventry Club will take place on a Wednesday evening towards the end of November or early December.

Birmingham.—M.A.R.S. had a very successful meeting this month, attended by 50 members and friends. All the usual stations are active.

DISTRICT 4 (East Midlands).

At Derby on October 24 thirty-seven members attended to hear Mr. W. A. Scarr, M.A. (G2WS), give a very interesting lecture on " The Reflection and Refraction of Radio Waves." This was very much appreciated by all. After the lecture T.R.'s were asked to endeavour to hold meetings in their respective towns. This they agreed to do providing they obtain the support of local members. Members who find it difficult to afford or travel to district meetings should find these town meetings of great value.

After the business of the meeting was over a film taken by Mr. Henton (G5VU) at N.F.D. was shown. This was enjoyed by all, and it brought back memories of a very happy time spent at Kirklington under the able leadership of G6CW. It was to be regretted that we were unable to show the films taken by G6CW owing to the inability to obtain a suitable projector.

The film show was followed by a junk sale which for some reason did not appeal, and the owners of gear hardly cleared haulage expenses !

Support Local Meetings.

Nottingham.—No one deems it necessary to report so the T.R. has done the best he can to fill the gap. G8JV is erecting a rotating beam for 56 Mc. He is being assisted by G6CW with this work. 28 Mc. claims G6HL, 6CW, 5VU, 5DM and 2IO. On 14 Mc. we hear 5JX and 2HD ; the latter states that there was an absence of 14 Mc. signals during early October which coincided with the sun spot activity. The month in the air produced FQ8A on 28 Mc., who gave his QRA as Dakar, French West Africa, therefore his prefix should be FF and not FQ (Equatorial Africa).

FORTHCOMING EVENTS.

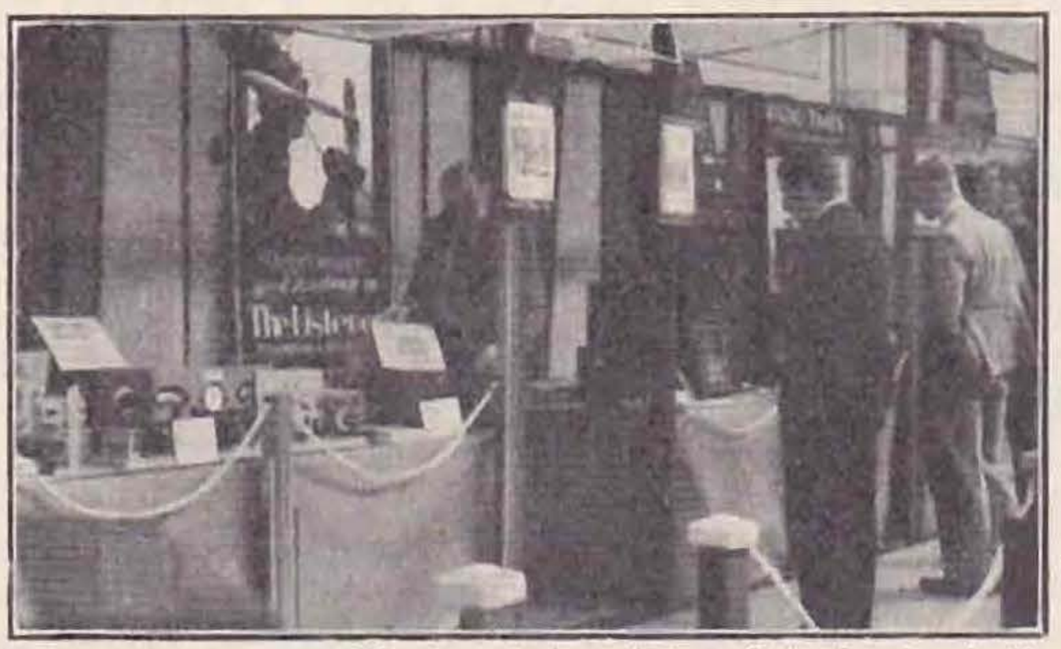
Nov. 17.—District 15, 7.30 p.m., at G6CO, 22, Chipstead Gardens, Humber Rd., Cricklewood, N.W.2 (near Cricklewood Broadway).
,, 18.—District 6 (Torquay Section), 7.30 p.m., at G5SY, " Sherrington," Cleveland Road, Torquay.
,, 18.—Scotland " A " and " E " Districts, 7 p.m., in Royal Technical College, George Street, Glasgow, Natural Philosophy Section, Room 119. *
,, 18.—District 14 (Chelmsford Section), 7.30 p.m., at the Cottage Restaurant, Tindall Street, Chelmsford. *
,, 19.—District 12, 7.45 p.m., at the Orpheum Cinema, Temple Fortune, Golders Green, N.W.
,, 21.—District 4, 3.30 p.m., at the King's Head Hotel, Loughborough. Talk to be arranged by G6VD.
,, 23.—District 14 (East London Section), 7.30 p.m., at G6AH, 3, Bradford Road, Seven Kings.
,, 24.—District 14 (East Essex Section), 8 p.m., at G2MY, " Kemora," Byrne Drive, Prittlewell (off Manners Way, near Ekco Works,)
,, 24.—Scotland " A " and " E " Districts. 7.30 p.m., in room " A " Institution of Engineers and Shipbuilders, 39, Elmbank Crescent, Glasgow.
,, 26.—London Meeting at the I.E.E. Tea from 6 p.m. Commence 6.45 p.m. Lecture by Mr. de Grouchy, Everett Edgecumbe & Co., on " Measuring Instruments as applied to the Radio Field."
,, 26.—District 6 (Plymouth Section), 7.30 p.m., at 2AHX, 40, Salisbury Road, Plymouth.
,, 28.—District 11, 7.30 p.m., at GW6AA, The Flagstaff, Colwyn Bay. *
Dec. 1.—District 6 (Exeter Section), 8 p.m., at the Y.W.C.A., Exeter.
,, 5.—District 7, 2.30 p.m., at G2YL, Redholm, Walton-on-the-Hill, Tadworth, Surrey.

* Sale of disused apparatus at this meeting.

Leicester.—At the last general meeting of the Leicester Section the " Ridgway Challenge Trophy " was presented to G8SH, of Loughborough, who won the 14 Mc. contest in September. The receiving trophy was presented to BRS2503.

New calls are as follows : G8VA, 2RI and 2IX. G2RI's wife, who was BRS2497, keeps her husband's call in the family by taking it herself ; she is now 2BLR. (We shall be pleased to see her with a full call so that she can help to swell the group of YL operators.—G5KG.) G8VA reports that his call is being pirated on 7 Mc., and asked stations working that call to ask for verification. His QRA is 11, Batten Street, Leicester. The T.R. wishes to thank 2CKW, 2CKV, 8CZ and 2CPG for travelling a considerable distance to the section meeting.

Worksop.—Active stations are G6MN, 8PO, 8ON, 2CAJ. G8PO has rebuilt final, using an RK23, but is experiencing trouble. He receives A.P. sound signals very well. G6MN does not report, but we hope that he will do in the future. G8ON has rebuilt using 6A6, 6L6, T20. 2CAJ has built a new receiver which is giving good results. We hope soon to be able to include Oldcotes and Bawtry in this area, as two new members are expected.



[By permission of the " Kettering Leader."

The Stand of the Kettering Radio and Physical Society, at the recent Exhibition organised by that Society. Mr. I. L. Holmes (Hon. Sec.) is in the centre.

Mansfield.—An informal meeting of the Mansfield area members was held at the Plaza Café. It was decided that G8SA should act as temporary T.R. so that meetings could be arranged.

Ilkeston.—It has been noted with interest that there is a great increase in 56 Mc. activity in the District. Six stations have been heard working together at the same time, whilst a link has been established from Nottingham to Derby *via* Ilkeston. The following stations are taking part in these experiments : G6CW, 5VU, 8AZ, 2WS, 2SD, 8JV.

The D.R. notes with pleasure that these members are doing good work in a field of activity which calls for more and more co-operation. It is hoped that other stations will follow their lead.

