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Safety

In a recent comment in this space, we touched upon the necessity for taking proper precautions in the design of a mobile installation, so that it would be safe to operate under all road conditions.

Safety does not, of course, begin and end with the mobile rig. In a different sense, due regard must also be paid to safety in and about the station itself. There is a long catalogue of precautions which can be taken, and which will in any event suggest themselves to the serious and responsible radio amateur. To attempt to list them all here will be of no help to anyone who fails to keep constantly in mind that the ordinary HT power pack is dangerous, and can be lethal.

It is not clever, or bold, or daring to dice with death like a Teddy-boy on a motor-cycle when handling power leads — it is foolish, irresponsible and inconsiderate, and frequently has the same consequences as those that eventually catch up on the reckless motor-cyclist.

The most important precautions to be taken for safety in the amateur station have often been stated: Keep N, L, E, sorted out all through the mains wiring; fit a double-pole master switch for cutting the power to the whole station, and make sure other members of the household know where it is and what it is for; earth down all chassis; instal high-voltage power units out of immediate reach, preferably in protective cages; bleed all HT filters; fuse HT supplies and packs at all possible points; protect all HV points on open-chassis apparatus — the easiest way to do this is to put it out of reach; never use both hands if adjustments have to be made to live gear — one hand should always be in a pocket; if a large rack-built assembly is in use, it should stand on, and be surrounded by, rubber mats; fit a large aerial earthing switch, and use it when there is heavy static about; make sure that even in the event of a major break-down, no HV DC can reach the aerial.

A station laid out in accordance with these broad principles should be absolutely safe not only to the operator, but also to his family and his friends.
Clip that Audio!
FULL MODULATION WITHOUT SPLATTER
D. M. GILL (4S7MG)

Nothing annoys your neighbours on the band more than too much modulation, producing splatter and harshy noises well off your frequency. However, with a properly designed, and adjusted, speech clipper, you can still make full use of your carrier without any noises-off. This article explains exactly how to do it.—Editor.

If you have ever connected a cathode ray tube to the second detector of a receiver and watched the modulation percentage of the B.B.C. transmitters you will immediately notice its low average level and how seldom the modulation approaches anything like 70 to 80%. Speech is a very uneconomical form of intelligence to transmit as the peak values are very high compared with the average values. Thus, to prevent going over the 100% modulation mark low averages must be employed. With the relatively small powers available to amateur transmitters this does not make the best use of the carrier.

Cause and Effect

In actual fact, the tendency is for most amateur phone stations to over-modulate. With some who are over-modulating heavily it is evident as distortion and splatter. Others may be going slightly over the 100% mark without any marked deterioration in quality, as the ear is very kind in this respect. Unless the distortion lasts more than a certain period—some fraction of a second—the ear does not “hear” the distortion, nevertheless, it can be observed on a cathode ray tube, and also on the receiver as slight splatter either side of the carrier. Some operators take the attitude “Oh, well, it’s very slight, so why worry?” In these days, however, that is not good enough, as it does add to the noises on our bands to an extent that is really not necessary. Modern receivers do help to sort out a lot of the mess, but it is the writer’s contention that the design of AM phone transmitters is many years behind the design of receivers. It is not that the techniques are not known, but that they are not being applied in all cases.

Consider TVI, for instance. This is caused mainly by the radiation of unwanted harmonics and these can be cleared up. Part of TVI is also due to spurious frequencies being generated during the process of modulation, and are usually caused by over-modulation and nothing else.

Economical Frequency Range

To radiate speech effectively it is only necessary to transmit the frequencies between 300 and 3000 cycles-sec. and at the same time to chop off all the peaks of excessive amplitude. This also will considerably increase the talk-power of the transmitter—but how many actually do it? The pre-amplifier to be described will do most of what is required and provided it is followed by a well-designed modulator it will still give you “B.B.C. quality.” This may sound improbable to those without experience in the use of clippers; it is, however, absolutely true provided the clipping is not carried too far. As an example, the writer would mention that a lot of the short-wave broadcasting stations outside England do use clippers permanently in circuit—but it is impossible to know this simply by listening to their signal. The whole secret is not to carry the process of clipping too far. This is where the fault so often lies when reports of poor quality are received. Unless you have a cathode ray tube to observe the audio waveform from the pre-amplifier it is not really possible to know exactly where clipping starts. The man at the other end is not always a reliable guide as to how the rig is operating; he will simply tell you: “It sounds quite O.K. to me.” (People do not invariably give critical reports!)

Practical Considerations

The circuit given here is not original. It is easy to build, and the clipper does not require any adjustment except for the setting of control P1.

The circuit is shown in Fig. 1. It is designed (in the writer’s case) for a low-impedance moving coil microphone; if you are using a crystal microphone the input transformer T1 is omitted and a resistor of about one megohm or more (depending upon the microphone characteristic) is connected from grid to earth in order to complete the DC path. Remember, however, that the higher the DC grid resistance, the greater the hum is likely to be from the first valve. The first valve (V1) here is a 6AU6, which is not really an audio type at all, but was used as it was available. A 6BR7 would be the proper choice. A circuit for the 6BR7 pentode with correct values of re-
Fig. 1. Circuit of the speech pre-amplifier and clipper unit, V2B-V3, described by 6S7MG. S1 switches the Clipper in or out of circuit, as required. To achieve the curve shown in Fig. 4 it is essential to use a choke of generous proportions for Ch and to adhere to the values of C12, C13. The input end can be arranged for a crystal microphone, as shown in Fig. 2.

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>50 µµF</td>
</tr>
<tr>
<td>C2, C7</td>
<td>100 µµF, 25v</td>
</tr>
<tr>
<td>C3</td>
<td>0.03 µF</td>
</tr>
<tr>
<td>C4</td>
<td>100 µµF (see text)</td>
</tr>
<tr>
<td>C5, C9</td>
<td>8 µF, 450v</td>
</tr>
<tr>
<td>C6, C11</td>
<td>.001 µF, 600v</td>
</tr>
<tr>
<td>C8</td>
<td>150 µµF</td>
</tr>
<tr>
<td>C12, C13</td>
<td>330 µµF</td>
</tr>
<tr>
<td>R1</td>
<td>1,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>560,000 ohms</td>
</tr>
<tr>
<td>R3</td>
<td>220,000 ohms</td>
</tr>
<tr>
<td>R4, R9</td>
<td>47,000 ohms, 1-w</td>
</tr>
<tr>
<td>R5</td>
<td>3,600 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R7</td>
<td>22,000 ohms</td>
</tr>
<tr>
<td>R8</td>
<td>1 megohm</td>
</tr>
<tr>
<td>R10</td>
<td>1,500 ohms, 1-w</td>
</tr>
<tr>
<td>R11</td>
<td>55,000 ohms, 1-w</td>
</tr>
<tr>
<td>R12</td>
<td>0.5 megohm</td>
</tr>
<tr>
<td>P1, P2</td>
<td>potentiometers</td>
</tr>
<tr>
<td>RFC</td>
<td>Small 1.5 mH RF</td>
</tr>
<tr>
<td>Ch</td>
<td>5 Henry (see text)</td>
</tr>
<tr>
<td>T1</td>
<td>1.50 microphone</td>
</tr>
<tr>
<td>V1</td>
<td>6AU6</td>
</tr>
<tr>
<td>V2A, V2B</td>
<td>6S7N7</td>
</tr>
<tr>
<td>V3</td>
<td>6J5</td>
</tr>
</tbody>
</table>

Note: All resistors 1-watt unless otherwise stated.

When designing a pre-amplifier it is difficult to know how much gain or amplification to build into it as there is such a variety of microphones available with varying outputs, any of which might be used. More amplification than usual is required when clipping is employed, as the speech level has to be built up to sufficient amplitude to clip, or just to start to clip, on normal levels of speech. Usually, a pentode stage followed by a triode is sufficient for most low-output microphones. Carbon track potentiometers require a minimum value of signal voltage per ohm or kilohm if they are to be kept from going noisy. If they follow a pentode stage in a microphone amplifier the level is usually sufficiently high.

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Referring to Fig. 1, it will be seen that there is a low pass filter in the grid circuit of V1. The RF choke and C1 should be right up on the pin in order to prevent RF reaching the grid of V1. Similarly, C4 is connected directly from the anode pin to earth in order to provide a short circuit for RF. Nevertheless, the 6AU6 should be screened and all leads kept short, if not, it is a good idea to use screened wire. A modulator that howls because RF is getting into the front end is a nuisance. It can be avoided by taking simple precautions.

The measured gain of the V1 stage from the primary of the microphone transformer to the volume control P1 turned out to be 2500 times. As the microphone transformer had a step up of 1:50 the stage gain of the 6AU6 is thus in the region of 50. (The expected gain was 100, but one seldom gets the amplification given in the books!) A loss of 6 dB is not much and as it happens there is quite sufficient gain in the amplifier so no attempt was made to find out what happened to the lost 6 dB. The stage gain of V2A was not measured; it should be in the region of 10.

Clipping Action

With this type of cathode coupled clipper, V2B and V3; clipping will start when the voltage to the grid of V2B exceeds about 1 volt peak, or 0.7 volt r.m.s. Assuming the gain from the grid of the 6AU6 to the grid of the clipper is about 500, then the input voltage at the grid of the 6AU6, for clipping to commence, should be 0.0014 volts, or 1.4 mV. The measured value was 1 mV, which is near enough for all practical purposes.
As a 6BR7 would be better than a 6AU6 for the first stage of the amplifier, the circuit arrangement is shown here, for a crystal microphone. All values are as for Fig. 1, except as follows: Cc, 100 µF, 25v.; Rc, 2200 ohms; Rm, 1-3 megohms to suit microphone; Rs, 1.5 megohms. With a 6BR7, the voltage gain in the first stage should be about 125 times. If the input voltage is increased above this value, 1 mV, the amplitude of the output does not increase at all. The waveshape, of course, changes from sine to square-ish and if the output level is read on a voltmeter there will be a slight apparent increase in output due to the changing waveshape. Fig. 2 shows this relationship between input and output voltages. The clipping introduces some distortion, but at low levels it is not severe as the low-pass filter, consisting of the 5 Henry choke Ch. and two 330 µµF silver mica condensers, C12, C13, removes most of the harmonics. The frequency of the input wave was 1000 cps. The low-pass filter is absolutely essential in order to remove the unwanted harmonics generated by the clipping action. It will be seen from the overall response of the amplifier and clipper, shown in Fig. 4, that it starts to cut off at 300 cycles and has virtually no response at all above 4000 cycles per second. A word of warning: If you want the identical response use a good choke. "Any old choke," even if it is marked 5 Henry, may not do, as for this purpose it should have a generous-sized core or a large air gap, or both.

No layout details are given as normal speech amplifier construction technique can be used, and in any event most people have their own ideas. This model was built up on a
panel 19 inches wide by 3½ inches deep, complete with a small power unit, which resulted in components being somewhat crowded. Despite this, the noise level, including hum, was 44 dB below the maximum audio output.

The peak output of the unit as described here is about 5 volts r.m.s., which is sufficient to drive most amplifiers at the intermediate stage.

Setting Up

To set up the clipper for correct operation a cathode ray oscillograph is really essential, and if you do possess such an instrument (as you should for serious work!) the job is delightfully simple. All you have to do is to connect the CRT to the output and increase on P1 while talking into the microphone. As P1 is turned up, the deflection on the CRT will also increase, but eventually a setting of P1 will be found beyond which there will be no increase in the deflection of the trace on the CRT. This is the point where clipping or limiting commences. On the model, this setting was marked "LC." (Limiting Commences) and the control then turned very slightly beyond this point. If you go too far your speech will sound unnatural. The clipper circuit is now delivering an audio wave of constant amplitude and all that is further required is to set the gain on the modulator, by R12, so that the modulation does not exceed 90%; to do this properly you will again need an oscilloscope.

Well, some good designs have appeared in Short Wave Magazine!

RADIO RESEARCH IN 1956

Radio wave propagation over a very wide frequency band has been one of the principal subjects of research during 1956. The research contributes information required for the efficient use of the radio frequency spectrum for communication and other purposes. The Radio Research Organisation is participating in measurements on the ionosphere and radio noise during the present International Geophysical Year. Equipment for this work has been constructed for use at Slough, at the Department's stations at Inverness and overseas, and at the Royal Society's special base at Halley Bay in Antarctica.

Radio Communication and Broadcasting

Regular ionospheric measurements are made at the Department's observatories, and these, together with similar measurements made by other countries, are translated into forecasts of world-wide ionospheric conditions for use in high-frequency communication and broadcasting.

Practical studies of long-distance communications have been made in the high-frequency band using signals received from distant pulsed transmitters. Back scatter sounding, in which no distant transmitter is required for examining transmission conditions, has been examined in relation to possible application to civil aviation communications; encouraging results were obtained in tests over the North Atlantic air route. Radio noise, due to atmospherics, and its effects on radio services continues to be studied.

In the VHF bands, long-distance transmission by way of forward scattering in the ionosphere has received attention, particularly in relation to the angular spread and direction of arrival of the energy distribution constituting the scattered signal. At still higher frequencies the forward scatter radiation from the un-ionised lower atmosphere—the troposphere—

is being studied in order to understand this propagation process so that the best practical use can be made of it. Work is in progress on this subject in collaboration with the Post Office, on a frequency of 1.37 Gc (1370 mc).

Radio-Navigation

Basic research is being undertaken into the possibilities of very low-frequency radio waves in the region of 10 to 20 kc for long-distance navigational aids. The variable phase changes introduced by the ionosphere constitute a limitation on the accuracy attainable, and it is this matter which is being investigated experimentally in co-operation with the Admiralty.

Semi-conductors and Transistors

Semi-conducting materials and devices made from them are studied to obtain a better physical insight into the factors determining their properties. Because of the trend towards the application of transistors to higher frequencies, special attention has been paid to high-frequency transistors. This has been facilitated by the development at the Radio Research Station of equipment for measuring the current gain of transistors up to rather more than 100 mc.

The foregoing is a brief outline of the very important work in hand at the Radio Research Board, contained in the Report of the Director (Dr. R. L. Smith-Rose). This report is actually a well-produced booklet of some 50 pages, containing a great deal of useful, interesting and unexpected information. It costs only 3s. 2d. post free, and is obtainable from any branch of the Stationery Office (in Belfast, Birmingham, Bristol, Cardiff, Edinburgh and Manchester), or to order through any bookseller, or direct from H.M.S.O., York House, Kingsway, London, W.C.2.
Automatic Change-Over System

INGENIOUS BK/MUTING CIRCUIT

From Notes By G3HSR

The circuit shown here was evolved after having had the experience of the slick break-in working possible with an SSB transmitter and receiver, in the SSB mode. The requirement became that of being able to operate the equipment, in the same sort of way, for normal CW working; that is, with full break-in and complete receiver muting. It was found that only a few circuit changes need be involved. The arrangement has since been used on other transmitters, and has given consistently satisfactory results.

For smooth BK operation, the oscillator must be cut without being keyed, as this is the failing of many break-in systems, i.e., while, of course, the oscillator follows the keying, other sections of the transmitter must be completely cut-off. The ideal to aim for is complete cut-off between words. Similarly, the PA stage must be controlled in the same way as the oscillator, radiating only when the key is down. Hence, keying in the sense in which it is normally understood should be carried out in some intermediate stage in the transmitter.

Fig. 1 is a block diagram to show the sequence of operations. With the relay contacts open, both the oscillator (VFO) and PA stage grids are a full 100v. negative to earth, and are completely cut off. When the relay is closed, point A is earthed, so the oscillator is fired; point B goes about 20v. negative, so the PA stage is normally biased and can take drive, though at all times it has this degree of protective bias under no-drive conditions. Keying is carried out in the cathode of an intermediate stage, as indicated.

Practical Circuit

The control sequence having been arranged, the next point is that the keying and operation of the relay contacts must be tied into a common system, as shown in Fig. 2. In this, V1 operates as a 1,000-cycle (audio) oscillator, and across T1 appears the audio voltage when the cathode of V1 is closed. This voltage is rectified by the first half of V2, diode connected, and

**Table of Values**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>8 µF, 250v.</td>
</tr>
<tr>
<td>C2, C3</td>
<td>0.001 µF</td>
</tr>
<tr>
<td>C4</td>
<td>0.1 µF (see text)</td>
</tr>
<tr>
<td>R1</td>
<td>1,000 ohms</td>
</tr>
<tr>
<td>R2</td>
<td>50,000 ohms</td>
</tr>
<tr>
<td>R3</td>
<td>25,000 ohms</td>
</tr>
<tr>
<td>R4, R5</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R6</td>
<td>See text (about 1,500 ohms)</td>
</tr>
<tr>
<td>R7</td>
<td>1.5 megohm (or near) pot meter</td>
</tr>
<tr>
<td>T1</td>
<td>Any small step-up transformer</td>
</tr>
<tr>
<td>V1</td>
<td>6SN7</td>
</tr>
<tr>
<td>V2</td>
<td>6SL7</td>
</tr>
<tr>
<td>Ryl</td>
<td>Small SPDT type relay (8 mA working or as suitable)</td>
</tr>
</tbody>
</table>
passed to the grid of the second half, as a negative voltage which will be controlled by the setting of R7. The grid of the triode section of V2 will retain its negative charge for a space of time, governed by C4 and R7.

If we then arranged R6 so that the current through the triode portion of V2 energises the relay Ryl in its anode, it follows that when we close the cathode of V1, the rectified audio will be sufficient to reduce the current through the relay valve, thus de-energising the relay. It will stay that way until we release the key and the charge on C4 can leak away. Having achieved this relay action, the rest is easy.

The cathode of the intermediate stage to be actually keyed is returned to point Y in the cathode of V1, Fig. 2, with the key in J1. The intermediate stage can then be keyed together with the oscillator, with full blocking of the PA when the key is up—see Fig. 1 again.

On keying at normal speeds, the rectified audio on the relay valve never gets time to leak away through C4, so the relay stays de-energised; however, the setting of R7 (and perhaps the value of C4) can be adjusted so that the relay is energised between words, so switching out the VFO and the PA.

