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The "Lighthouse" is the symbol of your Eddystone dealer and our map shows where the nearest one to you is located. The list on the following pages gives you their full address. They are all able to give you full information on any Eddystone receiver that interests you and most have demonstration facilities. In case of any difficulties contact the main Eddystone retail distributors—Imhofs, 112-116 New Oxford Street, London W.C.1.

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E. & O. E. 667
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The SHORT-WAVE Magazine

EDITORIAL

Situation We are now at the peak of the season for activity on the amateur bands—whether we communicate across the parish or over the world. Top Band and VHF will be well populated, with (all being well) DX being found on the former and much local working taking place on the latter—for we cannot expect a lot in the way of EU/DX openings on two or four metres at this time of year, unless there are Auroral manifestations.

But things are, perhaps, not so happy on the HF bands. From the point of view of the world beyond, there are—so we are told—not enough G’s being heard in DX parts, and it is not the fault of conditions. It is said that as soon as TV opens up for the evening hours, U.K. activity on the HF/DX bands dies away.

This is understandable in urban conurbations, where 15 and 20 metres are obviously difficult in terms of local TVI, especially in those areas where the TV signal level is anyway marginal.

However, the fact remains that there is plenty of scope for late-evening and early-morning activity on the 40- and 80-metre bands, when they are full of DX—and (at this time of year) for day-time working on 15 and 20 metres for those who can be on before the evening hours, when TVI becomes the menace, lurking over the shoulder of any amateur surrounded by TV aerials.

This gloomy situation in the U.K. is not really understood at DX, where there is not much local TV in what we call the Band I frequency area—so the feeling tends to be that G’s close down to watch TV! Well, some do—but the great majority would much rather be able to operate without having to worry about TVI.

It is a fact that many U.K. amateurs have overcome the problem—and much has been written about how it can be tackled. The first thing to do is to make sure one’s own screen is clear. Then, if there are complaints from neighbours (often made anonymously and treated as confidential by the Radio Interference Dept.) it is a matter for the authorities to carry out an investigation and, if possible, to find a solution which, in most cases, they always try to do in the interests of all concerned.

★★★★

To all our readers, at home and overseas, our trade friends and our supporters,
A Successful and Prosperous New Year.

Auszin Footn. GO6OF

WORLD-WIDE COMMUNICATION
THE need of a system whereby a three-element beam could be elevated to a height of 40 feet with the minimum of danger to neighbours and the antenna itself, and without having to press-gang an enormous work party into helping had long been felt at the QTH of 9H1R. However, in keeping with the usual principle of listing proposed modifications until something goes wrong and enforces remedial action, the opportunity never presented itself until March this year, when the rotator ground to a shuddering and permanent halt, with the beam in the opposite direction to the U.K., of course.

Upon subsequent inspection, it transpired that the drive ring in the CDR AR22 rotator had snapped in two places. This was the result of the wind and the fact that the existing home-made three-element three-band beam was far too heavy. It was a "plumber's delight" construction, using a 1-inch water pipe boom with welded cross pieces supporting three 6ft. 2 x 1 inch timbers which in turn supported the elements. It weighed 120 lbs.! True, it has stood up to 70 m.p.h. gusts for eight long years—but—Oh! what a job to raise and lower for routine maintenance, and what a strain on the rotator.

Having had five months to mull over the various plans for some means of elevating and lowering the beam more easily, preferably single-handed, the system described here was evolved and worked extremely well. Countless plans for crank-up and topping-lift-type towers were abandoned in the interests of simplicity. The specifications were broadly drawn up as follows:—

(a) The beam itself had to be reduced in weight from 120 lbs. to approx. 25 lbs.,

(b) It had to look acceptable aesthetically (no drooping elements, etc.),

(c) It had to be capable of elevation up to 40ft. by one person and of being lowered again within seconds to allow ease of servicing and adjustments.