Northants.—The Kettering Radio & Physical Society ran a successful stand at the Kettering Radio Exhibition held there recently. A fine selection of amateur gear was on view, including a number of types of short-wave transmitters, modulation equipment, portable apparatus and receivers kindly loaned by Mr. W. Nightingale (G5NI). Also on view were the two-band units designed by G2WD.

G5LP is reported to be very active. Any one

interested in the before-mentioned Society will be welcomed at their meetings, which are held on Monday evenings at 7.30 p.m. at the Ivy Café, Gold Street, Kettering.

District Meeting.—The next District Meeting will be held at 3.30 p.m. on November 21, at the King's Head Hotel, Loughborough. A talk will be arranged by G6VD. It is hoped that all who can will attend.

DISTRICT 5 (Western).

At a recent joint meeting of R.S.G.B. and B.A.R.S. members it was unanimously decided to combine the two bodies, and the B.A.R.S. has ceased to exist. The rooms at 23, Bridge Street, become the headquarters of the members of District 5, and all are invited to make good use of the facilities provided there, including a comprehensive library and operating room. The call G8LL has also been taken over, and it is hoped that more use will be made of it in the near future.

The Bristol members were treated to a most remarkable lecture on October 7. After the peculiar characteristics of the fifth dimension had been explained and reasons given for the very poor performance of the modern valve, the lecturer informed those present that he had invented a new valve of extremely high sensitivity and possessing such unique features that it will be possible to tune from 4½ to 2,000 metres without any wave change switch, whilst Television from Alexandra Palace will be receivable from Lands End to John O'Groats. The B.B.C. *will* be pleased !

2BMK has passed his Morse test and is now G2IK, whilst Mr. F. W. Warren (ex Ei7J) is now G8WW ; both are active on 7 and 14 Mc. G8HU suffered an accident to his left hand but is now recovering. G5WI has gone back into hospital for an operation, and the best wishes of all members go with him. Activity has noticeably increased, and all the amateur bands are being put to good use. Stations heard include G5KT, 8TC, 8QQ, 6RB, 6VK, 6VF, 5UH, 5FS, 6OZ and 6GN.

No report is to hand from Cheltenham, but it is known that activity is well maintained. G5BK is transmitting simultaneously on 1.7 and 56 Mc.

DISTRICT 6 (South Western).

Torquay.—The first meeting of the winter season was held at the QRA of the DR. on Thursday, October 14. There was a record attendance of eighteen, and all spent a very enjoyable time. Those present were G2FP, 5GD, 5IF, 5QA, 5SY, 2AUI, 2BXU, 2CAA, 2CRL, 2CWR, BRS2338, 2339, 2649, 2927, 3072 and three others. The DR. thanks the contingent from Exeter for their welcome and timely appearance at the meeting !

It is hoped to have many more such meetings in the future.

Most stations are active, and putting in considerable periods on the air.

The next meeting will be on November 18.

Exeter.—The usual meeting was held on Wednesday, October 6. There was an attendance of twelve. Various matters were discussed. The November meeting will have taken place before these notes appear, but the following one is on Wednesday, December 1.

Taunton.—A very successful meeting was held at the QRA of 2BVC. There were sixteen present, including the DR. Members present were the TR G5LM, 2JM, 5AK, 5SY, 6LQ, 2CFG, 2BAM, 2BVC, 2BXZ, 2BYK, 2BUH, 2CAJ, BRS2445. The chief event was the presentation to G2JM of the "G2CI" 56 Mc. Challenge Cup. The presentation was made by the DR. on behalf of G2CI, who was unable to be present. The DR. was given a very enjoyable time by the local members, and for this, very many thanks, OM's.

North Devon.—The monthly meeting was held at the QRA of 2ADJ, Northam, on October 13, those present being 2ADJ, G6FO, 6GM, 8US, 8UI, while 2ID joined in over the air. 8US is a new member, hereby heartily welcomed, and 8UI was a visitor from Nottingham. 8US has worked W2 on 7 Mc., and 6GM is testing out a 1.7 half wave end on for all band working. 2ADJ, 2CBK, and 2CHY are all in the final stages of attempting to get two letter calls. We wish them luck ! If these succeed there will soon be seven active transmitters in the area. The four stations at present working use between them all the bands from 1.7 to 28 Mc. It is hoped that other District stations will use the 1.7 and 3.5 bands more.

Plymouth.—The second meeting of the winter was held at the QRA of 2CYJ on Friday, October 29. Those present were G8PN, 2AHX, 2CYJ, 2CZP, BRS2932, 2997. There was a vigorous discussion on aerials, and on receivers, straight versus superhets. (Were any conclusions reached ?—DR.) G6RF was unable to be present, as, to use the words of the local scribe, "he is about to experiment with the oldest form of link coupling, in which we wish him and his opposite number every success." The DR. would like to take this opportunity, on behalf of the whole District, of wishing 6RF and his wife good luck and every happiness.

The next meeting will be on November 26.

DISTRICT 7 (Southern).

The September meeting at Farnborough was well attended and much interest was shown in the various topics that came up for discussion.

The next meeting will be held at G2YL's home at Redholm, Walton-on-the-Hill, Tadworth, Surrey, on Sunday, December 5, at 2.30 p.m.

We are pleased to welcome Oxfordshire members to our district. This county has been added because our meeting points are more convenient to them than their previous district meeting points. This makes No. 7 District one of the largest in the country, and the D.R. is anxious that this fact shall be no disadvantage as far as representation is concerned, and would point out that there is still room for further T.R.'s in several large towns which have the requisite number of members, but are not already represented.

A full list of T.R.'s will be given in the next issue of the BULLETIN.

Croydon.—Activity is strong amongst the local members, and a number of tests have been carried out during the various periods lately when conditions have been poor. Of the newer licences G8TB has been working on a new rig with a 6L6 oscillator and two 59's in P.P. for the P.A. on 14 Mc., and though finding many snags, appears to be getting things going now. G5RF is turning his activities to a Rotary Beam, so we shall never be able to judge conditions by listening to his ground wave. G2KU has been getting over to the States very well on 28 Mc. 'phone, and has worked all districts except W7. G5AN is planning a new rig while things seem quiet. G2MV is not heard so

very often nowadays, but he is doing a lot of experimental work on 28 and 56 Mc., especially the latter. Still, the same old grouse to finish up with—news please, OM's.

Southampton.—It has been discovered that the G8OV reported in Goole was due to a clerical error on the part of the G.P.O. and various QSL's which had gone astray have now reached their rightful owners. G8OV is making good progress on 14 Mc., but is still waiting for a contact outside Europe. G5PT and G2VF are trying T20s. G5OB has deserted 14 Mc. temporarily and is now on 7 Mc. Although 28 Mc. is now receiving attention no DX contacts have as yet been reported. The October meeting was very well attended, and a hearty welcome extended to 2BUN, a new member.

If you want to have your activities reported in the BULLETIN, please drop your T.R. a card.

Oxford.—Oxfordshire members join in thanking the D.R. for his recent efforts on their behalf, and also for the letter of welcome to District 7, which was read at the last meeting and very much appreciated. We extend a hearty welcome to a new member, Mr. Delnevo, 2CSV, of Witney, who becomes the first R.S.G.B. member in that town. Other activity seems to have been well maintained.

Portsmouth.—At the October meeting of the South Hants R.T.S. G6NZ gave a talk on "Amateur Morse Recording." Specimens of tapes from amateur and commercial stations were shown and compared. Several members made autographs of their own sending. Eighteen members also visited the local Electricity Works, and had a most interesting time, and a ragchew at tea afterwards. Local activity continues high, 28 Mc. being the greatest attraction, with 2XC as the star performer. 2AWC reports trying his new TX at 2ZR. At the November meeting 2CBL will talk on "Straight Receivers."

