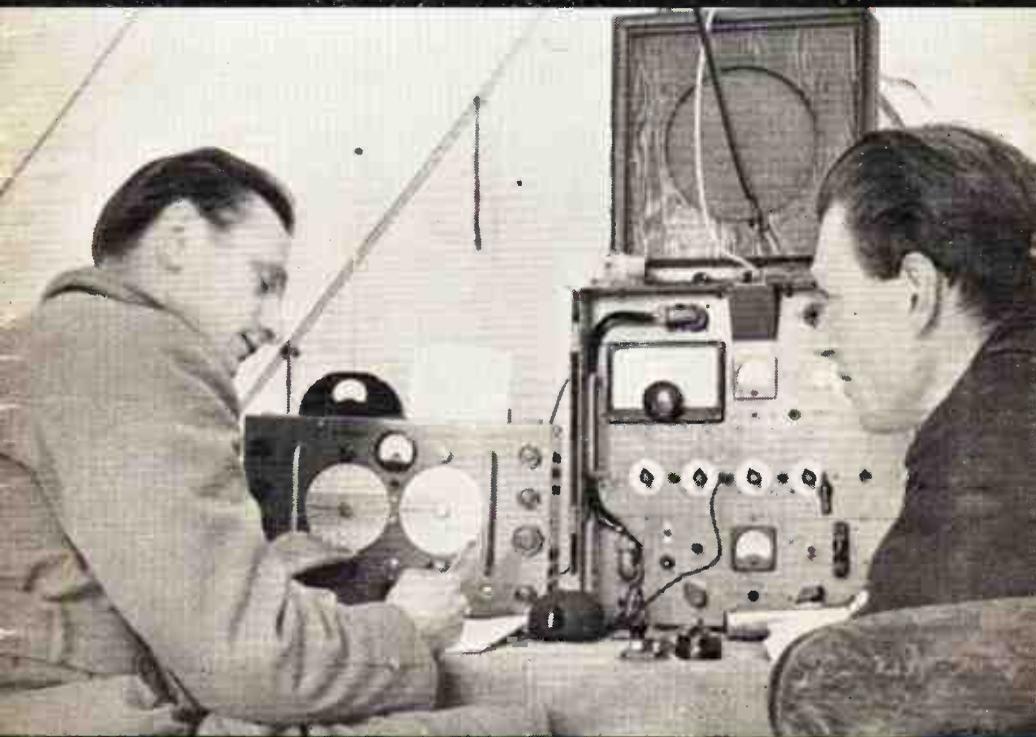


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Number 8
AUGUST
1952

RADIO AMATEUR

incorporating "Short Wave News"



IN THIS ISSUE . . .

Efficiency in the Transmission. The "S-9'er." The Design of Mains Transformers. The QSL Problem. TV Linkage of England and Scotland. Workshop Practice. Around the Shacks. Amateur Band, SW Broadcast Band and VHF Commentaries, Club Notes, etc., etc.

19

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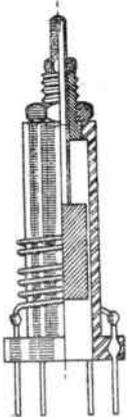
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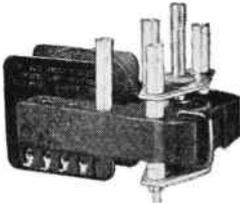
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OUR COVER PHOTO

Our cover photo is of G3DDK/P operating at Ship Meadow Farm, near Bungay, Suffolk, during the recent NFD.



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EDITORIAL.

QSL'S AND SWL REPORTS

We publish elsewhere in this issue, an interesting article from one of our SWL readers on the subject of QSL's and SWL reports to amateur transmitters.

This topic has always been one guaranteed to produce a lively discussion at any gathering of radio amateurs and we have no doubt but that the ideas put forward by our contributor will come up for their share of discussion too.

The exchange of QSL's between transmitting amateurs has always been a popular feature of our hobby, though the impression one gets nowadays is that it is not so extensively practised as it was. One very important factor in this respect is, no doubt, their high cost these days. In this connection it is only fair to remind readers that a goodly proportion of the cost is tax. At one time, a large proportion of stations promised "100% QSLing" or "QSL for QSL," but one hears this less frequently over the air as things are at the moment. Amongst the transmitting fraternity, a specific request for a particular card, whether it be to confirm a rare contact, a new country or to substantiate a claim for some certificate is usually honoured. The SWL, however, has always had a raw deal in respect of getting in QSL's in return for his reports. The reasons for this are too well known to need elaboration again here and some of them are dealt with in the article referred to. We do think our contributor's suggestions go a long way towards meeting this problem and we invite our readers to let us have their views on the matter. No doubt, if sufficient interest is shown in the scheme, the printers of QSL cards will soon prepare some stock designs.

—2UK.

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THE EDITOR invites original contributions on short wave radio subjects. All material used will be paid for. Articles should be clearly written, preferably typewritten, and photographs should be clear and sharp. Diagrams need not be large or perfectly drawn, as our draughtsmen will redraw in most cases, but relevant information should be included. All MSS must be accompanied by a stamped addressed envelope for reply or return. Each item must bear the sender's name and address.

Component Review. Manufacturers, publishers, etc., are invited to submit samples or information of new products for review in the section.

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A Companion Journal to THE RADIO CONSTRUCTOR

EFFICIENCY IN THE TRANSMISSION LINE

by

H. E. SMITH, G6UH

Foreword.

Calculation of aerial efficiency is a difficult problem, and the usual method adopted is to compare the results obtained on a new aerial system with those obtained on the previous one. The standing wave ratio is usually measured on an indicator of the home-made variety, and while casting no reflections on the capability of the average Amateur to construct a piece of apparatus of this nature, it often occurs that, in spite of careful construction the readings obtained are of dubious reliability, and the unit may produce readings which will be entirely misleading. Many Amateurs do not use a standing wave indicator but rely on the figures given in handbooks, using the recommended feeder for the type of aerial constructed, and calling it "good enough." In many cases this is, in fact, good enough, especially when comparatively high power is being used. If the input is 150 watts and the feeder/aerial efficiency is only 50% there is still some 75 watts being radiated, but the fact that many weak signals are being missed on the receiving side is often overlooked. The facts which follow are, perhaps, more applicable to the receiving side, but the QRP man will find something of interest to him also.

Dipole Radiation Resistance.

The Dipole is, perhaps, the most common type of aerial used on the LF bands, and possibly some hundreds of Amateurs use low impedance twin of the 80 ohm variety as the feeder, assuming that as the radiation resistance of a dipole is in the order of 75 ohms, the mismatch will not matter very much. The figure of 75 ohms for a dipole applies only if it is in *free space* and in actual practice the impedance is often far removed from this figure. Let us look at a typical case of a 7 Mc/s dipole erected at approximately 30 ft. high. At this height the impedance may be anything between 30 and 45 ohms, *not more*. There is something like a 2 to 1 mismatch to the 80 ohm feeder, and we shall see how this affects the efficiency of the whole system.

First of all, though, let us look at a few figures on this subject of height. How the radiation resistance of a dipole varies with height is shown in this short table:—

Height		Radiation resistance
0.15 Wavelength	..	30 Ohms
0.2	..	65 "
0.3	..	95 "
0.45	..	80 "

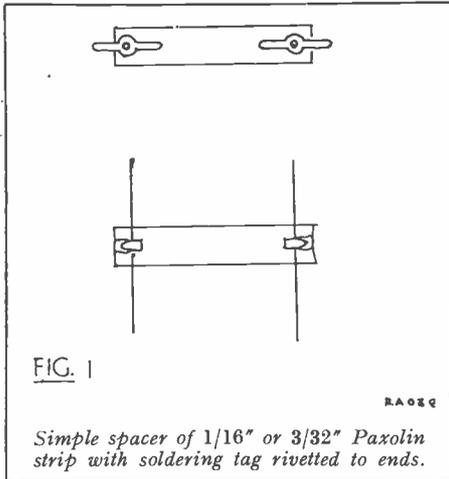
It will be seen that only at a height of 0.45 wavelength is the 80 ohm feeder correctly matched to the dipole. (The half-wave dipole is being used as an example for two reasons. Firstly, to show that even with such a simple aerial it is possible to go wrong in your calculations; and secondly, to prove how unsuspected losses can be present on the simplest of aerials.) Leaving the question of height *v.* radiation resistance for the moment, let us assume that a half-wave dipole has been erected for operation on 28 Mc/s, and 80 ohm feeder is being used with the hope that the slight mismatch will not prevent us working or hearing the Dx stations (conditions permitting). With, say, 50 watts input, let us see how much will be "lost in transit." Assuming that our mismatch from feeder to aerial is in the order of 0.25 : 1, we cannot expect a better standing wave ratio than approximately 3 : 1, possibly greater, but we will not attempt to stretch this figure as it is quite bad enough! A standing wave ratio of 3 : 1 represents a power *loss ratio* of 1.5. The RF loss figure of 80 ohm feeder is approximately 1.9 db's at 28 Mc/s (per 100 ft). Assuming that our feeder is 50 ft in length, we can halve this figure and it now becomes 0.95 db's, or a power loss of 20%. This figure must now be multiplied by the power loss ratio of 1.5, making a total overall power loss of 30%, nearly one-third of the total available power. If we now cut the dipole for operation on 144 Mc/s, and use the same feeder length, the power loss may easily be in the neighbourhood of 70%. Even if the standing wave ratio were unity, the loss would be about 50%.

Now what about the long wire type of aerial? Take a full wave or a $1\frac{1}{2}$ wave aerial, fed at a low impedance point with 70 or 80 ohm twin. We are again asking for a high standing wave ratio and the consequent power loss because the lowest impedance point existing on a full wave aerial is approximately 100 ohms, and the figure for a $1\frac{1}{2}$ wave aerial is 120 ohms. (Some authoritative sources quote these figures as 110 ohms and 130 ohms respectively). It is understood, of course, that these figures remain constant, whatever the operating frequency.

How are we to deal with this problem of RF loss? Bearing in mind our overall power loss of some 30% on the dipole, what is the result if we use spaced feeders and a matching transformer connected to the aerial? The first and most important point is that instead

of a feeder loss of 0.95 dbs per 50 ft on 28 Mc/s, we get a figure of 0.05 dbs per 50 ft. Secondly, as the linear transformer will automatically take up the correct impedance (to within 10-15 ohms or so) of the aerial, we may be certain of a standing wave ratio of well below 2 : 1 and thus the power loss will probably not exceed 5%. 95% efficiency against a questionable 70% on the previous arrangement.

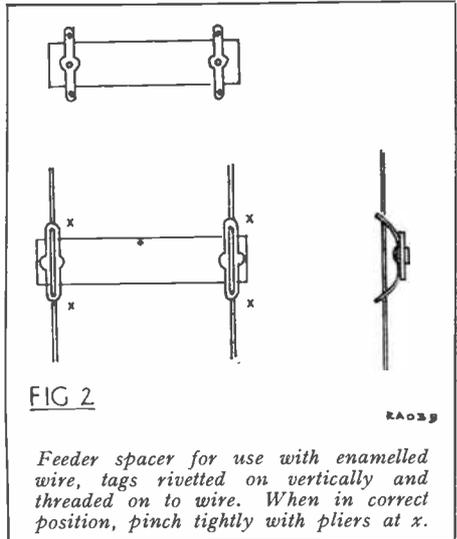
It will be apparent that if such loss figures can exist on a simple dipole, the losses which may occur on a more complicated aerial system could be far more serious, and in actual fact, in a recently investigated case of a three-element beam fed with 50 ohm co-axial feeder, the total RF loss was proved to be in excess of 65%, which meant that on received signals, everything was being received at less than half the strength it would normally have been, had the aerial been properly fed and matched.



Open Wire Feeders.

Feeding an aerial with open wires is often looked upon as a cumbersome method, with installation difficulties, and additional weight on the aerial. Making up spaced feeders is certainly a little more difficult than any of the more usual installation jobs, but there is no reason why it should be beyond the capability of the average listener or even the very beginner. As far as weight is concerned, there is no necessity for the spaced feeder to be any heavier than the lightest of the balanced types of low impedance feeder. The spacers may be constructed from perspex or paxolin, both substances having the required strength and insulating properties for the job. Fig. 1 shows a typical method of constructing the spacers, which may be

soldered on to the feeder at intervals of approximately 9". To avoid corrosion on the feeder wires, it may be found better to use enamelled wire. This would involve cleaning the wire at every joint, and giving the completed joint a coat of enamel for protection (quite a long process). So for enamelled wires the method shown in Fig. 2 is recommended. This requires no soldering and the spacers remain quite secure, the strain on the wires produced by their own weight causes the wire to lock itself more securely to the tags on the spacers. No. 18 or 20 SWG is quite suitable for any spaced feeder and there is no necessity to use any heavier gauge, unless, of course, you want to. If No. 20 SWG is used, the spacing for 600 ohms will be approximately 2". 600 ohm line is quite a good value to work with, and this same line may be used to feed any aerial system provided a suitable matching transformer is used at the aerial end. Many Amateurs look on the question of matching transformers with

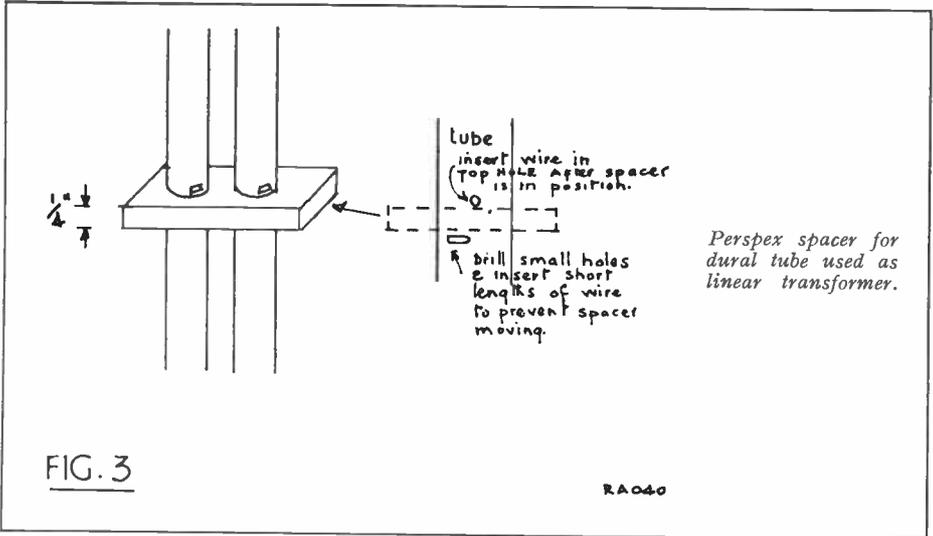


some doubt, and it is often imagined that their construction is somewhat difficult. In actual fact, the quarter-wave linear transformer is simple to make up and is about the most efficient method of connecting two differing impedances together.

The Quarter-Wave Transformer.

The simple equation for determining the required impedance of a matching transformer is as follows :—

$$Z_t = \sqrt{Z_f Z_a}$$



where Z_f is the feeder impedance and Z_a the aerial impedance. In other words, the value in ohms of the transformer is equal to the geometric mean between the feeder and aerial impedances. Therefore, if our feeder is a 600 ohm line and we estimate the impedance of our dipole to be 65 ohms, we shall require a matching transformer of 200 ohms. This would also apply, of course, if our aerial had an impedance of 600 ohms and we were using 65 ohm feeder. A 200 ohm linear transformer can be constructed in the following manner. For the 28 Mc/s band, two 8' 6" lengths of $\frac{1}{4}$ " Dural tube spaced $\frac{1}{2}$ " between centres. The spacing may be maintained by drilling small pieces of Perspex with two holes on $\frac{1}{2}$ " centres, the holes being a nice push fit for the Dural tube. These spacers may be kept in position by drilling the tube with a fine drill and inserting a short piece of wire and bending over (Fig. 3).

If no suitable Dural tube is available, two lengths of $\frac{1}{8}$ " copper wire to the dimensions as given above may be used, the spacing now being $\frac{1}{4}$ " between centres. The same type of spacers may be constructed as for the Dural tube but as it will now be difficult to drill the $\frac{1}{8}$ " copper in order to secure the spacers, it will be better to drill the feeder holes slightly under size, and cut the spacer in half down the centre. Then place in position on the feeder and secure it by binding a few turns of 18 SWG wire round each end (Fig. 4).

Full data on the spacings for various impedances may be found in any good handbook, but for the convenience of those who have no ready access to one, the tables and

chart shown in Fig. 5 have been compiled. When changing over to open wire feeders, do not forget that the coupling to your receiver

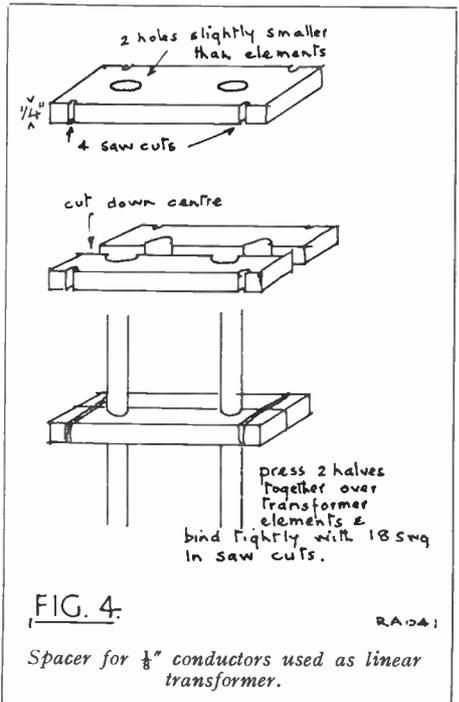


Fig. 5.