(d) Access to the flat roof of the author's dwelling from the garden shack was needed to allow for the "forgotten tools" and obviate the danger of climbing through a bedroom window,

(e) The rotator should be placed as low as

[cont'd p.672]
Fig. 1. Showing main constructional details, and method of raising and lowering.
possible to reduce unwieldy top-weight.

(f) The whole assembly should also cater for the maximum number of uses.

With reference to the last item, the two-metre Yagi and the domestic TV aerials were stacked six feet above the HF beam assembly so the rotator performed three jobs as did the mast.

The repaired rotator was placed halfway between the two 20ft. mast sections, the lower half of which was 2-inch heavy water pipe and the upper section of 2-inch dural tubing. The rotator therefore acted as a convenient "joint" between the two sections and being lower placed than previously, lessened the top-weight. This satisfied the requirement of item (e).

The reduction in weight of the beam was achieved by substituting the old water-pipe boom and crosspieces by a twin aluminium boom and the aesthetic problem was solved by the use of small diameter aluminium supports and nylon cords supporting the elements, indicated as in one of the photographs. The drawings show the general arrangement, including the method of raising and lowering—see p.671.

Nylon cord with a B/S of 1000 lbs. was used for the guys and these were pre-cut to the exact lengths by trial-and-error—raising and lowering the mast without the antennae fixed. Bowlines were used to prevent slip and the loose ends were secured by whipping with light wire. The upper guys were attached by "D" shackles to a prepared shroud plate to allow the whole assembly to rotate freely. The lower guys went to the bottom of the rotator which is static.

One pair of the upper guys was permanently fixed and the other pair ran through pulleys at the corners of the rooftop and back through a centre double pulley (see Fig. 1), so it was a simple matter to pull on the two guys simultaneously and elevate the whole structure. The lower guys were fitted after erection as a form of insurance and to bolster the author's self confidence!

The swivel base action was achieved by welding a 3ft. piece of 1-inch water pipe across the mast base, and clamping it to two large blocks of Maltese limestone with rawlbolts and suitable clamps—see photograph. About 2in. clearance between the heel of the mast and the foot was needed.

Up It Went

The HF beam was clamped in place on the mast, the two-metre Yagi and domestic TV antennae, already fixed to their 6ft. poles, were inserted into the end of the mast and bolted in position. The coax feeds were taped to the mast and the tape whipped with binding wire to prevent its natural tendency to unfurl after some time exposed to the weather. The author's 17-year old son then heaved on the nylon guys and the whole assembly soared into the air in about 5 seconds. The ends of the hoisting guys were secured and the lower guys attached.

As flat roofs in the U.K. are not very usual there is no reason why this same approach should not be employed at ground level—indeed, one would not be limited to
The 9H1R array in position. Above the three-element HF tri-bander are a two-metre Yagi and a TV aerial.

guy length (and therefore purchase) by such physical limitations as the area of the roof.

In conclusion, the mechanical arrangements for elevating and lowering provided ideal. The electrical side, however, showed that in spite of the six feet of separation, the stacking of the 2-metre Yagi and domestic TV aerials had slightly upset the previous low SWR of the HF beam. This was no longer a serious matter since it only involved lowering the assembly and unbolting the two offending antennae and removing them, which was now a simple job.

Anti-Climax!

Still, the benefits of the arrangement were not to be savoured to the full, since twenty-four hours after erection the author was informed by the Malta Education Department that he was being sent on a year’s course of study at the Plymouth College of Technology and down it all had to come! However, it speaks well of the system that, no longer the onerous task of the past, it took only two hours to dismantle the whole set-up and store it away for future use.

JOIN YOUR LOCAL CLUB

Each month, in the “Month with The Clubs” feature in SHORT WAVE MAGAZINE, we publish a list of the secretaries of those Clubs reported for the current period—see p.643 December issue. Over three or four consecutive months, practically all active Clubs are covered. Thus, anyone interested in joining a local Club should be able to find out if there is one in his locality, with the address of the honorary secretary. For the beginner in Amateur Radio, there are great advantages in joining a Club—the collective advice of members is available on all manner of topics, based on experience and more can be learnt in one evening than by hours of reading or letter-writing.