**Receiver Control**

For full automatic BK, the system must, of course, be extended into the receiver. The point marked X in the cathode of V2, Fig. 2, can be opened and another relay inserted to control the receiver muting. Alternatively, this could be done by using for Ryl a relay with a second pair of contacts.

At G3HSR, a separate aerial is used for reception, and Fig. 3 shows the control arrangement for the receiver. On "transmit" the aerial terminals are shorted out and a muting level resistor is brought in, series-ed with the normal RF gain control. This external control can be set for the required degree of muting.

The system as described here works well, gives full automatic break-in without splash, ensures a good clean keying characteristic and, once set up, is completely trouble-free. It is only when the whole station control is on the key itself that one experiences the real pleasure of smooth CW operation. For VFO netting, the cathode of the oscillator can be closed by a push-switch, and a further refinement could be to use the audio tone from V1 in Fig. 2 as a keying monitor—though normally one hears the signal as radiated in the muted receiver.

**R.A.E. in October**

Once again, the G.P.O. will be holding the autumn examination and Morse test for the radio amateur licence. The written test will be on October 5, 2.0-5.0 p.m., at the G.P.O., Armour House, London, E.C.1; at the Radio Surveyor's Office, 2 Bute Place, Cardiff; and at the Radio Surveyor's Office, Customs House, Dock Place, Leith, Edinburgh. Applications to sit, with a remittance for 25s., must reach the W/T Section, Radio Dept., Union House, G.P.O., London, E.C.1, by September 7 latest.

**NUCLEAR POWER ENGINEERING**

Those interested in this subject should write to the South-East London Technical College for the syllabus and details of a course of 18 lectures, which begins on November 12. Applications should be made to: Head of Department, Electrical Engineering and Applied Physics, L.C.C. South-East London Technical College, Lewisham Way, London, S.E.4, as soon as possible after September 7. The College also offers courses—part-time, full time, day and evening—on a wide range of electrical, communication and radio engineering subjects, at very modest-fees.

**CARDS IN THE BOX**

Stations listed here are those for which we have no forwarding address, to clear cards held for them at our QSL Bureau. Please send a large, stamped addressed envelope, with name and call-sign, to: BCM/QSL, London, W.C.1, and the cards will be despatched with the next G clearance. If you would like your call-sign/address to appear in our "New QTH" feature, and in Radio Amateur Call Book—the only directory to the radio amateurs of the world—that should be mentioned when sending for your cards.

G3BPJ, 3BYK, 3FRE, 3HHJ, 3JWT, 3KCL, 3KFW, 3KXW, 3LFX, 3LIT, 3LJC, 3LKE, 3LKN, 3LLT, 3LQC, 3LRB, G13FKJ.
AMATEUR TV DEMONSTRATED
DAGENHAM, JULY 13-14

WHILE it is true that amateur television transmission has not yet got a very numerous following, it is also true to say that those interested and active in this field more than make up for lack of numbers by their efficiency and enthusiasm.

There are at the present time some 30 U.K. amateurs licensed for TV transmission, in the 430 mc band. Those with fully operational ATV stations are considerably fewer than this, though nearly all have some essential item of equipment for TV transmission — the camera being, of course, the main complication and expense. The organisation responsible for co-ordinating their efforts and interests is the British Amateur Television Club, which has also laid down the necessary technical standards for the transmission system. For the last eight years or so, the activities of the B.A.T.C. have been largely inspired by M. Barlow, G3CVO, who is also responsible for the Club's own quarterly publication CQ-TV. This is always useful and interesting, covering the technical aspects of ATV, as well as giving news on the progress of B.A.T.C. members.

The photographs illustrating this article were taken when the B.A.T.C. demonstrated ATV very successfully at the Dagenham Town Show on July 13-14. This display is thought to have been the largest and most ambitious of its kind yet given in this country, and probably in the world. The S/W Essex Group of the Club co-ordinated all support and dealt directly with the organisers of the Show itself. The group also supplied the inter-com-
TV marquee, in collaboration with G2WJ/T.

"Roving Eye"

The remarkable vehicle shown in this photograph accompanied the Cambridge Group of the B.A.T.C.—a complete roving-eye OB unit, known as "Matilda II." An old London taxi has been fully equipped with petrol generating set, control gear, 70 cm aerial and transmitting equipment, with a staticon camera (the work of G8PY), mounted on the roof. Another photograph shows Matilda's look-out, an electrician's extension stand, equipped with inter-com. and receiving aerials, rotated by hand to keep Matilda "in view" in the radio sense. Excellent pictures were received and displayed in the TV marquee when Matilda was two miles or more away.

For the two days of the Show, the B.A.T.C. gave a continuous ATV demonstration, without any serious hitches, and with first-class results. The cameras, entirely home-constructed by G2WJ/T, G3KKD/T, G3KOK/T and G8PY/T, performed admirably, as did the rest of the necessarily rather complicated gear and circuitry required to keep the demonstration before the public. The display was on twelve TV receivers generously lent for the occasion by Philco Radio, to whom the Club is much indebted. And readers will agree that the British Amateur Television Club itself also deserves thanks and congratulations for having staged a demonstration much to the credit of Amateur Radio.

COURSES FOR THE R.A.E.

In the September issue of SHORT WAVE MAGAZINE we hope to publish a list of those schools, local authorities and club organisations under which courses of instruction will be given this coming season for the Radio Amateurs' Examination to be held in May next year. In the meantime, we ask that those bodies who may not yet have reported their arrangements to let us have the details by August 19 latest for the September issue. Readers interested in the 1958 City & Guilds R.A.E. may like to refer to p.357 of the September 1956 issue of SHORT WAVE MAGAZINE for some immediate information—most of it is still applicable to the next Examination.

VHF CAR RADIO

In the opinion of the BBC, as expressed by Sir Ian Jacob recently, the radio industry of this country has been slow in developing portable and car radio VHF receivers; the Germans are five years ahead of us in this respect. In this connection, it is interesting to note that the firm of Radio Telephone Aerial Systems, Ltd., formed in association with J-Beam Aerials, Ltd., (of which G2HCG is managing director) now offer for the commercial market a new type of mobile whip aerial.

It is an end-fed arrangement, designed for wing or scuttle mounting, and is cased in fibre-glass. It is flexible in any direction and will give results as good as, if not better than, the roof-mounted ground plane type. The new J-Beam design overcomes the difficulty brought about by the increasing use of plastic head-linings on modern cars.

LOW-TIDE FROLIC

On August 25, Norwich & District Radio Club hope to have G3JGI/A operating on Top Band and 15 metres from Scroby Sands, a half-tide bank of sand about three miles off the Yarmouth-Caister coast line. The tide is the critical factor in this operation, as when and how long they can be there depends entirely on how it serves. On this occasion, it fits in well, as August 25 is a Sunday, and the activity period can be 1200-1700 clock time. Special QSL cards will be sent to all stations worked. This Scroby Sands outing is becoming an annual adventure for the Norwich group, and must involve a good deal of staff work to get the party, with all its gear and provender, to the right place at the right time. And for the information of those who may be inclined to ask, a contact with G3JGI/A on Scroby Sands would count only for Norfolk — the island is not (yet) recognised (by the ARRL) as a new country!
Controlled Carrier Constant Modulation

NOTES ON ANOTHER “EFFICIENCY” SYSTEM

Modulation systems such as screen, suppressor, clamp and cathode control are, in effect, attempts to get “something for nothing,” in the sense that the aim is to modulate fully with the simplest possible audio equipment, i.e. to swing the carrier using considerably less audio than would be required for full modulation under normal high level (plate-and-screen) conditions.

In fact, of the types mentioned, it would be fair to say that only screen control using an 813 can be considered fully effective; in round terms, the reason for this is that it is only a valve in the 813 category that can be run satisfactorily at the full 150 watts DC input with the low static screen voltage (about 200v.) which enables full modulation to be achieved by swinging on the screen. This is something of a generalisation, because it could be said that with low static screen voltage the 813 does not develop the full RF output of which it is capable with 150 watts DC input. This is true under CW conditions, but not under modulation.

The snag is that screen control in the ordinary way demands lowered static screen voltage for clean modulation. No valve smaller than an 813 can be run at anything like the full DC input at the screen voltage necessary for full and distortionless modulation. Hence the great disparity in performance (not at all accounted for by the difference in DC input, or carrier power) between, say, a screen-modulated 807 and an 813 modulated on the screen. The difference is, of course, due to the fact that the 813 can easily be driven to 150 watts with less than half the rated voltage on the screen. The audio power required to achieve full, clean modulation under these conditions is less than 10 watts. Indeed, for amateur-band transmitters using 813’s run at a genuine 150 watts input, there is no need to have a high-level modulator at all; full control can be obtained by swinging the screen with about six watts of audio.

Another Screen Control System

So much for the better-known low audio power systems. Here we get away from 813’s and discuss yet another efficiency circuit, known as Controlled Carrier Constant Modulation, also involving audio drive on the screen of the PA — 807, 832, 829, or whatever. It can be described as a much superior form of screen modulation, the advantages of which may be tabulated as follows:

1. Inexpensive modulating equipment — a 6V6 will modulate a 150-watt carrier, or a pair of 6L6’s a kilowatt.
2. A constant high level of modulated signal is radiated at all times, because the actual carrier amplitude is controlled by the modulating voltages.
3. Higher inputs can be run with smaller valves, as the peak input is only reached when modulating. An 832 can be pushed to 80 watts, and types similar to the 829 easily to 150 watts.
4. The system is extremely simple, needing only a small audio amplifier, and is easily adjusted.
5. Heterodyne interference is reduced, as the full carrier appears only when modulating; this helps to increase readability.

It is virtually impossible to over-modulate; if the system is properly set up, all that happens is that the carrier level increases with audio drive.

The disadvantage (naturally, there is always one or more of these!) is that the higher DC input demands bigger HT supplies, giving voltages of 750-1000v. with good regulation, even with valves in the 807/829 category. An 813 would have to be run at from 1500 to 2000 volts on the plate in this circuit. However, as a single 807 should drive to 100 watts or so peak with about 1000v. on the plate, there is no need to bother with 813’s — unless you want to go really big!

Action of the Circuit

The output from the audio is rectified, and this rectified voltage applied to the screen of the PA. No other DC voltage is used on the screen, unless complete cut-off between words is wanted, in which case a little negative bias must be applied in addition to the rectified DC from the audio drive. This in practice is not a good thing, as when working DX the effect is to make the signal bob up and down too much, disappearing into the noise at low speech levels; this causes violent AVC and S-meter variations at the receiver.

It is better, therefore, to radiate a reasonable carrier level at all times, with voice peaks increasing power to maximum. In practice, this will appear as about a 20 dB increase in S-meter reading at the other end. Unfortunately, some valves almost cut off with no screen voltage, so different types will give different.
degrees of control. (It would be worth experimenting with small static voltages on the screen to retain some level of carrier when not modulating.)

As examples, an 832 gives a 30-40 dB increase in S-meter reading when fully driven, with almost no carrier, whereas a QQV06-40 produces a fairly carrier, with a correspondingly smaller dB gain as shown on the S-meter; but the signal is easier to tune and to identify because of the presence of the carrier.

In reception, it is sometimes better to tune a controlled-carrier constant-modulation signal as when taking CW, *i.e.* with AVC off and less RF gain.

**A Practical Circuit**

This is shown in the diagram, which should make things quite clear. The 6L6 is in Class-A, which will be suitable for most PA’s capable of a peak power of 100-120 watts input. The metal rectifier should be rated at about 30 mA, but a bigger one will drop less volts across it, making more available for the screen. The type RM4 suggested has an excellent characteristic in this respect, and has been proved to be entirely satisfactory as regards both voltage output and quality.

For setting up the PA, it will be necessary to incorporate the Phone/CW switch S1, because all preliminary adjustment is carried out under full CW conditions — that is, the PA and its loading are set for full RF output into the aerial, which can be slightly over rather than under coupled. To go over to phone, simply throw S1 — and there you are.

One other point — T1 can be as given, but even better results could probably be obtained by using a multi-match transformer, such as Woden UM1, with the tappings arranged to produce the highest possible audio voltage across the output or secondary side, connected into the rectifier. It should also be noted that because higher-than-usual HT voltage for the valve in use will be employed, the screen dropper R4 must be of greater value than is normally used; otherwise the valve will be over-run under CW or tune conditions.

**Table of Values**

<table>
<thead>
<tr>
<th>Modulator-PA Circuit for Constant Modulation</th>
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<tbody>
<tr>
<td>C1 = 0.1 µF, or as normally used</td>
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<tr>
<td>C2 = 25 µF</td>
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<tr>
<td>C3 = 16 µF</td>
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<tr>
<td>C4 = 0.2 µF</td>
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<tr>
<td>C5 = 0,01 µF, 600v. w/kng.</td>
</tr>
<tr>
<td>C6 = As normally used</td>
</tr>
<tr>
<td>C7 = 0.01 µF, rated at twice HT voltage</td>
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<tr>
<td>R1 w/ht</td>
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<tr>
<td>R2</td>
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**FACTORY LINE AT THE RADIO SHOW**

As in previous years at the National Radio Exhibition, Multicore Solders Ltd. will be putting on, by way of a demonstration of the use of their cored solder products, a miniature factory production-line. This time it will be Decca record player amplifiers which will be shown under construction. These will be standard production units and will eventually be sold into the trade in the ordinary way; ten Decca operatives will be employed on the demonstration, for the duration of the exhibition—which opens at Earl’s Court on August 28.

Erwin Multicore solders have been used for nearly 20 years by most of the leading manufacturers of radio, television and electronic apparatus—in addition to which the firm does a very large export business, and is a significant dollar earner.

**MORSE TEST ARRANGEMENTS**

Early in September, Morse tests for the Radio Amateur Licence will be held at the head post offices in Birmingham, Cambridge, Derby, Edinburgh, Leeds and Manchester. Application forms, which should be applied for immediately, can be obtained from the W/T Section, Radio Dept., Union House, G.P.O., London, E.C.1. These application forms, with 10s. in stamps, have to be returned before August 20, so that the place, date and time for the Test can be fixed with the candidate.
TRIUMPH OF THE SPIRIT
THE GENESIS OF G3MAC

W. L. Rimmington (G2DVD)

This is a story of difficulties faced and overcome which will touch the heart, and stir the conscience, of everyone who reads it. The way in which G3MAC has been brought on the air is probably without parallel in the annals of Amateur Radio. And we can say here, what he does not say himself, is that much of the credit for a remarkable achievement is due to G2DVD.

—Editor.

Recently, accounts have appeared in the national Press about “Man from the jungle who takes polio as a matter of course” and “The man polio cannot beat.”

They went on to tell how a young officer of the Royal Sussex Regiment had, during his period of service in Malaya, contracted poliomyelitis, as a result of which he had been invalided home, completely paralysed from the neck down. In spite of the terrible handicap of having to spend his entire existence on his back, completely dependent on an electrically powered artificial lung for respiration, and requiring attention for 24 hours a day, Paul Bates has been able, as a result of his spirit and tenacity, to make for himself a life—which, although not what he would have expected to return to after his period of service, was at least varied and full of interest.

These newspaper articles told how 23-year-old Paul was using an electric typewriter, operating the keys by means of a wooden hammer held in his teeth, and how he was able to play chess and bridge. He has, of course, other interests, such as television, radio, and a very fine collection of gramophone records. But, by special request, from the first article was omitted Paul’s keen interest in Amateur Radio—for at that time he had not progressed far enough.

Now that the story can be told in full, the writer (who has been intimately connected with the whole project from the beginning) feels that there is so much which should be told, not only to show how the courage of one man can take him far along a road which to most people would be impassable, but to give encouragement to those who are in any way handicapped, and imagine that which should be told at all, and it is felt that the widest publicity possible should be given to their part in the emergence of G3MAC.

This, then, is a brief account of how a newcomer to the ranks of Amateur Radio—who has possibly been worked already, under various call-signs, by many readers of SHORT WAVE MAGAZINE—came to be operative under his own call.

Making a Start

In the newspaper story already mentioned, a phrase used was “The awful moment of realisation.” This more than somewhat describes the feeling of the writer late in the autumn of 1956, when it was realised what a task lay ahead. A letter was received from a friend of Paul Bates, addressed to G2DVD, asking whether there was a local club which might be interested in helping in some way. As the circumstances of the case were already well known to the writer, the task at first seemed an almost impossible one.

Imagine the situation: The only movement possible to Paul was that of his head from side to side, and slight control of the first joints of the first and second fingers of the left hand. On this basis, the whole campaign was planned, and shortly after the New Year, a start was made.

In the somewhat sparsely populated (from an amateur point of view) district of north-west Sussex, there are about ten stations within striking distance of Slinfold, where both G2DVD and G3MAC are situated, and it is much to their credit that all offered to take what part they could in order to get the necessary work done.

One member of the group undertook the coaching in theory, and another the Morse Code, because it was found that whatever the condition of the applicant for a licence, the two essential examinations had to be taken, and passed, before a licence could be granted. However, the G.P.O. responded magnificently and made a most important concession—namely, that a full-power station could be installed at Paul’s home, to be operated by him, although unlicensed, under the immediate supervision of G2DVD, and using the alternative call of G2DVD/A.

This, of course, was just the incentive needed. Before more than a few days had passed, an Edystone S.640 was installed, and an order given for a Minimitter transmitter. These two pieces of equipment were decided on after quite some thought, as being the most easily operable, yet capable of giving the best results. The original idea was to motorise as much of the equipment as possible, but this was not acceptable to our young friend, who insisted that the job must be done by his own efforts, without mechanical aid, where it could possibly be avoided. He planned the station entirely by himself, and it was only left for others to put his ideas into operation.

Equipment Control Problems

As can be seen from the photograph, which shows the latest acquisition, an AR88, Paul’s ideas were
essentially practical. They were first tried out on the S.640; all controls were grouped within reach of a stick held in his mouth, the knobs being drilled and bolts inserted to form a sort of capstan, which could be engaged by the stick. Where controls were too far away to be reached, extra knobs were fitted inside the area covered by the stick, and connected to the controls by means of spring driving cords.