MATCHING TRANSFORMER IMPEDANCES

<i>For Matching</i>	<i>To</i>	<i>Transformer Impedance required</i>
600 ohms	100 ohms	245 ohms
" "	80 "	219 "
" "	75 "	212 "
" "	50 "	173 "
800 "	300 "	490 "
" "	100 "	283 "
" "	80 "	253 "
" "	75 "	245 "
" "	50 "	200 "

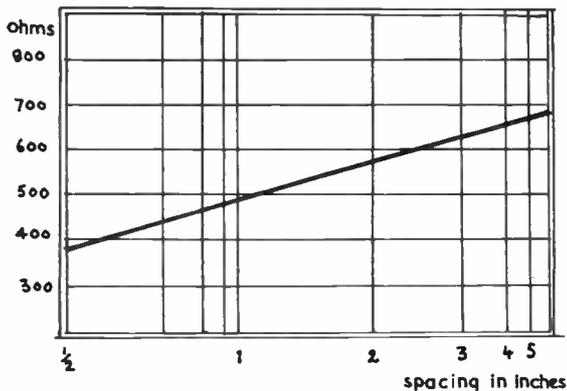
For two dipoles co-linear, or the centre of a full wave aerial, the impedance may be taken as 1,800 ohms. Open wire feeder may be constructed to feed this direct, and any value of 600 ohms or greater may be used with little or no difference in the standing wave ratio.

or transmitter must now be modified to suit the higher impedance of the spaced feeder. If you were using a two or three-turn coil for coupling the low impedance feeder to the aerial tuning unit, you will now need to increase this to roughly three times the number of turns.

One final word. It may be that you are not sure what the impedance of your aerial may be in the first place, especially if it is a multi-element type. The only answer to this is, if you have been using a low impedance feeder with moderate success, call this the value of your aerial impedance in your calculations. The quarter-wave transformer will

automatically take care of any minor errors in impedance over a range of plus or minus 10% or so with no measurable increase in standing ratio.

(NOTE.—The open wire feeder, while being far more efficient than the low impedance types, is more liable to radiation unless it is properly balanced. Make sure that each wire of the feeder is of the same length, and that you have a really balanced circuit connecting the feeder to the transmitter. This also applies to the receiver, as if the feeders are not balanced, more local interference will be picked up.)



Approximate impedance of a pair of 18 SWG open wire feeders relative to spacing between wires.

FIG 5A

PA041

THE "S-9'ER" by EVERT KALEVELD, PAΦXE

NEARLY every amateur knows the advantage that can be had from a well-designed RF amplifier ahead of the mixer stage in a superhet receiver.

The main source of noise in the receiver is this mixer-stage, and the higher the signal-level is at the mixer-grid, the better it will overcome the mixer-noise. In other words, the better will be the signal to noise ratio, a very important figure in a modern receiver. With a well-designed broad-band RF pre-amplifier stage ahead of a receiver, we can get by using a suitable valve such as the 6AK5 or the Mullard EF95, a gain of 20 to 30 db on 14 Mc/s—which represents a gain of from four to six S points! A very worthwhile gain which certainly warrants the small cost and work involved in the construction of such a preamplifier.

But before you start building, read on and learn how this preamplifier can very easily be changed into an S-9'er, making the unbelievable true, as with an S-9'er a gain of 50 to 60 db can be had, enabling one to really hear signals which were S⁹ or even S minus 5—if that exists! As the preamplifier is broad-band, it requires no tuning once adjusted and can easily be put in some odd corner next to or behind the receiver.

Principle of Operation.

No transmitting amateur would ever dream of connecting an odd piece of wire to a curtain rail and feeding it with RF, and expect to work the corners of the world. Yet that is what we do to the most important piece of gear in our shack, viz., the receiver. You can't work Dx if you cannot hear it! Our receiver terminals are usually marked "300 ohms" and the best of us connect a 300 ohm feeder to them and are then very pleased with ourselves. However, have you ever measured that 300 ohm impedance input on your receiver? It can vary from 100 ohms to 300 ohms on the various bands! Experimentally it has been found that by connecting a well-matched line to the receiver, a gain from 5 to 30 db can be expected, meaning 4 to 5 S points. If we combine this matching device with a preamplifier, the aforementioned staggering figure of ten to twelve S points gain can be expected on the 14Mc/s band.

The Circuit.

The S-9'er consists of a broadband grid circuit and plate circuit, which are identical except for C6, which serves to keep the plate-voltage from C8, so that we can ground the rotor. In the grid circuit we can exactly match the antenna to the grid circuit impedance by varying C2. C2 is variable from

100 pf to its minimum capacity, which we may assume to be about 10 pf. The series condenser value (C1) is 10 pf. By varying C2 from maximum to minimum, the total capacity across L1 changes only by from five to nine pf. Rotating C2 has, therefore, but negligible effect on the frequency of the tuned circuit L1—C1C2. L1 is tuned by its iron core to the band centre. By rotating C2, we can vary the input impedance with the given values between 1750 and 57 ohms on ten metres according to the formula:—

$$\text{Impedance} = \frac{7,000}{\left(\frac{C1 + C2}{C1}\right)^2}$$

These same remarks apply, of course, to the plate circuit, where the 6AK5 plate impedance has to be matched to the existing receiver impedance.

Construction.

Keep all leads short. If you have one of those old boxes which housed the well-known RF24 or RF25 units, these can be very well used for the S-9'er, with its thorough screening and nice ceramic switch.

The coils are soldered directly on the contacts of the switch. If, of course, you are only interested in one band, you can omit the switch and use only the coils for your favourite band. It is essential that the two coils, grid and plate, be very well shielded. As a further precaution against self-oscillation, the coils should be mounted at right-angles to each other.

The 6AK5 must be shielded and also underneath the base of the valve a piece of metal should divide the plate and grid circuits. Use one ground point for the plate circuits and another for the grid circuit, the latter preferably being the cathode ground point.

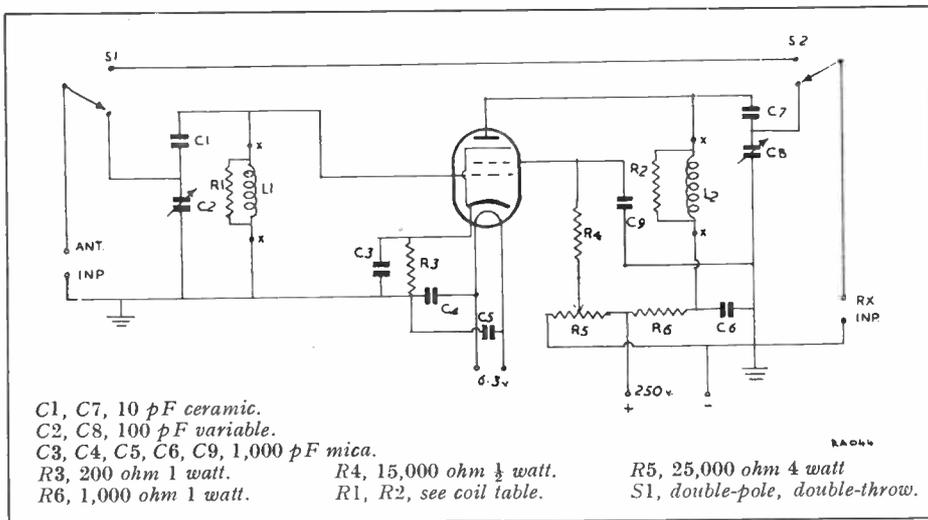
The coils are very important. Coils with thick wire are not good. Keep to the data given in the coil table.

To avoid complicating the circuit diagram, only one coil is shown, without the switch, a cross indicating where the switch should be connected.

Adjusting and Operation.

The S-9'er can be best adjusted with a constant signal, either given by the station VFO or CO or the help of a transmitting amateur might be called upon to provide a strong RF signal. Ideally, of course, a signal generator should be used.

First, L1 and L2 are tuned for maximum signal, after the receiver has, of course, been tuned to the test signal. C1 is then tuned for



COIL TABLE. L1 and L2 are identical			
28 Mc/s	16 turns No. 27 SWG enamel. Iron cored former ½" dia. Close wound.		R1 and R2 7,000 Ω
21 Mc/s	20 turns No. 33 SWG enamel. Iron cored former ½" dia. Close wound.		15,000 Ω
14 Mc/s	25 turns No. 33 SWG enamel. Iron cored former ½" dia. Close wound.		15,000 Ω
7 Mc/s	40 turns No. 40 SWG enamel. Iron cored former ½" dia. Close wound.		omit or 15,000 Ω

maximum output and probably we shall have to touch up L1 a bit after this adjustment, as the coil and condensers do, of course, interact a little. The same procedure applies to C8 and L2.

Now the potentiometer R5 is adjusted for maximum signal with the lowest screen voltage. This setting is good for all bands so a potentiometer with screw driver adjustment can, with advantage, be used.

Changing bands involves retuning C1 and C8, but once the right position is found, it can easily be reset to that position. On tuning across a particular band, the S-9'er needs no attention, being broad-band tuned.

No attempt has been made to include 80 metre band coils on the unit, mainly because most signals on that band have sufficient strength without need of further amplification and also because the particular switch that happened to be available had but

three positions. However, nothing prevents the builder using plug-in coils, so that 21 Mc/s can be covered as well as 3.5 Mc/s if desired.

Plate and heater voltages can in most cases be "robbed" from the receiver itself, requirements being 6.3 volts, 0.175 amps for the heater, and 200 volts 10mA plate and screen voltage.

Summary.

The S9'er is a broadband tuned preamplifier with its input and output circuits widely variable in impedance, thereby permitting matching the receiving antenna to the pre-amplifier input, and the preamplifier output to the receiver input. With proper matching together with the additional gain of the valve, a gain of 50 to 60 db can be expected. It requires no tuning and has very moderate power demands which can easily be delivered by the receiver power pack.

THE DESIGN OF MAINS TRANSFORMERS

Part I.

by W. E. THOMPSON

IT is probably true to say that the majority of home constructors think nothing of making up an elaborate piece of radio or testing apparatus, even to the extent of doing a certain amount of design work themselves, yet one often finds that these same capable people fight shy of tackling the design and construction of a mains transformer. The author has already shown in his article concerning the design of iron-cored chokes, in the "Radio Constructor" (October, 1951) that that particular piece of equipment can be dealt with quite easily at home, and it is the purpose of this present article to show how you can master the seeming mysteries of the mains transformer.

A study of prices charged reveals that transformers giving certain standard outputs can be bought fairly cheaply; for instance, one giving 250-0-250V, 100mA, 5.0V 2.0A, and 6.3V 3.0A, with primary tapped for input voltages ranging from 200V to 250V, costs about 20/-, which it must be agreed is quite reasonable. We would be hard put to it to make one at home much cheaper than this if labour were taken into account, but when our needs demand a transformer with higher ratings, that's when the rub comes. It is at this stage that home construction shows the greatest saving: furthermore, as will be seen, once the general principles of design have been understood and applied, it is seldom that the serious home-constructor need consider buying a transformer, for providing that he possesses the necessary stampings for the core and can obtain the wire for the coils, the rest comes easy.

Stampings need not present too great a problem, since most of us seem to acquire many odd transformers and chokes as time goes on, and items of this sort found in ex-Govt. gear can be stripped of windings in order that the stampings can be built into new coils wound at home for the particular purpose in view.

Although the preparation of a particular design is not exactly child's play, the task can be made fairly simple if certain "rules-of-thumb" are employed, and if the process of design is approached in an orderly and methodical manner there is no reason why one's first design should not be a success. As an example of the truth of this statement, I designed and made my first transformer some 20 years ago—I had opened a small radio shop and set about making my own battery-charging plant. A mains transformer was made which provided 30-0-30V 6.0A and

1.8V 8.0A for a Phillips rectifier valve. As might be imagined, this turned out to be a fairly hefty piece of apparatus; the primary was wound with 18 SWG, the 30-0-30V winding with 16 SWG, and the 1.8V winding with 14 SWG. Even though the finished appearance was "amateur" this transformer ran continuously, 24 hours a day, for over three years without once giving trouble. It passed out of my hands as a going concern when the business was sold, and by "going concern" I don't mean "going west."

Design Considerations.

In setting about the design we first of all need to know the conditions under which the transformer will work, i.e. continuously or intermittently, and the watts to be delivered by the various secondary windings. (It is more correct to speak of Volt-Amps in relation to transformers, but for our purpose we will stick to Volts \times Amps = Watts.) From these factors we decide upon the design of the primary, having regard also for the mains voltage(s) to which the primary will be connected, and the size of the iron core. The wire sizes to be used for the various windings depend primarily upon the currents to be carried or delivered by them, and we must also take care to see that having designed the coils, they can be accommodated in the winding window of the core. To some degree, this aspect sometimes needs a measure of compromise—the aim is to fill the window if possible, since this produces a more efficient transformer than one which has wide open spaces between coil and core.

The actual physical disposition of the windings on the bobbin is mainly a function of insulation requirements. Insulation of the windings themselves, the degree of insulation between windings, and between windings and core, must also be duly considered, in the interests of reliability and safety. As coils must by their very nature possess resistance, and the iron will have certain losses also, the transformer will tend to heat up in service; a good design will naturally run cooler than a bad one, but in any case one must see to it that temperature rise is kept within certain limits.

Simple Theory.

It might help just to spend a little while brushing up our transformer theory before embarking on the treatment of specific requirements. Referring to Fig. 1, which shows an iron core on which are wound two

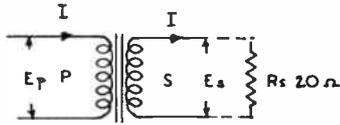


FIG. 1. SIMPLE TRANSFORMER

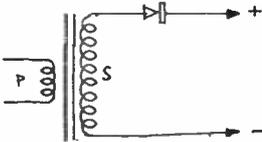


FIG. 2A. HALF-WAVE

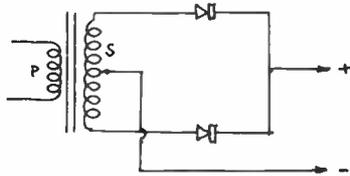


FIG. 2B. FULL-WAVE.

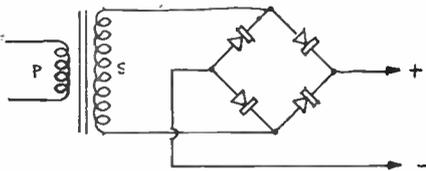


FIG. 2C. BRIDGE

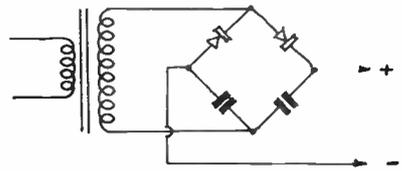


FIG. 2D. VOLTAGE DOUBLER.

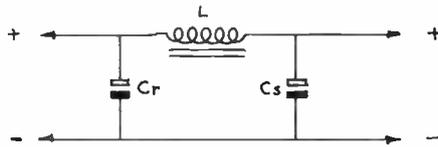


FIG. 2E. CAPACITOR-INPUT SMOOTHING FILTER

RA083

separate coils of insulated wire which are not connected to each other, we know that if we pass a current through the primary, lines of magnetic force will be induced around the coil, and these will magnetize the iron core. We also know that these same lines of force will link with the turns of wire in the secondary and induce a voltage in that coil. If the primary circuit is broken, the flux (lines of force) will collapse, and a voltage will be induced in the secondary in the reverse

direction. If the primary is connected to the AC supply mains, an AC voltage will appear across the secondary.

The magnitude of the secondary voltage is directly proportional to the ratio of primary to secondary turns, assuming that there are no losses in the transformer. If the primary has 100 turns and the secondary 500, the step-up ratio is 1 : 5, and applying 2.0V to the primary will produce 10.0V in the secondary. If the ratio had been 5 : 1

step-down (primary 500, secondary 100), 2.0V on the primary would give only 0.4V on the secondary.

It is usual, of course, to connect some form of load to the secondary which will draw a certain current from the winding. The power consumed by the load has to be supplied in the first place by the primary, so clearly the primary load will be the same as that on the secondary. Still assuming the ideal condition, with our 1:5 step-up transformer connected to a 20-ohm load, the load current

$$\text{will be } \frac{E_s}{R_s} = \frac{10}{20} = 0.5A. \text{ The secondary}$$

watts, then, will be $W_s = E_s \times I_s = 10 \times 0.5 = 5.0W$. Since primary watts = secondary watts, $W_p = W_s = 5.0W$ and as

$$W_p = E_p \times I_p, I_p = \frac{W_p}{E_p} = \frac{5}{2} = 2.5A.$$

By collecting these formulae, we derive:—

$$\begin{aligned} W_s &= E_s \times I_s \\ \text{and } W_p &= E_p \times I_p \\ \text{but } W_p &= W_s \\ \text{so } E_p \times I_p &= E_s \times I_s \\ & \quad \quad \quad \frac{E_s \times I_s}{E_p} \end{aligned}$$

$$\text{from which } I_p = \frac{E_p I_s}{E_s}$$

Applying this to our example above, we see that:—

$$I_p = \frac{10 \times 0.5}{2} = 2.5A \text{ as before.}$$

If the 20-ohm load had been connected to the step-down transformer, the secondary voltage of which was found to be 0.4V, the

$$\text{secondary current, } I_s, \text{ would be } \frac{0.4}{20} = 0.02A.$$

Using the formula to find primary current, we have:—

$$I_p = \frac{0.4 \times 0.02}{2} = 0.004A.$$

It will be noticed that if the voltage is stepped up, the current is stepped down proportionately. With the step-up ratio, 2.0V and 2.5V in the primary produces 10.0V 0.5A in the secondary, and with the step-down ratio 2.0V 0.004A in the primary gives us 0.4V 0.02A in the secondary. We conclude, therefore, that secondary voltage is directly proportional to the turns ratio, and secondary current is inversely proportional to the turns ratio.

Secondary Windings.

In the foregoing simple theory we have considered the secondary output as a function of the primary energization. In designing a transformer it is more convenient to reverse

this procedure by designing for a certain value of secondary watts, and deriving from this the required primary winding to suit the conditions. In the case of windings supplying resistive loads, the simple assumption of Volts \times Amps = Watts holds good, as for example, a winding supplying valve heaters. When reactive loads are connected to a secondary, however, the conditions are more complex, and a correction factor has to be applied to the design of the secondary. A valve rectifier connected to the usual form of smoothing filter presents a complex load to the secondary; the load has both inductive and capacitive reactances, and due to the rectifier action the secondary current will be of a pulsating form instead of sinusoidal.