Reading.—At the October meeting of R.T. and R.S. some 18 members were present. A questionnaire was set by G2IT and this was won by G2GG and 8MS. The evening was then given over to general discussion. Many Reading members have recently been working on 28 Mc. and G2IT has worked all W districts, HR, VE, OK, and OH on this band. G8MG has worked VK, VS2 and TI on 'phone, while the recent DX of G5HH is CX, CE7, W5 and 6, VK2, 3 and 6, ZL, KAI and FI8. G8MS raised UPOL on a test call. G5AO and 6WO trying out on 28 Mc; 6WO has erected a matched impedance aerial. G2YB trying out his new RX. G5TP still putting out good 'phone. G5VI once more back in the district and will soon be on the air again. 2BIG passed code test and awaiting full call. Several BRS men are applying for A.A. licence; G2GG, 5RT, 6CU, 6GT, 8KJ and 2BTY all report active. The next local meeting will be on Wednesday, November 17, at Y.M.C.A., Reading.

Guildford.—G5WP has agreed to serve as T.R. for Guildford, Woking and district. Please send all notes to reach him before the 25th of the month. His QRA is W. E. Russell, G5WP, "Milestones," Westfield Road, Mayford, Woking, Surrey.

DISTRICT 8 (Home Counties).

A very successful District meeting was held in Cambridge on October 1, at which 15 members were given the opportunity to chat on matters in general. Several points were discussed, but very few decisions were reached! A supply of Junk was brought along by 2BQC, which sale added some fun to the meeting. The question of a District DX contest was raised and the suggestion welcomed by all; details are to be arranged by Mr. Jones, G5JO, and Mr. Carter, G2NJ, and submitted to the next meeting. Mr. Granfield (now G5BQ) very kindly offered to present a splendid silver cup to be competed for annually. There was also a suggestion to run the District 7 Mc. N.F.D. station in the Peterborough area next year, which appeared to meet with general approval.

Reports this month are scarce, and even local activity seems to be conspicuous by its absence. Such stations as G2PL, 5JO, 8SY, 8FF, seem to be rarely heard, whilst 5DR is rebuilding. Two new licences have appeared, however, in the form of 5DQ (ex 2CGO) and 5BQ (ex 2AQX); both these stations are known to be active. 2XV has been conducting tests on 7 and 3.5 Mc. with occasional periods on 14 Mc. when conditions appear reasonable.

Peterborough reports little apart from the fact that 2NJ is erecting another 40 ft. mast which he hopes will give improved results on 14 Mc.

The next meeting in this District will take place on Friday evening, December 3, and will be notified to members by post in the usual way. The D.R. wishes to thank all members who so kindly troubled to return the membership list recently sent to them with their comments and corrections noted thereon; this has been very helpful. It is also desired to thank Mr. Jones, G5JO, for his kindness in arranging for the duplication of these and other sheets which he has provided in the past.

DISTRICT 9 (East Anglia).

Winter activities seem to have started in earnest, judging by the number of reports received this month.

Norwich.—G6UA is active on 7 Mc. phone, and is also doing good DX on 14 Mc. He is awaiting a U9 card for W.A.C. G5IX and 6QZ are busy on 56 and 28 Mc. Both are expecting to move to more favourable QRA's before long, and are busy planning beam aerial systems.

Lowestoft.—G8DD is building a new transmitter for 28 and 56 Mc. G5QO is completely rebuilding, but is occasionally active on 3.5 Mc. He has a new mains operated receiver for the lower frequencies. Mr. Lark (2CWO) is building a new receiver.

Ipswich.—G8IS reports some good DX on 14 Mc., using quite low power. He is now planning modulation gear. G6TI is on 14 Mc. G8AN is QRT owing to pressure of business.

Beccles.—2CRY is progressing with morse; 2CRT is experimenting with 6L6 oscillators and a 6L6 P.A. stage, with very satisfactory results; 2AFC is working on transmitter design and listening on his *National* NC 100 X to 28 Mc. DX.

From the R.A.F., Honington, 2BIP reports trouble with an U.H.F. receiver.

A suggestion has been received that we might hold more District Meetings a year. With our increased numbers it is quite possible that we could, and make a success of them. Any suggestions regarding this would be welcome. A postcard to the D.R. giving your views, and suggestion as to time, and place of meeting, is all that is required.

This month has been a record for the number of activity reports received, and the scribe thanks all those who contributed. Please report again

for next month's notes direct to G5QO, and not later than the 25th of the month.

DISTRICT 10 (South Wales and Monmouthshire).

Cardiff—We extend a hearty welcome to ex-EI7G, who is now in Cardiff and will soon be on the air under the call of GW8WD. The first meeting of the season was held at the Roath Park Hotel on October 21 and a very enjoyable evening was spent. It has been decided to hold these meetings monthly and the next will be on November 18.

Congrats to 2CMX, who is now 2XZ. He has already contacted W, 8UH wants VK for WAC. 2BHA and 2BHZ have passed the Morse test and await full calls, as does 2AJN. Other active stations are 5BI, 5XN, 6ON, 8AM and 8NP.

Blackwood.—8CT obtained 28 Mc. permit and has already worked VK. 2NG is also on this band. Others active are 6BK and 8PU.

Newport.—2JL is active on 1.7 Mc. at week-ends.

Rhondda Valley.—GW8SO has worked PY using 5 watts from batteries. Others active are 2BNC, 2BPW, and 2CUU. The Scribe would be pleased to hear from 2XM.

Llanelly.—2CZJ and 8RS are active. The latter reports his call being pirated by two outsiders, one having a T5 note. Congrats to BRS2894 on the arrival of another junior op. No report has been received from Swansea, but stations known to be active are 2WO, 2UL, 5PH and 8HI. 2OP finds conditions good on 3.5 and 1.7 Mc. on Sundays. He has contacted Cardiff on the latter band during strong sunlight. He is also active on 14 and 28 Mc. The D.R. and D.S. urge local members to use the 1.7 Mc. band for local 'phone contacts instead of filling up 7 Mc., which is now good for DX when QRM allows.

All reports by 25th of each month, please.

DISTRICT 11 (North Wales).

These being the first notes for some months, a synopsis of summer activity will be given. This has been almost totally confined to the 56 Mc. band, with outdoor portable work in progress every week-end.

GW6OK did a great amount of work from Snowdon summit, and during six or seven expeditions worked the following DX stations: (distances are given in brackets): G2NFP (Skiddaw, 118), GI6YWP (114), G5BM (98), G2DCP (85), EI2L (95), G6MXP (Isle of Man, 86), G5MQ (50), G6GL (45), G6OM (82), G8JYP and G6CWP (Leek, 78), G5ZTP (85), and many others at shorter distances.

GW5FU also carried out some tests from Snowdon Summit, contacting EI2L and G2DC, in addition to nearer stations.

GW6AA took portable apparatus over to the Isle of Man in September, working under his call 6MXP. On 56 Mc. he was successful in working G2DCP near Buxton, Derbyshire. The distance is 124 miles, and now stands as the British two-way 56 Mc. communication record. G6OM at 105 miles was also worked, and a large number of stations between 60 and 90 miles distant were contacted.

6AA has also carried out a number of 56 Mc. tests from Llanelian Mountain in Denbugh. Distances up to 75 miles were worked at great strength.

The District put a non-contest station on the air during N.F.D. A good number of stations were contacted, but the operators endured appalling weather conditions with a 50-60 m.p.h. wind, mist, and driving rain.

We are pleased to welcome two newly-licensed stations, 2GV, of Old Colwyn, and 5TC, of Deganwy. It is also a pleasure to have 5YB in the district. His location is Penmon, Anglesey, in the shadow of the new B.B.C. relay station.

It is hoped that there will be a good attendance at the November meeting at 6AA when plans for the winter will be discussed. In order to help members to reach the rather isolated meeting-place with the minimum of effort, 6AA and 6OK will be pleased to convey anyone by car from Colwyn Bay station, and take them back after the meeting.

Will any member wishing to be met please drop a card to the D.R.? Bring along your latest gear for inspection. It adds to the interest of the meeting.

DISTRICT 12 (London North and Hertford).