A relay unit and power pack had in the meantime been made, and the station was ready for operation, the sole problem remaining being that of switching. This, as usual, was solved by Paul himself. A plaster cast of his arm was made, on the end of which were mounted two switches, one a micro-switch to operate the netting control on the transmitter, and the other a very light push-on, push-off switch which actuated the main switch and the relay systems. The manufacturers of the transmitter had brought out to the front panel a pair of coax sockets, which were in parallel with the "transmit" and "VFO" switches normally used.

In the meantime, other members of the Sussex group had installed a long-wire aerial, and dipoles for 80, 20 and 10 metres; a metal trolley had been made which carried all the station, the only external connections necessary being to the mains, and to the aerial in use. This trolley was constructed so that it could be easily wheeled about the room by the nurses, and placed across the bed whenever wanted.

It is gratifying to be able to record that all the gear worked perfectly as planned from the beginning and also that, with one minor exception, there was no interference whatever to the TV receiver working in the same room.

Many contacts were enjoyed as G2DVL/A. From time to time, other members of the group called, and often operated /A, so that a certain amount of confusion was caused by the receiving and sending of cards all for the same person, but under different callsigns. It is hoped that any operators who may have been puzzled by this will now understand the somewhat unusual circumstances under which Paul was operating.

Exam. Preparation

During all this time, coaching was going on, and it was decided that the Radio Amateur's Examination held on May 10 should be attempted. The City and Guilds of London Institute was approached; the authorities there were just as helpful as the G.P.O., being unstinting in their efforts to make the job as smooth as possible. They suggested that they felt that it would be better if someone to whom Paul were accustomed were to take the examination. and they therefore asked the writer to act as Examiner. On the evening of May 10, Paul was duly examined, of course orally. The whole session was recorded for future reference and checking by the City and Guilds; and with no difficulty whatsoever, a pass figure of over 80% was obtained.

The first hurdle having thus been overcome, it was decided to apply for the Morse Test to be taken. A second plaster cast had been made, with a very lightly balanced key fitted to the end, and everything was ready. Here again, full credit should be given to the G.P.O. for arranging for one of its staff members to come and conduct the Test. A pass resulted, and it only remained now to put in the formal application for the licence. A callsign had already been allotted, cards had been ordered, and the new station was ready to go, with Paul himself in charge under his own call. From start to finish, the whole project had taken six months only.

The final additions to the station—a fully motorised HF beam, and equipment for listening on two metres—are now being dealt with, and will no doubt be in operation by the time this article appears in print.

Although the task has at times been difficult, it has been the most satisfying job that has ever been undertaken by the writer in twenty-odd years' connection with Amateur Radio, and it is very much hoped that for G3MAC many years of enjoyment will be the result of it all.

Acknowledgements

Special thanks are due to Mr. G. Nisbet, who provided the necessary knowhow and equipment to make the gear workable; to Mr. Goldsmith of the Radio and Accommodations Dept. of the G.P.O. for his invaluable help in making the special arrangements; to Mr. Carlow of the City and Guilds of London Institute for his sympathy and understanding in handling the details concerning the Examination itself; to Mr. Harris Ward of the G.P.O. (and, indeed, to his wife also) for giving up an afternoon of their holiday on the South Coast to take the Morse Test on a day when the temperature was over 80°; and to G3ABJ, G3HCU, G3JEP, G3KWU, G3LKB, G5PR and other local amateurs for coaching, transport, assistance and encouragement—and finally to G3MAC himself for making the "awful moment of realisation" into the splendid moment of realisation that the job could be done, and after all done so easily.

"ONE HUNDRED WATTS OF AUDIO"

With reference to this article in our July issue, Standard Telephones & Cables, Ltd. draw attention to the fact that the grid input impedance of a pair of 807's in Class-B push-pull is 7,100 ohms, and not as stated; thus, the input transformer T1 should have an impedance ratio of 1:1.6, for which a turns ratio of 1:1.25 is near enough, this being taken as for an impedance ratio of 1:1.25 is near enough, this being taken as for

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A Page of

BOOK REVIEWS

We discuss below some of the new books and manuals we are now stocking, available for immediate delivery. The prices quoted are post free, and orders should be sent to: Publications Dept., SHORT WAVE MAGAZINE, LTD., 55 Victoria Street, London, S.W.1. Readers overseas can remit by international money order, by cheque drawn on a U.K. account, or in any convertible currency.

COMMAND SETS. This is a brand-new, 136-page manual dealing with that item of American "surplus" equipment described variously as the SCR-274N, ARC-5 or (as it is best known in this country) the Command Set. These are the U.S. Navy, Army and Air Force designations for what is virtually the same unit, though there are numerous sub-marks of receiver, transmitter and power supply, covering a wide frequency range and several applications. There are, in fact, altogether six receivers and six transmitters, all similar in appearance, but designed for different frequency bands and having differing IF channels.

The book discusses various modification possibilities, giving data and circuitry for the use of Command Sets as amateur-band transmitters and receivers, also on modulation, TVI-proofing, mobile operation and some special conversions. There is plenty of illustration with many diagrams and circuits. The cost of Command Sets is 12s. 6d.

RADIO ELECTRONICS HANDBOOK (Radio Data Book). This is a compilation of nearly 900 pages, giving basic information, reference data, formulae and test procedures covering AM Receivers and Transmitters, FM techniques, basic Television theory and practice, Sound reproduction and Recording, Aerials and Transmission Lines, Test Gear and Alignment sequences. Divided into 18 sections, the Radio Electronics Handbook correlates and condenses the information which otherwise could only be obtained by consulting something like 300 different text books and manuals. It has been produced by an American industrial engineering organisation whose function it is to prepare technical manuals on radio and electronics for the Armed Forces of the U.S.A. It was found that this gigantic task could only be undertaken by first producing a compendium of all the basic data, over the whole field of radionics. The Radio Electronics Handbook is the result, and is now in the third printing of its second edition.

Some 200 pages, in seven sections, are devoted to what is described as "a briefing on fundamentals," amply illustrated and well explained. There are then nine sections divided as outlined above, followed by two more sections covering Data and Formulse (86 pages), and Valve and CRT Charts (138 pages).

The book is adequately indexed, the space devoted to contents and index totalling some 17 pages. Radio Electronics Handbook is the sort of manual which will be found invaluable by the professional radio engineer, the Service technician, the laboratory worker, students and radio amateurs—of whatever grade or proficiency. As the preface so rightly says, the book is intended for use on the board, on the bench, on the desk and in the field. Radio Electronics Handbook, by Boyce & Roche, price 40s.

COYNE TECHNICAL DICTIONARY. Prepared as an aid to teaching by the Coyne Electrical School, Chicago, this is a 150-page handbook giving the accepted meanings of some 4,000 terms, abbreviations, symbols and expressions used in the radio, electrical, electronics and television fields. In addition, there is a quick reference data section of 36 pages, which gives formulæ, tables and basic electrical information (the latter being mainly applicable to American practice and technique). The great value of this book over here lies in its very useful dictionary content. The price is 16s. 6d.

RADIO AMATEUR CALL BOOK, Summer Edition, 1957. For the first time, the latest issue of the Call Book—containing the call-sign, name and address of every known amateur in the world—makes just the 600 pages. The current offering is more than twice the size of the last pre-war issue (Summer, 1939) available in the U.K. The Call Book is a remarkable publication in many ways. Launched some 35 years ago, with local agents in all countries where there are radio amateurs, the aim of the publishers has always been to make each issue as complete, as accurate and as up-to-date as possible. Of course, the ultimate can never quite be achieved, because new amateurs are being licensed, or changing their addresses, even while each quarterly edition is at press.

So far as the G Section is concerned, having been for many years agents for the Call Book in the U.K. and Europe, we are responsible for keeping the British Isles listings up-to-date. All U.K. amateurs—whether subscribers to or even readers of SHORT WAVE MAGAZINE—are invited to notify us immediately of a new licence or a change of address.

This latest Call Book contains 28 pages of U.K.
call-sign/addresses. Taking the world as a whole, the total amateur listings are now estimated at not less than 215,000, of which the United States alone accounts for some 149,000 licensed amateurs. The remaining 66,000 are listed in 178 pages, alphabetically by prefix and call-sign, and nearly all countries outside the U.S.A. are represented. These astonishing figures take no account of the total amateur population (which is known to be high) in the Iron Curtain countries; some of them, like the Soviet Union, Czechoslovakia and Roumania, do not allow their amateur station addresses to be published; a notable exception is YU, Yugoslavia.

The Call Book also gives a lot of other essential DX information besides these call-sign listings—such as the QSL bureau addresses for each country, its zone number in the 40 zones into which the Amateur Radio world is arbitrarily divided for DX purposes, a two-page world map showing prefix locations, the ARRL agreed list of countries, lists by prefix and country alphabetically, a world time-conversion chart, and how the 48 American States and the District of Columbia fall into the ten WI-WO call areas.

Still the only directory to the radio amateur stations of the world, the Radio Amateur Call Book is always available in two editions of each issue—the Full and the Abridged. The latter omits the 400 pages of American call-sign/addresses, but is otherwise complete with all the usual Call Book data and QTH’s for the rest of the world outside the United States. The Full (or Complete) Edition of the Summer 1957 issue costs 37s. 6d., and the Abridged Edition 17s. 9d.

THE RADIO AMATEUR’S HANDBOOK, 34th Edition, 1957. The earliest example of the ARRL Handbook (as it is usually known) that we possess is a much-cherished copy of the third edition, second printing, of some 200 pages, and dated 1928; this sold 10,000 copies at a dollar a-piece (even in 1928). Nearly 30 years on, and now we have the 34th edition of the Handbook, in much the same format, but more than three times the size. And it is to the credit of the ARRL that the cover price has only gone up in just about the same ratio—it is now £3.50 in the U.S.A. This is mainly because the ARRL Handbook has always been a best seller. Over the years, literally millions of copies have been sold throughout the world, not only in the Amateur Radio field, but because it is accepted as a standard radio text, meeting the needs of the professional radio engineer in the same way that it does those of the amateur. To produce anything at all comparable in this country—to sell into a guaranteed market of, say, fifteen thousand copies—would mean a cover price of not less than £5. A British book on the lines of the ARRL Handbook could certainly be produced, but to sell at a competitive price it would have to be heavily subsidised for years, and even at best it could only divide the market.

The Radio Amateur’s Handbook is now as much an institution as Amateur Radio itself. It has earned universal acceptance because it is essentially practical, giving the quick answer to almost any problem in the communications field—whether it be the design of a receiver, the construction of a transmitter, or the layout of an aerial system. Taking the frequency range from HF to VHF, the Handbook covers theory, design, construction and operation, all from the strictly Amateur Radio point of view. You can build the gear either in a well-equipped workshop (such as many amateurs have) or on the end of the kitchen table (which is what most use). There are better and more comprehensive books on particular branches of the art, but there is no other bringing it all under one cover in language that that mysterious individual, “the average amateur,” can clearly comprehend. There is an illustration, or a circuit diagram or two, on practically every page—the block cost alone must be astronomical by ordinary book standards. Whether it be VHF, mobile, SSB, modulating capability, super-selectivity receivers, transmitters for high or low power, the construction of elaborate beam aerial systems or the feeding of a simple sky-wire, work-bench methods, an explanation of how the valve works, the approach to TVI-proofing, or the characteristics of a valve type you have never heard of before—it’s all in the ARRL Handbook, and all strictly in relation to the amateur bands and the amateur’s needs.

We are, and always have been, enthusiastic about the Radio Amateur’s Handbook, not because it is American, but because all along it has given the right sort of information at what is relatively a very low price. To be exact, 34s.

(All the Books mentioned in this Review are obtainable from stock at the prices given from: The Publications Department, SHORT WAVE MAGAZINE, LTD., 55 Victoria Street, London, S.W.1. The current issues of the Call Book and the 1957 Radio Amateur’s Handbook will only be available while present stocks last.)
DURING the period under review—mid-June to mid-July—conditions have varied from bad to excellent, through all the intermediate stages. We have had a cross-sectional view of all that the DX bands can do, with spells that could only be described as mediocre, dull and downright dead.

At the time of writing the previous Commentary the sunspot activity had thoroughly upset all bands, and conditions continued to be really poor for ten days or a fortnight. By mid-July, however, they had come right up to a level that was at least interesting, if not phenomenal. We imagine that they will still be fluctuating for another month or two, before settling down to what we hope will be the DX-hunter's paradise in the autumn.

Ten has been open on the North-South path, with occasional openings on East-West lines (notably on July 14-15). Fifteen has no longer been the best DX band, as it has been shut down by conditions for so much of the time. Twenty has been unreliable but nearly always worth a look round.

The month's DX visitor was PX1FC, an expedition about which many tales have been circulating (among them the one that they were using half a kilowatt from batteries!). The operators were apparently F9FC, ON4AU and HB9MQ, and the station was on all bands from a QTH 7500 ft. above sea level. Their signal on Twenty and Fifteen was phenomenal, as were the pile-ups caused by their appearance. Other interesting pieces of DX are promised, and are reviewed in the appropriate places in the story which follows.

Round the DX Bands

G3DO (Sutton Coldfield) added to his scores with KV4BU, ET3XY and VQ6ST, all on Fifteen phone; also new, for the Marathon, was HK7LX on Twenty phone. Otherwise he was not very active.

G5FA (London, N.11) boosted his Marathon figures with VS1HC on Fifteen; EA6AW, U05, LU, TA, ZB2R, UI8 and OA4GT on Twenty; and UA0BC, UR2AN and HE1AW on Forty. He promises good conditions during the last two weeks of August, when he will be away on holiday!

New ones for G2BLA (Morden) were OK3NM and ZD6RM on Ten CW; PX1FC, EL1P, 3V8AD, UQ and HA on Fifteen CW; OH3AA/0 and KL7CDF on Twenty CW. Among the others worked were VK6WT on Twenty for a new Zone, U9KAG on Twenty (QTH Magnitogorsk) and sundry bread-and-butter contacts.

G3LKF (Cleadon) finds Twenty the only band likely to yield anything new, and on CW he dug out UN1KAA, CN8, U05, IT, SV0WZ, YV4AU and OH3TC0. Phone fetched in TF2WBZ for one more new one.

G3ABG (Cannock) stuck to CW and raised EL2S, ZA2ACB, UA9 and 0, CR6 and 7, and PX1FC on Twenty, with OH3TC/0, FE8AH, MP4BBL, EA8BF and W8ADS/MM on Fifteen. CR6AI told him that CR5P would be operating as CR5P from the Principe Islands in mid-July—Twenty phone. G3ABG is probably unique in being able to use a TVI complaint as a proof of his whereabouts during a recent police check in the Cannock district! He and G2YV were both able to show that they
were at home by entries in their logs, but the TVI must have added some weight.

G5BZ (Croydon), after quite a spell of "non-enthusiasm," got going again and made a few additions. On Fifteen he collected ZP9AW, VS6, ZE2, OQ5, FP8AA, FBB8X (Nossi Be), JA, VP8BS, PX1FC and others; Twenty yielded VO6AB, FP8AA and ZD4CM. G5BZ was surprised at the terrific opening to the U.S.A. on Fifteen during the week-end of July 13-14; he thought it quite remarkable for the time of year, and found even Ten wide open to East Coast W's; otherwise conditions were pretty unexciting.

G3BDQ (St. Leonards) kept on Twenty and emerged with VK's, VS1's, VU, 3W8AA, OH0, EA9EB, VP8BS, JA's, CE3UA, UH8, UJ8, UA9 and Ø, and VK9JF, a new one on Cocos-Keeling who wants QSO's with Cornwall, especially Penzance. G3BDQ also heard XW8AB and 8AG but wasn't able to call them at the time.

G2DHV/A operated while on holiday at Broadstairs, and raised HB1MX/FL, 5A2TY, VE and VK on Twenty. Later, he was hoping to work both /A and /M from the Isle of Wight. From home he raised FF8, PJ, PX1FC, VQ 2 and 4, VP5 and VE8 on Fifteen, and UD6 and UM8 on Twenty.

GM3EOJ (Aberdeen) operated only on Twenty and during the evenings, finding things pretty poor except for occasional openings. Russians were very prominent and he raised UN1, U05, UD6 and U6G, among others; two new countries both arrived on July 8 when he worked 3W8AA and ZD1NW. VK5DK was booked in on July 1 at 1915 GMT in peculiar conditions. Up there in the North, GM3EOJ tells us, the East/West path hardly ever seems to open.

G3LNO (Coventry) is a new correspondent, and we duly welcome him. Normally a Top-Bander, he made an excursion to Twenty with 7 watts, rock-bound on 14015 kc. With this QRP rig he raised four W districts, lots of Russians and an HK, plus all Europe on short skip—indeed enough to whet his appetite for more!

G3JJG (Mitcham) used to write to us when he was a Top-Bander a few years back. Now he has an 813 rig and joins the Five-Band Table. He is also licensed as 5A2CR, whence he operated for six weeks earlier in the year.

DX on Forty

As ever, reports on Forty metres are scarce, but G3JAG (Rochdale) upholds the honour of that band in a big way, as his log shows. Recent catches have been H1B8E (0100), KZ5RF (0010), KG1JA (0400) and lots of PY's. He has had a sked with W6MOJ which produced over 100 QSO's, but that has failed during the summer months. W's are now scarce, but he heard K5AJK at S7 (0404) just recently. A month or so back he worked CM8EM, OQ5GU and ZC4BN, and he has 40-metre cards from 3W8AA, CE3AG, YV5FT and XE1KD, together with a goodly waiting list. The rig that does this for him runs 150 watts to parallel PT-15's; receiver is an R.103A; and the aerial is a folded ground-plane with six radials. G3JAG recommends bamboo for ground-plane supports—not only light and strong, but only 8s. 6d. for a 20-ft. length.

G3LNR (Nottingham) worked several new Europeans on Forty, including OH3AA/Ø, Y03RN and a UA3. DX heard, but not worked, included KZ5RF, ZP9AY.

"... I think that capacity hat makes the whole thing look slightly ridiculous..."
OX3LW, PJ2AV, HH2Y, VP3VN, lots of W and PY and the inevitable Russians. The queerest one heard was G9KVK/F—and your guess is as good as ours.