Fig. 2 depicts four conventional rectifier circuits, and the type of smoothing filter to which they would normally be connected. In designing a secondary winding for Fig. 2a (half-wave), the nominal secondary watts are increased by a factor of 2.46. If, in that circuit, the required output is 250V at 60mA,

$$\text{the nominal load is } \frac{250 \times 60}{1000} = 15.0W, \text{ and}$$

the design figure will be $15 \times 2.46 = 36.9W$. With the other three forms of rectifier shown, however, the correction factor is 1.34. Thus, in the full-wave circuit of Fig. 2b, for the same output the design figure becomes $15 \times 1.34 = 20.1W$. It will be seen that the half-wave rectifier is not very economical compared with the other forms shown, since the secondary current is nearly twice the value required for full-wave, bridge or voltage-doubler. The excess current is due to the higher proportion of ripple volts present in the output and a high percentage of harmonics of the supply frequency produced in the rectifier. Smoothing of a half-wave rectifier is consequently more difficult.

The correction factors given above refer only to a capacitor-input smoothing filter as shown in Fig. 2e. If the reservoir capacitor, Cr, is omitted, the figures are different, since the circuit then becomes a choke-input filter; other things need consideration then since the design of the choke, L, requires special treatment, and as this article is based upon transformers which feed capacitor-input filters the matter will be left at that.

Efficiency.

It is one of the fundamentals of Nature that energy cannot be created or lost. No matter what we do with energy, or how we convert it to other forms, every bit of it must be accounted for; we can't get something for nothing (with the possible exception of the Income Tax man!) and invariably we get less than we bargain for. So it is with

(Contd. on p. 303)

THE QSL PROBLEM

by

R. L. KENYON

SHORTWAVE LISTENING STATION

G5103

THIS IS TO VERIFY THE RECEPTION
OF A TRUE REPORT ON MY TRANSMISSIONS.

QRG. (1) 29.7m (2) (3) (4)
PhCW. (1) Ph. (2) (3) (4)
QRT. (1) 1806 (2) (3) (4)
DATE. (1) 7-6-52 (2) (3) (4)

CALL SIGN XYIBK

SIG. OF OPERATOR J. Brown.

RA055

FROM time to time, the problem of QSLing listener reports crops up and much recrimination occurs between the SWL's and transmitters. In this article, the writer wishes to examine dispassionately both sides of the problem and to offer a possible solution which it is hoped will satisfy both sides.

From the SW Listener's point of view one may say that an active listener spends many hours at his receiver compiling reports of the transmissions he hears. Some leave it at that but others send these reports to the transmitters concerned in the hope that they will receive in return either a QSL card or other verification. These are necessary if the SWL wishes to obtain the certificates which are offered by the various clubs and societies. Quite obviously, some sort of verification of the transmissions which the SWL claims to have heard is necessary otherwise the certificates would be worthless. It must be most galling to all those who aspire to these certificates to be prevented from claiming them, because their reports have not been QSL'd.

Quite apart from this certificate-collecting business, a varied and worldwide selection of cards can be of interest in themselves and are a tangible reward for many hours of patient listening.

It has been stated many times in this magazine that listener reports should be as useful as possible and cover a number of transmissions by the particular station. Even so, in many cases where excellent reports of this nature are sent, a QSL is not always forthcoming. Thus, even though the listener does all he can to merit a reply it is purely a matter of chance whether or not he gets his verification.

In the writer's opinion, this state of affairs is neither desirable nor healthy for amateur radio. It does not breed the spirit of comradeship and mutual help which has in the past been so characteristic a feature of the hobby of amateur radio.

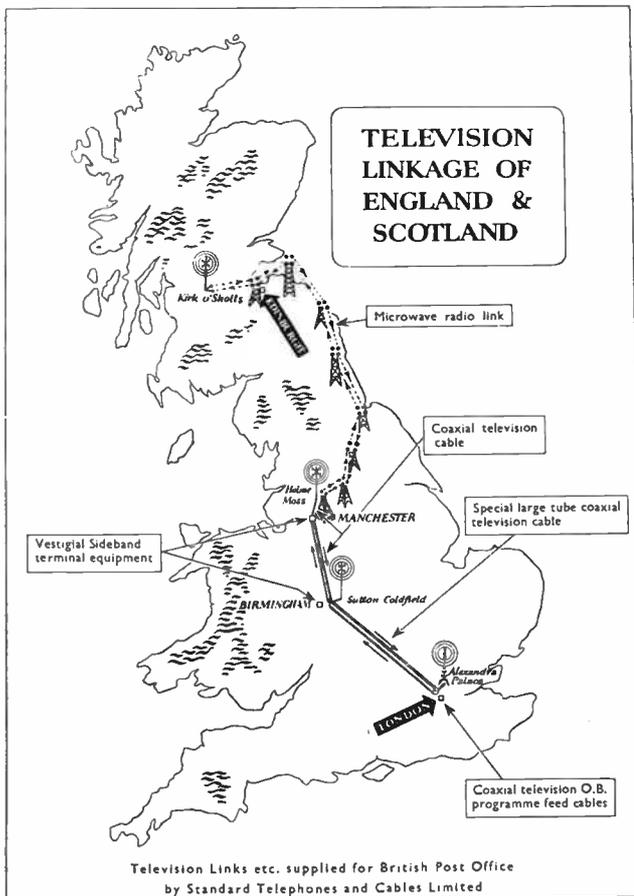
From the transmitter's point of view the following line of reasoning no doubt takes place. Most of these listeners' reports are unsolicited and the transmitter receiving them may not want them. He is, no doubt, content to rely on the reports he gets over the air. Or he may receive a number of reports on a particular transmission all telling him the same story and naturally he will not consider that he should send out cards to all these reports. Moreover, few transmitters have unlimited cash or time and it may be virtually impossible to purchase cards or to find the time to fill them in. So what can he do?

Two courses could be suggested. One is, of course, that he does not QSL any reports from SWL at all. Or he may choose one or two reports and QSL these only. The rest are unlucky!

So it is that many SWL's are disappointed and I think the spirit of amateur radio is such that many transmitters will not take either course without some pang of conscience!

Summing up we may say that there seem to be three major reasons why the majority of transmitters do not feel obliged to QSL SWL reports: (a) the high cost of printing prohibits him from buying all the cards necessary; (b) if he wrote out all the cards he gets from SWL's he would never have time to get on the air; and (c) the reports are unsolicited in any case and he, therefore, does not feel obliged to answer them.

(Contd. on p. 303)



THE T.V. LINKAGE of ENGLAND and SCOTLAND

WITH the official opening of the Kirk o'Shotts television station approximately mid-way between Glasgow and Edinburgh last March, the B.B.C. has achieved the greater part of its development programme aimed at bringing a television service within the reach of 80 per cent. of the population of the United Kingdom by 1954. Working on full power it is estimated that the Kirk o'Shotts transmitter serves an additional population of over four million, bringing the total national coverage to about 68 per cent.

Since the re-opening of the Alexandra Palace station on the 7th June, 1946, this ambitious undertaking has been implemented by means of a network of G.P.O. coaxial cables and radio links first between Alexandra Palace and the 30-kilowatt television transmitter opened at Sutton Coldfield on the 17th December, 1949, then from Birmingham to the 45-kilowatt Holme Moss transmitter

opened on the 12th October, 1951, and now over a further 250 miles from Manchester to the first Scottish Television Transmitter at Kirk o'Shotts.

Standard Telephones and Cables Limited have been associated with all stages of the development of the television network including the design, development and installation for the British Post Office of the coaxial cable which connects the London and Midland transmitters, the coaxial cable and associated vestigial sideband transmission terminal equipment linking the Midland and Northern transmitters, and the micro-wave radio relay system now serving the Scottish transmitter. Equipment for all three stages of the linkage has been produced to meet the technical requirements of the Post Office.

Television Outside Broadcast Facilities.

Coaxial cables have been installed by Standard Telephones and Cables Limited for

The steel lattice tower of the repeater station built into the hill-side at Blackford Hill, near Edinburgh. This picture shows the receiving and transmitting antennae communicating with Kirk o' Shotts, to the right, and a similar pair of "dishes" in optical alignment with the next repeater along the route towards Manchester. The main waveguide feeds may be seen passing down the centre of the tower to the repeater station nestling into the hill-side.



the GPO in the London Area. These short coaxial links are used for collecting outside broadcast television programmes. They centre on Museum Exchange, the principal switching point for the long-distance links.

To places from which outside broadcast programmes are regularly taken there are direct coaxial cables to Museum telephone exchange. These include the Empire Pool and the Stadium, Wembley, and the two cricket grounds at Lords and the Oval respectively. For more general outside broadcast material coaxial cables link the main West End telephone exchanges, such as Gerrard, Mayfair, Victoria and Faraday. Programmes from places within a mile or so of these exchanges may be collected on ordinary telephone cable lines. There are about 40 miles of "Standard" coaxial cables in the London outside broadcast networks and some of these have been in use since the beginning of television broadcasting from Alexandra Palace in 1936.

The London-Birmingham coaxial television cables.

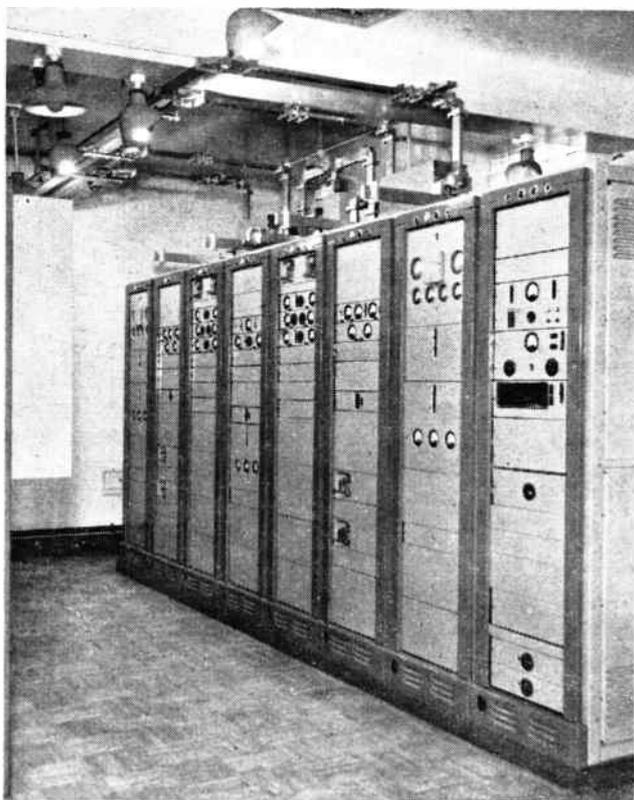
Consisting of three parts—the main cable and a short tail cable at each end—the latest London-Birmingham coaxial cable follows the route of the old Roman road via Watford,

Aylesbury, Daventry, Coventry and Birmingham. The main cable, forming part of the Post Office trunk telephone network, covers a distance of just over 121 miles, with 43 repeater stations *en route*, of which 11 are required for present-day programmes. The cable terminates at Museum Exchange, London, and Telephone House, Birmingham, and the end connections to the transmitters are provided by tail cables between Museum Exchange and Alexandra Palace and between Telephone House and Sutton Coldfield.

The London-Birmingham cable incorporates two 0.975-inch and four 0.375-inch coaxial tubes. The larger tubes are used, with repeaters designed and made by the GPO at 12-mile spacing, for two-way transmission of 405-line television signals requiring a video bandwidth of approximately 3 Mc/s. Ultimately, these tubes may be required for very-high-definition or colour television, and frequencies up to 26 Mc/s may be involved with repeaters at three-mile spacing. The 0.375-inch tubes are used for broad-band telephony purposes, each pair being capable of carrying 600 speech circuits. The whole system has been planned to meet the recommendations of the 1943 Television Committee.*

*The 1943 Television Committee, under the Chairmanship of Lord Hankey, recommended in its report, published in 1945, that after the way the 405-line system should be reinstated in London and extended first to Birmingham and then to other provincial centres. It also recommended, among other things, that developments be planned on

the assumption that a higher definition system, perhaps incorporating colour, would for some time be operated side-by-side with the present system. These recommendations form the framework within which the British Post Office planned the transmission by cable of television signals to Birmingham.



A standard suite of transmission cubicles installed at one of the seven repeater stations spaced at about 30-mile intervals along the route from Manchester to Kirk o' Shotts, these cubicles represent one complete set of receiving and re-transmitting apparatus for both directions of transmission. A second complete set of duplicate equipment is mounted back-to-back to act as a standby in the event of breakdown.

The Birmingham-Holme Moss coaxial television cable and associated vestigial sideband transmission equipment.

Between Birmingham and Manchester there is a Standard Telephones and Cables Limited coaxial cable including six 0.375-inch tubes, of which two are used for the transmission of video signals, 16 paper-insulated quads for controlling the repeater stations associated with the coaxials, and 172 paper-insulated quads for local telephone traffic. The repeater stations, with equipment designed and installed by the GPO, are spaced at about six-mile intervals.

Beyond Manchester the cable extends through Hyde to Mottram, and from Mottram to Holme Moss the television network has been completed by means of a two-tube coaxial spur cable containing four screened pairs for music circuits and 24 paper-insulated quads for repeater control in addition to the two 0.375-inch coaxial tubes.

Vestigial sideband terminal equipment

supplied by Standard Telephones and Cables Limited is used with this cable link to translate the video signals to a frequency band suitable for transmission over the coaxial cable.

The Vestigial Sideband principle consists in the modulation on a carrier of the video band and the transmission over the cable of the whole of one sideband plus a vestige of the other sideband. This small but significant part of the other sideband enables the video-frequency band to be shifted appropriately without greatly increasing the transmitted band beyond that of the video band and, incidentally, obviates the very difficult technical problems involved in the single-sideband transmission of television signals.

The Manchester-Edinburgh micro-wave radio link.

The latest link in the chain, from Manchester to Kirk o' Shotts, made its successful debut on an experimental basis almost a month

ahead of schedule when called on at very short notice to permit Scottish viewers to share with their English compatriots in the funeral ceremonies of our late King George VI. This link is a two-way micro-wave radio relay link which operates on the general principle of beamed micro-wave transmissions at a frequency of the order of 4,000 megacycles or a wavelength of 7.5 cm, over a series of optical paths along a carefully planned and surveyed route connecting the two terminal stations. The total length of this route is 250 miles. The preliminary survey, carried out with portable micro-wave television links of the type supplied by "Standard" for a number of important BBC "outside television broadcasts" during 1950 and 1951, confirmed calculated heights for transmitter and receiver antennae as well as their spacing along the route. Accordingly, each individual micro-wave transmission traverses an average distance of some 30 miles, a total of seven repeater stations being provided for receiving and re-transmitting programme signals *en route*.

Equipment at terminal and repeater stations affords one uni-directional channel from Manchester to Kirk o'Shotts simultaneously with a second similar channel in the reverse direction. Each channel is designed to handle the 0.3 megacycle bandwidth of a 405-line definition, 50 frames per second, double-interlaced television programme in one direction of transmission. Full remote control and supervisory facilities are provided whereby each terminal station is able to control the operation of the equipment at all points along the route to the other terminal.

To ensure a high degree of reliability, all transmission equipment with the exception of parabolic reflectors and main waveguide feeds is provided in duplicate; the change-over from one set of equipment to the other being fully automatic in the event of breakdown. In the same way, automatic standby sources of power supply have been provided to cater for a breakdown in local public mains supplies.

The intermediate two-way repeater stations are designed to work unattended. Should the occasion arise, however, engineers could adapt them so that locally-derived programme material may be injected into the network for transmission in either or both directions. In this way, the Manchester-Edinburgh link not only extends the television service to new areas, but can also facilitate programme contributions to that service from the areas through which it passes.

Transmitting equipment for the micro-wave radio link at Kirk o'Shotts and Manchester is designed to accept the video-frequency bandwidth of 0.3 megacycles at

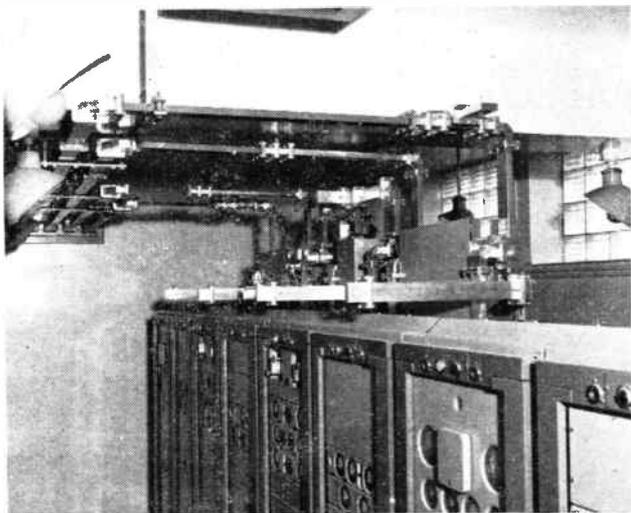
a level of 1 volt DAP in 75 ohms. The video signal modulates the reflector-cathode circuit of a reflex klystron oscillating at a basic frequency of the order of 4,000 megacycles per second, in such a way that the output frequency is deviated by a total of 6 megacycles per second for a change from the bottom of a synchronising pulse to a peak white picture. The RF oscillator frequency is stabilised by means of a precision crystal oscillator with a basic or fundamental frequency of the order of 20 megacycles per second.

The SHF output from the klystron is fed through waveguides to a travelling wave amplifier and thence to the transmitting antenna. Transmitting and receiving antennae at the terminal and repeater stations consist of waveguide horns feeding paraboloids which are 10 ft. in diameter and mounted on steel towers; two paraboloids at each of the terminals and four at each repeater station. The heights of these towers range from 20 to 200 ft depending on the altitude of the site in relation to the terrain covered by the beamed transmission. The width of each transmitted beam is $\pm 1\frac{1}{2}^\circ$ to the half power points and the waveguide feed delivers a power of 1 watt to the antenna.