The attendance at the monthly meetings continues to be excellent and it appears that the decision to change the QRA has resulted in a decided increase in the attendance. At the October meeting Mr. H. A. M. Clarke, G6OT, gave us a most interesting chat on aerial equipment and measurements. We were pleased to see at this meeting G6UN, G6CL, and our old friend Reg. Radford, G2IM.

G8NV has now worked all W districts on 7 Mc. with the exception of W6 and 7. He is licensed for 28 and 56 Mc. and hopes to have four separate transmitters completed by the new year. G5FA is at work on a new modulator using 6L6's in class AB.

We should like to remind members that the nominations for T.R.'s should be in to Headquarters by now. If you have not already nominated a member to serve in your area please do so now. The prospective candidate should be approached and his permission obtained before the nomination is made.

The District Treasurer would like to record his appreciation of the financial support given to the district funds at the last two meetings.

Watford.—The Watford meeting was held on October 18 when, in spite of very foggy weather, five members attended. DE3154, of Hagen, who is staying with G8MH, was the guest of honour. Transmitter design in general was the subject of discussion, with particular comments on suppressor-grid modulation. G8MH has obtained his 25 watt permit. BRS1224 is now 2BUP and hopes to be working on a 56 Mc. C.C. outfit before long. As the November meeting of the Watford district took place before the BULLETIN was published, members were notified individually.

DISTRICT 13 (London South).

The District meeting held on October 28 was very well supported, but we must apologise to those who had to stand for the lack of seats! The South London Trophy was presented to Mr. Chitty (G5IU), who obtained the highest score of any station in this District during the B.E.R.U. Junior Contest, 1937. The N.F.D. Replica and N.F.D. Swiss Diploma were presented to Mr. R. F. Clarke (G5PY) who was in charge of the 7 Mc. station during N.F.D. 1937.

A junk sale followed the presentations, and a

very satisfactory sum was placed to the credit of the District Fund.

The D.R. regrets very much indeed that he was unable to be present as he was, unfortunately, ill in bed. His sincere thanks are due to all those who turned up and made such a success of the meeting, not forgetting G2ZQ, who kindly took the chair. Thanks are also due to the T.R.'s this month for their reports, which are more numerous than last month.

Kennington Area.—G8LQ has moved to Morden but still remains attached to District 13. 2AJT is applying for his full licence, whilst G6HM and 6AN are known to be active. 2JB is active on 28 Mc. using a 14 Mc. Windom.

Balham and Tooting Area.—2ADY, who is now G2JK, is active on 7 and 14 Mc. Congratulations are due to him for obtaining a certificate for listeners' reports on the 56 Mc. Field Day. G5PY has rebuilt to Tritet, and is active on 14 and 56 Mc. 2BFH is experimenting with transmitting circuits. G2UX attempted a rebuild and after pulling his transmitter to pieces decided to rebuild it as it was! No damage was done apparently.

Wandsworth Area.—2BNL has erected a large lattice mast and is experimenting with single valve transmitting circuits. G6GQ and 2RC are active.

New Cross Area.—G8GP, 5WG, 6CS and 2GZ are all active. We regret to learn that 5OA is off the air at present owing to very bad health. We hope he will soon be recovered and on the air again.

Blackheath Area.—G2YG is on 28 Mc., whilst 2ZQ is active between digging operations on his new property.

It had been hoped to make an announcement this month, about the proposed London Hamfeast in November, but owing to illness it has had to be postponed. As soon as the D.R. is up and about again a meeting of the London D.R.'s is to be held, to discuss the matter. Such a meeting was being arranged during October but had to be held over.

Editorial Note.—Mr. Kershaw was ill with bronchial pneumonia when these notes were written. His devotion to the work of the Society is most deeply appreciated. We wish him a speedy recovery.

DISTRICT 14 (Eastern).

East London.—The October meeting at 2AGD, Leyton, was poorly attended. The proposed London District Conventionette was discussed and Morse practices arranged. Will any members interested get in touch with Mr. Hooper (a new member), 8, Hall Lane, South Chingford, E.4, who will be acting as organiser of the practices? BRS3046, a new member at Thaxted, has reported and hopes to attend meetings arranged in the Chelmsford area. QRA'S are required for December and future meetings.

East Essex.—At the first meeting of the winter season at G2KH the attendance of 15 was disappointing. It is hoped that all who possibly can will attend the November meeting, as at this meeting a ballot will be taken to select the T.R. for the forthcoming year.

The Morse classes mentioned last month have been attended by six "pupils" and G5XI has rendered valuable assistance at the key. In order not to clash with the District meetings the classes will be held on the Tuesdays of those weeks.

Once again an appeal is made to members in this area to centre their interest on the 56 Mc. band G2LC has had surprising results with his new long lines transmitter on this band and has heard and received confirmation from ON4AP. Reports are required.

G2SO has continued his fine performance on 14 Mc. Other stations active are G6IF, 2KH, 5XI (QRP on 7 Mc.) and 8RT. G5QK, 6CD, 5VQ, 6CT and 5UK are all rebuilding.

A new member, omitted from these notes last month, is 2CLW, of Westcliff.

DISTRICT 15 (London West, Middlesex and Buckinghamshire).

Despite a bad fog, 28 members and friends attended the October meeting at G8MA. Mrs. Hearn is cordially thanked for the catering. At this meeting the D.R. raffled his last copy of the Guide and realised a total of 2s. 4d. consequently, the fund benefited by 1s. 10d. The November meeting will be held at the West London T.R.'s address. (See Forthcoming Events.)

Only nine reports arrived this month and it is to be hoped that in future more will be forthcoming without the T.R.s having to resort to the "News Hound" method. The D.R. is relieved to hear that T.R.s are being nominated for all Groups.

London West.—G6CO heard a little 28 Mc. DX; G6WN had several 'phone contacts with VK on 14 Mc. and added VE4 on 28 Mc.; 2CCK, now G8WR (Congratulations), has his transmitter on 28 Mc., but is having trouble with receiver; 2CMG finds 2A5 more efficient as CO than 59 or 47, but a little unstable; a "welcome back" is extended to BRS3052, who was 2GF in the days before prefixes. He saw a note asking new members to communicate with D.R.s and promptly did so.

Middlesex South.—G2KI involved in 56 Mc. observation tests; 2LA occasionally on 28 Mc.; 2NN had 55 DX contacts, including VK, ZL, VU, ZU, LU, XU, PK1, W6, VE's, and W's with his "Johnson Q"; 2VV makes steady progress with rebuilding; 5VB too busy for radio; 8MK using 6L6 in new transmitter; 2CZG testing 6L6 and other valves in P.A. The following are also active: G2ZY, 6GB, 8FV, and 8IP.

Middlesex West.—G6VP has some new crystals and has found new pastures at the low-frequency end of the 14 Mc. band. Was WAC in the daytime four times in the same week, and did it once in 3 hours 10 minutes between 17.25 and 20.25 G.M.T. with VU2FX, W6HIW, W6IED, ZS1B, ZL4AF, GM8HP, W7GBI, LU8EN. This on October 20. His DX is colossal. 2BMI built TNT and also smashed his crystal.

Middlesex North.—Only G6LJ reports. He is getting ready for 1.7 and 3.5 Mc., and remarks on the advantages of that band with steady and deliberate signals. Why no other reports?

The T.V.A.R.T.S. were treated to a very fine lecture on "Radio Test Apparatus for the Home Constructor" given by Mr. Harold E. Stoakes. Most amateurs think test gear is costly and complicated, but simple and efficient apparatus for measuring frequency, capacity of condensers, etc., was demonstrated.

The S.R.S. are also enjoying some fine lectures, and anyone interested should write to the secretary, Mr. H. F. Reeve, 26, Green Drive, Southall.

DISTRICT 16 (South-Eastern).

Once again the TR reports have been plentiful, and we take this opportunity of thanking them for their work.

Ashford.—G2QT on 14 Mc. and working DX. He is shortly rebuilding, using a Taylor T20. 2KJ is on 1.7 Mc. and is getting very good results from a double-doublet receiving aerial. 8RK is on 1.7 Mc. and wants QSO's. 2JV hopes to have his 28 Mc. permit soon, and is going on 56 Mc. again.