CW Fiesta

The Fifth Annual “Topsfest” will be held at the Swan Hotel, Lichfield, on Sunday, August 25. A full programme has been arranged, and it is hoped that over 100 will attend this year. Admission costs but 2s., and the inclusive price for the meeting and high tea is 8s. 6d. Tickets may be obtained from G3ABG, 24 Walhouse Street, Cannock, and should be applied for before August 20.

The Tops CW Club, sponsors of this event, also invite everyone to listen to their “Tops Newscast,” radiated on Forty CW every Sunday at 1700 GMT by a rota of Tops operators. Readers wishing to improve their Morse, and DX’ers looking out for hot tips may all benefit from this.

DX Bands Again

G3M3BCL (Aberdeen) amends his Marathon score to 28Z and 68C, which may not seem a remarkable figure—unless one knows that it represents Ten phone only! He has been having rather a thin time during the last few months, of course, but short-skip has produced some new ones. G3M3BCL is now off holiday, but is taking a very QRP 40-metre rig with him. On his return, he hopes again to be “in daily conflict with the ionosphere”—his own phrase.

G3DNR (Broadstairs) has been another single-bander, twenty being the one. New contacts were furnished by KV4AA, K17BA, UN1, UD6 and YY5BX. G3DNR thinks the bright side of poor conditions is that one can always get on with gardening and the other domestic chores without trooading on what one might be missing.

G3AFT (Grafton’s Club Tx) operates only on Fridays (2000-2200) and with 25 watts to a 68-ft. centre-fed affair, but they have raised KV4AA, 3V8AD, PY’s, VK’s, CN8, many Russian prefixes and, of course, plenty of W’s—all on CW. Old Grafton members are asked to note that G3AFT is now in the DX business!

G3LET (Westcliff) thought June was the poorest month this year, but he collected 9 new countries and 4 new Zones, so he is not despondent. One of his contacts was LA2JE/P (Hope Is.), and was looked on as No Good because of G3JXE’s note last month. However, LA5HE told G3LET that he knew him personally and that he is quite OK. And he adds that LA2HF/P is on from the same QTH. They both run 15 watts and promise to QSL when they return to Norway in the autumn of 1958.

Other news from G3LET is that 11ADW was trying out a QRP rig intended for M1 operation in August, and that the SV’s say that there is now no one left in Crete. G3GZJ (London, S.E.23) collected ZP9AY on Fifteen; also KZ5RF and a UR on Forty—all new ones. Many new ones on Twenty included TF, HC1CM, CR4AH, CP1CI, OH3AA/0, H18BE, PZ1AP and HC7WK—among others.

G3JGW (Halifax) reports on Fifteen only, where he worked OA7I on CW, and heard 3W8AA (CW) and FS7RT, TG9WB, HH2DB, H17LS, BV1US and VP5CM (phone).

G3HQQ (Mitcham) improved his score with EL1R, KZ5, ZD2MFM, UF6AC, UN1AE and others on Twenty, and with VS6 and short-skippers on Fifteen. He has found Ten pretty dead (and haven’t we all?).

Early-Bird Stuff

G3JQC (Barrow-in-Furness) still operates Twenty phone around sunrise and has found things excellent just recently. Contacts include three XE’s, T12FFD, KZ5EA, ZP5CF and PJ2CE. Early evening work brought in 15FL, H21NA and a VQ4. G3JQC uses a long wire, 275 feet, N.-S., and had excellent results last winter with the north end only eight feet high, including five QSO’s with ZK1BS and reports of S9 plus 10 dB. He wonders where VU, VS, DU and KA have disappeared to these days and reminisces about his receiving results from that direction in 1938-9 with an 0-V-2
receiver.

G3FPK (London, E.10) has also been an Early Bird in his attempts to collect WAS; he finds the 0600-0700 period useful when chasing W6, 7 and Ø, since many of the East Coast stations have gone to bed by then. After a lengthy rebuild, G3FPK has been on regularly and has worked 97C in 3Z2. He asks which Zone UA0KFG (Sakhalin Island) is in, rather hoping that it might be Zone 25; our information is that he is Zone 19. (See later paragraph on distribution of Far East Russians.)

On Twenty CW G3FPK has landed EL1R (0530), KX6NB (1640), HC7WK (0001), KZ5IF (0600) and 3W8AA (1730). He has found conditions pretty good to VK and ZL in the mornings... but his best DX of the year was on Eighty, when he worked PJ2ME.

G3FXB (Southwick) comments on the spectacular improvement on the bands in mid-July. On Twenty he raised FB8CD (Comoro Is.) and says also that VQ9HAY is active with a B.2 but not much tape raising G's. ZK2AD was heard but not worked; and as for FW8AA... G3FXB was told that the best way of raising him is to send him a cable. He will then come up and work you and go QRT again! On Fifteen, G3FXB lists BV1US, CP1CF, ET3XY, HB1MX/HE, HC1RY, OA4H, PJ2MC, VP2GC, VP5AR, VR2AZ, V59AI, ZK1BS and H17LMQ (all phone, and as nice a bunch as we have seen this summer). CW fetched in KG4AN, KR6AK, UD6 and 3V8. Apparently MP4BBL and a couple of G's worked VR6TC on Fifteen phone (July 15) while G3FXB was looking for DX on Twenty; he also missed the ZA2ACB expedition, but understands that OK1MB is making one later.

G3BHW (Margate) is back on the air after his beam damaged by a gale. He actually had some luck on Ten phone, raising ZD8SC, ZD9G, VP5CP and many others from a southerly direction—plus shortskip Europeans, of course. On Fifteen he found things much better and worked LX1DC, HB1MX/FL, HI7LMQ, TG7CB, 9BG and 9AD, CP1AK, EL1P and many others, all on phone. The Central and South Americans were all worked between 2200 and midnight GMT. Twenty CW brought in GC3AAE, PX1FC and TA1FA for all-time new ones.

G3KMA (London, N.W.11) was very active on Twenty CW, and was rewarded with KL7, KZ5's, VE6 and 7, W7, PZ1AP, YV5BX, ZP5AY, OA4GT, OH3AA/Ø, VK, ZL and Russians. He runs 60 watts to a long wire.

G6TC (Wolverhampton) has gone up to 150 watts for the first time in his twenty years on the air; he is looking forward to returning to his old love (Forty?) in the autumn and winter. Meanwhile he has raised UA0, VE6, KL7, HK and CR7 on Twenty; and JA, KZ5, VS1 and 6, and 4S7 on Fifteen.

Top Band Topics

There have been so few changes in the Top Band Ladder this month that we are not reproducing it, but holding over until next issue. This also means there is not much 160-metre news from correspondents. G3KNH/M (Can-nock) was pleased to work G3LIQ in Hull, from a QTH near Bewdley, Worcs. He would like to see more details of such "DX" from Top-Band Mobiles and to know how they are getting on; he would also like fixed stations to pause occasionally in their rag-
chews on Eighty and One-Sixty in case the mobileers are calling them. His own equipment is a ZC1 (7 watts) with a 14-ft. centre-loaded whip.

G3HH (Hounslow) managed to sort out G5PP/P when he was in Wigtown, through a terrific noise floor, and GM's and GI trips, and received reports from Sweden (SM6) on two different nights.

Russian Zoning

This information has been published before, but G3ESY kindly supplies it in very compact form and we feel that it will be useful to Zone-chasers:

Zone 16: UA9S, 9K5S, 9W, 9KQ, 9KU, 9KV.
Zone 17: UA9A and KA, 9C and KC, 9D and KD, 9F andKF, 9J and KJ, 9M and KM, 9Q and KQ.
Zone 18: UA9H and KH, 9Q and KO, 9U and KU, 9V and KY, UA9A and KA, 0KB, 0O and KO, 0P, 0S and KS, 0U and 0V.
Zone 19: UA0BF and KF, 0KG, 0KL, 0KK and 0KQ.
Zone 23: UA0DKT.

SWL Column

J. W. Cave (Parkstone) has been a ten-metre enthusiast for years, and says that except during complete fade-outs he has found signals well above the normal for June and July — such as FF8, ZD3, ZS9, VS6 and so on. On July 14 he received all W districts except 6 and 7 between 1200 and 1400 GMT.

M. J. Prestidge (Birmingham) logged FB8CD (Comoro) on Twenty at 1720 and says he works both phone and CW — prefers phone. On Fifteen he heard "YASB," said to be in Kabul but somewhat doubtful!

Miscellany

From a QSL from W6KG (Alameda) we quote the following. Details because they are interesting and unusual. No fewer than 21 previous calls have been heard by him, including such as FA8JD, KL7KG, JA2K, J2USA, DL4A's, W2, W4 and W7; 82 countries have been actually visited (including all 48 States and all 8 VE districts). The family (OM, XYL, and YL) have, between them, worked 66,000 stations in 252 countries . . . about "half the active amateurs of the world." Finally, W6KG holds 26 awards, and belongs to 17 radio clubs. And the QSL also leaves space for details of the QSO! Our admiring 73 to Lloyd and his other two operators, Iris and Joy.

G3ESY tells us (concerning a recent paragraph) that ZC6UNJ was operating from Jerusalem as recently as April 1957. QSL via United Nations, Government House, Jerusalem; operator, Paul Altorf. (Recent information was that ZC6UNJ had packed up in 1956, but this other must be a new operator with the same call.)

Sheepskins

WASM II (Class B) is available to amateurs outside LA, OH, OZ and SM who submit proof of having worked all 25 counties of .
Sweden since January 1, 1953—
any band, CW or phone. QSL's and five IRC's to SM6ID.

WASM is simpler, the qualification being two contacts with each of the seven Swedish call areas, SM1-7 inclusive. QSL's and ten IRC's to SSA, Stockholm 4.


The "Beira Delegation Certificate" is for two contacts with amateurs in Beira during August 1957, the town's 50th anniversary. QSL's and two IRC's to CR7BN, Box 875, Beira. The Mayor of Beira will sign each certificate. (Thanks to G3AIM/ZZ4MG for the CR7 details.)

Someone asked us the other day who originated the expression "Sheepskins" for Certificates and Awards. Apart from feeling fairly certain that the country of origin is the U.S.A., we are stumped. But we have a clue as to the inner significance of the term—we always believe in inventing a bit of inner significance where none was intended.

Sheepskins are made available to the wolves, who have for countless years been lamenting the absence of sheep's clothing in which to hide themselves.

The PRA

This is, perhaps (not!), the best point at which to mention that we shall shortly be offering a new SHORT WAVE MAGAZINE parchment, which we hope will be of interest to all serious seekers of the elusive. It is the "Polar Regions Award"—almost self-explanatory, but there are rules and conditions, which will duly be unfolded in our next. In the meantime, get out your atlas and study the lie of the land north of the Arctic Circle and south of the parallel of latitude that takes in the Falkland Islands.

Long Wires

How long is a long wire? We regret to note that this perfectly proper technical expression, once reserved for the description of aerials carrying quite a number of half-waves along their tops, now seems to mean nothing whatever. During a few excursions to the world of Forty phone we heard no fewer than five stations asserting that their radiating equipment is a "long wire, 67 feet long"; so apparently a dipole is now described as a long wire!

The happy owner of 136 feet of conductor can doubtless describe it as a long-wire to his friends on 28, 21 or even 14 mc, but it would be stretching a point to term it such on 7 mc and absolute nonsense on 3.5. Come to think about it, we are certain we have heard talk of "long wires" of 100 feet or so—on Top Band!

Let's try and get some sense into the nomenclature: and reserve this term for aerials that really are long wires in relation to the band in use—say, at least four half-waves in length. For the shorter ones we should talk about dipoles, full waves and "three half-waves."

News from Overseas

ZD1EO (Freetown) writes to say that he is active with 40 watts, mostly on Ten and Twenty, and mainly phone. On occasional visits to Fifteen he uses CW only. In the first three weeks on the air he raised about sixty stations asserting that their radiating equipment is a "long wire, 67 feet long"; so apparently a dipole is now described as a long wire!

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ZD1EO (Freetown) writes to say that he is active with 40 watts, mostly on Ten and Twenty, and mainly phone. On occasional visits to Fifteen he uses CW only. In the first three weeks on the air he raised about sixty stations in 16 countries, and promises QSL's all round, as soon as the cards arrive. QSL to him c/o SLEME, Army Post Office, Freetown. ZD1FG is ex-ZL2FG, and very active on all bands, usually on phone. ZD1PW, a Club station at the Prince of Wales' School, will also be active very shortly. ZD1EO reports that G's are best on Ten in the mornings, and on Twenty in the late evening; these are different times from the W's, who are almost the
reverse, so the main QRM comes from ZS’s, who arrive practically all the time.

G3ICH (home QTH Leighton Buzzard) writes from Habbaniya in YI-land, where he is unfortunately in hospital at present. He tells us that, despite the end of the “state of emergency” in Iraq, YI2AM shows no signs of being allowed on the air again. There are about seven or eight exiled amateurs out there, but all Y1 activity since the Middle East troubles has been unlicensed. G3ICH (who is also ex-DL2SU) hopes to be back on the air somewhere, somehow as soon as possible. Meanwhile we reciprocate his kind wishes to the “Commentary” and hope he will soon be well and active again.

ON4QX (Antwerp) tells us that his planned expedition to San Marino or Luxembourg will not take place this year ... too QRL. He was puzzled last year by working more than 20 G’s from Luxembourg, but very few asked for his QSL. Does this mean, he asks, that all G’s have worked LX?

DX Strays

First of all, here is a red-hot one, or the promise thereof: VQ8AG (Mauritius) tells us that R. A. Davis, ex-G3EAQ, ST2RD and ZC4RD, has just received VQ8AS as his fourth call-sign. The point is that he will not operate from Mauritius, but from Rodrigues Island, which is situated 350 miles east of Mauritius, of which it is a dependency. The QTH is 18° S., 62°5’ E. No amateur station has ever operated from Rodrigues before, and it seems likely that it will achieve country status.

VQ8AS, who works for Cable and Wireless, Ltd., will be there for about three years — so don’t all speak at once ... The snag is that his only supply will be 100 volts DC, and all gear must be obtained from Mauritius or the U.K.

The genuine ZK2AB was on from Niue last January, and worked only about fifteen stations, mostly W6’s. All those who have worked “ZK2AB” since then have been taken in by a phoney.

Likewise ZM7AC, strongly suspected of being the same character owing to his operating characteristics and apparent direction.

ZA2ACB, operated by DM2ACB, is said to be OK. and probably the first genuine Albanian in history! HB9MQ, who was in on the PX1FC deal, promises to operate from Leichtenstein some time this summer (signing HB9MQ/FL).

CE0AC and 0AD are shortly departing from Easter Island for good, leaving no amateur population thereon. ... VR3G has probably left Christmas Island by now and will be G3KDE once more. ... W7FNK/KP6 is putting Palmyra on the air once again, and very welcome, too; Twenty CW seems to be the medium. ... Look for VS4BA on 14086 kc with 100 watts and a dipole, but a better aerial expected soon.

VK2NF is ex-GM3HXT, and has met ex-GM3GUS out there, who hopes to be VK5DS ...
Bogus DX

The DX bands would make a wonderful study for a psychiatrist (if one could find a psychiatrist who really understood what Amateur Radio was all about). Just as many people who are cool and placid in their homes, kind to children and dogs, and altogether models of gentle living become ravening wolves when placed at the wheel of a motor-car, so there are many who are completely transformed when the door of the shack shuts behind them.

We all know about bad manners on the air, and the tactics adopted by the clever boys to raise the rare DX at the expense of anyone else who may be around. But the manifestation that bothers us now is different—it is the desire to be recognised as rare DX. To explain... it only needs a rare DX station like PX1FC to appear on the air for one or two obviously bogus "PX1FC's" to materialise on the same band.

We have noticed this over and over again. By the time one has identified a rare one and noted his tactics, he becomes part of the scenery for as long as he stays on the band. Not so the badly-operated chirper, without a clue about procedure, who adopts the same call-sign and shovels out a barely-recognisable "CQ DX".

The only reason for this must be the desire to hear lots of stations replying to a CQ call... and this ties up with the fact that the types indulging in this practice do normally call CQ for hours and hours without getting replies. They must feel very frustrated when they adopt a rare but bogus call and still don't pull anything in; we heard the phoney PX1FC putting out CQ after CQ without a single reply. Maybe the reason was that the real one was peeling them off only a few kilocycles away!

Other obvious phony recently operating include AC4A, ZK2AB, ZD9AF and 9AG, ZM7AC, and strange fruit like ZZXY; other pirates use common- or garden call-signs which attract no attention (such as G's and W's) and manage to stay around for quite a long time... but the axe descends eventually.

The QSL Business

Frequently, correspondents mention in the course of their letters that they can't get a QSL out of this or that station, and how is it done? Others say that they are so fed up with the poor response ratio that they no longer originate any cards, but answer all those coming in.

This is a natural phenomenon caused by the greatly increased activity on all bands and the impossibility of QSL'ing all stations. G6PJ says he has worked 74 countries this year, but only 10 are verified; but he adds that he no longer sends cards until the others arrive. If everyone he works adopts this principle, of course, there will be no traffic in either direction! He formerly spent "a small fortune" in direct QSL's to rare ones, without much in the way of results.

Surely the sensible thing to do, in these busy periods, is to originate QSL's to those stations whose card you really need; to answer all others coming in; and to make use of the Bureau to save the "small fortune" that you would otherwise dissipate on direct mail.

And so we round off another month's activity. Deadline for the next issue is first post on Friday, August 16 (and for the following one September 13). Address everything to "DX Commentary," Short Wave Magazine, 55 Victoria Street, London, S.W.1, and don't be late—or your news will be delayed by one month, 73, BCNU, and Good Hunting till we meet again.

NATIONAL RADIO EXHIBITION

This year's Radio Show at Earl's Court, August 28 to September 7, will mark the 21st anniversary of the start of the world's first regular high-definition TV service. More than 100 manufacturers will be exhibiting, and among the Service and Government authorities with large stands will be the Royal Air Force and the Post Office. The Show, under the patronage of Her Majesty, will be opened by that remarkable man Lord Brabazon, who is himself a pioneer in the radio field, as in many other developments of this 20th century.