On arrival at the first repeater the frequency modulated SHF wave is passed by means of a waveguide feed from the parabolic reflector to a super-heterodyne receiver. This receiver employs a crystal controlled local oscillator operating at a frequency of 60 megacycles above the mid-frequency of the incoming signal (or 57 megacycles above the incoming frequency corresponding to synchronising pulses) to produce an intermediate-frequency band centred on 60 megacycles. The IF signals are amplified in an amplifier fitted with AVC and again translated to a radio frequency 37 megacycles above or below the incoming RF. An automatic frequency control maintains the frequency of the second local oscillator 37 megacycles above or below that of the first local oscillator.

Unwanted products of the last process are eliminated by means of a filter, the required single sideband being amplified by a travelling wave amplifier to a power of 1 watt and passed to the transmitting antenna.

This process is repeated at each successive repeater station until the other terminal of the link is reached. Here the SHF band from the antenna is passed to a superheterodyne receiver. This receiver, as in the case of the repeaters, uses a crystal-controlled local oscillator to produce an IF band centred on 60 megacycles. Thereafter, however, the output from the IF amplifier is frequency demodulated in a discriminator which converts the frequency modulated IF band to



A view of the waveguide circuit arrangements above a suite of cubicles at a repeater station showing the four main line feeds to and from the transmitting and receiving antennae and the waveguide switches communicating with either the main or standby equipment.

the video frequency range. This is then available at a level of 1 volt DAP in 75 ohms for passing either directly to a television transmitter or further radio link, or via a vestigial sideband system to a coaxial cable network.

To eliminate mutual interference due to multiple path effects, two radio frequencies are employed, these being used in alternate directions on alternate sections. These differ from each other by about 37 megacycles.

The waveguides and waveguide circuit elements such as attenuators, filters, hybrid-type junctions and switches carrying SHF waves have a rectangular cross-section of approximately $2" \times \frac{1}{2}"$ and are made of either brass or copper. The waveguide run from the equipment racks to the horn feed is filled with dry nitrogen maintained under slight pressure in order to preserve the inside surface of the guide from corrosion. Inside the equipment racks it would be inconvenient to fill with nitrogen and maintain a hermetic seal and the waveguide surfaces are protected by gold-plating instead of the varnish finish used for the main run.

An interesting feature of the complete link is the elaborate precautions which are taken against the possibility of interruption of the service. As already mentioned, these include duplication of the majority of the equipment with automatic change-over to standby equipment immediately on failure of the working equipment. In addition, provision is made for remote switching of equipment from control stations at Kirk

o'Shotts and Manchester, where the condition of equipment at each station is displayed continuously on a control board. A 4-wire land-line circuit interconnects all terminal and repeater stations and provides a party line speaker circuit and a two-tone VF telegraph circuit which carries the supervisory and remote control signals. The remote control desks incorporate testing and monitoring apparatus designed and manufactured by Kolster-Brandes Ltd., a subsidiary of Standard Telephone and Cables Limited.

Equipment at all stations operates normally from the local three-phase AC mains supplies; dynamic voltage regulators stabilising the output voltage to within ± 1 per cent. of nominal being provided for each phase. Standby power-supply equipment for use on failure of the public mains supply comprises a diesel-engine-alternator set which is arranged to start up and take over the load automatically within 15 seconds of a failure of the local public mains supply.

CORRECTION

We have been asked by the contributor of "A Receiving Station for the Amateur" to draw readers' attention to the following corrections: In Fig. 6, p. 208, June edition, the cathode of the 5Z4G rectifier should be connected to the junction of C4 and choke C1. The negative tags of condensers C3 and C4 should be joined together and wired to the HT negative line to the rotary contact of S3.

WORKSHOP PRACTICE

by

C. H. LAMBORN

The Bench.

Most important of all is the bench upon which the work is to be carried out. A kitchen table may be used as a start, but is unsatisfactory as everything has to be cleared away and packed when it is required for its more normal uses. Do try to find a corner where a reasonable bench can be wedged in and left permanent, such as under the window of the garage or garden tool shed. It is preferable to make the shed or garage as draught-proof as possible, as one can work more easily and comfortably when the place is warm and dry. If it has a concrete floor make a duck-board on which to stand, as concrete strikes cold to the feet and is tiring to stand on for long periods.

A duckboard is composed of a few lengths of wood, the length of the bench, say about 2in or 3in wide by an inch thick nailed to cross pieces underneath about 1in apart.

And now the bench itself. To reduce the cost, as new wood to-day is expensive and difficult to obtain, look around the wood-yards who dispose of secondhand timber of the "bomb damage" variety, as good seasoned wood can often be picked up very cheaply. The length of the bench depends on the room available but if not cramped too much for space it is advisable to have it 6 or 7ft long by about 2ft 6in wide. Choose three 10in by 1½in deals of the length required and sufficient wood with which to cross brace it. These braces should be about 9in wide by 1½in thick. Next determine the height you require and as a guide 34in is the standard recognised height. The legs must be of good sturdy timber as the bench must be rigid and free from vibration, therefore 3in by 2in or 2½in square should be selected. Longitudinal struts and cross-braces for the bottom of the legs must also be purchased, this again being of heavy section dependant upon what is available in the yard.

In building the bench use stout wood screws throughout of sufficient length to penetrate deeply into the wood, as it is essential to make it rigid. Nails are not advised, as they tend to work loose under vibration and strain. Firmly attach it to the wall when completed, as this will give added support, and see it is well lighted either by being under a window or by fixing up artificial light. Fit shelves and racks above it to house the tools and keep each tool in its own place so you always know where to find it. If your shed or garage is damp wipe over the tools now and again with an oily rag, as this will prevent rust from spoiling

them when left out of use. To improve the look of the bench, and to assist in keeping it clean, cover the top with a piece of old oil-cloth. This makes it easy to clean down as there are then no cracks in which the swarf can stick. Keep handy one or two pieces of thick wood, say 9in by 9in by 1½in, or for that matter any old pieces which may be around on which to drill, nail or screw as this will avoid spoiling your bench and filling it full of holes.

The Vice.

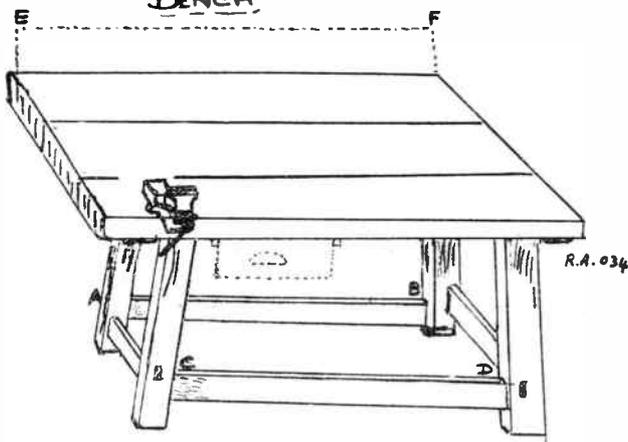
Without a vice little can be done, so this piece of equipment is really essential. As this will be in constant use it must be of a serviceable type, therefore choose one made of cast steel, as cast iron vices are a waste of money, the jaw being likely to fracture with a sudden jar especially when the weather is cold. The most suitable type to purchase is the parallel jaw quick-release pattern with 4½in jaws. The small lever close to the vice handle operates the quick adjustment, and when this lever is pressed inwards towards the handle, the sliding part becomes free, and the vice may be set to the desired opening. The sliding jaw is kept parallel by the long horizontal machined surface, which slides in the fixed casting, and the tension is provided by the buttress-type screw thread which gives great strength to the thread in the direction of closing. The jaws are faced with hardened steel grips, held in position by screws and are cross-cut to provide a good grip on the work.

For light work and to prevent marking on polished or finished surfaces, metal clamps should be inserted in between and over the jaws. These can be made quite easily from lead, zinc or brass whichever is available. When mounting the vice on the bench, if possible see it is over or near one of the legs and use nuts and bolts to secure it, not wood screws as they are not of sufficient strength to hold it. Keep the vice clean and occasionally oil the thread. Do not use the rear sliding portion as an anvil for riveting but rather keep a heavy flat piece of steel for the latter work.

When using the kitchen table obviously the vice cannot be bolted to it, as in no circumstances would this be appreciated by the permanent users of this article. Purchase a piece of wood, say about 1½in thick and of sufficient area to take the vice comfortably. Drill to fit the holes in the base and counter-sink the underside holes in the wood. Bolt

BENCH

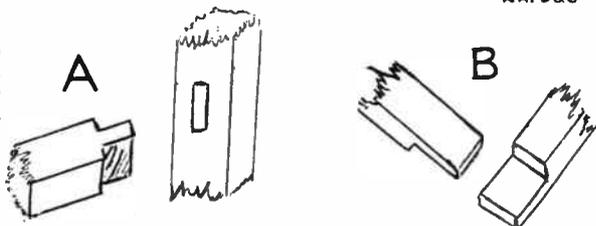
Rack to carry tools can be fitted between E-F if desired.



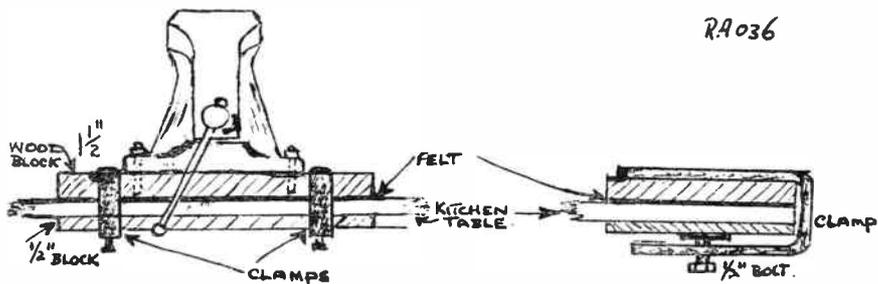
ABCD boarded and used to store parts, etc.

RA.035

Mortice and tenon joint as at A can be used for legs and braces. Halved joint, as at B is easier to make.



RA036



the vice tightly to this, so the ends of the bolts are below the wood surface.

Glue a piece of baize or felt to the underside, so as when the vice is stood on the table the surface of the latter will be protected. Take another piece of wood of the same area as that bolted to the vice, but of thinner section, say $\frac{1}{2}$ in, and then get your local garage, a smithy, to make up two strong clamps, a little wider than the combined width of the two pieces already cut, plus the width of the table. Drill the underside of each clamp and tap to take a standard $\frac{1}{2}$ in Whitworth

bolt, thread the bolt through the hole and get a $1\frac{1}{2}$ in circular plate on each bolt. The vice can then be stood on the table, the flat piece of wood placed underneath, the clamps slid over each end and tightened down with a $\frac{1}{2}$ in spanner. This makes a rigid job, protects the table, and only takes a few moments to erect or dismantle.

Costs as a guide, 1950.

4in Vice, standard pattern, 38/6.

4in Vice, with quick-release, 51/-.

AROUND THE SHACKS

MAL GEDDES,
ZE3JO



OLDER readers of this magazine will remember Mal Geddes, G2SO, who was a frequent contributor to our pages. Many will know, too, that in 1950 he went out to Rhodesia, and it is very nice to be able to present this shack write-up from which it is very apparent that Mal is now well and truly established in Salisbury and is as active on the bands as ever.

G2SO first obtained his call in 1936. His present ZE call was issued to him in June, 1950. For his first year with this call, he operated 100% CW using thirty to fifty watts only, exclusively on 14 Mc/s. During the past year he has extended his activities and since September of last year he has been on 7, 14 and 28 Mc/s, using both phone and CW. On phone the Tx runs at 20-25 watts and on CW at 30 watts. He still has a preference for CW however, and says that 95% of his QSO's are on CW.

To date he has worked 101 countries on phone or CW and 34 zones. 30 countries have been worked on phone alone. WAC

and WBE certificates have been obtained on 14 Mc/s. He requires a W phone contact to WAC on phone on 28 Mc/s.

The rig at present is a vfo-fd-fd-pa, with 807 pa. Another 807 is used as the modulator, the microphone being an Adcos crystal one. Both straight and bug keys are used.

Plenty of room allows ZE3JO to have some nice aerials. There is a 270 foot end-fed running N-S and another 132 footer E-W.

Mal says that his interests are mainly Dx on 20 metre CW, with a phone contact "now and then." He quite naturally very much enjoys a CW "natter" with any G station. His QTH is an excellent one for radio, there being five acres of land, which is situated 5,000 ft above sea-level. The QTH is ten miles from Salisbury, which is the capital of S. Rhodesia. Mal is the QSL Bureau Manager for ZE—the address of which, by the way, is Box 2377, Salisbury. After two years in the country, Mal's opinion of it is that it is just fine and he loves both the country and the climate.

BROADCAST BANDS REVIEW

by JACK FAIRS

All Times GMT.

“Nf” :—New Frequency.

EVEN though the fine summer weather is with us as we write these lines, the number of reports to hand has by no means diminished, so we'll get down to the month's Broadcast News without further delay.

EUROPE.

Spain. Many readers will, no doubt, be interested in the following “roll-call” of Spanish stations operating in the 7 Mc/s band, and we should think that most of those “Unidentified Spanish” queries could be solved by reference to this very useful list, as recently published by *World Radio Handbook*. All are associated stations of “Radio SEU” (“Sindicato Espagnol Universitario”), Madrid, at present operating on 7085 kc/s with 1 kW power.

On 7100 kc/s: “Radio Martorel,” Barcelona (100 watts); “Radio Plasencia,” Caceres (40 watts); “Radio Ribadavia,” Orense (15 watts); “Radio San Feliu,” Barcelona (60 watts); “Radio Villacarrillo,” Jaen (6 watts); “Radio Menorca,” Mahon (80 watts); and “Radio Molins de Rey,” Barcelona (20 watts).

On 7104 kc/s: “Radio Juventud de Murcia,” Murcia (200 watts).

On 7126 kc/s: “Radio Villanueva del Arzobispo,” Jaen (40 watts).

On 7140 kc/s: “Radio Merida,” Badajoz (60 watts).

On 7200 kc/s: “Radio Juventud de Sabadell,” Barcelona (60 watts); “Radio Juventud de Cadiz,” Cadiz (600 watts); “Radio Barbastro,” Huesca (80 watts); and “Radio Juventud de Albacete,” Albacete (100 watts).

On 7260 kc/s: “Radio Ayora,” Valencia (45 watts); and “Radio Juventud de Almeria,” Almeria (60 watts).

On 7281 kc/s: “Radio Almansa,” Albacete (40 watts); “Radio Union,” Barcelona (40 watts); and “Radio Granollers,” Barcelona (40 watts).

We should think it quite probable that some of the above frequencies are liable to considerable variation, eg, “Radio Juventud de Sabadell” has been noted here with good signals on 7155 and later on 7140 kc/s.

John Bell, of Stirling, Scotland, has been hearing “Radio Nacional de Espana,” Madrid, on 15635 kc/s at 1600 to close at 1630 (sometimes later), with music and a feature programme in Spanish. This outlet is beamed on South America.

Denmark. The Danish State Radio broadcasts, since June 1st, a transmission for India, Burma and Malaya on 15165 kc/s, at 1400-1500 on Tuesdays, Thursdays and Saturdays. An English talk, “Glimpses of Danish History,” can be heard at 1450. (Sidney Pearce, Berkhamsted. Hope you had some fh weather for your holidays, OM !)

Hungary. “Radio Budapest” is now on summer schedule, and uses 7220, 9833, 11910 and 15500 kc/s. (WRH.) The latter (Nf) is used in the North American Service, and is logged in New Zealand at 0400. (Arthur Cushen, Invercargill.)

Luxembourg. “Radio-Luxembourg” now uses the 15350 kc/s outlet again, reports Roy Patrick, Oldham, and at 1100-1300 has programmes in Flemish. 6090 kc/s carries the English programmes at 1800-2300 (Suns. 2330), and all the above are relays of 1442 kc/s (208 metres MW). “Sweden Calling Dx-ers” reports the following special transmissions at 1300-1315 on 15350 kc/s only: Monday to Albania, Tuesday to Bulgaria, Wednesday to Roumania, and Friday to Yugoslavia.

USA in Europe. “Radio Free Europe” now verifies reports with QSL cards, says Sidney Pearce, who has received cards for 9090, 9604 (this Tx is at Lisbon) and 5970 kc/s. A new outlet near 9717 kc/s causes bad QRM to Cairo on 9715 kc/s.

Poland. English transmissions from “Polskie Radio,” Warsaw, are now broadcast for Europe on this latest schedule, which includes four new frequencies. 1730-1800 on 7155, 9525 and 11935 kc/s (Nf); 1815-1845 on 7145, 9555 and 11740 kc/s; 1850-1920 on 5975 (Nf), 7155, 9525 and 11935 kc/s; 2045-2115 on 6115, 7175, 9600 (Nf) and 11845 kc/s (Nf); 2115-2145 on 7145, 9555 and 11740 kc/s.

AFRICA.

Egypt (Suez Canal Zone). L/Cpl. Phil. Skelton (ISWL/MD5-5344) on the staff of No. 3 Forces Broadcasting Service, has very kindly sent along details of the Medium-wave Tx at Fayid. (Tnx for the “gen,” OM, and best wishes to you all over there.)

We quote: “The Tx is a RCA ET4750 running at 7.5 kW on 1420 kc/s, and hours of transmission are 0330-0530, 1030-2100 on weekdays and 0500-2100 on Sundays. This is a new Tx and are we having trouble—hi ! The old set-up was a BC610 rather over-run at 350 watts. If (?) anyone does hear us we

would greatly appreciate reception reports; the QRA is 'The Chief Technical Officer, HQ, FBS, GHQ, MELF17.'

Angola. Ian Hardwick, of Hikutaia, Thames Line, New Zealand, sends along some very interesting Dx items this month, including mention of the "Radio Club de Benguela" being heard at 1730-1930 on both 5042 kc/s (Nf) and 9165 kc/s. The latter outlet (CR6RB) is reported by Sidney Pearce with good signals around 1800, though sometimes with severe CW QRM.

Nigeria. The current schedule of "Radio Nigeria," Lagos, runs as follows: 9650 and 7250 kc/s at 0430-0800, 1055-2215; 7285 kc/s at 1100-1300; 4990 kc/s at 1700-2000. Programmes consist of local and BBC relays. (This item comes from Fred Pilkington, Radio Op. on the *SS Benue*, via Roy Patrick.)