Bromley and District.—The new T.R. for this Group, G2NK, reports that the meetings have been reorganised and are now held at *A.C.S. Radio*, 52, Widmore Road, Bromley. The next is on November 20 at 8.15 p.m. G2HG and 5LB are active on 56 Mc., and 6WY intends to be on that band with both CW and phone in the near future. Also mentioned in the report are 2GB, 8DN, 2BSO, 2BAV and 2ALL, while we have pleasure in welcoming a new member, 2AVI, to the Society.

Gravesend.—The first lecture of the winter season was given by Mr. Hollins, of *Messrs. Mullards*, his subject being "The Cathode Ray Tube." The meeting was well attended, and the lecturer's interesting and lucid explanation was much appreciated by those present. It was unfortunate the night fixed for the meeting, when Mr. Parker, of the G.P.O. gave a talk on "Electrical Interference with Broadcasting," coincided with a particularly bad Thames fog; as a result the attendance was far smaller than usual. Congratulations to 6BQ and 6VC who finished first and second respectively in the Chatham "Observer" Cup contest.

Chichester.—G2NM, the President of the newly-formed West Sussex Short Wave and Television Club, gave an interesting talk on his reminiscences of Amateur Radio covering the period pre-war to the present time, which was highly appreciated by all present. 2PF is planning a 100-watt C.C. Tx for 56 Mc., while 2AAH has an efficient TRF straight Rx on which he has heard the Berlin television signals on 4½ metres. The following are also active:—8RO, 2BBB, 2764, 5PH, 2ZV, 2881 and 2760, the first three being on 56 Mc.

Tunbridge Wells.—2UJ is mostly on 3.5 Mc. where he is getting out well with a 99-ft. aerial. He is also obtaining good results with a TRF amplifier on television sound using a 6K7 feeding a super regen detector. 2AKQ has completed a super het, and is busy with a 60-ft. mast in anticipation of his full licence. All other stations are active but have nothing special to report. 2FT, of Mablethorpe, is on holiday in the town and has been visiting local stations.

Brighton and Hove.—This Group have meetings at the Imperial Hotel, Queen's Road, Brighton, on the first Thursday in the month at 8 p.m.

Eastbourne and District.—2AO, on 4 watts to a 6L6G tritet, worked ZL and got R5, S5, 5IH, 8CP, 2CSI and 2CNO are also active.

Heathfield.—5AQ rebuilding and erecting a doublet. 1173 heard 106 stations and scored 6,690 points in the first week-end of the VK/ZL contest. 5JZ on 14 Mc. with HT accumulators as mains have not yet arrived. 5PR, 5PN, 2BRI and 2CJZ also report.

DISTRICT 17 (Mid-East).

Boston.—G6LH, who is active on 28, 14 and 7 Mc., has worked ZU on 14 Mc. for a new country. G8BQ anxiously awaits the final change over to A.C. mains. G6GH, who is getting plenty of good DX on 14 Mc., has added HS, HC, VP5, HH, and CN1 to his list.

Cranwell.—Cranwell welcomes three newcomers in G8GS, 8HC, and 8PI; all will soon be active. We regret to learn from ST2CM that our old friend "Wally" Dunn, ST2LR, is suffering from eye trouble and is likely to be posted to SU or G. The new Beam Array at 8FC should be working by the time this is in print. A bigger and better transmitter is being built and a superhet receiver is being installed. G8PF continues his QRP DX work by scoring 1,512 points in the VK/ZL contest and is now W.B.E. G8PQ is testing a very portable 7 Mc. transmitter in anticipation of Christmas leave.

Mablethorpe and Sutton.—Although there is no report from this part of the county, both G5CY and 5BD are known to be active.

Brigg.—We are pleased to record that G8AP has acquired an ex-YL and offer our congratulations.

Grimsby and District.—The D.R. is disappointed at the absence of notes, especially from the Grimsby District, and hopes all members will send in a regular report. 2AZH again leads the field in 56 Mc. activity and has just completed another super receiver. G8PV has received confirmation of his QSO with XU8RL. BRS3056 now awaits his A.A. permit. The following stations are active: G5GS, 2VY, 8PV, 8HD, 8JN, 6RN, 6AK, 2QA, 2AZH and 3056.

DISTRICT 18 (East Yorkshire).

Scarborough.—This month the T.R. hoped to give prominence to reports from all B.R.S. and A.A. members, but the response has been disappointing. G6SO, ex 2BMD, has had an unlucky start, having spent the first month ill in bed and made only one contact up to the time these notes were compiled. We all wish him success and a speedy return to health, as he has been one of our keenest short-wave listeners during his B.R.S. and artificial aerial days.

BRS2359 is settling down at a new QRA, and is listening on 28, 14 and 7 Mc. 2CIW has his CO and PA working satisfactorily on 14 and 7 Mc. In the 28 Mc. band G2TK is having more than his fair share of DX contacts. By working HR4AF he made the first G/HR contact on 28 Mc., and has worked all W districts in three-quarters of an hour, and W.B.E. in 1½ hours. He is now testing the "Four half-wave in phase" aerial as used by W3AIR. G5HZ is also working regularly on this band, but no details are to hand. G8TQ has left 14 for 56 Mc. G8KU is still working Europe, and hopes to taste DX when his new aerial is ready. G5GI is another who is re-designing his sky array. G2CP is busy with R.N.W.A.R. and speeding up his code. G6TG is drilling holes in one-inch angle iron, and looking for DX on 14 Mc. A contact with any station in Asia is particularly required. No notes received this month from G6CP, 8BB or 5MV, although they are active.

Junk sales are to be held on the first Monday each month at the Scarborough Short Wave Club, and all R.S.G.B. members and others are invited to attend either as buyers or sellers.

Scotland.

The season has now made a good start and enthusiasm is running at a high level. New stations are coming on the air regularly and this

progress promises to continue. The regular district meetings have now got into stride and are being well attended.

"A" District.—The committee appointed to go into the question of an additional monthly meeting reported at the October meeting that they have been able to secure a room at the Royal Technical College, George Street, Glasgow. The first of these meetings will be held there in room 119 on Thursday, November 18, and thereafter on the third Thursday of each month. It is hoped that these additional meetings will be well supported. Thursday was deliberately chosen so as to give an alternative night for those members who cannot attend the usual monthly meeting through classes, etc. The present meetings on the last Wednesday of every month will continue as at present. A junk sale proved highly entertaining, and was much enjoyed by the members at the October meeting. G5BD was a visitor at the meeting. New licences obtained during the month were Mr. G. L. McKillop (2CAF) GM8WK and Mr. J. I. M. Sinclair (2CJY) GM8VL, while Mr. H. Munro (BRS2891) is now 2BQO. 56 Mc. work is on the upgrade, and GM6WL, 8AH and 8MJ are all active regularly each Sunday. GM5YG scored 2,300 odd points in the VK contest. GM6JD is now WAC and WBE, and is conducting research on aerials and has reached some interesting conclusions.

"B" District.—Meetings are being well attended, and GM2OX has continued his instructive talks on 56 Mc. work. 2CHK is hearing amazing DX on 28 Mc., and has received a card from VE5LD on King William Island, just south of the magnetic pole. GM8SV is doing excellent QRP telephony work on dry batteries, and has a sked weekly with HH3L. GM6IZ is active on 14 Mc. telephony and 28 Mc. C.W. A come-back has been staged by GM8AT, who works much DX, including K7. DX is also coming the way of GM8LR and GM6VO, despite their being genuine QRP stations. The district's sole entrant in the VK contest was GM5YN, who is planning a new transmitter having push-pull or push-push in every stage. GM6BM has broken all vows and has reappeared on 7 Mc. telephony, using class B linear modulation. Mr. W. Grant (BRS2982) is now 2BYX. 2CJR has now more time to spare for radio, and is getting down to building.