“TOP BAND MOBILE TRANSCEIVER”

Further to the Editorial note on p.614 of the December issue, herewith the circuit diagram to use with the Denco BFO.2/456, substituting for the HSO.460 shown in the main circuit diagram on p.542 of the November issue.
ECONOMICAL AM PHONE ON TWO METRES

QQV06-40A RF AMPLIFIER,
SERIES-GATE MODULATED

B. A. PICKERS, B.Sc. (G3YUA)

There is quite often considerable difficulty and expense involved in going QRO up to the legal maximum input on two metres. It was found at this station that a reasonable approach was to rebuild from scratch and use modern techniques for modulation. Series-Gate control seemed to offer chances of success because of the simplicity of the circuit and the very good signals heard on VHF from other stations using this transmission mode. It is simple to set up and is capable of very good results.

With the carrier running at high level, the transmission, at long range, sounds like very heavy plate-and-screen control, and certainly has anti-QSB properties. As the carrier sinks down in the noise, the modulation will bring it up an S-point or two and this has a very definite tendency to combat fading. No fancy equipment (apart from a 100-watt lamp) is needed to set the system up, and in the author's view, it is as simple to use as normal high level (plate-and-screen) modulation, with the added advantage of giving complete control over the transmitted power, ranging from a few watts right up to the maximum legal input. Due to the low duty-cycle of Series-Gate modulation (it compares with SSB in this respect), it is possible to get high peak powers with quite modest equipment.

Fig. 1 shows the circuit of a two-metre transmitter which is Series-Gate modulated, and capable of taking a DC input varying from about twenty watts to 150 watts. Fig. 2 is the arrangement for the modulator, which is built as a sub-chassis unit to afford maximum screening.

The circuitry has been kept as economical as possible while still retaining desirable features, such as ample drive and the ability to key various stages. For low power levels, anode keying of the last driver stage is quite adequate, but when using maximum input it is preferable to key the screen of the power amplifier. This can be done by simply inserting a key socket in series with the screen feed. A more sophisticated method would be to key the cathode of the Series-Gate modulator. Either is quite satisfactory.

**Description**

Valve V1 is the triode half of an ECL80, and is used as an overtone oscillator. The anode of this stage is tuned to 24 mc, as this offers the facility of using 8, 12 or 24 mc crystals. To compensate for the rather low level of drive from this stage when using 8 mc crystals, V2, an EF80, is used as a buffer amplifier, also tuned to 24 mc. V3 is a conventional 5763 frequency tripler to 72 mc and V4 is a further frequency multiplier to 144 mc.
The exciter sequence is therefore 24-24-72-144 mc.

With this choice of exciter stage, 48 mc is not boosted, avoiding a large harmonic content on or about 190 mc which in the Midlands can cause considerable trouble with ITV transmissions.

The anode of V4 is tuned with a pseudo push-pull circuit to suit interwinding with the grids of the power amplifier. The power amplifier, V5, is of conventional design using the well known QJV06-40A. The HT required for this stage is 1000 volts at 150 mA. Power requirements for the exciter chain and modulator are 350 volts at 150 mA. It may be noted that with 1000 volts on the anodes of the power amplifier, a milliammeter will give direct readout of DC input to that stage, e.g. 150 mA = 150 watts, etc.

Construction

The construction of the transmitter follows the normal lines for any VHF transmitter. Thus, it is very important to by-pass all heater leads, and power leads to and from the main transmitter. The power amplifier valve base must be mounted below chassis level to ensure that the internal screen in the valve is level with the top of the chassis. It is preferable that the base of the PA be in a screened sub-compartment to ensure that the grid circuit is isolated.

Several switched crystals could be used in the oscillator, but at G3YUA it was thought that a front panel-mounted crystal holder would be better. This resulted in rather long leads between the crystal and the oscillator stage but in practice this was not found to be troublesome.