Kenya. The Forces Broadcasting Service, East Africa Command, Nairobi, have sent a QSL card and letter to Sidney Pearce for his report on 7265 kc/s. The schedule is given as 0300-0500, 0930-2000 on weekdays and 0400-2000 on Sundays and Public Holidays. Frequencies are 1420 kc/s (MW) and 7265 kc/s.

Azores. B. J. C. Brown, Derby, reports a strong station on 4865 kc/s from 2100 onwards, which he believes to be CSA93, Ponta Delgada. This is quite correct, OM, as mentioned in the June "Review," and they are still, at the time of writing, on this frequency. The interval signal is certainly two gong notes, and the call usually runs: "Emissora Regional dos Acores, Emissora Nacional."

Italian Somaliland. "Radio Mogadishu" (or Mogadiscio) is still audible near 7385 kc/s by Sidney Pearce (also your Scribe) from around 1645 in Somali, and Italian at 1700 after clock chimes and call "Qui e Radio Mogadiscio." They close with "Buena Sera" and a dance tune at 1800. Ian Hardwick and Sidney have both received QSL letters giving the schedule as: 1030-1115 (Italian), 1415-1515 (Somali), 1600-1700 (Somali) and 1700-1800 (Italian).

Tangier. "Radio Africa," Tangier, 7126 kc/s, have Swedish programmes sponsored by "Dux Radio" of Stockholm, at 2130-2200 on Tuesdays, with a repeat on Thursdays at the same time. A special QSL card is issued by the sponsors for these transmissions, if you send your report to Dux Radio, Stockholm 12, Sweden. (Roy Patrick and Sidney Pearce.) A later report, however (from "Radio Sweden") quotes an alteration to the above times, ie, 2.00-2030 on Tuesdays and 2030-2100 Thursdays.

ASIA.

Ceylon. The Commercial Service of "Radio Ceylon" has been logged on the 15120 kc/s

outlet, Q5 S9 at 0445. (B. J. C. Brown.) Cedric Johns, of Bournemouth, lists 11975 kc/s with the sponsored programmes from around 1500. Sidney Pearce also reports 15120 kc/s heard until 0630 in Hindu, and then English to sign-off at 0730, in parallel with 7190 kc/s; 17820 kc/s has the English Commercial Service to close at 0630.

India. The English transmission of All India Radio for South-East Asia and the Far East is a very good signal at 1330-1445 daily on 11780 kc/s; this is in parallel with 15190. (Scribe.)

Malaya. The British Far Eastern Broadcasting Service, Singapore, is contemplating using the regular 9690 kc/s channel for the BBC News relay at 1300-1315 for Australia and New Zealand, instead of 11820 kc/s ("Australian Dx-ers Calling"). Ronald Thorndike, at present in the RAF at Lyneham, Wilts., hears the BFEBs with good signals on 17755 and 15435 kc/s during the afternoon to close at 1630. John Bell mentions the latter outlet at 1530 onwards.

Taiwan (Formosa). Manfred Lepple, Stuttgart, and Sidney Pearce, both list BED4, "The Voice of Free China," at Taipei, on 11920 kc/s, with the English programmes now one hour earlier, that is, 1820-1850. Mike O'Sullivan, of West Hartlepool, wonders if Formosa counts as a separate country to the Chinese mainland. Well, OM, under the present political situation, and as two governments are in power, these two count as separate countries for Honour Roll scoring.

Vietnam. "Radio France-Asie," Saigon, announcing as "The Voice of France in the Far East," has good signals from 2230 on 9754 kc/s. News in English and records are heard until 2250, when they announce: "We return to the air at 7.30 a.m. Saigon time (2330 GMT) with News in English on 7230 kc/s." After the "Knightsbridge March" and French announcements, 9754 kc/s signs-off. (Pearce.)

PACIFIC.

Fiji. Stations VRO6 on 6005 kc/s and ZBJ on 17860 kc/s, located at Suva, are reported by "Sweden Calling Dx-ers" to have been heard around 0400. "Radio Australia" also mentions Suva testing around 0430 on the announced frequency of 6006 kc/s, and again at 0310-0400. VRO6 (actually a Posts and Telegraphs Tx) has been used during the recent Yacht Races, relaying, together with ZBJ, the programmes of ZJV on Medium wave. ("New Zealand Dx Times.")

Australia. Transmissions to South and South-East Asia from "Radio Australia" are now as follows: 0828-1100 on VLC15 (15320 kc/s), 0845-1400 on VLG11 (11850

kc/s), 1000-1145 on VLA11 (11810 kc/s), 1115-1615 on VLC7 (7220 kc/s—Nf), and 1400-1500 on VLB9 (9580 kc/s). Reception reports giving full details of signal strength and QRM, if any, are particularly required by "Radio Australia" on the new 7 Mc/s transmissions. (Mike O'Sullivan and "Radio Australia".)

B. J. C. Brown lists the North American Service on 15200 kc/s (VLA15—Scribe) at 0530-0545 with "Australian Dx-ers Calling" on Sundays.

New Caledonia. "Radio Noumea, La Voix de la France dans le Pacifique," is still on 6035 kc/s, and is heard in New Zealand opening at 0700 with a French programme to 1030. (Ian Hardwick.)

Tahiti. "Radio Tahiti," Papeete, has been logged on the old frequency of 6980 kc/s signing-off after a French transmission; Arthur Cushen, who forwards this item, says it is a better signal than the 6135 kc/s outlet, but suffers from severe CW QRM.

Guam. A 1 kW transmitter belonging to "Radio Free Asia" is now operating on the island of Guam at 1200-1410, and using 9490 kc/s. ("Sweden Calling Dx-ers.") A second Tx on Guam is an Armed Forces Radio Service station on 4590 kc/s, and reported heard in New Zealand with weak signals and severe CW QRM at 1900.

NORTH AND CENTRAL AMERICA.

Canada. A hitherto inactive frequency belonging to "Radio Canada," CKEX on 11900 kc/s, is now used in place of CKNC (17820 kc/s) for the programmes to Canadian Forces in Europe. This alteration applies on Sundays only at 1220-1405, and is in parallel with the existing outlet, CKLX (15090 kc/s). We logged CKEX during the first transmission, and signals were decidedly not up to the usual CBC standard; it is understood that it may be replaced by CHOL (11720 kc/s) at a later date.

United States. Chas. Valentine, of Chapel Hill, North Carolina, sends along some press cuttings on the new high-powered "Voice of America" transmitters. Construction of two stations was commenced last January, one at Dungeness, Washington State, and the other in the eastern part of North Carolina. The latter, due to antennae construction, is expected to "produce in excess of 8,000,000 watts in broadcasting world-wide VOA programmes..." (Anyone like to buy a nice Preselector?—hi.)

The VOA floating Relay Station, *SS Courier*, is a 5,800-ton converted Navy cargo vessel. One medium-wave Tx of 150 kW power, and two Short-wave Tx's of 35 kW each, are located in the hold, all being mounted on a platform of eight-inch thick concrete, which, in turn, "floats" on cork

slabs to absorb vibration. "Voice of America" programmes are usually relayed from temporary shore locations where foreign governments assign a frequency and a site for a temporary land installation. Should the occasion demand, however, the *Courier* may relay programmes from the high seas, lifting its antenna via a captive helium-inflated barrage balloon. (VOA Schedule, July-August.)

Frank Grist, Rhymney, Mon., reports fine reception of KW1D, San Francisco, on 9570 kc/s, around 0415 with a broadcast from Los Angeles Stadium. (This would be KW1D2 carrying the AFRS to Alaska and the Aleutians. Scribe.)

WLWO5 Bethany, Ohio, is now on 15165 kc/s (Nf) at 1445-2245, beamed to North Africa, and on the same service, WLWO7 Cincinnati, Ohio, is using 15190 kc/s (Nf) at 2015-2230. (Scribe.)

Mexico. Station XEQQ, "Radio Panamericana," Mexico City, 9680 kc/s, has been noted with dance music to close at 0600. (Ian Hardwick.)

"La Voz de Mexico," Mexico City, has opened a new Tx on 6065 kc/s (call-letters XEXE), relaying NEX on MW and XEXE on 11900 kc/s, says Arthur Cushen; Arthur also mentions 15205 kc/s in parallel, yet this frequency verifies reports as NESC of "Difusoras XEMC-EXSC." (Is this the same network?) 15205 kc/s was logged here with Q3-4 S5-6 signals at 2215 onwards. (Scribe.)

Cuba. John Whittington, Worthing, reports a Cuban station near 6450 kc/s around 0400 with a very rapid call sounding like "COCY," but his list gives "COHL." WRH lists COCY "RHC Cadena Azul" on this frequency, OM, relaying CHMI and CMCY both on MW, while Ian Hardwick says they announce as "on the air from 1100 to 0530 on CMCY, 590 kc/s MW, and COCY on 6450 and 11740 kc/s." Ian hears them in New Zealand with News in Spanish at 0500 and sign-off with English announcements at 0530.

Guatemala. Arthur Cushen sends along some interesting details of the International Missionary Station, TGNA, which he has received in a QSL from the Director, Mr. Harold Van Brookhaven, for reception of TGNC, 11850 kc/s. They are using a dual-wave 5 kW transmitter with "quad" antenna, the new 31-metre one going into service last May. A new dipole for the 49-mb is to be installed, then a new 25-mb rotary "quad"; later, 15 and 17 Mc/s frequencies will be put into operation. They also plan to move the MW frequency from 1180 to either 540 or 580 kc/s, depending on field strength tests. TGNA is located on the south-west side of Guatemala City, and they

have over 35,000 feet of buried bare copper wire for an "earth"!

Panama. Station HOJA, "Radio Provincias," Chitre, 9645 kc/s, has dance music followed by news in Spanish at 0400 to sign-off with English announcements at 0405. (Hardwick.)

SOUTH AMERICA.

Ecuador. Six new low-powered Ecuadorean stations are reported by *World Radio Handbook* this month, and are presented herewith.

HCNE1, "Radio Nacional Espejo," Quito (300 watts) on 4470 kc/s.

HCOF4, "La Voz de Chone," Chone (200 watts) on 4780 kc/s.

HCRT6, "Radio Cultural Religiosa," Ambato (250 watts) on 4885 kc/s.

HCRQ2, "La Voz del Tropico," Quevedo (250 watts) on 6050 kc/s.

HCPT5, "La Voz del Perpetuo Socorro," Cuenca (250 watts) on 6095 kc/s.

HCDC4, "Radio Cenit," Manta (250 watts) on 7300 kc/s.

Frank Grist (also your Scribe) heard HCJB "La Voz de los Andes," Quito, announce over 15115 kc/s that they were due to abandon their 12455 kc/s outlet, and on July 1st would move down to the 11 Mc/s band on to 11915 kc/s (Nf). The 9745 kc/s channel has been heard by B. J. B. Brown with Q5 S9 signals and the "Radio Bible Class" at 0300.

Edward Lambert, of Camrose, Alberta, has been listening to HCA1, "La Voz de la Democracia," Quito, with Q5 S9 signals to sign-off at varying times between 0430 and 0530; the frequency is near 6205 kc/s and not 6060. Arthur Cushen confirms this, quoting 6210 kc/s to close at 0450.

HCAO5, "La Voz de Tomebamba," Cuenca, 4200 kc/s: heard to sign-off at 0630 Sundays. (NZ Dx Times.)

Uruguay. CXA19, "Radio El Espectador," Montevideo, 11835 kc/s: Q4 S7 from 2100 onwards. (Manfred Lepple.)

Brazil. PRN9 "Radiodifusora do Departamento Federal de Segurança Publica," Rio de Janeiro, 9295 kc/s have sent a QSL letter (also a flag souvenir!) to Sidney Pearce. They have a Spanish programme, "Alo America," at 1830-1900, other transmissions in Portuguese.

PRK9, "Radio Inconfidencia," Belo Horizonte, 15185 kc/s: Q4 S5-7 (with slight QRM from GSO) announcing at 2200 as "Emissoras da Radio Inconfidencia de Minas Gerais, de Belo Horizonte . . ." and followed by a typical Brazilian "fiesta"-type of programme! (Scribe.)

The transmission times of ZYK2, "Radio Jornal do Comercio," at Recife, on 11825 kc/s, are 2100 to 0220, according to their latest QSL received by Manfred Lepple.

English programmes, "Brazil Calling," are on this outlet at 0035-0100 weekdays, and 2105-2130 Sundays. Phil. Allwood also has their QSL, and adds that ZYK3 (9565 kc/s) carries this same transmission at 0105-0130 (2125-2200 Suns.).

PRB23, "Radio Record," Sao Paulo, 15135 kc/s, was Q3 S4-6 with QRM from WRCA (15130) at 2215. (Scribe.) PRB21, on 6055 kc/s, is heard after 2300, in parallel with PRB22, 9505 kc/s. (Pearce.)

B. J. C. Brown reports ZYI21, "Radio Poti," at Natal, 4935 kc/s, often heard from around 2200 with Q3-5 S7-9 signals plus strong CQ QRM at times. This reader says he has been concentrating on the 60-metre band of late, and finds it very interesting, especially as there is no jamming and no propaganda—we certainly agree with you, OM!

Peru. Station OAX4C, "La Voz del Primer Puerto del Peru," at Callao, 6564 kc/s, has been heard until sign-off at 0500. (Cushen.)

Colombia. HJKJ, "Emisora Nueva Granada," Bogota, on 6160 kc/s, is reported by John Whittington with Q5 S8 signals at 0400 on his R1224A. John says that a spot of toothache was the only reason for him listening at this unearthly hour! Arthur Cushen tells us that Colombians are fine signals down there in Invercargill, and included in an impressive list of them is also HJKJ, heard to close at 0430, and using a cuckoo identification signal.

Venezuela. YVQO, "Ondas Portenas," at Puerto la Cruz, 3380 kc/s, signs on at 1030 with the "Stars and Stripes"; also YVMW, "Ondas del Caribe," Punto Fijo, on 4770 kc/s, opens at this same time. (Cushen.) YVNB, "Ondas de las Medanos," Coro, 4820 kc/s, verifies reports by airmail letters from the Director, Snr. Cruz Roca; QRA is Apartado 15, Coro. (NZ Dx Times.)

CONCLUSION.

Here, again, is the Honour Roll of countries verified (SW Broadcast only), the listing being up-to-date at the time of going to press. Both Arthur Cushen and Sidney Pearce have slipped in with another one—namely, Mogadishu, Italian Somaliland. If you already hold a position, it is not necessary to repeat the full list, only new countries (and the stations QSL'd) need be quoted, but don't forget to include also the total number of countries claimed.

The Editor and your Scribe thank all readers for their letters, we make due acknowledgments to all contributors to these notes, and regret that space limitations do not allow the inclusion of more items. Your Broadcast News is always welcome, and should be sent to: J. Fairs, 2a, Durham Road, Redcar, Yorkshire, England, to arrive not later than the 26th of the month. 73, Good Luck, and Good Dx till next month.

ON THE HIGHER FREQUENCIES

Monthly Notes and News

Conducted by H. E. SMITH, G6UH

Full VHF Contest Results.

We should like to apologise to everyone for the seemingly long delay in publishing the results of our VHF Contest, but there just wasn't time to complete the assessment in time for the July issue.

G3WW, Wimbington, Cambs., gains first place with a total mileage of 7,012, with a total aerial height ASL of 76 ft.

We congratulate G3WW on his performance and have pleasure in awarding him one EMI Trimming Tool Kit and one year's free subscription to the Radio Amateur.

G5YV, Leeds, Yorks., obtains second place with a total mileage of 11,178, with an aerial height ASL of 655 ft. G5YV's mileage is simply staggering, even if one accepts the fact that his location is a good one, and we should not be surprised if G5YV has broken a record and made the highest total mileage score of any VHF Contest to date. The award to G5YV is one EMI Trimming Tool Kit.

G6NB, of Aylesbury, and G8SB, of Manchester, share third place. It was decided to adopt this course as their two merit figures came so close together that it would have been unfair to have penalised either station. So, with G6NB's total mileage of 8,391, with an aerial height of 270 ft ASL, and G8SB's total mileage of 3,168, with an aerial height of only 32 ft ASL, both stations are awarded one year's free subscription to the "Radio Amateur."

GW2ADZ, Llanymynech, N. Wales, comes fourth with a total mileage of 6,718, with an aerial height of 257 ft ASL, and is awarded the EMI Loudspeaker Unit.

As the third place was shared by two stations, it was decided to cancel the fifth award, due mainly to the comparative low number of entries received.

The Listener response was not up to expectations, only four actual Contest entries being received.

J. E. Harman, of Eastbourne, gained first place with a total mileage heard of 4,865 and a total aerial height of 185 ft ASL, and is awarded one year's free subscription to this journal.

R. Russell, of Southampton, comes second with a total of 2,265 miles and an aerial height of 75 ft. He is awarded six months' free subscription.

We should like to have made an award to **A. W. Blandford, of Mitcham**, who came very close with a total of 1,949 miles with an aerial height of only 33 ft ASL, but owing to the low number of entries we were unable to do

so. We do, however, congratulate this entrant, also **R. L. Bastin, of Coventry**, who returned an entry of 2,435 miles with an aerial height of 200 ft ASL.

The total activity rate for the period of the Contest was 244 stations and all except two were passing serial numbers in support of the Contest. These stations are detailed below, and we thank them all for co-operating so readily with those who were actively entering the Contest. As stated earlier, the Contest entries received were lower than last year, but to counterbalance this many useful and fully detailed check logs were received, thus providing much useful data on the local conditions under which these stations operate.

Check logs were received from: G2YB, G2MQ, G2JU, G2KF, G3MI, G3EHY, G3EDD, G5AS, G5LN and EI2W.