"C" District.—The experimental slow morse transmissions from GM8CF have been abandoned in favour of individual oscillator practice. GM5WT has new rig on the air, 59, 59 and T20's in push-pull. GM6KO is active on 7 and 28 Mc. Experiments with S.G. battery valves for QRP work are being made by GM6RI, and the results are encouraging. A new mast and aerial have been erected by GM8CF to overcome telephone wire absorption. GM8HM is active as usual on 7 Mc.

"D" District.—We welcome Mr. T. W. Readshaw (GM6UU) to the office of D.O. Meetings are being well supported. Mr. J. J. E. Black (2CIJ) is now GM6NO and Mr. W. N. Craig (BRS2138) is now GM6JJ. GM2BD states that conditions at his normal time of operation, 0300-0400 G.M.T. have been rather bad; he also reports that he has almost completed a new transmitter designed primarily for 28 Mc.

"E" District.—Last month we said that GM5KF had had the first GM/VS1AA 28 Mc. contact; we should have said the first Great Britain/VS1AA 28 Mc. contact. Mr. G. Percy (BRS1798) is now 2BXR.

"F" District.—The second meeting was a big success, and it is hoped that the future meetings will be supported in a like manner. GM6RV scored 2,200 odd points and GM6NX 1,845 points in the VK contest. Conditions were found bad during the contest and QRM was particularly heavy.

"G" District.—Mr. J. P. Blair (GM5FT) has resigned as D.O., and we welcome Mr. B. Groom (GM6RG) as his successor. GM8NW awaits arrival of the necessary cards to claim WAC. Short informal talks given by a different member each meeting have been started as a new feature, and are proving popular. Meetings are held every alternate Thursday, usually in the King's Temperance Hotel, Galashiels.

Northern Ireland

GI8TS has returned to Cambridge, 5SJ is again rebuilding, 2SP has completed a very nice rack and panel job. 2KR is working S. Americans. 5MZ has his 50-ft. mast up. 6YW has had several visits from VE3AHQ, who has been touring G, GM, and GI on a bicycle after attending the Coronation with a group of Canadian Scouts.

One hundred and five QSL cards have just arrived for GI call signs which are unknown. It is obvious that piracy is rife, and while some of the pirates may not be in GI there are indications that quite a number are. Any amateur who condones piracy is doing the amateur cause a great disservice.

Egyptian Notes

The transition between summer and winter conditions is almost at an end and, as usual, the period has been marked by very heavy QRN on all bands. The 28 Mc. band is not yet "alive," as far as SU is concerned. When we read in other parts of this journal that G stations are able to WAC and WBE in the space of a week-end, or perhaps a day, we feel rather left out in the cold. There is nothing to suggest that the same state of affairs is likely to occur here until well on in November, so we shall have to bide our time.

On 14 Mc. things have been much different: W 6, 7, K 4, 5, 6, 7, HH, HK, and XE in the West and FI8, J, VK, ZL, and VR4OC in the East have been either worked or heard. It is believed that the last-mentioned station is the first VR4 to be heard in SU, and the writer is out for a "first" contact!

SU1SG has very little to report this month, except that his daily schedules with GW2UL continue to be satisfactory. It has been noted that signals fade out between these stations at about 20.30 G.M.T. (How about an article?—Ed.) Apart from these schedules, little or no operating has been done owing to his being rather QRL.

SU2TW is still busy building up speech equipment and comparing the simple half-wave doublet fed with a *Belling Lee* low-impedance line and a W3EDP type of aerial. Up to the present the latter seems to be giving the better results.

The above are the only reports received this month, although a special request was made to all members last month. A further and final appeal is therefore made to ask those who have not sent in notes for December to please do so immediately, otherwise the writer will know that these notes are not required and will know how to act. SU1WM.

BRITISH EMPIRE NEWS AND NOTES

British West Indies (Eastern Group)

By VP2AT.

Conditions on 14 Mc. during September were poor for DX, but good for W/VE stations, who filled the band with S8 to 9 signals. Short skip was very pronounced on 14 Mc. during the month, signals as near as 250 miles coming in S9, with the skip probably much shorter than this distance. This state of affairs is quite different to that of recent years, when at this time of year DX was at its best. This change in conditions is brought about, no doubt, by the progression of the eleven-year cycle of sun-spot activity.

28 Mc. opened up during the month, and signals have been numerous, although mostly weak. No real DX has been heard, but conditions should continue to improve as the weeks pass.

Activity in Trinidad has shown some increase this month, 4TC and 4TH being active on phone, the former on 7 Mc. and the latter on 14 Mc. 4TC hopes to be able to start on the erection of his B.C. transmitter soon.

3BG in British Guiana has also been active on 14 Mc. phone. The owner of this station also has a commercial broadcast transmitter on the air in the 49 metre broadcast band, using the same call.

In Barbados 6TR, 6YB, and 6NW have been active on phone. 6YB is using 180 watts input on 14 Mc.

Activity in Antigua has been rather low, which is, no doubt, due to the poor conditions prevailing. 2DA is active on 14 Mc. phone, and getting good results. His rig was fully described by W5BDB, the builder, in September QST. 2AT has replaced the 89 in his oscillator with a 6L6 and is very pleased with results. 2CD broadcast a very successful concert given by local artistes on the afternoon of the 16th. 2TG had regular schedules with CLX in Cuba during the hurricane season for the purpose of exchanging weather reports.

The writer of these notes would be very glad to hear from all amateurs in this area.

Ceylon

By VS7RP

Conditions on 14 Mc. for September showed an improvement over August, although QRN was bad at times and QRM from telephony stations as bad as ever. A noticeable feature during the month was the paucity of signals from VU, and when heard they were generally very weak. It was found that just prior to and after showers of rain QSB was very prominent.

Only one report is to hand and that is from VS7MB, who states that he and VS7RF have been experimenting on 28 Mc. 7MB one evening between the hours of 17.20 and 18.45 G.M.T. had six contacts with G, PA, W and VU, and the band was still alive when he closed down. Since then he has established contact with OE, OK and VS7. He is of opinion that this band is possible for local QSO's, as the distance between him and 7RF is about 25 miles, with the main mountain ranges between the two stations.

VS7JW and 7EB do not report owing to pressure of business.

7RP continues to work on 14 Mc. as he finds 7 Mc. too noisy. During the month he was able at long last to contact VP5PZ, which gives him WBE, as soon as confirmation is received. On the particular evening this contact was made, signals from that area were coming in well, and contact was also made with HH3. All continents except S. America were worked during the month.

Channel Isles.

By G8DO.

Mr. Dowding has offered to act as Channel Isles Representative, and sends us his first notes.—Ed.

Wedding bells have chimed in Guernsey for G8MF. Hearty congratulations, OM! He has also taken unto himself a Super Skyrider, and is rebuilding his transmitter for the winter.

2BTP is experimenting with metal valves for QRP working, and is tackling the difficulty of not having mains by using interrupter vibratory methods. These experiments are proving very successful. He is also trying out parallel tritet arrangements, but is experiencing high crystal current with somewhat poor R.F. output. Congratulations to 2AIX, ex BRS1752, on obtaining his A.A. call. He is building CO-PA and busily engaged in morse practice. 2AOU, of Jersey, reports active.

During the summer months 8DO was visited by 2PL, of Cambridge, 8CY of Tottenham and 2BHV of Bristol. Amateurs on holiday in the Channel Islands are cordially invited to get in touch with G8DO.

Irish Free State

By EI9D.

Congratulations to ex E17J who has now received his new licence and is G8WW. He operates CW on 7,026 kc, and is anxious to make EI contacts.

EI5J has moved his QRA to "Rock View," Albert Road, Sligo.

At a meeting of the committee of I.R.T.S., held at EI8J's on October 22, arrangements for the proposed Irish Convention were brought nearer completion. It is hoped to announce the date in the next Notes.

Kenya, Uganda, Tanganyika and Nyasaland

By VQ4CRH.

Recent weeks have produced five new VQ3, and one VQ5 call. We therefore extend a hearty welcome to VQ3ROS, VQ3PAB, VQ3ALT, VQ3TOM, VQ3HJP, and VQ5KLB. (G6WY please note.)