ECHO FROM STONEY CROSS

In our account of the Mobile Rally at Stoney Cross in the July issue, it was remarked that after the gathering broke up at 6.00 p.m., many of the mobiles headed for Bournemouth. It seems that at this point G31UG (Poole) came on the air, and thereafter did a masterly job of traffic control and direction, since most of the visitors were strangers to the neighbourhood. He talked them into car parks, told them where they could get tea and—a most complicated manoeuvre, this—directed several cars from Bournemouth Pier to Shell Bay and the Studland-Swanage road; this entails crossing the entrance to Poole Harbour by the old steam-driven chain ferry. It was on this crossing that G31UG was working his contacts as Mobile/MM—well, perhaps not quite /MM, because this ferry is permanently connected by chains to the jetty at each end of its travel; no "free navigation" is involved! G31UG kept in contact with some of the mobiles through Corfe Castle all the way to Swanage, warning them of every bend and bump in the road; he also directed cars away from Bournemouth to the A31 for Winchester and London. It is reported that this contribution by G31UG made a most interesting and enjoyable finish to the Rally; at one time he had no less than seven mobiles on his hook, all dependent on him for directions, which they got without mistake or confusion.

NEW R.I.C. SECRETARY

It is announced that Mr. G. B. Campbell has been appointed the new Secretary of the Radio Industry Council, in succession to Mr. R. P. Browne, on retirement. This is an important appointment, because the R.I.C. is the co-ordinating authority for four trade associations within the industry—those representing domestic receiver manufacturers, the valve and CRT firms, the component manufacturing section, and the makers of communications equipment, radio and radar navigation aids and industrial electronic apparatus.
EARLY in 1950, the writer was asked to prepare a series of articles dealing with station design and planning. It was intended that they would review post-war trends and operating practice. The first drafts were completed and agreed by the publisher, "subject to a few minor corrections." Those corrections were never made and the articles wound up in the waste paper basket, for at that time G6LX discovered single-sideband. Within a few hours of making the first two-way SSB contact using a barefoot exciter, it was pretty obvious that all the time spent in correlating information about CW and AM stations had been wasted, for here was a communications method that not only out-performed much high powered AM stations, but required so very much less equipment to achieve the object. Furthermore, the operating techniques used by the sideband fraternity were a revelation to a poor innocent who thought that single control send-receive switching was the ultimate in operating convenience.

The articles should, of course, have been re-written to include the newly obtained SSB know-how, but by then the author had lost all interest in the project—he was far too busy building more SSB gear!

The G2MA Linear Amplifier

It seems that we really started something by publishing the description of the G2MA "drive controlled" Class-B tetrode amplifier (June "SSB Topics"). The letters have been rolling in, and both G2MA and your scribe have been hard pushed to sort out the many and varied queries.

First, to ease the minds of a number of readers who did not understand the purpose of the RF choke connected across the output socket of the pi-tank anode circuit—see p.203, June. Typical queries in this category include "Is it really necessary?" "It must short the output," "What does it do?" "Surely a drawing error," "Does it reduce harmonics?" and so forth.

Well, it is always good safety practice to introduce this choke, even if only to ensure that there is no chance of high voltage being applied to the aerial feeder, either by accidental contact or through component breakdown. The anode blocking condenser (C7 in the G2MA circuit) can be a real hazard in the pi-tank circuit, for no matter how good it may be or how much it is under-run, it is subjected to high electrical stresses. The inclusion of RFC5 provides a DC path, which in the event of a breakdown of C7, will short the HT to earth and blow the HT fuse. (Assuming a fuse is included, as it should be, in the feed circuit or in the power supply.) It is true that in many cases the pi-output is connected to an aerial tuner via a link which would provide the necessary DC path, but it is still common sense to include the choke. A few shillings plus two soldered joints might save a lot of trouble.

The second major query concerns the diodes D1 and D2 and a number of readers have asked for this component to be specified by make and type number. G2MA advises that any of the normal TV and general-purpose types are suitable, and the only point to watch is the peak voltage rating. This factor dictated the use of two diodes in series in the original circuit. If preferred, a valve diode can be used in place of the crystals, but it may be necessary to put in heater chokes for correct operation. If diode trouble is suspected the rectified RF bias voltage can be checked by means of a valve voltmeter.

Many readers have complained that the amplifier is difficult to drive to the point where sufficient clamp valve bias is developed to provide the correct screen bias.
voltage for the amplifier valve. G2MA finds that 25-30 volts bias is satisfactory, and this will provide a screen voltage of 350v. under drive conditions. The no-signal standing screen voltage is 40 and the peak grid current is 8-10 mA indicated. G3MY is also using an 813 final connected as for the G2MA circuit and he finds 14-2 watts of drive sufficient for full output. He points out that as the amplifier is operated in Class-B zero-bias, careful impedance matching is required between the drive source and the amplifier grid. Careful checks at G6LX indicate that the required drive is more than that required for Class-A or AB1 operation, but quite a lot less than for Class-AB2.

144 mc Single-Sideband

As evidenced by previous notes in “SSB Topics,” two-metre SSB has a small but enthusiastic following in the U.S.A. With the usual summer improvement in VHF conditions providing opportunities for inter-European working, several of our Continental readers have asked for information as to current SSB VHF activity in the U.K. Although several stations were interested and some test transmissions were made towards the end of 1956, it is believed that G3ILL is now about the only British station regularly active on SSB in the two-metre band.

W2EWL, who was responsible for the Command Set conversion called “Cheap and Easy Sideband” has recently built a mixer-amplifier unit which allows him to use his 14 mc SSB exciter as the sideband generator for two metres. His circuit (Fig. 1) was first described in QST for May, 1957, in an article reviewing SSB ideas for the VHF man. During a discussion with W2EWL at the SSB Dinner in New York he recommended the use of a high-Q tuned filter between the driver unit and amplifier to avoid possible trouble from spurious mixer products.

Query Department

A mixed bag this month. First a Manchester reader asks if there is any published information on the transformerless balanced modulator which was mentioned in “SSB Topics” some months ago. The circuit was first included in an advertisement of the Airborne Instrument Laboratories which appeared in the SSB issue of the I.R.E. Proceedings for December, 1956. A short description of the circuit was also included in QST for February, 1957. Developed by W2CSY, it is very similar to the tripleriode product detector described recently in “SSB
Topics.” The circuit is shown in Fig. 2.

Several readers have asked for circuit details of DSSC transmitter adaptors suitable for mobile application. Although we have not got any original circuit information on hand, another Command Set conversion, this time described in CQ for May, 1957, shows a very simple method of generating a DSB signal. Figs. 3 and 4 give the circuit modifications that are required to the 1625 PA stage to convert it for balanced modulator operation.

Next a reader in Cambridge asks for an explanation of the term P.E.P. that is coming into common use by sidebanders in the States.

P.E.P. is the now accepted abbreviation for the “peak envelope power” rating of SSB transmitter output. The usual definition of P.E.P. is the RMS power during the maximum RF cycle developed in the transmitter. When making two-tone tests, this occurs during the coincidence of the peaks of the two test tones.

News and Views

Activity reports for this period refer more to holidays and hot weather, rather than activity. Some people, however, keep at it all the time, otherwise there would be little to report in this section.

G3KTV (Esher) is back at his /A location in Mill Hill and is very active on 80 metres most weekends. He is very interested in ultra-miniature equipment and is planning a new sideband exciter using transistors. His initial ideas about suitable circuits were centred around the Jennings exciter with a half-lattice crystal section in place of the mechanical filter. If anyone has any better ideas he would like to hear about them.

G3AUB (Stockport) was heard operating I1LOV on 14 mc during a holiday visit in June. Also from Italy, I1BAO is back in Milan and has a new three-band beam mounted on top of his penthouse QTH.

It seems only yesterday that ZD4BF returned to Ghana after his last spell of leave in the U.K. He is, however, homeward bound again and expects to arrive in London early in August. Most of his leave will be spent in the Channel Isles and although sideband operation is not planned during this visit he expects to be able to sort out the aerial situation with an eye to the future.

Another exile in far-distant places is AP2BP, who recently returned to Pakistan after six months’ leave in the U.K. He is active on 20 and 15 metres and hopes that his old G sideband friends have not forgotten where to head their beams.

G3GKG and G3CWB are both testing the G2MA circuit. SV0WZ has returned to Greece and has collected a new exciter during his visit to the States. He also is building a G2MA linear amplifier.

DJ1VD and DJ2XC are using DSSC on 3.8 mc with good results. Another double-sider is W2PUI, who recently converted from SSB! In the other direction is W2DG0, who started on DSSB and is now SSB. He says the change was well worth while. SM4BPM is also new on DSSB.

G3AOO sends along the news that he has been very busy recently and has not been able to spend much time on the air. With his brother (G2FOS) he has developed a small crystal filter exciter which he expects to manufacture for sale in the amateur market. G3GKG has not been very active, but sends in amended scores for the Table.

A recent visitor to London was W2LNT, who was en route for Paris and DL4 land. W2JVO is also due and W2KG expects to be over in Europe later this month.

DX Notes

Expeditions are in the news again, for in addition to the OHØ visit reported in the last “Topics,” several others are expected. A weekend trip to the Channel Isles during September is planned by several active G sidebanders. Operation on 14, 21 and 28 mc SSB is their objective, so as to give DX stations the chance of a new country.

SM5KV, who has been active from Spitzbergen during the winter months, has recently taken an interest in SSB. He is due to return to the Arctic later this year, and hopes to be able to work sideband in addition to his more usual AI activity. A visit to Luxembourg has been arranged by QN4CC for August 15 to 18. Sideband operation will be on 20 and 80 metres.

It seems we all missed a good one recently. During a series of flight tests of a new airborne SSB equipment, K2AAA made a stop at Ascension Island (ZD8). Although prior notification had been given to the authorities, the required licence for fixed operation was not granted. Bad luck, OM! On the way to

![Fig. 2. A very interesting transformer-less balanced modulator circuit, suggested by W2CSV. C2 must be a very small capacity.](image)

**Table of Values**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>0.01 µF</td>
</tr>
<tr>
<td>C2</td>
<td>Less than 1 µF (adjacent wire coupling)</td>
</tr>
<tr>
<td>C3, C4</td>
<td>By-pass at carrier frequency</td>
</tr>
<tr>
<td>RFC1</td>
<td>2.5 mH RF choke</td>
</tr>
<tr>
<td>R1</td>
<td>10,000-ohm potentiometer</td>
</tr>
<tr>
<td>R2, R3, R5, R7</td>
<td>470 ohms, 1,000 ohms, 1 megalohm</td>
</tr>
<tr>
<td>R4</td>
<td>2,700 ohms</td>
</tr>
<tr>
<td>V1, V2</td>
<td>Any triodes similar 6C4, 6J5, 12AU7, 6SN7</td>
</tr>
</tbody>
</table>
Ascension a sideband transmitter was left on the Windward Islands for VP2LU to operate. Although only active for a few days, many people collected this new one.

DU7SV has finally got going on 20 metres and has been putting a very fine SSB signal into Europe during the early evenings. Another newcomer reported active is CR9AH.

G3MY, sending in his score for the ladder, passes the word that W6ITH is back in St. Martin and will be on again from PJ2MC and FS7RT. HR2WC has returned to Honduras after his visit to W6 and has a new miniature final using water-cooled valves! He reports activity from KZ5AW, KZ5WZ and VP5MU, all of whom are looking for European contacts on SSB.

VQ4EO complains that conditions have been poor for G contacts, but sideband has been getting through. He expects to return to England on leave later this year, but VQ4EU and VQ4BP will remain active. VQ4EO has heard Y12RP and ET3RF working into the States on 20-metre SSB. (Our information is that the status of all Y1 stations is doubtful.)

These last two stations are also reported by OH2OJ, but again no QSO. OH2OJ mentions that his XYL is licensed as OH2QJ and will be on SSB herself during the OHØ expedition.

Other newcomers this month include ON4DM, who is on 15 and 20 metres, T12HP and T12AA on 14 mc, and OQ5GU, who appeared just as the disturbed conditions due to the solar flares made things difficult early in July.

Information for these notes was provided by:

**Table of Values**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2</td>
<td>As fitted</td>
</tr>
<tr>
<td>C3, Cn</td>
<td>As fitted</td>
</tr>
<tr>
<td>L1, L2</td>
<td>As fitted</td>
</tr>
<tr>
<td>T1</td>
<td>Driver xformer, Class-B type, (6V6/6L6 to P/P grids)</td>
</tr>
</tbody>
</table>

G3GKG, G3MY, HR2WC, OH2OJ, ON4CC, SM5AQW, VQ4EO, W2KR, W4NQN, ZD4BF and SWL’s Amie and Leslie. Many thanks to them all, and we look forward to a lot more for the next (October) issue.

**Dead-line Date**

This will be August 30, with your news, views, claims, comments and suggestions addressed “SSB Topics,” c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1. 73 de G6LX.

**MAGAZINE DISTRIBUTION**

We publish on the Friday after the first Wednesday every month, and on the morning of that Friday all direct subscribers in the U.K. should receive their copies by post. In some centres, bookstall readers may also be able to obtain their copies the same day—but in any event, U.K. distribution to newsagents should be completed by the Saturday in most parts of the country. As all bulk deliveries are made the day before publication, readers would help us by asking their newsagents to take up any instances of late delivery.

**Are Your Power Circuits Safe?**
SINCE the Big Night on June 19 last—when conditions were probably better than they have ever been before on the VHF bands—two metres has relapsed into its more usual summer condition: Rather languid, with propagation occasionally good for GDX and the nearer EU's, and not much activity unless there happens to be an opening or a contest on.

One evening was, however, of particular interest, though apparently very few people noticed it. Commencing at about 2200 clock time, there was a good Aurora opening on Sunday, June 30, with GM easily workable from the south of England. It was a great pity that there were hardly any stations on the two-metre band at the time, for it is certain that a great many new QSO's could have been made. Bob of G5MA was there all right, and had two good contacts north of the Border, with GM3EGW (Dunfermline) and GM3KYI (Dundee); notes were strong T3, and all the usual Aurora manifestations were in evidence.

During this period of solar eruptions and disturbances, it is always worth keeping a look-out for Aurora conditions, which will not usually develop until fairly late in the evening. The symptoms are clear enough—notes go fuzzy and "thick," phone becomes more or less unreadable, and all signals are strongest (from whatever direction they may originate) when beams are headed somewhere between north and northwest. The IGY warnings now being given by the BBC at about 11.05 p.m., after the late-night news summary on the Home Service, are very useful in this respect.

The contest during the week-end July 6/7 was, as usual, an interesting event, but (again as usual!) failed to coincide with even fair conditions for GDX. There were a good number of portable stations, and some mobiles, but scoring was not at a particularly high rate and there was no solid path between the northern counties and the south of England. On the Sunday, fading was bad on signals at around the 100-mile mark—this sort of distance now being cons-

idered as within the effective area of most portable stations.

New World Records

It is reported that after about nine months of regular schedule keeping on two metres, W6NLZ (nr. Los Angeles) and KH6UK on the Island of Oahu in the Pacific succeeded in making CW contact, and holding it for over an hour, from 1230 GMT on July 8, the distance being about 2,600 miles. Signals were fairly steady over noise, and the theory is that the propagation mode was tropospheric; at any rate, it is an ocean path. The latitude of Los Angeles is about the same as Gibraltar, and Oahu is in the Hawaiians, west by south of California.

This outstanding QSO was achieved not only after long and patient effort, but by the use of elaborate equipment at both ends. Each station runs a kilowatt, with a large aerial installation. Their new record will be very hard to beat, the main difficulty being a geographical one. The distance is about the same as from London to Baghdad, or the Cape Verde Is.; to extend it from this country, we would need a station somewhere on the west coast of Africa south of Bathurst, or in Kenya. Well, there are active two-metre stations in VQ4.

Last month in this space, the outstanding 70-cm QSO between G3HAZ and DL3YBA was recorded, and mentioned as being a possible new (world) record; this is indeed the case, the distance being just about 20 miles further for G3HAZ than it is for G5YV—Harold had also worked DL3YBA, about an hour before G3HAZ got him. Our congratulations to all concerned!

Talking of distances, it will be noticed in the Activity Report that SM6ANR (Gothenburg) shows a list of U.K. stations worked and heard on two metres during the June opening; for those interested in the QRB's involved in these fine contacts, the distance Manchester-Gothenburg is near enough 630 miles.

Journeys Portable

The G3JQN/G3KEQ expedition duly came off as planned, and has given much satisfaction to many people. On safari through uninhabited Wales, GW3KEQ/P came up from the rare counties of Breck., Carms., Pembs., Cards. and Merioneth, and many beams were headed in their direction during this pilgrimage. These boys put up a very good show, and many correspondents this month mention G3JQN/G3KEQ with gratitude.

Some other interesting /P trips are in prospect for the immediate future. During August 17-30, GM6WL will (he hopes) be giving Wigtownshire from the Mull of Galloway, on both two metres and 70 centimetres; he is even thinking of taking some 4-metre gear if room can be found for it. Then, from September 1st to 14th, GM3B0C/A will be at Brora in Sutherland, on every evening at 1900-2230 clock time. And if you have heard or worked G3DKF/P during the week to August 9, he was in Cornwall, as mentioned last month.

Over the next ten days or so (until August 21), Harold will be signing G5YV/P from Rutland, Hunts., Oxon. and Hereford, using frequencies 144.24 to 144.86 mc.
The General Report

Naturally, most of the correspondence this month has been concerned with the June opening; much of the story is told in the Activity Report, and there have been many claims for all the Tables. These, we hope, are right up to date as presented here. Incidentally, Annual Counties comes to the end of its allotted span on August 31—how time flies! As usual, we would like your last claims for this Table with the September report, so that the final placings and the analysis can be shown in the October issue. (It seems only a few weeks ago that we were making the same note for last year's Annual Counties.)