Here are the actual entries in order of total miles worked with heights above sea-level:—

Station	Miles worked	Aerial height ASL
G5YV, Leeds	11,178	655ft
G6NB, Aylesbury	8,391	270ft
G3WW, Cambs.	7,012	76ft
GW2ADZ, N. Wales	6,718	257ft
G2FTS, Sussex	5,689	213ft
G2DLJ/A, Derby	4,923	167ft
G8SB, Manchester	3,168	32ft
G2HDZ, Pinner	3,147	195ft
G2OI, Eccles	3,079	94ft
G2HGR, Bolton	2,865	450ft
G3HBW, Wembley	2,565	135ft
G2FCL, Shipley	2,516	670ft
G5DS, Surbiton	2,377	133ft
G2FNW, Melton Mowbray	2,336	550ft
G3CC, Hull	1,834	105ft
G3GBO, Denham	1,569	127ft
G5MR, Hythe	1,544	210ft
G3HXS, Tring	1,494	305ft
G6XX, Nr. Goole	1,405	65ft
G6UH, Hayes	1,280	120ft
G3AJP, Nr. Gt. Yarmouth	960	34ft
G3BJQ, Rugby	957	360ft
G5ML, Coventry	609	140ft
G3HZK, Hayes	467	120ft
G3AJS, Forest Gate	135	59ft

It is only fair to state that many of the stations listed operated for only a short period of the Contest, but sportingly sent in an entry. G3AJP had a burn-out on the Saturday night and was unable to continue. (Your conductor makes no apology for the low

mileage worked in the Contest, but of some 60 stations heard and called only 28 were worked. We did have a little trouble with the driver stage so perhaps this had something to do with it.)

Activity Rate.

Although the Contest may appear to have been disappointing from the point of view of entries, there is no doubt that with the aid of the good conditions which prevailed, the Contest was successful in its main aim, i.e. the promotion of activity.

The following list of stations active, compiled from logs received, is evidence of the high rate of activity which prevailed.

G2: AJ, AHP, ADR, ATK, ALN, ALL, AIW, AVR, ANT, ASR, ANC, AOK/A, BCB, BRR, BN, BMI, BMZ, COP, CPT, DTO, DLJ/A, DKH/P, DSW, FNV, FQP, FKZ, FCL, FTS, FTL, FJR, FZU, FCV, HDZ, HGK, HCJ/P, HCG, HIF, HLF, HOP, IQ, JU, KF, MV, MQ, NH, OI, PU, UQ, UN, VO, WJ, WS, XC, XV, XU, XS, YB.

G3: AJP, ABH, APY, AMM, AJS, AOO, AYT, ABA, AUS, ANB, AGS, AGA, BPJ, BY, BJO, BLP, BOC, BGR, BWS, BUN, BHS, BNC, CFK, CC, CMF, CVK, CJY, CYY, CGE, DMU, DVQ, DA, DJQ, DUP, DIV, DKH/P, DO, EHY, EDD, EGE, EYV, ELT, ENS, FZL, FD, FAN, FGT, FXG, FEX, FFV, FIH, FAR, FP, FFX, GDR, GHO, GBO, GSO, GUD, GCX, GHI, GAD, GMX, GGJ, GCK, GOP, GAV, HWJ, HBW, HXS, HUV, HOP, HAB, HCK, HVO, HZR, HII, HXO, HSC, HZF, HCU, HWC, MI, MY/P, NL, VM, WW.

G4: CC, CI, FB, GR, HT, PV, RK, SA.

G5: AS, BM, BD, CP, CD, DS, DF, GX, HB, HN, IX, JU, LC, LN, LK, LQ, MA/P, ML, MR, MP, RO, RP, RD, TP, UD, UM, UF, WP, YV.

G6: CI, JP, JD, KB, LR, LC, LI, NB, PR, PJ, QN, QT, TA, UH, VX, XM, XX, YU, YP, YO.

G8: AO/A, DM, DA, GL, HK, IC, IL, KL, MZ, ML, NM, OO, OU, QY, SB, SK, VZ.

GW: 2ADZ, 3FYR, 3ENY, 3BOC/P.

GM: 3ENJ, GC2CNC, EI2W.

F3: CA, LR.

F8: AA, BY, NH, MX, UX, UV, NW.

F9: DI, MB, MX.

ON: 4HN, HU, BZ.

PAΦ: NL, FB, EO.

DL: 3QA.

That is the list, and a very satisfying one it is. If the conditions and activity rate which existed during the week-end of May 24th were maintained for only a few months of the year, we should see far more interest in VHF operation, and if only a few more had shown sufficient interest by sending in a log with station details we should have been

able to get down still further to the question of what makes "things tick" on VHF. The data obtained over three years of these "little Contests" (we might call them "sprints") has been found very useful however, and in the near future we shall publish our findings in full. We are aware that in spite of being compiled from actual results, there will still be critics against our findings on this matter, so we should like to anticipate such criticism by saying that some of the data compiled is unfavourable to our own pet theories. If, perchance, the data reveals that height above sea-level has no prime bearing on VHF Dx (we say "if"), we shall publish it, as it is of no use compiling data unless it is displayed in an unbiased and "uncooked" state.

Contest Comments.

Regarding Contests in general, EI2W says: "I do not think EI, GI or GM stations will be able to operate on equal terms with London stations unless some form of handicapping is carried out. I do think points should be awarded for 25-mile units and a reduction for each 100 ft above sea-level over 250 ft (this would penalise my own station, but it is a fair system). On the unit system a QSO of 25 miles or less would get, say, 1 point, and for each 25 miles a further point, thus a QSO of 250 miles would receive 10 points. On this system a London station would have to work 10 short distance contacts for each 250-mile Dx contact by an Irish or Scottish station."

(Yes, OM, but what about those London area stations who are so well situated that they can work 10 250-mile Dx stations for every one such contact made by an Irish or Scottish station?)

EI2W is, however, quite correct in his view that stations in remote areas cannot compete with London stations while the present system of points scoring which most Contest organisers insist on using, is still used.

G3HXS: "Conditions as a whole were very good, and it was very nice to hear the band so full after the 'empty band' of the last few months."

G3HZK: "Not enough phone stations searched for CW stations, thus penalising those who were not able to use phone."

G3WW: "I greatly enjoyed the Contest and express my thanks to you for again organising it."

G3BJX: "I hope that the number of entries will justify running the Contest again next year." (We are just wondering, OM.)

G2HDZ: "I thoroughly enjoyed the event and congratulate you on its evident success."

G2OI: "The only station I could find capable of a QSO on 70 cm/s was GW2ADZ. Nothing was heard of some of the well-known

stations such as G2XC, G3BW, CXD, ATZ, ABA, G4HT, G5RW, JU, UF, BY, G6XM, LK, etc." (Several of these stations were on during the Contest period, if only for a short while.)

GW2ADZ : "The Saturday evening was good up to 250 miles but several stations over 200 miles eluded me, G3AJP, G3ANB and G5MR, to name a few. Several stations were worked after not being worked for several years, G8IC (not since 5-metre days), G3CFK (2 years) and G6UH (2½ years). All was very friendly indeed and a short chat was possible in many cases. I certainly did enjoy it."

Ray Bastin, Coventry : "Altogether I must say I enjoyed the Contest much better this year than last, when I was in a poor QTH and suffered from continuous car QRM. You certainly picked a FB week-end for the Contest and it was quite an effort to stay in the shack instead of outside in a deck chair."

A. W. Blandford, Mitcham : "What a difference in reception conditions to last year ! and how I wished I could read CW. The Contest certainly did create some activity, and if only this would carry on."

Many more comments were received but space does not permit including them all. One final one from G5DS says : "A good Contest but would have been better if more stations had been aware that a Contest was on and had details of the rules and promoters."

The Contest was advertised several months previously in this journal, it was mentioned in the Bulletin, and your conductor personally sent details of it to a great number of clubs up and down the country. We do not think that many stations were unaware that the Contest was on, but we *do* think that our rules do not suit a great number of stations, especially those situated in good locations. Surely even a "little Contest" like ours cannot run for three successive years without most VHF operators knowing something about it? It is strange, too, that this apparent lack of knowledge of the Contest seemed to be confined to stations in the London area. Anyway, we did our best.

Whether or not we shall be holding another Contest next year is yet to be decided, but we do most sincerely thank all those who participated, with a special thank-you to those who returned a log. The special awards to the winners will have been despatched by the time this appears, and we hope they will be found useful.

We are glad to note that other Contest organisers are following our pioneer efforts in the direction of awarding something useful in the way of prizes to the leading stations in VHF Contests, and may we suggest that our National Society could, perhaps, set aside

a pound or two for the purchase of sundry small items of gear, to be awarded as prizes in *all* Contests. This would include a Contest in which *listeners* could take part. More VHF listeners are very badly needed and some form of encouragement is obviously necessary. We do everything we can in these columns to encourage the listener and the beginner, and judging from our postbag our efforts are meeting with some success. In a recent letter EI2W says : "We have still a lot to learn about 144 Mc/s propagation, and more intensive study of weather and propagation would help the VHF operator. Listeners could help a lot in this direction." Our particular circle of listeners is small but keen, and we should like to see something like 100 or more keen listeners spread over the country, each keeping a complete record of local weather conditions and temperature, together with his log, with sessions of listening regularly carried out for two or three nights each week. Such data would be of invaluable assistance in compiling some basic facts regarding VHF operation. So there you are, listeners, what about it?

Station Reports.

EI2W, Dublin, sends his usual comprehensive report which again points to a maximum of activity on Harry's part. As the report covering the period May 18th to June 5th did not arrive in time for our last issue, we will include the most interesting portions in with EI2W's report No. 6, covering the period June 6th to July 5th. New stations worked during the first period included : G3ABH (Poole), G2DCI (Liverpool), G3AYT, HWC, CSC, AOO, GUU (Lytham), G5JU and GM6KH. GI3BIL was also worked for a first contact. Towards the end of June conditions were good for Scottish stations, and GM3DIQ with his new 20-element "Signal Squirter" was an outstanding signal. GM3BDA was also booming in on his new 16-element. EI2W says : "that pleasant Scots voice of Walter is well-known in both EI and GI."

From the 10th of June onwards things looked up with a vengeance, and we quote from EI2W's log : "On the evening of the 10th June things opened up well. New stations worked were, G2CBR, G2HOP and G3BPD. The 11th and 12th brought G8DA and G2HCG. Conditions fell off a little until the 23rd, and on the 23rd and 24th the following stations were worked for the first time : G2UQ, FJR, G3AUS, IAI, DUP, G4MW and G6YU. The best stations for consistency of signals are G5YV, G3BLP, G2HGR, G2HIF, and, of course, G3EHY, who is workable almost every night at S9 and seldom below S7/8. G4CI and G3ABA were worked for the first time on the 25th

of June, and from the 25th until the end of the month first contacts were made with G2FRE, FQP, G3CXD, GFT, G5BD, ML, G8IC, VZ. On the 28th June G2AJ was 30/40 db over S9 at 2300 hours.

July opened with more new contacts, G2JJ and G6UJ. EI2W has now worked 124 stations and qualifies for VHFCC. Counties worked total 45.

In the European VHF Contest weekend, 5th and 6th of July, a fairly good score was put up from this difficult QTH with 17 stations worked, but Sunday, the 6th, proved a disappointment as a thunderstorm during the morning and poor conditions during the afternoon put paid to any further progress. During the Sunday storm only G3BLP was heard on the band, his signals being R5 and S7.

EI2W has received several listener reports and has replied to them all. A pleasant surprise was a letter from Ray Bastin, a well-known listener and contributor to these columns, with a wealth of detail and useful information. Thanks also, Ray, for the list of frequencies (acknowledged by letter). Further listener reports will be welcomed and all will be acknowledged. G8IC is to be congratulated on his sensible method of calling which eliminates any doubt as to his identity. "G8IC calling EI2W" repeated for about half a minute is the best possible call, as even if QSB brings the signal down, the call of both stations is bound to be recognised on the rising signal." (Thanks, Harry, for yet another extremely interesting report.)

G3WW, Wimblington, Cambs., has made a number of new contacts over the past few weeks, GM3BDA for his first Scottish QSO, G8AO/MM (off Southwold), G3IIT, a new Cambridge station, G3BPD, 12 miles SE of Doncaster, in Notts., G3IEX, Henlow, Beds., and several others. Conditions were good between the 23rd and 27th of June when several good Dx stations were worked including G3AGA and G2BAT, both of Falmouth, EI2W, G3CSC, G2FO, GW3ENY (for a new county), F8AA, G2FCV, G3CNF and G2DKH/P. On the 27th June, G3GGJ had SM5ABC in the shack and his interesting description of 144 Mc/s activity in Sweden was recorded by G3WW. On that same evening the following stations were heard by G3WW: G2FTS, FKZ, UQ, FNL, BRR, G3GMX, CAD, EDD, GDR, IIT, DVK, BW, BLP, ABA, G4PV, G5UM and G6RH. With the change of weather on July 1st, nothing was heard north of a line from Newcastle-under-Lyme to Sutton Bridge, Lincs. (some 13 miles north of G3WW). However, the Norfolk, Suffolk and Essex stations were being well heard, including G3FIJ and G3ANB (both new), G4OT,

G2BEB, G2WJ. The Continent was represented by PE-I-PL, F8JR, ON4BZ and HN. G3FAN was 57/8-59, and almost the only loud signal from the South. From the West Midlands, G2FXK, Staffs., a new fugitive from 80 metres, G3ABA, G5JU, G3COP and 3BJQ were all being heard. July 2nd produced signals from the South and South-West, with G3BHS, G3HVO, G3DIV, G2UN, G6RH and several more to make up a total of 12 counties worked on this evening. On the 3rd July, G2MV was heard calling CQ at 0732 hrs., and was worked. (Do these chaps ever sleep!)

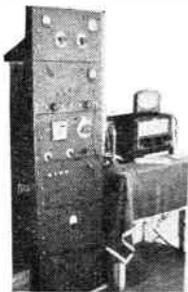
(G3WW is a busy man, apart from a purely business angle, being the Regional Rep. (RSGB) among other activities, and it says something for his keenness in VHF operation when he is able to return a report like the above. We only wish there were more like him, and that we ourselves could find the energy that he seems to have an abundance of!)

GW2ADZ (Llanymynech) found June to be quite good up to an average of 250 miles, but has nothing outstanding to report. On the 30th a QSO was had with F9JY who was difficult to raise because he repeatedly went back to nearer G stations. F9JY was 579 on 144.400 Mc/s. G2BAT (Falmouth) has been heard well but so far has not been worked. F8GH (360 miles) has been frequently heard but cannot be raised, perhaps because nearer G stations are stronger. On 70 cm/s, much time has been spent in calling CQ and Bill wonders whether many of the stations who claim to be active on this band are really active. 26 contacts were made on 70 cm/s during June. Stations worked include G2JT, G2FKZ, OI, G3EHY, FZL, APY/P and G8QY/P. GW2ADZ says that it is necessary to have a first-class crystal diode for efficient operation on this band. A valve as a mixer is hardly good enough, and while it works the better Dx always comes in on the Crystal type receiver. No RF stage is necessary and it is, in fact, better to use a large beam and obtain positive gain that way. The London schedule still holds good at 2000 till 2020 for anyone interested. G5GX on 435.240 Mc/s beams towards GW2ADZ each night at 2100 BST for ten minutes.

Well, that seems to be all for this month. If any reports have been left out, we do apologise, but we had to get the Contest results in this month. Don't forget that the date for reports is the 6th of the month, direct to your conductor, please. By the way, we nearly forgot, G5TZ, Newport, I.O.W., is coming back to the band. We have that information straight from the Jumbo's mouth. Hi.

Cheerio, and good hunting everybody.

G6UH.



AMATEUR BANDS

COMMENTARY

Conducted by **STANLEY HERBERT, G3ATU.**

BACK to normal" would seem as good a way as any of describing conditions in general at the moment. After last month's high-jinks and Dx junketings, our long-suffering Twenty seems to have retired hurt. Being the band it is, though, it will probably burst into life again any time at all and throw up another load of exotic stuff.

Let's hope we're not all on holiday just then.

Talking of exotic stuff, we've heard nothing yet of activity from any of the "Journey To A Rare Country" boys. The EA8AW gang may well be battling it out from Rio-de-Oro, about the time you read this, as also may WΦELA from Sarawak/Brunei. When these two do open up, there should be no difficulty at all in determining at least their approximate frequencies, if you get what we mean!

As far as we know, there has'nt been a squeak so far out of 4WIMY. Let's hope the awful hammering Dick took at FL8MY has'nt given him second thoughts on the subject of future jaunts of a like nature.

Our latest info indicates approaching activity in—wait for it—St. Helena. Interesting?—yes, yes! Read on, we'll have more to say on the subject in due course.

The Month's Doings. 21 Mc/s.

No need to cast around for a starting point this time. Our new band has it. Came July 1st and we were all set to go, but for a day or so it didn't look as if we were going anywhere at all, except back to Twenty; then, slowly but surely, Fourteen started to show signs of doing its stuff. In the last week or so, there have been several interesting openings as a result of which we now have a fair idea of the probable future behaviour of the band. As was to be expected, the openings have been very similar to those on Ten a couple of years ago, though European short skip is more in evidence at the moment. The general noise level seems to be quite low, certainly much lower than it is on Twenty, with the result that even weak signals are easy to copy. However, we have noticed some very pronounced fading at certain times—similar to what was known, on Ten, as the

"Malta Effect"—one minute a station is coming through at good strength, next moment he's vanished altogether.

Commercial QRM is still very much in evidence and for two days recently one particular offender must have been the cause of many rude words. He started bad key-clicks on his fundamental, accompanied by a shower of T2 parasitics all through the band!

To give some idea of the present state of affairs, here's what we've been hearing. So far, nothing has been heard much before noon, when ZS, ZE and VQ4 start to come through, often being consistent signals until early evening. VQ4AQ, using a "G-directed" Vee Beam, has been S8 to 9 for hours at a stretch. Afternoon has produced Middle East stuff, ZC4RX, 4XP, 4RS, JY1OG, 4X4 and SU1XZ all putting in good signals. In the evenings we have KP4CC (T8C), MI3, ZB1, OQ5, PY, HK3CK, plus short skip from 9S4, YU, EA, EI, OE, ON, OZ, etc., while one evening saw the band full of S9 signals from EI, GI, GC, GM, GW and G! Just like Eighty, in fact.

A point for the transmitting boys interested in swelling their countries score on the band. Get in now and work as much short skip as you can. The time is not far distant when European stations will have worked their "quota" of G's. They'll all be calling "CQ Dx"; there is one way out, though—wait until the bloke you're after has worked a Dx station and nip in smartly, after he's signed but before he has time to churn out another "CQ." Never know, you may be lucky!