Uganda is once again on the active list after many years, and we can assure VQ5KLB that QSO's will not be lacking for some considerable time owing to the scarcity of VQ5 calls.

We have also to welcome a new member in BERS404, of Nairobi.

VQ4KTF, of Kitale, is now on the air with a new transmitter, and reports will be welcome.

VQ4CRE, 4SNB, 4KTA are back on the air with phone stations on 7 and 14 Mc. (How about first VQ phone WAC.)

With the 1938 B.E.R.U. Contests looming up before us, it is hoped that a record entry from this Zone will be recorded, with serious designs on annexing one of the B.E.R.U. trophies. We would remind members that in connection with these contests, the "Davidson Trophy" is awarded to the B.E.R.U. member of this Zone who secures the highest number of points in either the Senior or Junior Contests. This is a very handsome trophy, and is retained by the winner for twelve months.

May we also remind members that the Crystal Register, which is still in existence, needs bringing up to date? This cannot be done unless members give the writer particulars of new crystals and deletions, which is essential at the present moment, owing to the number of new licences and requests for vacant frequencies.

As these notes will be the last under the pen of VQ4CRH for a few months owing to home leave, he takes this opportunity of wishing all members the very best for 1938, and good luck in the B.E.R.U. contests. VQ4CRC has kindly consented to take over the duties of scribe. All correspondence should be addressed until further notice to Mr. H. J. Walker, VQ4CRC, P.O. Box 79, Nairobi, Kenya.

Malaya and Borneo

By VS1AA.

We have to record pleasant personal QSO's with Mr. Eurich, W8IGQ (WCFT of Yacht "Yankee").

VS2AK reports much work on directional aerials and low impedance feeders. He contacted G6XR on September 20 at 2.20 p.m. G.M.T., a most unusual time, even for 14 Mc. He asks whether a Malayan Convention is possible. Well, it's up to the rest of you; please write if interested. VS1AH has left for G., while a new station, 2AS, has taken the air in Kuala Lumpur. Good luck, OM's. VS1AA had a good run recently on 28 Mc. (See 28 Mc. Notes.) VK5KO is one of the most consistent stations heard on 28 Mc. Still no sign of the Letter Budget.

Malta

By ZB1E.

ZB1E and 1L are on the air with phone as well as CW, the former uses class "A" and the latter class "AB" modulation, both on a carrier of 30 watts. ZB1C is mostly on 28 Mc. on which band he is doing quite a good lot of work, being on the air practically at all hours of the day and most of the night. Among his observations about this band is one where he states he could hear and work only G stations for two hours, while a G station reported making WAC in the same period.

Conditions on 14 Mc. are much like the local weather, very unsettled with occasional fair DX periods. The 28 Mc. band is still very erratic.

We welcome G6UR who is staying at this station for some weeks and hopes to be on the air with a ZB1 call soon.

Stations active: ZB1C, 1E, 1H, 1J, 1L, 1P.

New Zealand.

By ZL3AZ.

After two weeks' vacation in sunny Auckland, your scribe feels in good fettle, and if this report is inclined to look on the sunny side of things, he must be forgiven. With the advent of our warmer weather, radio conditions have rapidly improved, and 14 Mc. is a moving mass of signals. Literally hundreds of G stations are audible here daily around 07.30 G.M.T. The first week-end of the VK-ZL contest has come and gone, and although the writer did very poorly, reports from the northern districts indicate that some good bags were secured. French Indo-China and South Africa are among the countries snagged by the northerners. The writer was lucky enough to contact VQ8AS in late August. It is believed that this station is in the Chagos Islands, some 1,500 miles from Mauritius, but this statement stands open to correction.

Reports from users of 28 Mc. indicate that this band is also greatly improved. ZL3DJ and ZL3AB have recently worked ZE and ZS respectively. South Africa is our "hard country" in New Zealand, and 28 Mc. gives us more contacts with this country than any other band. 56 Mc. is also getting more attention from amateurs here. Several groups have been formed and there are some moderately high power stations under construction for operation on this band. Efforts are being made by several to link up Wellington and Christchurch on 56 Mc., but all efforts have failed so far.

3.5 Mc. has almost degenerated solely into a 'phone band. "Degenerated" is used purposely, as it would appear that the bad manners and pseudo-Americanisms of a few are getting 'phone stations an unfavourable name. Uncle Tom can rest assured that his troubles are not confined to lil' ole England. Oh! pardon me, this must be catching! In all fairness, however, it must be emphasised that only a few are to blame.

Reverting to general DX, ZL1GX is making strenuous efforts to break an even 100 countries by the end of this year. His total is now 96. He was fortunate in working the elusive AC4YN, making another Zone for him.

N.Z.A.R.T. has at last secured permission from the Post and Telegraph Department for the use of telephony on the 14 Mc. band. Several restrictions are being imposed, and it will only be the most able operators who will be able to fill all requirements. As yet, no station has been granted permission to operate on 14 Mc. 'phone as it is expected that some little time will elapse before arrangements are finalised. 'Phone operation will be permitted only between the hours of midnight and 7 a.m. N.Z. time, coinciding with 12.00 to 19.00 G.M.T.

South Africa

Division One.

The 28 Mc. band is rapidly opening up, contacts with W's being possible up to 20.00 G.M.T. G's come in very well between 16.00 and 17.30 G.M.T., the best being G2PL, 5LI and 6DH.

Among those active on 28 Mc. are ZS1AH, ZS1AN, ZU1C, ZS1B and ZS1C. ZS1AN is still waiting for his first 28 Mc. contact, whilst ZS1AH, using a full wave 7 Mc. Zepp, is putting his signals into all parts of the globe. ZS1B uses a ½ wave 28 Mc. doublet, but can only contact Europe. A new aerial is being erected when better results are anticipated. Incidently his first 28 Mc. QSO was with VU2CQ (RST579), the aerial used being ½ wave 14 Mc. doublet.

ZU6P is now operating 56 Mc. telephony with an input of 50 watts. He has had no reports yet, but is hoping for the best.

ZS1AL reports he heard the London sound signals on 7 metres at good strength. He uses a 1937 Skyrider.

We offer our deepest sympathy to o.m. Shoyer ZS1H on the death of his grandmother who died suddenly on October 16. ZS1B.

* * *

Division Five.—Conditions generally are improving, especially on the higher frequencies, but 7 Mc. is still noisy at times.

The 14 Mc. band is very popular at the moment, mostly owing to the appearance of ZL'S which are very scarce and usually not heard at this time of the year.

On 28 Mc. signals are coming in nicely, and seem to be increasing in strength daily.

The African Radio Research Union are contemplating extensive activity on 112 and 224 Mc. in the very near future, 56 Mc. proving very successful so far. ZU5L and ZU5Q are keeping daily schedules with 100 per cent. QSO's.

ZS2L after rebuilding is active with very fine quality signals; he has certainly been rewarded for the time and trouble taken in making his new rig.

ZT5R and ZS5AK are keeping daily skeds on 1.75 Mc.

ZS5U is active on 7, 14 and 28 Mc.

The following R.S.G.B. members have also been justifying their existence, ZU5AC, ZS5Z and ZU5AF. ZU5Q.

* * *

Division Six.—The Slow Morse Competition, organised by the African Radio Research Union, proved a popular event, judging by the number of Score Charts received. The contest period was from July to September. The winner, Mr. R. Prunhoe, ZU5AC, received the prize of valuable radio components and a photograph of his station appears with these notes.

During the competition, ZU5AC was engaged for about an hour each night, for three nights a week, and active the full three months. He received letters reporting his morse from 25 pupils. Of these, three have since passed the Government Morse Examination, and have been allotted call signs.

ZU5AC states that he received an average of forty letters a month from his morse students. We all congratulate him on his fine achievement, and hope that, although the contest has finished, he will continue with the good work of teaching morse *via* radio, to the many listeners interested in our hobby.