Linear lines were used to tune the anodes of the power amplifier because they have a higher Q than a lumped circuit on VHF and so help to suppress any harmonics present. They are also slightly more efficient.

The design and construction of the Series-Gate modulator is quite straightforward, but it was found necessary to build the entire unit in a small die-cast box under the main transmitter chassis next to the PA compartment.

Table of Values

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<td>39 µµF</td>
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<td>R3, R4</td>
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<td>0-200 mA</td>
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<td>R7</td>
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<td>C6, C7</td>
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Table of Coil Data

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</tr>
<tr>
<td>L2</td>
<td>12 turns 23g, on 1 in. dia. former</td>
</tr>
<tr>
<td>L3</td>
<td>7 turns 23g, on 1 in. dia. former</td>
</tr>
<tr>
<td>L4</td>
<td>4 turns 23g, self-supporting, 1 in. dia.</td>
</tr>
<tr>
<td>L5</td>
<td>4 turns 14g, self-supporting, 1 in. dia.</td>
</tr>
<tr>
<td>PA</td>
<td>Tank circuit lines to dimensions given in 'Radio Communications Handbook'</td>
</tr>
</tbody>
</table>

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Linear lines were used to tune the anodes of the power amplifier because they have a higher Q than a lumped circuit on VHF and so help to suppress any harmonics present. They are also slightly more efficient.

The design and construction of the Series-Gate modulator is quite straightforward, but it was found necessary to build the entire unit in a small die-cast box under the main transmitter chassis next to the PA compartment.

Generous screening and by-passing is required, and great care must be taken to eliminate hum loops in the screened wiring. All heaters must be by-passed with .001 µF capacitors, and the usual filtering precautions be taken when wiring the microphone amplifier. Adequate gain is available using an ECC83 as microphone amplifier and the series-gate modulator can be an ECC82 or similar valve.
VERSATILE ATU FOR TOP BAND
MULTI-MATCH DEVICE FOR ANY TYPE OF AERIAL

P. R. CRAGG (G3UGK)

LONG wires, short wires, medium-length wires, high wires, low wires, end-fed wires, centre-fed wires—at one time or another most Top Band operators will have tried one or more of these, or their variants, in the never-ending search for a Better Signal. Having got the aerial up, the problem of feeding power into it is the next consideration—and always a problem because there are very few transmitters capable of coping with much outside the usual 50-75 ohms of input impedance. And how many 160-metre aerials present this magic figure to the Tx? Virtually none.

Many and varied are the configurations of ATU to be found in the literature—but none of them can cope with impedances that depart very much from the design figures.

The ATU described here is a combination of the three most commonly-needed configurations, selectable at the turn of a switch, to enable high or low impedances, balanced or unbalanced, to be transformed into a suitable match for the transmitter.

Design Considerations

No matter what the height or length of your aerial, or its feed point, it will look like one of the following to the transmitter: (1) Low impedance, unbalanced; (2) High impedance, unbalanced; (3) Low impedance, balanced; and (4) High impedance, balanced.

DC input to the power amplifier is controlled by adjustment of the audio gain.

Results

In practice it has been found that best results were obtained when the resting carrier level was set to 100 watts and the system then talked-up to 150 watts. This gave distant stations a strong carrier to tune and hold. TVI was much less troublesome when the resting carrier was brought down to 20 watts and talked up to high power on speech peaks.

This form of modulation is capable of very good results provided that the audio from the microphone amplifier is clean. On-the-air-reports are the best guide. If a reflectometer is available with a headphone socket, this will give a very good indication of the audio quality as transmitted.

When this new transmitter was put into service, very good results were obtained straight away and a consistently strong signal was radiated into the Continent. In two months the SHORT WAVE MAGAZINE VHFC award was obtained.

To deal with Case (4) first, the reader will realise that it would be unrealistic to cater for this, because a high-impedance balanced feed necessitates the use of a folded dipole at a height of not less than one half wavelength, say, 265ft. for Top Band. Anyone able to put up such an aerial would not need a multi-match ATU to couple it to the Tx.