We have very few Dx reports for the band this month, due to its poor performance before July. Short skip was about all coming through, most of the time.

P. M. Crawford caught a good Trans-Atlantic opening and heard W9OPA, 9RPI, 9ROQ, W5ECT, W3, T18PE plus EK1 on CW, with OD5AB on A3.

N. C. Smith heard ZS6 and ZD9 being called and pulled in ZC4, ZE, VQ4, KP4, plus a goodly number of Europeans.

D. L. McLean comments on the lack of activity except at weekends. Phone was heard from 5A2TO, OQ5 and PY.

Final word on the band. If your VFO isn't all it might be, Fourteen will soon demonstrate the fact. We've noticed drift on quite a number of stations. One or two, in fact, have quite a gallop, which makes life a little difficult for the fellow they're working! **The Month on Twenty.**

Despite the quiet state of affairs already referred to, Twenty still commands more attention than the rest of the bands put together.

From **D. E. Lord (MELF11)**, now using a battery-operated O-V-1, comes news of CW activity from CM9AA/M, CSIWB, FQ8AI, HR1SO, JA2OM, VK2HK, VP4AA, YK1AE, ZL2BE and much lesser Dx.

D.E.L. solves the mystery of the CS1 calls which have been causing a certain amount of head-scratching of late. They are, he tells us, Army Signals, operating in the Canal Zone. CSIWB is at Port Said.

D. L. McLean (Yeovil), submitting his usual comprehensive Phone list, comments on the poor conditions in the early mornings, when only a few weak W6's, KH6's and KL7's have been heard. The best time has been from 1700 to 2100. Mac gives some freqs and times for Dx such as AP2L (14242-1920), CR6AJ (14270-1830), EL9A, KR6DJ (14280-1700), KT1JS/Airborne, KV4BB (14258-0630), M1B, VP5AK (14200-1810), VQ3CP (14200-1900), W8MY/P, 5A2TV/Airborne (over Greece), ZP5DC (14267-2115).

The Yeovil Amateur Radio Club station, G3CMH, runs an 807 PA into a 274 ft VS1AA, sixty feet high. With this impressive sky-wire, they are up to 13Z, 55C and during June, worked on CW, SU3JQ (ex-ZE3JQ, Xtal on 14032), W and VE. Phone QSO's were with HZ1TA, PY, TA, SP9KKA, Y13BZL, ZC4RX and ZP5DC (ex-ZP7AW, 14267-2100).

KC6QL was heard and called at 2100 (we've called him ourselves on sundry occasions around 1400, also with conspicuous lack of success!), as was ZD1SS, whose CQ brought all Europe on to the channel. G3CMH is active also on 21 Mc/s, some evenings, and has worked OQ5BQ and ZC4DT.

R. Balister (Croxley Green), has not had much time for listening, but snagged on A3, JY1OG, ZC4RX, ZB2A and LX1DC. CW heard includes OX3FP, LU9CI, LZ1KAB, ZS5KT and CR8AB. R.B. wonders about the goodness or otherwise of the latter. Yes, indeed, if he's good, he's really good, is that one.

N. C. Smith (Petts Wood) has been on holiday, but still manages to send in some formidable Dx. Phone such as HC1JW, H16EC (who may be heard around mid-day, as well as in the late evening), HP, HR, KH6, KJ6AW (0735), KL7, OA4BC, PJ2AA, VQ2DT, VQ5DQ, VS1DQ and

ZS6Z, was heard in addition to more usual Dx. On CW, Norman unearthed CE5AW (1830), F18AB (1630), F08AB, FQ8AK, KZ5BC, TI2TG, VE5, VE8DE, YK1AH, ZE and ZD2JAB. He awaits the reappearance of ZC2MAC, whose call was heard among W6 QRM, May 16th. If the note was T7, that would be 'MAC. He has quite a ripple on his QRO rig, though he has a flea-popper outfit which sounds T9.

G5XG (Torquay) made a QSO of unusual interest with a three-way phone contact—'5XG, KL7ADR and KL7AGP/MM, whose position was 88-31N, 141-30W, which is just about as far North as is possible. From that latitude he could almost knock over the North Pole!

P. M. Crawford (Darlington) says: "In view of the general state of the band, I am amazed to find Pacific stations coming in so well." He certainly has heard some good ones, too. On Phone, there is CX2CO, FQ8, HH2X, HR, JY, KR6AB, KJ6AW, TI2OE, UAφAYO (that's a nifty one), VQ3CP, WφEGY/KJ6, XZ2EN, 2CP, 2SS, ZC2MAC (14175), ZC6UNJ and ZP2AA. CW Dx was HK5EV, KB6AD, KW6AZ, ZD9AA and ZK2AA. Martin has removed from his list FH8AB and FW8AA, both of whom are in the "un-good" category, and, like ourselves, looks with deep suspicion on VR6AC (T5), who informs all and sundry he is running "a full gallon."

C. R. Johns (Bournemouth) is the man to thank for the info. on the forthcoming expedition to St. Helena. The trip is being organised by some of the ZS boys and they are due to set sail for ZD7 sometime in October. This seems like a wise move—condx should, by then, be more favourable for Dx working.

C.R.J. found the band "pretty ribby," but the O-V-1 pulled in CE2CC for a new country, together with HZ1AB, 1TA, MI3RH, SU5EB, TF, VQ4, Y13BZL, YV3AU and VE1HP/M, working portable from a hillside.

QSL's have arrived from CO8MP and VQ4RF.

We are pleased to hear from a young listener, **R. Goodman (Edgware)**, who has heard some nice Phone Dx, using only an O-V-0 receiver and two Window aeriels. His best are HP1, H16, HK, HR, FM7WJ, OA1SO, YN5AV, YV, YS1A, VR2CG, S2G, ZK1BC, PJ4RM, VE8RG, KL7EGP/MM (way up North), VP3, 5 and 9, plus CE, etc. Good showing indeed, with 38Z, 134C in a year-and-a-half's listening.

B. J. C. Brown (Derby) comes up with a steady increase to 30Z, 98C. In an interesting letter, he quotes ZP5CB as saying that all Paraguayan stations have been allotted new call-signs, so that the Call Book list is now useless.

B. J. C. heard and was puzzled by CS1WB, but he got the QTH—Port Said—which turns out to be quite in order.

He has some good suggestions to make on the subject of Set Listening Periods, to which we will refer later.

Phone logged includes CE3CZ, CO, EL9A (2020), HC1FS (2320), JA2OM (1800), JA8AB (0520), KV4BB, KL7, OA4M (0545), OA6C, SU1JY, VE7BF, ZD4AX (1815); a curious feature is the present absence of signals from VK and ZL.

G3HSL (West Hartlepool) is pressing on most successfully. In the last month, he has worked eleven new countries, CE3MX, CX6AD, JY1AJ, KP4, KZ5GD, LZ1KAB, MF2AB, OY2Z and 3IGO, TA3AA, TI2TG, and ZS6. All CW, as was AP2K. Fred's total is up to 63, so the NE should have another DXCC ere long.

M. Lillington (Orpington) reports an unexciting month, with lots of short skip (including 9S4AL, for a new one) and JY1OG, CN2AD, HZ1TA, YI3BZL and some W's.

D. E. Nunn (Hove) remarks how difficult it is to separate the Dx from the all too prevalent European QRM. KT1OC was heard at S8, using only nine watts NBFM. Heard also were 5A2TV/Airborne, CO2OZ, EA8AY, LU, SU5EB, VP6, VQ4 and 5.

Don is building a converter for 21 Mc/s, which looks a better proposition than 28 Mc/s just now.

C. L. Bradbrook (Alton) has had an interesting, if not wildly exciting, month. He draws attention to a "slight" slip we made in last month's commentary, when we put ET3R darned nearly into the Two Metre Band. We put him on 143900, which is just one "0" too many. However, as C.L.B. says, it's quite a thought!

MF2AA was heard to say he had a sked with EC3PT; puzzle, puzzle! Knowing Bob's Irish brogue, we'd hazard a guess he was talking about AC3PT. The frequency mentioned was 14250, so we'll keep an ear open around there.

Eight new countries have been snagged, bringing the score to 36Z, 147C. Phone heard was CX2AS, HS1SS, JA2OM, 7SL, KR6AF, LZ1KAB, OA3G, Pj2AA, VR1B, VS7, VU2AG, 2BN, 2RX, ZD2TTE, ZD4BF, ZL4FO (2220), and lots of lesser Dx. CW brought forth CE3DW, COTAH, FO8AB, I5PR, KH6, KS6ES (we won't say anything, but KH6ES is very active. Was this chap using an El-bug, we wonder?), KV4AA, MD6BZL, MP4KAE, VP8AJ (5 and 8 for over an hour, one evening), 9B3AA, ZA2AB(?) and U.S.S.R.'s UC, UP, UQ.

John Whittington (Worthing) found Dx quite good on most bands. KV4AQ and KZ5GF came through on CW, while Phone

was heard from CE3FG, HC1LM, HP1HO, 1LA, I5SG, JY1AJ, 1OG, KZ5AR, PJ2 and 5, TI2CAF, 2RCA, VQ2DC, 5DQ and YN1EN.

Our own offerings this month are all CW. We sneaked up on XE2NV (0000-14090), HH3L (2300-14050) and missed a beauty in VP2AD (Antigua, Leeward Is.), heard at 2200 on about 14080 kc/s. HS1WR (Bangkok) was 569x at 1800 and ZS7C is intermittently active on the low end around the same time.

News from Here and There.

From VQ4DO we learn that a ZS9—either ZS9D or 9F, has a sked almost every morning with three ZS5 stations. The time is 0400 GMT and the frequency is 7050. Not too good for "G," but you never know.

'4DO, who is ex-ZS6DO, has a large moan to make about the treatment given to most of his directional CQ's. If he calls "CQ no Europe" he invariably gets a load of hopefuls calling him. Some of the worst offenders become quite rude when ignored.

"Am I," he asks, "here for my own pleasure or for the convenience of these thick-skinned clots?" In fact Pi is so fed up that he has started a black list of people he will never work.

We were mightily amused one day, while listening to Norman Joly, ZC4RX, calling CQ and saying, with considerable emphasis, "Please do not reply on this frequency." He stood by and smack on the channel appeared a CT1, who called him at great length, several times, finishing on each occasion with the statement that he was "standing by for any possible call, come in someone, please!" We wonder if he ever gets a reply. Maybe he does—from someone with an impossible call!

The Ten Metre Band.

There have been bursts of activity on Ten of late and we have several reports, both of short skip and Dx activity. The short skip has on occasion been coming through until late in the evenings, but Dx openings have been of short duration.

D. L. McLean believes in checking the band and heard CE2CC, CX2CO, 4CS, CR6BX (1850), LU, OA4BC, PY, ZP5DC, WW2PFL/MM, IMXG/MM (in the North Atlantic) and several N. Africans.

J. Whittington heard CR6BH, 6BX, OQ5QC, 5VD and VQ2HN, who was heard also by M. Lillington.

B. J. C. Brown caught CX4CS, KT1DD, PZ1D, WIMXG/MM, W3MCJ/MM.

N. C. Smith weighs in with CE3LI, CR6BX, CX4CS, LU5 and 7, OQ5BI, W2XXM/MM (remember that call-sign?) and short-skippers.

Forty Metres.

Still producing results, if one has the necessary stamina.

Norman Smith's CW gleanings, for instance, are CE3AE, 3BM, CO2DN, 3OK, 8AI, 8AQ, W4, W5TCI, VE1EK and VP6AG.

P. M. Crawford casually mentions VK3AGU, ZL2OD, ZL4HP and VQ4CW, then slips in two shakers—ZK2AA and VS4BJ! Martin, you interest us more than somewhat!!

B. J. C. Brown unearthed two Dx Phones in the wee small hours—HK1EQ (0400) and YV5BS (0440).

John Whittington often hears TI2JV, after midnight.

Eighty Metres.

This time of the year, Dx chasing on Eighty is very much a sleep-losing occupation, but some good pickings are often to be had from various odd spots.

Martin Crawford picked up CN8EI, 8FQ, CT2BO, EA9AS, 9AP, FKS8BB, LU3EL and VP7NT, all on the key.

D. L. McLean dug out Phone from K1NAR, W1BLE, 3JH, 3PZA, 4HVJ, 4JZQ.

N. C. Smith presses tirelessly on with CW Dx'ers K4AF, KP4QR, KN2AHE, VE1XE, 2GF, Novice stations WN's 1UNV, 1VOK, 1VUF, 2FRR, 2IFI, SMSD, 4VPN, 4VZW and a hot one—ZS2HI (2355). EI9J also heard and called the ZS, but had no luck.

While on holiday, Norman lent his Eddystone 750 to friend John Hall, who heard several CE's on Eighty and knocked up a smooth twenty-eight countries on 21 Mc/s!

Top Band Doings.

U. Kvick (Kristinehamn, Sweden), continues to forge ahead in good style. Ullmar thinks he is Sweden's only active Top Band listener and is very pleased with his QSL returns, commenting in particular on the interesting and informative letters he has been getting from the UK. The score is up to 138 stations, 109 of 'em being G's.

During NFD, he logged a number of Portables, a list of which we give. All the following are /P—EI8P, G2DK, 2DTD, 2DVD, 3GIS, 3US, 3GIX, 3NT, 3HAC, 3ERD, 3ANK, 3ARM, 3EFA, 3HCY, 4DC, 4RP, 4KK, 4DV, 5LR, 6QP, 6MN, 6MB, 8IA, 8KU, 8NF, 8NN, 8DX, G13ML, GM2YY,

6RI, 8FM, 8MJ, GW3GWX, 4NZ. Only three Phone stations were heard, being G3EQS, 3FTE and GD3UB. Commenting on the terrific signal from "Uncle Baker," Ullmar says he got the shock of his life when he heard the GD call-sign. He quite thought he'd been listening to a Coast Radio Stn.!

B. J. C. Brown has found the band interesting and heard lots of strong G's, GW3FXZ (GLAM) and—GD3UB.

N. C. Smith added GM3IGW (Clackmannan) to his Top Band Counties list, which has now reached the formidable total of sixty-four.

Dx QTH Column.

- CR6BX. Box 1311, Luanda, Angola.
- HA5KBP. Box 185, Budapest, 4, Hungary.
- HP3FL. Box 76, David, Republic of Panama.
- KG6ABC. Chief W.O. C. W. Gorton, USN, Box 100, Agana, Guam, Marianas Is.
- OD5AD. Box 1202, Beirut, Lebanon.
- OA6C. T. Derossi, Box 64, Arequipa, Peru.
- VP6LD. Box 20, Bridgetown, Barbadoes, B.W.I.
- VS7WA. Box 907, Colombo, Ceylon.
- TI2CAF. Box 1963, San Jose, Costa Rica.
- ZP4AF. Fred Donna, Jr., Box 512, Asuncion, Paraguay.
- ZP5CB. c/o. US Embassy, Asuncion.
- ZP5DC. Capt. A. Sanchez, US Army (ex-ZP7AW). Mission, c/o. US Embassy, Asuncion.
- SU3JQ. } Via RSGB.
- SU5EB. }
- 5A2TT. RAF, Castel Benito, MEAF.
- 5A3TA. Box 372, Tripoli, Libya.

Response to the idea of resuming a form of SLP is rather uncertain at the moment, but we'll keep the matter in mind and hope to produce something novel this coming winter.

So one more month has slipped by. Thank you all for your support and comments. Keep 'em rolling and post direct, as usual, to Roker House, Roker, Sunderland, to arrive by August 6th.

Continued good hunting,
And the usual "73."

STRICTLY FOR THE BEGINNER

What aerial system would you advise a recently-licensed transmitting amateur to erect so that he can be assured of satisfactory results without too much difficulty with tuning and coupling methods?—C.G.

We assume that our enquirer is familiar with the fact that the length of a transmitting aerial must bear a definite relationship to the wave length of the transmissions. Before the war, most newcomers to amateur transmission started off on the 40 metre band—the "lids" band—as it was somewhat unkindly termed by the "high-hat" brigade! Nowadays, 80 metres appears to be the most popular band with the newcomer.

By far the easiest aerial to get working satisfactory is the "half-wave dipole." This consists of a length of copper wire—usually 14 SWG—cut to a length representing half the wavelength it is proposed to use. This length of wire is then cut into two equal lengths and each half is joined together by an insulator two inches or so long. The ends to which the supporting haliards are attached must, of course, be insulated too. This half-wave dipole aerial is coupled to the transmitter by *any* length of 80 ohm feeder—which can be purchased from most radio dealers. One end of the feeder is joined to the wire across the centre insulator, the other end being connected to a two or three-link coil coupled to the pa coil on the transmitter. The length of the aerial for the particular band in use can be found from one of the tables published in all radio amateur handbooks these days.

The only snag about this type of aerial for 80 metres is that it is rather long for the average location, viz. approx. 132 feet, as it should be erected all in one straight line well up in the clear. Consequently, the "end-fed" type is rather more popular with the newcomer on this band to start off with. This consists again of approx. 132 ft of wire, running from the aerial mast to the shack, in through an insulating duct and down to the transmitter. The end is then simply clipped on to the PA coil. To work satisfactorily, this type should be "pruned", i.e. short lengths cut off until it draws maximum PA current and we refer the newcomer to the section on aerials in one or other of the Handbooks for details of this procedure.

We would strongly advise the newcomer to gain his initial experience with either of these two types of aerial and once he has mastered the technique of cutting and coupling them, he can then pass on to the more efficient—but more difficult to adjust—types of aerials using couplers, tuned feeders, matching sections and so on.

I have had my 80 metre transmitter working very well from my own QTH with a 132 foot end-fed aerial. I recently lent it to a friend whose shack is on the top floor of some flats. He used exactly the same length of aerial as I did but cannot get it to tune. Can you suggest any reason for this?—L.T.

Yes, our guess is that the transmitting aerial tuning system when operated at the first QTH was earthed by quite a short earth lead. In the flat, the "earth" is probably a long length of water pipe or wire which itself represents an appreciable fraction of the wavelength in length. The tuning unit should be unearthed or a different ratio of turns and capacity used until the 132 ft end-fed will load up.