Looking at this month's Activity Report, notice the worked-list put in by G5YV—in a week's opening, 73 EU's in six Continental countries. And Harold has done it all before! There are no "firsts" in this lot, though no doubt many of the stations shown were worked for the first time. Incidentally, the new-boy LA9OD; his very first QSO with anybody on two metres was G5YV! He was only running 5 watts of CW, too. LA9OD told Harold he was also hearing about nine other G's, but only succeeded in raising G6XM after he had worked G5YV. For All-Time Counties, Harold can now show 76C, with a grand total of no less than 878 different stations worked on two metres. And for the information of those who have asked, one reason why G5YV is so far out in the All-Time table is because, being well placed for them and radiating a particularly potent signal, he has worked a number of GI and GM counties not yet claimed by other GDX operators who are also well up the Table, but who cannot get into GM so easily.

SM6ANR asks us to assure U.K. VHF operators that the Gothenburg stations are always there and looking for DX whenever there is time, and that their offers are not yet ‘claimed by other GDX operators.'

The two-Metre Activity Report (The lists of stations heard and worked are requested for this section, set out in the form shown below, with calligns in strict alphabetical and numerical order).
all those weak, mumbling voices ... please use your key; you can send as slowly as you want—as a DX station you will always meet patience. And if you have no hope of learning the code (!) please write your call in Morse on paper and learn to whistle it into the mike ... I hope these words will not make too many enemies for me"! Well, of course not.

Rolf is dead right, and we can only hope, with him, that some of those "weak, mumbling voices" will break into slow CW some-

full share of the DX and sends us, for inspection, the QSL card from the W4 which thought it clever (with the connivance of a particularly juvenile G3, whose identity is known) to fake up a phoney hear-report on the two-metre signals from G3GHO and G6NB. We can only hope that the G3 concerned will see fit to make a proper and manly apology for his infantile behaviour. At any rate, he will not be reported in this column until the first of August.

G3GHO (Roade) still gets his times.

TWO METRES
COUNTRIES WORKED SINCE SEPTEMBER 1, 1956
Starting Figure. 14
From Home QTH only

<table>
<thead>
<tr>
<th>Worked</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>G5MA</td>
</tr>
<tr>
<td>53</td>
<td>G3GHO</td>
</tr>
<tr>
<td>47</td>
<td>G3GPH</td>
</tr>
<tr>
<td>46</td>
<td>G3DKF</td>
</tr>
<tr>
<td>45</td>
<td>G3LHA</td>
</tr>
<tr>
<td>41</td>
<td>G3KEQ</td>
</tr>
<tr>
<td>35</td>
<td>G5ML</td>
</tr>
<tr>
<td>33</td>
<td>G2CIW, G3DLU, G3JWQ</td>
</tr>
<tr>
<td>33</td>
<td>G3JO0, G3JQN</td>
</tr>
<tr>
<td>32</td>
<td>G2DVD</td>
</tr>
<tr>
<td>30</td>
<td>G3CKQ, G3JEBK</td>
</tr>
<tr>
<td>27</td>
<td>G3IER</td>
</tr>
<tr>
<td>26</td>
<td>G3KHA</td>
</tr>
<tr>
<td>25</td>
<td>G3KUH</td>
</tr>
<tr>
<td>23</td>
<td>G3FUR, G3KHF, G3KPT</td>
</tr>
<tr>
<td>22</td>
<td>G5MR</td>
</tr>
<tr>
<td>19</td>
<td>G3FIIH</td>
</tr>
<tr>
<td>18</td>
<td>G2AHY</td>
</tr>
</tbody>
</table>

This Annual Counties Worked Table opened on September 1st, 1956, and will run till August 31st, 1957. All operators who work 14 or more Counties on TwoMetres in the year are eligible for entry in the Table. The final placings for the year will appear in the October issue. Table re-opens again w.e.f September 1st.

G3IOE (Newcastle) reports himself back in circulation again, with a QQV06-40, which he finds a much better PA valve than the 829B; at any rate, it gives more RF output and runs much cooler. G3IOE is another badly-located station, right down in a hole, and he needs everything he can lay on to work anything in the way of DX; he hopes to do better when he gets the 20-element job up again. G3DLU (Sheffield) puts in a good calls h/w list and moves up again. G3DLU puts in a good calls h/w list and moves up again. G3DLU puts in a good calls h/w list and moves up again. G3DLU puts in a good calls h/w list and moves up again. G3DLU puts in a good calls h/w list and moves up again. G3DLU puts in a good calls h/w list and moves up again.

All operators who work 14 or more Counties on TwoMetres in the year are eligible for entry in the Table. The final placings for the year will appear in the October issue. Table re-opens again w.e.f September 1st.
TWO METRES
ALL-TIME COUNTIES WORKED LIST
Starting Figure 14
From Fixed QTH Only

<table>
<thead>
<tr>
<th>Worked</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>G5YV (787)</td>
</tr>
<tr>
<td>57</td>
<td>G6NB, G6XM</td>
</tr>
<tr>
<td>59</td>
<td>G3CCH</td>
</tr>
<tr>
<td>66</td>
<td>G3BW</td>
</tr>
<tr>
<td>67</td>
<td>E12W (286), G3GHO, G3JUD (302), G5BD</td>
</tr>
<tr>
<td>68</td>
<td>G3BLP</td>
</tr>
<tr>
<td>69</td>
<td>G2FJR (542)</td>
</tr>
<tr>
<td>70</td>
<td>G5MA</td>
</tr>
<tr>
<td>72</td>
<td>G2O1 (402), G3DMJ</td>
</tr>
<tr>
<td>97</td>
<td>G3EY, G4SA</td>
</tr>
<tr>
<td>98</td>
<td>G3FBN (637), G3JOO, G4OU</td>
</tr>
<tr>
<td>99</td>
<td>G5SB</td>
</tr>
<tr>
<td>100</td>
<td>G3WW (770), G5DS (654)</td>
</tr>
<tr>
<td>101</td>
<td>G2HZZ (495), G2HIF, G5BM, G5MQ</td>
</tr>
<tr>
<td>102</td>
<td>G2AI (519), G4CI</td>
</tr>
<tr>
<td>103</td>
<td>G2NH, G6RH, G6XX, G2ADZ</td>
</tr>
<tr>
<td>104</td>
<td>G3HBW</td>
</tr>
<tr>
<td>105</td>
<td>G3ABA, G3GSE (518)</td>
</tr>
<tr>
<td>106</td>
<td>G3HAZ (358)</td>
</tr>
<tr>
<td>107</td>
<td>G3FIH, G5ML, G6TA (487)</td>
</tr>
<tr>
<td>108</td>
<td>G3DKF, G5WP</td>
</tr>
<tr>
<td>109</td>
<td>G4HT (476), G5BY, G6YU (205)</td>
</tr>
<tr>
<td>110</td>
<td>G2DVD (362), G2XC, G1BQ, G1KEK, G1LHA (261), G5JU</td>
</tr>
<tr>
<td>111</td>
<td>G2CTW (214)*, G3BK, G8DA</td>
</tr>
<tr>
<td>112</td>
<td>G2AHF (500), G2DD, G3BA, G1COI, G3HHW, G3JWQ (325), G4OR, G5DF</td>
</tr>
<tr>
<td>113</td>
<td>G2HOP, G1BNC, G3DLU*, G6CI (220), GM3EGW (146)</td>
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<tr>
<td>114</td>
<td>G2CZS (282), G2FQP G3DO, G1WS (255)</td>
</tr>
<tr>
<td>115</td>
<td>G3CQG, G3IER, G8KL</td>
</tr>
<tr>
<td>116</td>
<td>G3IQ, G1DVK (208), G1GBO (434), G1VIM, G8IL (325)</td>
</tr>
<tr>
<td>117</td>
<td>G2FCL (234), G1APY, G3CKO, G1HTY, G5MR (343), GBVN (190)</td>
</tr>
<tr>
<td>118</td>
<td>G2FW, G2FZU (180), G3DLU, G3EBK (260)</td>
</tr>
<tr>
<td>119</td>
<td>G2DC (155), G3CXM, G3DLU*, G3HT, G3KHA (159), G6CB (312), G8IP</td>
</tr>
<tr>
<td>120</td>
<td>G3FZL, G3FY (235), G3HCU (224)</td>
</tr>
<tr>
<td>121</td>
<td>G3AE, G3CQK (162), G8IC</td>
</tr>
<tr>
<td>122</td>
<td>G3HY (125)</td>
</tr>
</tbody>
</table>

GW3KEQ/P in Carms., Pemb's and Merioneth, these being counties G5MA had often given to others but never worked himself. G2CZS (Chelmsford) was on at the right time and found plenty of EDX to work, and G2AHY (Crowthorne) moves in both Tables with G2BMZ worked for Devon on July 3; G2AHY is hoping to do better with a new 4/4.

G3HBW (Bushey Heath) reports a number of interesting encounters with the GM's, heard and worked.

<table>
<thead>
<tr>
<th>Worked</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>G3HLH, G3QY, G8VR, G5CFZC</td>
</tr>
<tr>
<td>31</td>
<td>G3KX0, G3KPT (108), G5SRP</td>
</tr>
<tr>
<td>30</td>
<td>G3FYY, G3GO (208), G3GSO (160), G3GFV (129), G3JIR, G3KEF (110), G5NF, G3D1Q, G8W5U</td>
</tr>
<tr>
<td>29</td>
<td>G3AGS, G3AKU, G3FJ (191)</td>
</tr>
<tr>
<td>28</td>
<td>G3UT, G3KUH, G8DC, G3EMBA</td>
</tr>
<tr>
<td>27</td>
<td>G3COV (231), G3DAH, G3SHA (160), G5GR, G3QGB, G3JGWA</td>
</tr>
<tr>
<td>26</td>
<td>G2AHY, G2BRR, G3CFR (125), G3SM (211), G3YH, G4LX, G4MR (189)</td>
</tr>
<tr>
<td>25</td>
<td>G3JMA, G3JNNX (220), G5SK, G6P1</td>
</tr>
<tr>
<td>24</td>
<td>G3FD, G3FXG, G3XFR, G3HM</td>
</tr>
<tr>
<td>23</td>
<td>G3CWW (260), G3HSD, G4JJA/A G5PY</td>
</tr>
<tr>
<td>22</td>
<td>G3DRA, G3JGR (135), G3ASG (150), G3BPM, G3KQF, G5AM, G8NM</td>
</tr>
<tr>
<td>21</td>
<td>G2AOL (110), G3DVQ, G3JW, G6XY</td>
</tr>
<tr>
<td>20</td>
<td>G3EYV, G3H0E</td>
</tr>
<tr>
<td>19</td>
<td>G3FEX (118), G3G1CX, G3LQ (176)</td>
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<tr>
<td>18</td>
<td>G3DBP, G3GY, G3CNC</td>
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<td>15</td>
<td>G3JWA</td>
</tr>
<tr>
<td>14</td>
<td>G2DHV, G3CYY</td>
</tr>
</tbody>
</table>

Note: Figures in brackets after call are number of different stations worked on Two Metres. Starting figure for this classification, 100 stations worked. QSL cards are not required to verify for entry into this Table. On working 14C or more, a list showing stations and counties should be sent, and thereafter added to as more counties are worked.

* New QTH

and GD3UB for an all-time new one; also "a sort of sked developing" with G2FO during the opening; Arnold worked him ten times altogether, reports varying from 339 to 599.

Another to send in a very interesting calls h/w list is G2FJR, still Flying the Jolly Roger out at Sutton Bridge, Lincs. He worked no less than 32 new EU's (and 14 G's) during the opening; he heard himself played back by DL0HH on phone, and "finished up at midnight on June 21 with a snappy CW contact with SM7BZX. Other points made by G2FJR: To prevent confusion when listening to weak phone (these weak phones are always coming in for criticism of one sort or another) it would help if the transmitting station would sign over with his own call last — which, incidentally, is in accordance with CW procedure; G2FJR would also like to remind SWL's that he cannot QSL without return postage; and finally he asks if anyone can give him constructional data for an electron microscope.

All-VHF-Band Station
G3JHM (Worthing) has at last managed to attract the attention of G6NB on 70 cm, putting him up to 7C worked in that table, and is now getting good results with a pyramidal horn of the type used by the well-known French VHF men F3SK and F8OL. In tests with G3GDR (at 60 miles) the improvement is about 1½ S-pts. both ways, with a beam-width comparable with that of a 5-él Yagi. As G3JHM is active on 4 metres and 23 centimetres as well as on two metres and 70 centimetres, he hopes soon to complete contacts on all four UHF/VHF bands with his collaborators G2AIH and G3GDR, 38m and 60m, distant respectively. (That would be quite an achievement, and we look forward to hearing from G3JHM that he has accomplished it, as we are sure he will.) During a recent visit to the Radio Research Board station at Slough, G3JHM was much interested in their tropospheric scatter link with Bristol, on 1370 mc; the path distance is about 100 miles and the gear used is not
beyond amateur scope. G3JHM remarks (as we can confirm) that the results they are getting over this path are impressive for the frequency.

G3KQF (Derby) did well during the opening—see calls h/w list—and in his first experience of working outside the U.K. on VHF, raised six stations in three countries. His new beam is a pair of slots backed by four reflectors, which was in position just in time to catch the opening; the next job is to increase transmitter efficiency. G3CCH (Scunthorpe) notes a move of four up in the All-Time; he now stands at the high figure of 69C worked. G3GSO (Derby) found that for the opening “everyone in the zone” was on his frequency, but managed to work five EU’s in four countries nevertheless: apparently, in the North Midlands the two-metre band sounded like 20 metres during a contest!

Back again on two metres after too long an absence from our midst, G3WW (Wimbledon, Cums.) was glad to work a lot of old friends, after changing a somewhat makeshift aerial for a pair of slots. He mentions two stations worked for Denbighshire—GW2ANT/P and GW5GWA/P. The former is another who has been doing a good deal of useful portable work lately. G2DDD (Littlehampton) comes in again, to bring his claims up-to-date, and Arthur at G5BD (Mablethorpe) is in a good position on the 70-Centimetre Counties ladder.

G3JWQ (Ripley, Derbs.) made a very good showing for the opening, chalking up no less than 17 EU’s, including SM6BTT; other nice ones he mentions are GD3UB and GW3BOP/P for Merioneth. The 100-mile G3JWQ/G8VZ schedule now stands at 230 contacts made, with a negligible proportion of total failures. G8VZ, at Princes Risborough, still uses 12w. only, but gets out exceptionally well to the north.

ZE on Six Metres

We are glad to give space and publicity to a request from ZE2JV (Salisbury, S. Rhodesia) who is on 50 mc (six metres) every evening during 1630-1635 GMT, beaming north and calling on CW and phone. He asks for listener reports, and also the co-operation of G’s in making cross-band contacts 610. ZE2JV says that he always listens on Ten after calling on 50 mc. He runs 100w. and a 4-1e flat-top, and has already worked F and FA stations.

An interesting comment by ZE2JV is that he regularly receives BBC TV on Band 1, and has heard FM broadcasters on the VHF bands from France, Germany and Russia. As he says, things should be buzzing in a couple of months’ time!

Solar Noise on Two

EI4E, who tries so hard from Killarney but has very few stations in the log so far, sends in a very useful and interesting record of solar noise observations. On the three occasions, June 4, July 3 and July 6, the two-metre band showed noise effect of varying intensity: On June 4, 0935-0945, the level was about 6 dB above the normal receiver background; on July 3, it was noticeable from 0850 to 1040, peaking at 12 dB over at 1002; on July 6, the period was 0935-0944, peaking to about 8 dB over at times (which are GMT).

On July 20, there was a complete fade-out on the HF communication bands between 1340 and 1345 GMT: this brought no apparent solar noise effect on two metres, checked ten minutes after the HF bands returned to normal.

For anyone with a beam (preferably tiltable, or set at an angle) and a two-metre receiver, listening to and recording the incidence of solar noise can be very interesting. For instance, EI4E has graphed his observations for July 3, and the variations shown are much on the lines of the G3CGQ results reported here in the January issue.

VHFCC Elections

After a long silence, broken only by G3AGS last month, we now have no less than six VHF Century Club elections to register. They are: G. A. Piper, G3KQC, London. W.6, No. 212; J. Redrup, G8VZ, Princes Risborough, Bucks., No. 213; J. Berry, G3JZN, Whitefield, Lancs., No. 214; R. Bastin, G3LHA, Coventry, No. 215; T. W. Bryan, G3GSO, Derby, No. 216; and R. Jacobsson, SM6ANR, Gothenburg, No. 217. The (101) cards sent by SM6ANR show that he has worked on two metres, F3LQ for the first and only F/S contact; eleven DL’s; 22 G’s, including GM2FHH for the GM/SM “First”; eight LA’s; three ON’s; ten OZ’s; eleven PA’s; and 35 SM’s. Outside Sweden itself, this makes a total of 66 EDX stations in 8 European countries; having regard to Rolf’s geographical location, it is a record of which he may well be very proud.

And the election of G3LHA is probably unique in relation to the date of issue of his call.

In Conclusion

Your A.J.D. has been conducting some humble researches of his own and finds that he made the first regular contribution to SHORT WAVE MAGAZINE under the VHF heading just 19 years ago—in the August 1938 issue. The current offering is the 95th of the series. because our friend and distinguished colleague Ted Williams, ex-G2XCC (who, incidentally, still reads “VHF Bands”), held the chair for some years in the early post-war period. A.J.D. hopes to survive to make the century; it would help him compile his next effort in good time if your report for September arrived by Wednesday, August 21, addressed: A. J. Devon, “VHF Bands,” Short Wave Magazine, 55 Victoria Street. London. S.W.1.

And as this issue went down, it looked as if another opening was developing. . . .
Techniques for Two Metres

THE FRUITS OF EXPERIENCE WITH TRANSMITTERS AND RECEIVERS

PART I

B. SYKES (G2HCG)

The author of this article is one of the best-known of our VHF practitioners, who is consistently a most successful exponent of the art. Here he brings out a great number of those purely practical points of design—affecting both receiver and transmitter—which can only be discussed from knowledge gained by long experience. In the commercial field already one of our leading VHF aerial designers, by this article G2HCG will further enhance his reputation as a VHF technician.—Editor.

It is well-known that the performance of a receiver depends on the input stages, but the choice of which type of RF stage to use presents quite a problem. Everyone has his own ideas, and perhaps layout is more important than choice of circuit.