During October, the A.R.R.U. held a meeting and lecture at the Witwatersrand Technical College. Mr. Walker lectured on "Modern Radio Research Technique," and spoke about mechanical and electrical oscillators, measuring instruments, and uses of the oscillograph. Practical demonstration was given on the College instruments. Members expressed their appreciation of the lecture, and we hope that similar events will be scheduled for the near future.

We welcome Mrs. J. Bennett to Amateur Radio. Her call sign is ZS6BD, and she enjoys the privilege of being the first South African YL operator. We trust that the locals will answer all her CQ calls. Long may her tubes burn bright!

ZS6T is active on 28 Mc. telephony, and requires VK for WAC and G for WBE. His frequency is 28,160 kc, and time of operating is between 19.00 and 21.00 G.M.T.

ZU6C states that G stations on 14 Mc. are not very active; G5ML was heard testing telephony, but faded completely.

ZT6X recently managed a 'phone contact with ZL4DQ, and is proud of his achievement; ZL being the most difficult of all contacts made by ZT amateurs.

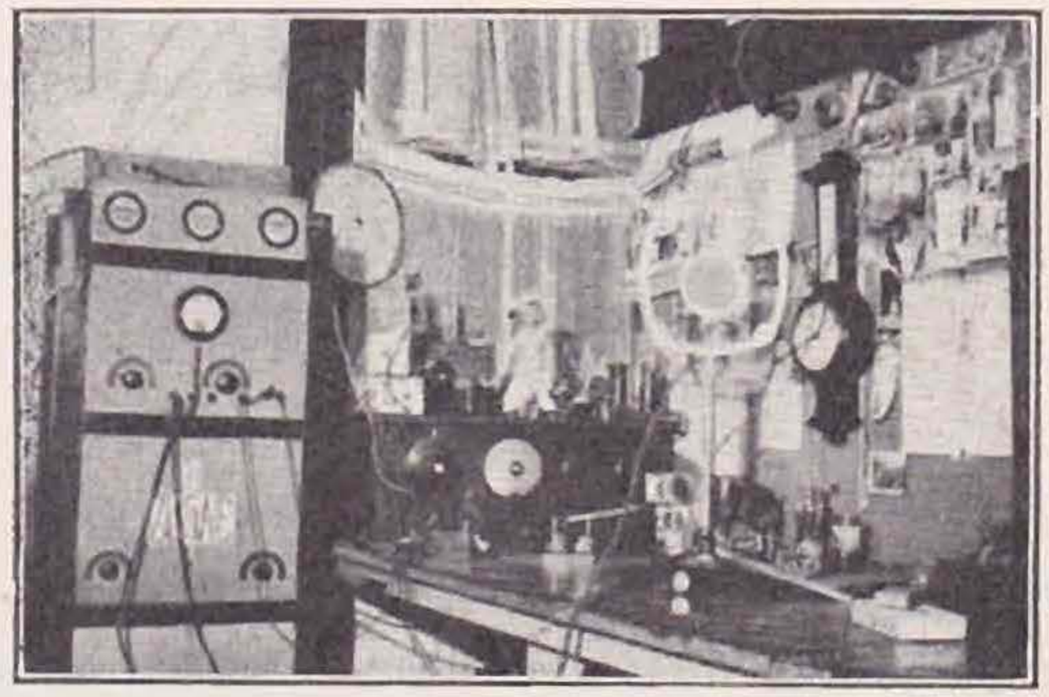
ZU6N had a unique experience when one of his 'phone transmissions was recorded by a W6 station, which relayed back the transmission the following day. ZU6N recently returned from a five years' stay in California.

ZS6Q was heard testing on 14 Mc., and the quality of his 'phone was good.

ZS6C, ZS6AM, ZT6M, ZT6AD, ZT6AQ, and ZU6AD are temporarily inactive. We believe they are all rebuilding for 28 Mc. activity.

ZU6V is on 14,276 kc, using cw. Recent additions to his DX log are:—VP5, W1, and W3. The aerial in use is a half-wave Zepp. on 14 Mc., and the power is 25 watts input.

News items of interest for inclusions in these notes will be appreciated by the Divisional Correspondent, Box 4020, Johannesburg. ZU6V.



ZU5AC Winning Station in A.R.R.U. Morse Contest

Sympathies

We have learned with very much regret that our South-Western D.R., Mr. W. Sydenham (G5SY), was recently bereaved by the loss of his sister after a long illness. On behalf of his many friends at home and abroad, we record this mark of condolence and sympathy.

Mr. Sydenham desires to thank all members who wrote to him on this sad occasion.

A HOLIDAY IN DRESDEN

—(*Continued from page* 243)

with an O-v-2 receiver. D4YTM is theoretically a similar station.

D4CDM has an aerial system constructed on lattice masts, but as it is situated in a military depot no information could be obtained, but it is believed to be a high-powered station.

Long aerials are very popular in Dresden, and G6FU was given both written and verbal proof of the extraordinary signal strength obtained with them when working DX stations. Having seen a 210-ft. one over the distant house-tops he decided that it must be so!

Concluding this brief account, the author desires to express his thanks to those amateurs who did so much to lighten his difficulties in a strange country, and to one and all he would say "alles gute und auf wiedersehen!"

MONTH ON THE AIR

—(*Continued from page* 256)

Finally ST2CM tells us something about himself. The average strength of G signals is S5-6, not bad considering the Sudan is known to produce the world's heaviest QRN. Inch sparks from his aerial are quite common during sand storms, whilst violent thunderstorms produce the static; a ½ kw. ICW station quarter mile away on 13,750 completes a dismal tale. Despite these handicaps, he has worked 42 countries since June. He is another to hear EF8BA on 14,100, but we still have no details.

Late News.

A late report from GM6JD says that with genuine QRP using an 807 final he has worked VU2FD, VQ3FAR, OXVC, HH3L and PY2KX, the last contact giving him W.A.C., and PY2KX QSL's at once. He has heard VQ3HJP, VO6L, HH4AS, KA1AN and K4RJ, K4DTH and K4ESH in Porto Rico.

A few scores for the VK/ZL Senior Contest. G6WY 4590, G6XL 3400, GM5YG 2,400 odd, GM6RV 2,200 odd, GM6NX 1,845. G6NF and G2HG both worked HR4AF in Honduras on 28 Mc. and both have received a card.

Late 56 Mc. News

Writing under date of November 8, Mr. D. W. Heightman (G6DH) informs us that his 56 Mc. signals were heard twice by W2JCY during the first week in November. Confirmation has also been received from W2JCY regarding his reception of G6DH last season.

Mr. Heightman tells us that he has been hearing signals up to 45 Mc. almost daily and W2XHG on 41 Mc. puts in a good signal most afternoons. G6DH has also heard several American amateur signals on 42 Mc., and has established the fact that these are third harmonics of powerful 14 Mc. doubler stages driving 28 Mc. power amplifiers. He proved this on November 7 by working W9FS on 42 Mc., whilst his own transmitter was tuned to 28 Mc. The American was S6 on 42 Mc.

EXCHANGE & MART

(*Continued from page* vii.)

"SKYBUDDY" COMMUNICATION RECEIVER (new), £8 10s. cash. Mains Transformer, 7s. 6d. M.C. Speaker, 5s. "Ekco" H.T. Eliminator, 6s. Microphone, 6s. 6d. Components, etc. Must be cleared. Write list.—Box 73, "Parrs," 121, Kingsway, London, W.C.2.

TRANSMITTING AMATEUR desires accommodation in Birmingham for B.I.F. 1938, with another active "Ham." State fullest details and whether garage available or near.—Box 74, "Parrs," 121, Kingsway, W.C.2.

WANTED, Eddystone Two Receiver, 10 to 200 metres, any type; reasonable price offered. —Box 90, "Parrs," 121, Kingsway, W.C.2.

1.7 Mc. CONTEST! G6WQ'S 160M. Tx 4-Valve E.C.O/C.O,2 Metres worked W, £3. 2-Valve Original Model RX, 10/160M., described in "Television" £2 10s. 0d. delivered or near offers. Chokes, Meters, Condensers.—Stamped envelope to G2CD, 7, Beddington Road, Seven Kings, Essex.

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