Can one use multi-strand insulated wire—as sold for ordinary broadcast aeriels—for transmitting aeriels or must it be the special single-strand wire usually specified for this purpose?—E.K.

Yes, the multi-strand type can be used for the end-fed type of aerial, particularly on the lower frequencies. Your editor uses 132 foot of this type of wire on 80 metres quite satisfactorily. However, the single-strand 14 or so SWG wire is preferable and must be used for those types of aerial which have to be cut of accurate dimensions, if only for the reason that the tables and formulae giving the dimensions of such aeriels have normally been calculated for this type of wire.

OMISSION.

We omitted to give two circuit component values in the article "Multi-band Aerials for Restricted Space," published last month. These are as follows: Fig. 3, p. 237, Coils: wound on Eddystone 1090 2½" formers. L1, 26 turns; L2, 3 turns for 3.5 Mc/s, 8 turns and 4 turns for 7 Mc/s, 4 and 2 for 14 Mc/s, 2 and 1 for 28 Mc/s.; L1 wound with 16 SWG enam. wire; L2 with 22 SWG PVC; C1 and C2, .001 mfd variables.

Fig. 4, p. 238: L3, 38 turns 18 SWG enam. wire on 3" former; L4, 4 turns PVC wound over L3 and adjusted; C3, .0005 mfd variable.

Design of Mains Transformer.

(Contd. from p. 280).

The QSL Problem.

(Contd. from p. 281).

transformers : we can never get the same out of them that we put in. Certain losses are always present, for the windings have resistance, and the iron core has hysteresis loop losses ; it also needs a certain magnetization current and will have losses due to eddy currents. A certain amount of flux linkage will be ineffective since magnetic leakage is bound to occur.

The primary must, therefore, supply currents for effective output and losses. Obviously, a transformer with small losses will be more efficient than one with high losses, so we strive to keep these as low as possible.

The efficiency can be expressed conveniently as a percentage, and is given by output

× 100. Although the output + losses

magnitude of the losses would appear to be large, judged by the list of them given above, the figure can be made favourable by suitable design. For the usual small transformer an efficiency of 85% can be assumed, and it is possible, under certain circumstances, to achieve 90% or more. As a guide to obtaining a good efficiency figure, it can be noted that coils of low resistance, and a properly proportioned iron core, assist in keeping losses down. A transformer which runs hot is usually an announcement of poor efficiency.

Primary Current.

From our considerations of efficiency we can deduce the primary current. If the transformer in Fig. 2b has a secondary load of 20.1W, as previously worked out, and the efficiency is 85%, the primary load will be 20.1 × 100

85 = 23.65W. For an input voltage

of 230V, the primary current will be $\frac{W_p}{E_p} = \frac{23.65}{230} = 0.103A$. We should note

here that for a lower input voltage, say 200V, the primary current would be $\frac{23.65}{200} = 0.118A$,

which is higher. Consequently, primary windings are designed with due regard for the highest current to be carried, that is, on the lowest voltage tapping.

(To be continued).

The writer would like to suggest the following as a possible solution to the problem :—

As it is the SWL who wants the cards, it is hardly fair to suggest that the transmitting operator should do anything about the problem. It is up to the SWL to help himself. He must get the veri's he requires himself. The idea put forward here is quite simple. The accompanying illustration shows what can be called a Listener's Verification Card. These would be purchased by the SWL and sent to the transmitter with a request that he signs it and returns it. If an addressed envelope and an International Reply Coupon were sent as well, the transmitter incurs no cost at all except that of the ink required to sign his name ! Moreover, if all the details are filled in (with the exception of the call-sign and signature of the operator) by the SWL before he sends the card off, little of the transmitter's time will be wasted in completing it.

Of course, the use of a card of this type does not prevent the operator sending his own QSL card if he so desires or feels that the report sent is good enough to merit one.

Although there may be objections to the idea, I think that the SWL will be able by its use to improve his reply ratio and thus qualify for the certificate he desires. This alone should outweigh any disadvantages the scheme may have. It must be realised that the SWL is always at a disadvantage and that any scheme which helps him to enjoy his hobby more is worthy of consideration and unless there are serious objections it should be adopted. This idea should at least remove the objections made by the transmitting fraternity to QSLing SWL reports.

ANNOUNCEMENT

Clifton Press will in future trade under the Data Publications. Their advertisement will be found on the back cover and those interested in getting together an inexpensive radio library are advised to study their list.

CLUB NOTES

Club Secretaries are invited to submit notes for this feature.

Coventry Amateur Radio Society. Hon. Sec. : K. Lines, G3FOH, 142, Shorncliffe Road, Coventry.

In order to foster interest in VHF activities, a fine cup has been presented to the Society by the Chairman, Freddie Miles, G5ML. Details of a contest for its award will be announced later.

By the time this appears in print, the members will probably have lost themselves in the first D/F event on 21st July, and search parties are standing by!

The Auction Sale on June 23rd provided the usual exchange of equipment, much of which, no doubt, will appear again at the next Auction Sale.

The Society were pleased to welcome G5QJ and G2BFT at a meeting during June.

Club Nights continue at YWCA, Queen's Road, at 7.30 p.m., and the forthcoming programme is as follows:—

4th August - No Meeting.

18th August - 144 Mc/s, Pt. I, "Receivers," by Ray Bastin.

West Lancs. Radio Society. Hon. Sec. : S. M. Sugden, G3GSS, 44, Gores Lane, Formby, Lancs.

Arrangements are now in hand for regular Morse classes to help members in search of a licence and encourage phone band SWL's to give the CW end a trial. All meetings are on Tuesday evenings (room over Gordon's sweetshop in St. John's Road, Waterloo). Any further details will be willingly supplied by the Hon. Sec.

Eccles and District Radio Society. G3GX1. Hon. Sec. : G. Gray, 2, Egerton Road, Monton Green, Eccles, Nr. Manchester.

The Club continues to meet weekly on Mondays at 7.30 p.m. at Eccles House Club, Abbey Grove, Eccles; and a cordial invitation is extended to any interested radio enthusiast to come along to its meetings. Full workshop facilities are now available, also access to test gear at nearby premises on a Wednesday night. Arrangements are being made for members to visit Holme Moss TV station in the near future.

Southend and District Radio Society. Hon. Sec. : G. Chapman, B.E.M., Bell Hotel, 20, Leigh Hill, Leigh-on-Sea, Essex.

At the last meeting of the Society, Mr. Ken Crispin, G6MH, gave a very interesting lecture on "Aerials and Aerial Coupling." Members of the Society joined with those of the Medway Society at their Hamfest held on Sunday, 6th July, for a very pleasant social occasion.

Birmingham and District Short Wave Society. Hon. Sec. : A. O. Frearson, 66, Wheelwright Road, Erdington, Birmingham, 24.

The Field Days scheduled for 15th June had, unfortunately, to be postponed until later in the year. It is hoped to hold it either during August or September; it is hoped to give further details very shortly.

The meeting on 14th July was devoted to an introductory talk and demonstration on Radio Model Control, which was given by members of the International Radio Control Model Society. This is a new departure for the Club, and it is believed that interest will be aroused in this aspect of radio. It is hoped to arrange for a demonstration on a larger scale later on in the year. Negotiations will be opened with Dr. C. Dawes, who is President of the International Society.

The meeting on 11th August will consist of a "Mystery Lecture," to be given by Mr. E. Evans, a former Secretary of the Birmingham Society.

At the last meeting of the Society on 9th June, a most interesting talk was given by Mr. N. Shirley, entitled "Valve Development." Mr. Shirley, as well as discussing the construction and development of very early types of valves, brought many examples along to illustrate his talk. These brought back many memories for the old-timers and opened the eyes of the younger members.

Purley and District Radio Club. Hon. Sec. : A. Frost, G3FTQ, 18, Beechwood Avenue, Thornton Heath, Surrey.

This is the old Sanderstead and Purley Amateur Radio Society in a new guise. At the June meeting a very interesting and informative talk was given by K. Perry, G3GKP, on "Oscilloscopes" and at the next meeting on August 28th C. E. Newton, G2FKZ, will be giving a talk on "Tropospheric Propagation."

Arrangements are in hand for two parties to visit the BBC receiving station at Tatsfield. The visit will be on two Sunday afternoons in either September or October on dates to be arranged. It is also hoped to arrange a concert and get-together in early October.

Meetings are held on the fourth Thursday of each month at 7.30 p.m. at the Railway Hotel, Purley. Full details of future activities can be obtained from the Secretary, A. Frost, G3FTQ, 18, Beechwood Avenue, Thornton Heath, Surrey.

Midland Amateur Radio Society. Hon. Sec. : G. W. C. Smith, G3HDK, 84, Woodlands Road, Birmingham, 11,

The field week-end organised by the above Society, held on June 28th/29th, was a great success, the weather being perfect, and an enjoyable time was had by all. A total of 20 countries were worked.

Please note: following our usual practice,

a General Meeting of the Society will not be held during the month of August.

Romford and District Amateur Radio Society. G4KF. Hon. Sec.: Douglas L. K. Coppendale, G3BNI, 9, Morden Road, Chadwell Heath, Essex.

Due to summer holidays and to the fact that the Secretary will be away in the Services for two weeks followed by a holiday, a definite programme has not been made out for August. It has been found, in the past, that attendance figures are extremely low during the summer holiday period, and it was decided, therefore, that a proper printed programme be left until September.

However, we are always pleased to see new members at the Society, which meets every Tuesday evening at 8 p.m. in the "Shack" attached to the YMCA building in Western Road, Romford. We have quite a number of licensed members amongst us and the Society takes the greatest interest in direction-finding activities. The Club also possess a transmitter which, at the moment, is being rebuilt by G3DNL.

The Club participated in the National Field Day contest held in June, and a good time was had by everyone despite the rain. The results of this contest are not yet known and it is doubted whether we are very high up on the list. Romford also organised the first of the D/F contests this year.

Slade Radio Society. The Society is now installed in its new headquarters, which are a marked improvement on the former ones. At the first meeting held there, the subject was "Electronic Digital Computers," given by Dr. F. Aughtie, M.I.Mech.E., M.I.E.E., of the Birmingham University. This subject, although very complex, was enjoyed by all present. A much anticipated event, the midnight O-F test took place recently and was very successful. During August meetings are as follows:—

15th : Evening DF test with instruction for beginners.

29th : Junk Sale.

Headquarters are at the Church House, High Street, Erdington, Birmingham, 23. Visitors are welcome at all meetings, which commence at 7.45 p.m. Further details may be obtained from the Hon. Sec., Mr. C. N. Smart, 110, Woolmore Road, Erdington, Birmingham, 23.

FROM OUR MAILBAG

Dear Sir,

I was deeply sorry to read in your Editorial (June, 1952) a statement which was not strictly true.

You maintained that the majority of RSGB members are in favour of higher power for NFD; whereas, in fact, the results of a questionnaire sent out by HQ confirmed the opposite opinion.

I personally think there has never been a case for higher power on 80 or 160 metres, and, with the prospect of improving conditions after this year, the period in which there was a slight call for 25 watts on the HF bands has now passed.

Until every station is equipped with a double-superhet or similar receiver capable of "knife-edge" tuning, and with operators who can read morse through a trifle of QRM, higher power would merely bring about chaos!

Yours faithfully,

John J. Yeend.

(G3CGD, T. R. Cheltenham).

We did not say that the majority of RSGB members were in favour of higher power for NFD, but that *from the approaches made to us it seemed that a majority of amateurs were in favour of higher power.* As our readers will know, this subject is a most controversial one at present and we thank our correspondent for introducing it to our pages. We should be most interested to hear the views of other readers on this question.—Editor.

THE QRP RESEARCH SOCIETY (affiliated to the RSGB)

is linking the low power radio enthusiasts of the British Isles and Overseas in a bond of companionship and mutual co-operation.

Whether you are a novice or an "old hand," and wherever you may live, membership of this specialised amateur organisation will add new interest to your hobby.

Full information can be had from the Hon. Sec. :—

J. Whitehead,

"The Retreat," 92 Ryden's Ave.,
Walton-on-Thames, Surrey.
(Phone : Walton 1619).

New Alternative Address and Portable Licence Regulations

AS an experimental measure the Post Office has decided to amend the licences under which the licensees of amateur wireless stations are permitted to operate their stations at alternative addresses or under portable conditions.

A new licence will be available at a charge of 10/- which will permit an amateur to operate for a period of up to one month at a temporary address. This licence is designed to cater for amateurs who desire to operate their stations during annual holidays.

Alternative Address and Portable Station Licences will continue to be available at a charge of 10/- per annum but in their new form these licences will permit certain additional facilities. The holder of the appropriate new licence will be permitted to operate his alternative address station occasionally at a temporary address, or his portable station within 5 miles of any notified geographic location, for a period of 48 hours provided in both cases that the Post Office Engineering Department has been notified in advance by registered letter or telegram of the location at which he intends to work. The use of a portable station on certain inland waters and lakes will also be permitted.

The arrangements will be reviewed early next year.

"MINICARD" RECORD CARDS

QSO record cards, 2½in. by 2½in., printed both sides, are now available for Amateur Station records, etc., 3/3 per 100, post paid.

Specially designed metal filing trays, heavy-gauge steel, in green enamel, to hold 500 cards, 3/3, post paid, from—

THE AMALGAMATED SHORT WAVE PRESS LTD.

57, Maida Vale, London, W.9.

Please Mention . . .

THIS MAGAZINE WHEN
WRITING TO ADVERTISERS

BOOK REVIEW

TELEVISION PRINCIPLES AND PRACTICE, by F. J. Camm. 215 pages, 144 illustrations. Price 25s. Published by George Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2.

The formula used for compiling this book seems to have been the simple process of choosing about a dozen titles of articles that have appeared in the pages of Newnes' monthly journal, *Practical Television*. One is presented with a general description of how television works from transmitter to receiver, in a manner which is most likely to appeal to readers with very little technical knowledge but who want to learn some of the underlying principles of the technique. For this reason the treatment is essentially non-mathematical.

A fairly clear insight can be obtained of the system of transmission used by the BBC, the principles of television cameras, and the way scenes are converted into electrical radiations and subsequently re-converted into moving pictures by the receiver. Projection receivers are dealt with in some detail, and certain circuits peculiar to them are well described. The pioneer work of Baird, and the later investigations of some American laboratories, in the specialized fields of stereoscopic and colour television are given notice.

The chapter on timebases would have been more complete with the inclusion of some reference to magnetic deflection oscillators and amplifiers; as it is, the chapter concentrates on electrostatic deflection, and readers having familiarity with such circuits will identify those given as belonging to the cathode-ray oscilloscope rather than the television set.

DC receivers are briefly discussed, and the many types of aerial and their chief characteristics are clearly presented. The chapter on servicing will be of general interest, though it would seem doubtful whether a person seeking basic knowledge could be the type who might venture to tackle a television receiver fault so early in his career! A few of the many forms of interference, and their causes, are given a few pages; a short chapter on choosing a receiver indicates some of the desirable features to be considered in a television installation.

In Chapters IX and XII, the reader is suddenly confronted with two short constructional articles on a London-Birmingham Converter and a Pattern Generator. They are undoubtedly useful in themselves for those who need them, but these chapters seem rather out of place in a book whose predominating feature is the broad treatment of principles.

Some space is devoted to the recommendations of the Beveridge Report, and the book concludes with a dictionary of television terms which takes up a fifth of the total pages. Although useful as a reference, it nevertheless contains many terms rarely, if ever, encountered in present-day television parlance. This last section of the book tends rather to detract instead of add value to a volume which, having regard for its contents, is priced at a figure that elevates it from the "popular" class to which it seems most fitting.

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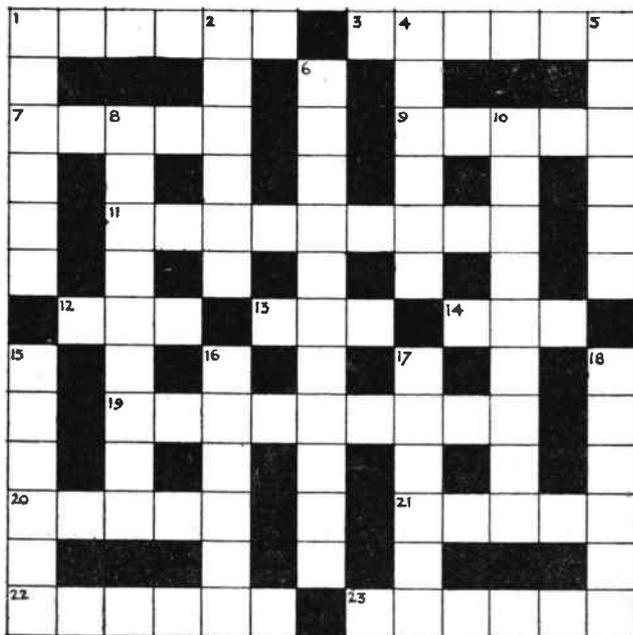
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CLUES.

ACROSS.

1. When these are severe we may lose our beams. (6).
3. The basic line structure of a television picture. (6).
7. A cut-out is preferred to a fuse because it can be ———. (5).
9. This may account for the rare long period echo of a radio signal. (5).
11. To 17 in the transmitter is sure to produce one of these. (9).
12. I am closing down. (3).
13. Imitate a monkey. (3).
14. This is usually the shack to the radio enthusiast. (3).
19. Comb Flare. (Anag.). (9).
20. The first word of many a call. (5).
21. To sit on or work on. (5).
22. What accumulators all too often accumulate at the bottom. (6).
23. Sort of wires for frequency measurement. (6).

DOWN.

1. It is usually these that break down our condensers. (6).
2. Not usually of the slot variety when on the rig. (6).
4. Another circle crossed by the great circle from London to Wellington (NZ). (6).
5. See 1 across. (6).
6. I may also take place here and cause a radio blackout. (11).
8. We assume the earth is this when calculating great circle distances. (9).
10. The person to tune the master oscillator? (6, 3).
15. Five of these make nought.
16. Shape, the area of which is the product of its sides. (6).
17. X2. (6).
18. Code Zero.

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