Any receiver can be made or marred by the aerial input circuit, and the importance of this does not seem to be clearly understood. Measurements with a noise generator usually suggest that over-coupling to the input circuit provides optimum noise factor or signal-to-noise ratio. This is undoubtedly true when the receiver is fed from a noise generator—but when the input is via a feeder from an aerial it should be realized that under reception conditions the load on that feeder is the receiver input and unless this is allowed for correctly, standing waves will result with all the attendant evils of noise pick-up, detuning of the aerial, and losses. Experience has shown that if noise-generator measurements are conducted through a long length of feeder to simulate operating conditions, then the input coupling will usually adjust to that which gives a match to the feeder and will not be over-coupled. A simple test to ascertain if the input coupling is providing a correct match to the feeder is to alter the length of feeder by 6 inches or so, noting the effect on a steady signal; any change, and there can be a lot, indicates incorrect input matching.

In fact, it is not easy to obtain a correct match at the input of a two-metre receiver, but a certain amount of perseverance will pay useful dividends. The greatest problem is the elimination of the reactive component and here it is preferable to tap the aerial feeder on to the input coil rather than use a coupling loop. A loop has inductance and therefore reactance and this must be balanced out by means of a series condenser, in effect making loop and condenser a series resonant circuit. The coupling under resonant loop conditions becomes very critical and mechanical problems make a perfect match difficult to obtain.

The choice of balanced or unbalanced feeder should be governed by the type of RF stage employed. The enthusiast for ribbon feeder should be using a push-pull RF stage, and coaxial feeders should go to single-ended stages. This rule can be circumvented by special circuits and the use of baluns, and a selection of possible RF input circuits for the receiver is illustrated in Figs. 1-6 herewith.

Figs. 1 and 2 are the obvious and easy ways of input coupling and the only point to bear in mind here is that when altering the position of the input taps there is no change in coupling between A and B in Fig. 7, even if B is further up the coil than A; this effect is due to inductive coupling between the wire to the tap and the turns of the coil and can only be overcome by suitably repositioning either the coil or the input connector.

Figs. 3 and 4 indicate the use of baluns, composed of half-waves of coaxial cable, to meet the needs of those whose feeders do not suit their receivers. Fig. 5 is another method of unbalance-to-balance conversion, but it should be remembered that the coupling coil must be made to resonate and it may be difficult to provide an accurate means of coupling adjustment under resonant conditions. Fig. 6 uses the pi-system of coupling and with a little care in adjustment probably provides the best match of all. The only snag is that due to the direct connection of aerial to input grid without the input coil being earthed, there is the possibility of break-through, although a VHF choke from aerial input to ground will minimise this.

The question of mechanical balance is most important with push-pull stages, and all the precautions taken with the transmitter apply equally to receivers. Figs. 1, 4 and 5 have a direct earth to the centre of the grid coil and it will be noticed that the cathode resistor in these circuits is not by-passed, to avoid the
difficulties associated with forcing two centre taps on to the circuit.

Correct neutralisation of triode RF stages is vitally important and before any attempts at input matching adjustments are made, the stage must be perfectly stable with no aerial connected. A common fault with push-pull triodes is the use of neutralising condensers of too great a physical size, necessitating long leads. Very simple, efficient and low minimum neutralising condensers can be made from miniature $\frac{1}{4}$ in. diameter coil formers with brass slugs, as shown in Fig 8, where each "plate" of the condenser consists of some half-dozen shorted turns of bare 22 SWG tinned copper wire, the capacity being adjusted by altering the position of the brass core. Fig. 9 illustrates a suitable layout utilising this type of neutralising condenser.

The Mixer Stage

Frequency changers are inherently noisy devices, and the choice of RF stage is governed to a certain extent by the fact that sufficient gain must be realised to overcome mixer noise. In this respect the push-pull neutralised triode probably offers the best and simplest solution. The cascode brigade may have differing views on this and to avoid a discussion on the relative merits of G2IQ and cascode it is probably safer to repeat as previously that “results depend more on, layout than on circuitry.”

The choice of mixer valve depends on the RF stage or stages preceding, and if one is prepared to go to extreme lengths, such as separate copper boxes and so forth, to obtain complete stability from two RF stages, then the diode or crystal mixer is supreme.

Normally, however, triode valves will be the choice, so that one fundamental fact must be kept in mind when push-pull mixers are used: There are three feeds around a mixer—signal input, oscillator input, and IF output. With a push-pull mixer, two of these must be push-pull and the third single-ended. It does not matter which is which so long as this fundamental is adhered to; normally, it is preferable to have both inputs in push-pull and the output single-ended, as there should then be complete cancellation of all inputs in the output circuit.

Oscillator Injection

It is vital to ensure adequate oscillator injection in true balanced push-pull mode to the grids. Injection by inductive coupling to the grid circuit cannot ever be satisfactory, as one is trying to couple into a circuit which is considerably off tune. Capacity coupling to each grid is much better and in the case of a tuned push-pull oscillator this is easily achieved.

The use of tuned oscillators at VHF is perhaps a subject for some discussion, but basically for serious work crystal controlled injection must be preferable.

The problem of push-pull injection from a single-ended multiplier can be solved in a variety of ways and Fig. 10 illustrates two such circuits. The choice of circuit depends on layout, Fig. 10A being suitable where the last multiplier output does not come within easy reach of the mixer, whereas Fig. 10B lends itself to a more compact layout — but care should be taken to balance the series-tuned circuit; this can be done by the use of a pencil to ensure that the centre of the coil is the dead point. With push-pull mixers the cathode resistor should be by-passed with a condenser of low impedance at the IF used. Mixer instability at VHF, especially with triodes, is easily cured by a 100-ohm anode stopper and/or $5 \mu F$ condenser from anode to cathode. The IF coil in the anode circuit should be inductively tuned without any external capacity in order to provide sufficient bandwidth to avoid falling-off of signal strength at either end of the band. Any good two-metre converter should be flat over the band and any tendency towards lack of coverage is a sure sign of instability, which must be overcome before best results can be achieved.

Spurious Beats

A serious problem with VHF receivers is that of spurious signals or birdies. Due to the conflicting requirements of a high IF to eliminate second channel and mixer blocking troubles and a low IF for selectivity, every VHF receiver must be a double-superhet; in the case of a converter in front of a double superhet communications receiver the final set-up is a triple superhet. Birdies are caused by harmonics of the various oscillators falling within the passbands of the receiver, and some very queer combinations of frequencies can occur! Trouble from the first oscillator can be overcome by suitable choice of frequency. The 1st IF is normally a tunable receiver and a frequency between 24 and 30 mc will usually give the least trouble.

The crystal controlled multiplier chain is therefore required to produce a final frequency between 114 and 120 mc, and it is imperative that the crystal oscillator should be a harmonic type (such as the Squier) giving an output frequency not lower than the 1st IF. A single
Each one of these sketches is discussed in the article. At Fig. 8 is a particularly ingenious idea for the construction of a small semi-variable capacity, such as a neutralising condenser, for a VHF receiver. (Fig. 9 shows how the design can be applied in the layout of, say, a 6J6 RF stage.)

Fig. 10A/10B. As explained by G2HCG, these are possible circuit arrangements for mixer-oscillator injection in the two-metre receiver. In Fig. 10A the link coupling can be made quite long if necessary, thus permitting the oscillator-multiplier chain to be well separated and screened, and improving general performance; construction is often made easier if the oscillator can be put together as a separate unit.
twin-triode valve is all that should be necessary for the multiplier chain, with the first half operating as Squier oscillator on the third harmonic of a 13 mc crystal (or fifth harmonic of 8 mc) and the second half tripling to 120 mc. Keeping the initial frequency of the first oscillator high removes any troubles from the harmonics in that stage, but a prolific source of beats is the second oscillator, and this should be run at the lowest possible HT voltage to reduce harmonic output. When designing a complete two-metre receiver it is as well to arrange the layout so that the second oscillator is well separated from the signal input, and provision for screening the second oscillator stage completely is a well worth-while precaution.

Break-through of stations on the frequency of the first IF can be very annoying and efficient screening and a short lead from the converter to the main receiver is necessary—in fact, bonding the converter chassis to the main receiver can be very useful. Certain break-through troubles are caused by signals at IF being picked up direct on the two-metre aerial and passed right through the VHF section. This can be eliminated by attention to one or more of the following points: Use a type of aerial which has a short circuit to DC across the feeder, or, failing this, fit a quarter-wave closed stub, with the shorted end earthed, across the feeder. Ensure that inductive coupling, rather than capacitive, is used between the RF stage and the mixer, as shown in Fig. 10. This inductive coupling will have other advantages, too, giving increased gain and stability on two metres.

(Part II of this article, dealing with the Transmitter, will appear in the next issue.)

One of the latest National products to the NC-109, an 11-valve receiver which covers 540 kc to 40 mc in four switched ranges, with calibrated bandspread for the 10-11-15-20-40-80 metre amateur bands. There are five selectivity positions, with a crystal filter having one specially sharp phasing notch over 60 dB deep. There is a separate product detector for CW and SSB reception, and the receiver will also take normal AM phone on another switch position. An S-meter is provided, and the rear chassis-drop has an "accessory socket" for external power take-off when using converters or other auxiliary units. The NC-188 is somewhat similar in appearance, but is a simpler and less expensive receiver. The cost of the NC-109 (which is, of course, an American type) is the equivalent of about £70 in the States.

RECIROCAL LICENSING ARRANGEMENT

By agreement between our G.P.O. and the East African High Commission, the holder of any VQ amateur permit will be granted a U.K. licence on production of his East African ticket and his birth certificate. (Acknowledgement Radio Society of East Africa's "Circular Letter").
NEW QTH'S

E19S, D. Murphy, 46 Marian Grove, Butterfield Avenue, Rathfarnham, Co. Dublin.
G3KEB, G. H. McDonald, 4 Bewick Road, Gateshead 8, Co. Durham.
G3INW, A. Davies, 39 Pullan Avenue, Eccleshill, Bradford 2, Yorkshire.
G3KOF, E. C. Banks, 121 Charles Street, Swinton, Manchester, Lancs.
G3KSS, F. J. Davies, 39 Pullan Avenue, Eccleshill, Bradford 2, Yorkshire.
G3KZQ, G. Goddard, 28 The Acre, Glossop, Derbyshire.
G3LEI, N. Mills, 196 Old Road East, Gravesend, Kent.
G3LFH, S. Allan, 18 Strandburn Street, Sydenham, Wimbledon, Surrey.
G3LFS, A. Foulsham, 84 Cranborne Avenue, Totton, Southampton, Hants.
G3LHW, D. Powles, 75 Cedar Street, Derby, Derbyshire.
G3LNG, G. Robbins, 35 Sunlight Street, Anfield, Liverpool 6, Lancashire.
G3LOM, J. McCann, 10 Southfield Crescent, Coatbridge, Lanarkshire.
G3LPB, J. Brown, The Waterworks, Penryn, Cornwall.
G3LVQ, A. D. Eyers, 198 Churchill Avenue, Chatham, Kent.
G3LRN, H. Clark, Rose-Ellen, King Richard Road, Hinckley, Leics.
G3LRS, Leicester Radio Society, c/o S. D. Hoff, 51 Gwenocle Crescent, Braunstone, Leicester.
G3LRU, J. P. Miller, 4 Burstow Road, West Wimbledon, London, S.W.20.
G3LSK, A. J. Goodwin, Thornbury, Earl Howe Road, Holmer Green, nr. High Wycombe, Bucks.
G3LST, P. F. L. Clarke (ex-DL2AK), Redroofs, Thordon Gate, Horongate, nr. Brentwood, Essex.
G3LTA, B. N. Brassett, 80 Forest Road, Loughborough, Leics. (Tel.: Loughborough 3779).
G3M3TB, A. Barnes, 7 South Park Terrace, Glasgow, W.2. (Tel.: West 4080).

CHANGE OF ADDRESS
GW3AHN, T. Higginson, 176 Countisbury Avenue, Llanrumney, Cardiff, Glam.
G3AKI, F. Knowles, School House, Ketton, Stamford, Lincs.
G3CZS, A. W. S. Whatley, A.M.Inst.B.E., 74 Barnfield Avenue, Allesley, Coventry, Warwick. (Tel.: Allesley 379).
G3EFE, A. R. Bryant (ex-J4AAP/YI3EFE/GW3EFE), 16 Benedict Drive, East Bedfont, Feltham, Middlesex.
GD3EGF, T. Kellett (ex-G3EGF), 44 York Road, Douglas, Isle of Man.
G3ENT, North Kent Radio Society, c/o 39 Woolwich Road, Bexleyheath, Kent.
G3EUK, R. W. Curtis, 19 Dumber Lane, Ashton-on-Mersey, Sale, Cheshire.
G3FMO, G. Elliott, 3 Sandgate Avenue, Tilehurst, Reading, Berks.
G3FRV, R. G. B. Vaughan, Cervante, Arundel Drive East, Saltdean, Brighton 7, Sussex.
G3GGL, A. W. G. Wormald, 100 Willow Avenue, Edgbaston, Birmingham, 17.
G3HC, A. E. White, Timbers Ridge, Hoe Lane, Peaslake, Surrey.
G3HMO, J. M. Osborne, M.A., Quarry House, Stow, Buckingham, Bucks.
G3HTA, J. D. Forward, 12 Clevelend Close, Pennsylvania, Exeter, Devon.
G3HTC, G. E. Storey, 10 Avon Road, Sunbury-on-Thames, Middlesex.
G3HVLZ, T. E. I. Bromham, 11 Caswell Avenue, Caswell, Swansea, Glam.
G3INA, R. G. Robinson, Cloudsings, Beech Avenue, Sandiacre, Notts.
G3IXZ, R. T. Bowden, Peninnis, Outwood Common Road, Billericy, Essex.
G3JYX, G. J. Leask, 32 Queen Anne Street, Bradwell, Wolverton, Bucks.
GM3JC, J. C. Cunningham, Dalserf Station Cottage, by Larkhall, Lanarkshire.
G3JD0, H. Martin, 30 Finchale Road, Monkton Lane, Hebburn, Co. Durham.
G3JKK, A. J. Nichols (ex-V565CY), 112 Blackbrook Road, Heathfield Estate, Fareham, Hants.
G3JUL, G. C. Volier, 13 Marlborough Road, Ashford, Middlesex. (Tel.: Ashford 3359).
GM3KDZ, C. Ferns (ex-G3KDC), Taybank, William Street, Tayside, Fife.
G3KXT, R. I. Richardson, 170 Orchard Way, Shirley, Croydon, Surrey.
G3XC, W. J.Colelough, Pentere, Christmas Lane, Farnham Common, Bucks.
G6MT, W. Davidson, 7 Gaborston Avenue, Alloa, Clackmannanshire.
G6WN, A. E. Reeve, 66 Newbury Road, Ipswich, Suffolk.
THE SHORT WAVE MAGAZINE

August, 1957

THE OTHER MAN'S STATION

G3LSC

The station of G3LSC—owned and operated by D. T. Wyatt at 4 Norman Avenue, Branksome, Poole, Dorset—is of particular interest for several reasons: It is about the simplest possible, runs less than ten watts, is for Top Band only with receiver and transmitter working from the same power supply, and the Tx itself is the "Top Band Talking Box," as described in the October 1956 issue of SHORT WAVE MAGAZINE.

In our photograph, the transmitter is on the left; the mechanical design and layout, constructionally, of the "Talking Box" as originally illustrated have been modified somewhat to suit G3LSC's own requirements; in fact, this amounts to no more than using a larger box and arranging the two tuning controls and the plate meter on the front panel—in all other respects the circuit is exactly the same as that given for the "Talking Box," with the addition of a small transformer for the valve heaters. As already mentioned, HT for the transmitter is obtained by switching over the supply from the CR-100. Incidentally, the CR-100 is one of the "surplus" receivers with a very ample power unit—the stations supplied to members of the R.N.V. (W). R. are powered in the same way, with the transmitter actually built into the CR-100 cabinet, in which there is plenty of space for a QRP job.

At G3LSC, the aerial is a 145-footer, end fed, and tuned against ground by a simple aerial tuning unit (seen resting on the transmitter) link coupled to the "Talking Box" output by a length of coax; the link winding on the ATU itself incorporates a Faraday shield.

It is said that with the rig as illustrated here G3LSC is one of the most potent Top Band signals in his district; he himself remarks that "it is doing a grand job and excellent reports are coming in from well up the country." Certainly, his is one of the simplest stations we have yet described in the many years that this feature has been running.

CARDS HELD FOR ZD4

We are asked by the manager of the ZD4 QSL Bureau (P.O. Box 565, Kumasi, Ghana, West Africa) to say that he is holding cards for a number of ex-ZD4 stations no longer operating in Ghana. As there are no less than 17 of them, he is anxious that they should claim their cards—this may also explain why your ZD4 card never materialised! The calls listed are ZD4 AC, AD, AH, AL*AM, AO, AP, AU, AW, AX, BA, BC, BD, BG, BH, BI and BS. The present address of none of these operators is known at the ZD4 Bureau.

G3CTS/T, TELEVISION SOCIETY STATION

We are asked to announce that G3CTS/T, located at Norwood Technical College and operated on 427 mc (vision) and 423.5 mc (sound) for the Television Society, will be off the air until September 8, for the holiday period.
OUR records of Club activities go right back to 1946, and they have been kept in their present card-index form since early in 1948. It is not surprising, therefore, that some illuminating facts and figures are on record, and some of them are interesting enough to be quoted on the odd occasion.

This card index is divided into three categories—Active, "Resting," and Dead. The Active clubs are those that report more or less regularly, and their cards are not moved into the "Resting" Section until they have failed to report for six or seven months. At present the Active clubs number 82.

The "Resting" section (we cannot think of a better word, since "Moribund" might be doing them an injustice!) at presents holds 98 cards. These include many clubs who reported for month after month and then (often after a change of secretary, incidentally) were never heard from again. It also includes quite a few who report perhaps twice a year and then lapse for a long period.

The "Dead" section is entirely composed of Clubs that reported to us just once, and failed ever to make a reappearance. This includes no fewer than 49 cards, and is regarded as a sad piece of evidence that one man's enthusiasm is insufficient to form a Club and also to keep it running.

These three figures make up the surprising total of 229 Clubs, past and present, who have at some time or other reported their proceedings in our columns.

Records also show that there are only five Clubs which have run since 1948 without a change of Secretary. These are Harrow, Kingston, Scarborough, Slade and Yeovil. There are many others, more recently formed, with only one Secretary's name on their cards, but the above five are the real old-stagers whose names and addresses we know by heart!

Bradford will hold an Informal Meeting on August 20, followed on September 10 by the opening meeting of the new season. Bury meet on August 13 for a "general discussion on matters of topical interest," which reads rather like a euphemism for a "ragchew!" On September 10 they will be having a talk on the Panda transmitter by G3DZU; on September 14 they are holding a Hamfest at the Derby Hotel, Bury—dinner, raffle and film show. Tickets are available now from the hon. sec.

The Hornsby and Chorleywood Radio Club held a get-together at the Y.M.C.A., Falmouth, for their July meeting, at which Dr. Charles Elliot gave a lecture on Deafness and Electronic Aids. Visitors to the district are invited to make themselves known, but unfortunately their next meeting after the foregoing was August 7—a few days before publication date.

Cray Valley devoted their July meeting to a Junk Sale in aid of Club funds. Crystal Palace meet on August 10 to hear G2HP's talk on Using the Mains. They also gather on September 3; both meetings are at Windermere House, Westow Street, Crystal Palace, S.E.19.

Derby have a talk on Television Interference, by G2CVV, on August 14. August 21 is an Open Evening, and August 28 is booked for a Film Show. Flintshire will not be meeting in August, but on September 2 they have a talk booked on Uses of RF in Landline Communication. During July they had two very interesting and successful "outing-visits"—one to the G.P.O. Telephone Exchange at Prestatyn, and another to the new Power Station at Connah's Quay, with 30 members in the coach.

Harrow recently made a presentation to Mr. "Pop" Wilson, their oldest member, on his 75th birthday. On August 9 they have a Practical Evening; on the 16th a Quiz; on the 23rd another Practical Evening, and on the 30th the meeting is called "Electrical Puzzles." All meetings in the Science Lab., Roxeth Manor Secondary Modern School, Eastcote Lane, South Harrow.

Harlepool will be operating an Exhibition Station at the West Harlepool Annual Gardens Guild Show, using the Club's call G3IDV/A. One section of this station will be on the lookout for any "mobile" visitors. Leven, a newcomer to these columns, meets each Wednesday at the Durie Foundry, Leven Bank. They have acquired the call GM3LUM and their members are now building a transmitter. Membership includes quite a few TV engineers and radio apprentices, together with a goodly number of amateurs and SWL's.

The Science Museum Radio Society has arranged the first of its new season's meetings for September 10 at 6 p.m., when Major G. Watson, VP8BP, will give an illustrated talk on Radio in Antarctica. Membership is open to all Civil Servants, and full details may be obtained from the hon. sec. (see panel).

Slade are meeting on August 16 for a lecture on Coil Design by Mr. N. B. Simmonds. On the 30th they will be visiting the sound recording studios of Messrs. Hollick and Taylor. On August 25 they hold the Har-
court Trophy D-F Test. The Club Station, G3JBN, is open for the use of members every day, and classes are held every Tuesday and Wednesday evening at Church House, High Street, Erdington, Birmingham 23.

Sutton and Cheam will be "going portable" from 8 p.m. onwards on August 20. On September 17 they have a talk on Measuring Instruments, by Mr. A. Pratt (Pullins). Torbay had an interesting lecture by G3FUT on Audio Fault-Finding at their July meeting; on August 10 the speaker will be Mr. D. Willoughby, DL2YU — 7.30 p.m. at the Y.M.C.A., Torquay.

Grafton recently held their Top-Band CW Contest for the G2AAN Cup, and the winner emerged as G3KQX, with G2HGT and G3KGM running second and third. Their annual Field Day on Hampstead Heath was a great success, as usual, with many local DX contacts made. Grafton is now closed for the summer recess but will re-open on September 6. The popular and successful R.A.E.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

BRADFORD: D. M. Pratt, G3KEP, 27 Woodlands Grove, Cottingley, Bingley.
BURY: J. Robinson, 56 Avondale Avenue, Bury.
CORNWALL: J. Brown, G3LBP, c/o W. A. Thomas, 38 Lower Market St., Penzance, Cornwall.
DERBY: F. C. Ward, G2CVY, 5 Uplands Avenue, Littleover, Derby.
FLINTSHIRE: J. Thornton Lawrence, GW3JGA, Perranporth, Cornwall.
HARROW: S. C. I. Phillips, 131 Belmont Road, Harrow Weald, Middlesex.
HASTINGS: W. E. Thompson, 8 Coventry Road, St. Leonards on Sea.
LEVEN: J. Taylor, GM2DBX, Main Street, Medehill, Leven, Fife.
NEWBURY: J. A. Gale, Wild Hedges, Crookham Common, near Newbury.
NORWICH: H. Staff, G4K0, 59 Charles Avenue, Thorpe, Norwich.
NOTTINGHAM (Amateur Radio Club): F. V. Farnsworth, G3DUL, 43 Plains Road, Mapperley, Nottingham.
NOTTINGHAM (Amateur Radio Society): H. H. Pickering, G2GCT, 9 Basford Street, Nuthall Road, Cinderhill, 7.30 p.m. There is no August meeting.
PONTEFRACT: W. Farrar, G3ESP, Stanton, Hemsworthy Road, Ackworth, Pontefract.
PURLEY: E. R. Honeywood, G3JGF, 105 Whyteleafe Road, Purley.
SHEFFORD: G. R. Cobb, G3JXG, 7 Hitchin Avenue, Shefford, Beds.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
STOCKPORT: G. R. Philips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
SUTTON AND CHEAM: F. J. Harris, G2BOF, 143 Collingwood Road, Sutton.
TORBAY: G. Western, G3LFL, 118 Salisbury Avenue, Barton, Torquay.
WANSTEAD AND WOODFORD: C. Stevenson, 25 Boundary Road, Barking, Essex.

and Morse classes will be re-starting by September 23.

Purley met on July 19 to hear about Multi-Range Test Meters from G3DPW, and on the 20th they were operating from the Summer Fair in the Rotary Field. Purley (which sounds like a good site for beams but is not what it appears!) Norwich inform us that they meet on Fridays, 7.30 p.m. at the Golden Lion, St. Johns, Maddermarket. A recent talk, by G3ASQ, was on the subject of Electronic Computers. As mentioned elsewhere in this issue, they are going out to Scroby Sands again on August 25 — wind, weather and circumstances permitting.

Hastings once more ran a very successful working demonstration at the Sciences Exhibition during Carnival Week, and made DX contacts on Twenty CW as well as many local phone QSO's on Forty. During the week they had a good contact with DLORR, the station in the Hobbies Exhibition at Recklinghausen in the Ruhr, and much local interest was aroused. Weekly meetings continue, every Tuesday at 22 Middle Street, Hastings.

Newbury ran informal meetings in June and July, and these proved to be very popular. August is a blank month, but on September 27 the programme is resumed. There will be a Hamfest on October 13. Newbury can produce two Mobiles at present.

Nottingham (Amateur Radio Society) will meet on September 20 at the Basford Hall Miners' Welfare, Nuthall Road, Cinderhill, 7.30 p.m. There is no August meeting.

Pontefract are preparing a Clubroom on the upper floor of the Queens Hotel, one of the highest buildings in the town, with a 20-ft. flagpole on top. New members will be welcomed on the 1st, 3rd and 5th (if any) Thursdays each month at 8 p.m.

Sheffield meet every Friday at Digswell House, 8 p.m. On August 16 G2DUS will talk on A Two-Metre Portable; on August 23, J. Brunt on Superhet Alignment; and on the 30th there is a Circuit-Drawing Quiz, which sounds intriguing. Recent events have included a
Colour TV demonstration by G2DUS, and talks on "Ham Jargon" and the Club history. 

Stockport do not meet again until August 28 (SSB, by G3AUB); on September 11 the subject is TVI, by G3AUB. Recent lectures have covered Oscillators, Transistors, Power Packs and Workshop Practice.

Wanstead and Woodford ask members to note that an Extraordinary General Meeting will be held on August 13 at 8 p.m. Their Two-Metre gear is now on the air, and they also have a Top-Band rig, almost ready.

The other Nottingham group, the Amateur Radio Club, are at Woodthorpe House, Mansfield Road every Tuesday evening (but not August 11 and 20) and prospective members are always welcome.

G6HH/A AT THE HASTINGS HOBBIES EXHIBITION

W. E. Thompson

(Hon. Secretary, Hastings & District Amateur Radio Club)

The Hastings & District Amateur Radio Club again exhibited at the Hobbies and Crafts Exhibition during Hastings Carnival Week. This popular exhibition is held in two indoor bowls pavilions in Falaise Road, Hastings, during the first full week in July each year. This is the fifth year that the Club has been present and operating an amateur station. The call-sign G6HH/A ("Happy Hastings") was used, and it is already well known as a potent signal from the yearly exhibition.

In previous years Eighty had been the band, but considerable difficulty had been experienced with QRМ from the Fair immediately adjoining the exhibition halls. So severe was this that operating the station during the afternoon was almost impossible, since only the strongest of S9 signals could penetrate the high noise level. When the Fair got into its full stride the station had to be closed down. Last year we tried 40 metres and found the band to be much quieter, so this year we decided to use this band again and also try 20 metres. The plan was to use 40 during the mornings and afternoons, and to go on 20 for CW in the late evening and try some long-haul stuff. Results have shown that the choice was justified.

Aerials were erected on the Wednesday evening, July 3, and the station installed on Friday 5th, in readiness for the exhibition which ran from July 6 to 13 inclusive with the exception of the Sunday. (We did, however, work a few stations on the Sunday to keep our hand in.)

The aerials were half-wave dipoles for 40 and 20 at a height of about 35ft., centre-fed with co-axial cable. They spanned one of the two bowling greens and were supported by three masts. The 40-metre aerial was about 80ft. from the station, and the 20-metre aerial some 50ft. away. Being on high ground above the White Rock Pavilion, they were some 150ft. a.s.l. The good site almost certainly accounts for the strong signals reported from all stations working during the week.

The 120-watt transmitter consisted of a modified Bendix TA12C modulated by a pair of 807s in Class-B, zero bias. A crystal deaf-aid microphone was used, mounted in a marble case. This equipment and the associated power supplies were built by the Club's chairman in readiness for the day, near at hand, when his own ticket arrives. The week's work gave the apparatus a good try-out and at least shows that it does (or did?) work. In the early part of the week the Club-secretary's SX-28 receiver was used, but on the Wednesday this developed shorted turns in one half of the HT windings on the mains transformer. It had previously given warning that all was not well when explosive noises and some traces of pungent smoke were emitted, but this proved to be nothing more serious than an 0.01 µF filter condenser across the mains input "going dry," so no serious notice was taken. However, shorted HT windings being a different kettle of fish, the chairman's CR-100 was brought into service, so we finished up with all his stuff on the table — and right well it worked, too.

During Friday morning, July 12, a fairly boisterous gale blew up, and in the middle of a QSO with G3DLP just at a point where he was about to turn the transmission over to us, the receiver suddenly went dead. A glance out of the window confirmed our worst fears — the aerials had gone! The centre mast had snapped in three places, precisely at 1145 a.m. A dash across the Cumberland turf and a quick pull on the 40-metre dipole halyard, a hasty make-off on a stay-rods and we were on the air again at 1155 hrs. with G2FQD, and G3DLP hooked up again at 1157. However, due to the feeder trailing along the ground, the transmitter could not be loaded up properly, so a second attempt at repairs was made at 1215, when a stump of the broken mast was slipped over a stay-rods and the 40-metre dipole fastened to it. This raised one end about 7 feet the other end then being some 20ft. high, thereby getting the feeder off the deck. The transmitter then loaded more sensibly, and reports still said S9 or S9+ so we left it like that!

Later, at 1300 B.S.T., an interesting QSO resulted with DL0RR, another exhibition station at Recklinghausen, near Essen, in the Ruhr district of Western Germany. A schedule was made for a further QSO at 1545 which turned out to be of considerable interest to the visitors at both exhibitions. DL0RR reported a large crowd around him, listening to us, and we were able to say the same from our end. In addition, we were fortunate to have a visit from the Hastings "Carnival Queen" and her four "Maids of Honour," each of whom spoke capably and confidently to the DL exhibition station, and exchanged greetings with the folk there.

On Saturday July 13 the whole morning was spent chasing a gremlin in the transmitter, which for some unknown reason would not load up properly, but when left to its own devices for the lunch hour was found to be in good order when next switched on!

There were other outstanding incidents, too. The Teddy-boy, for example, who sat himself down beside the operator when we were on 20 metre CW, and demanded, "Get a Ruski — go on — get a Ruski!" When we obliged he declared he could not understand the reply, so we explained that the chap the other end was talking in Russian Morse. Teddy then wanted us to send out a message and receive it back ourselves;
he seemed doubtful of our prowess because we could not do it for him. By this time we were a bit browned off, so we got rid of him.

Some words of wisdom were uttered by two members of the other sex; one explained to her small son that we were sending SOS's to ships, while another proclaimed that what she heard sounded "just like Luxembourg."

During the afternoon of Thursday July 11 the pirate of all pirates came up with the call-sign G3PGM. When we queried the call and announced that three operators, including two old-timers, were waiting for him, he took fright and vanished. The previous day we had QRZ to a station calling us, who returned to say they were Army radio mechs. in Germany testing, and would give us a report. We became stony silent.

The general reaction of onlookers was rather unusual. Much to our surprise they did not take a great deal of interest in us when we were working phone. It would seem that the general public has become used to seeing someone talk into a microphone, and hearing a voice from a loudspeaker. On the other hand, when we were pounding brass for dear life, sizeable crowds gathered round and looked to be intensely interested. Even though 99 out of 100 had not the faintest notion of what we were actually doing, they seemed completely mesmerised.

Interest became almost fanatical when some far-off country was contacted, the high-light being when G38BDQ hooked 3W8AA in Northern Viet-Nam. We felt certain many of the onlookers thought we understood Chinese.

To assist people who watched us, we chalked up on a black-board the call-sign and country of origin of stations worked. There was also a list which grew daily, showing countries worked to date. This aroused considerable comment. There was also an oscilloscope on a table nearby, rigged to amuse people by showing waveforms when they spoke into a microphone; but being in a strong RF field it also managed to reproduce our key and phone transmissions and thus demonstrate that we really were sending out something. The microphone also picked up sound from the speaker and showed waveforms of that, too. This accidental demonstration, at a distance, caused endless wonderment.

When the rig was fired up for a try-out on the evening of Friday July 5, our first QSO was with W1AXA on 14 mc CW, the second being with UB5AI. Our final contact before we went QRT on Saturday July 13, strangely, was also with a W, this time W2IOP on 14 mc CW.

Perhaps the two outstanding QSO's were those with G3HLS/M in Bromley, Kent, who was putting in a cracking signal, and the reply to a chance CQ-VK at 1050 on Friday July 12 which brought us VK3CX. Unfortunately, we lost the VK when a W1 and an OZ neatly sat on us and proceeded to pound out G6HH/A. What we called them was nobody's business.

An analysis of the station log shows that during the week we had 240 QSO's and worked 194 stations. Of these, 12 were worked on 14 mc phone, 56 on 14 mc CW and 126 on 7 mc phone. Eleven QSO's on 7 mc phone were with stations on the Continent, the remainder being with G's. A total of 35 countries was safely in the bag by the time we went QRT, which is not bad going.

G6HH/A would like to say a hearty "thank-you" to all stations worked for the very pleasant QSO's, and to reciprocate their 73.

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**SIEMENS-EDISWAN MERGER AFFECTS TUNGSRAM VALVES**

With the complete integration of Siemens Bros. and Edison, Swan the handling of Tungsram Valves reverts to the British Tungsram Radio Works Co., Ltd., West Road, Tottenham, London, N.17. The new firm of Siemens Edison Swan, Ltd. (as it is now known) will continue to be responsible for the manufacture and distribution of all Ediswan Mazda valve and CRT types. Certain of these have been increased in price since the beginning of July.

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**WARNING OF DANGER?**

In the House of Commons on July 3, the Postmaster-General said, in reply to a question, that he "Intends to set up a new Committee, which will include representatives of industry and users, to advise (him) on the broad aspects of radio frequency allocation." Since frequency allocation is settled by international agreement (one of the few matters in which the Russians do co-operate fully, because they have to) presumably the new PMG Committee will deal only with those frequency areas under direct domestic control. These are mainly UHF/VHF — but in view of the pressure on all our bands, HF as well as VHF, the situation, and the composition of this Committee, wants careful watching. We are surrounded by ill-disposed persons, who would gladly have us off the air altogether.

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**BLIND AMATEUR REGISTER**

Further to the notices in the June and July issues of SHORT WAVE MAGAZINE, we now have the callsigns, names and addresses of no less than 35 U.K. licensed amateurs who are sightless. Each is being asked to supply certain information for the Register of Blind Amateurs, and it is hoped to initiate regular net operation on the 80 and/or 40 metre bands, when details of equipment and operating times are available. In the meantime, anyone who is aware of a blind amateur who may not yet have made himself known is asked to put him in touch — see p. 190 June and p. 242 July for further information.

In connection with this project, we have in mind the possibility that readers generally may have items of equipment that they would like to donate to their sightless colleagues. In collaboration with G6KJ — who is in charge of the Register of Blind Amateurs, and is himself sightless — we would arrange for potential donors to be put in touch with those who may be in need of the apparatus they have for disposal. In the first instance, readers with spare gear for this purpose are asked to write in — to G6KJ, Blind Amateur Register, c/o The Editor — saying exactly what they have to give away. (It should, of course, be useful apparatus in reasonable working order.)

Please do not, however, send any such equipment in to us. Our function is simply to act as a clearing house for information, not for the actual gear. We will in due course put donors in contact with suitable recipients.
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