Thus, we are left with the more usual types of long wires and dipoles. End-fed quarter-waves and the like need the series-tuned circuit of Fig. 2A to match the Tx into the low-impedance unbalanced feed. A half-wave dipole (by definition, centre-fed) presents a balanced, low impedance feed point and would need an ATU to the circuit of Fig. 2B. On the other hand, the end-fed wire, of up to half a wavelength or so, will offer a high-impedance unbalanced feed point, and will call for the circuit of Fig. 2C. There are variations on Fig. 2B, but the arrangement shown here has been used successfully for years.

Circuit Description

By the circuit of Fig. 1, any of the three required configurations can be selected by Sw1, a rotary switch of the low-loss type. Posn. 1 gives the Fig. 2A arrangement; posn. 2, Fig. 2B; and posn. 3, Fig. 2C.

When on posns. 1 or 3, transmitter loading is adjusted by selecting any one of the 12 tapping points on the coil, by Sw2, and on posn. 2 by the number of turns and the degree of coupling of the link (centre winding). In the writer's case, the link coil was found by experiment to enable a dipole anywhere between 25 and 60 feet to be loaded, this being considered a sufficient range for normal use. This link coil is open-circuited on posns. 1 and 3, when it has a negligible effect on the operation of the ATU. On posns. 1 and 3, the main windings are connected in series by the action of switch Sw1B, and act as a single inductance.
Fig. 1. Circuit of the Tuner, and see Fig. 2. Values can be:

- C1, 500 µF, Rx type variable;
- Sw1, 6-pole 3-way rotary switch;
- Sw2, single-pole 12-way rotary;
- Coil, see text and Fig. 3;
- Meter, 0-1 amp. RF.

Construction

First, the coil. Close-wind 50 turns of 22g. enam. copper wire on a 1½in. dia. former. Cut the centre turn and solder leads on to each end of the severed turn, ensuring that they are long enough to reach the tags on Sw1. Close-wind six turns of p.v.c. insulated wire over the centre of the main winding, making sure to get three turns each side of the two centre leads. (Be careful to wind the link coil in the same direction as the main winding). Tape the link in place. Scrape away the enamel from one point of each the first 12 turns of the main coil, and solder suitable leads at these points, being very careful not to short turns; it is advisable to offset each tapping point alternately by about a quarter-inch.

The capacitor C1 must be insulated from ground,
The prototype as discussed here has performed every bit as well as expected, and has proved extremely useful over the last few months. It has had to cope with half-waves, end-fed wires, quarter-waves, an inverted-Vee, and a "5RV" with feeders strapped, in locations as varied as a field in Huntingdonshire, Dartford Heath, the West London Air Terminal, a hotel in Guernsey, various local stations, and the home QTH. It has tasted AM/CW/SSB using a Codar, a Vanguard, Vespa and KW-2000A—in other words, "I don't know what I'd do without it." The writer acknowledges help and advice from G3XTJ, G3XPE and G3RVV.

SUBSCRIPTION NOTE

A direct subscription to SHORT WAVE MAGAZINE costs 45s., (or 48s. "1st class mail") post free for a year of 12 twelve issues, starting any month. Despatch is guaranteed on the day before the last Friday in the month (which is publication day). Orders, with remittance, to: Subscription Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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THE "NEW QTH" PAGE

Periodically, as this month, we take some extra space to reduce the back-log of QTH's for publication, mainly changes-of-address—see pp.708-709 this issue. As explained on previous occasions, it behoves all interested in having their callsign/address published in the Magazine and the international Radio Amateur Call Book to let us know as soon as possible. It is a fact that new QTH's and changes-of-address come in literally daily, and so have to be taken strictly in rotation. And if you are notifying a change of address, please do not fail to say whether you are, or are not, a direct subscriber.

ALWAYS WANTED

Photographs of Amateur Radio interest, suitable for publication in SHORT WAVE MAGAZINE—either of equipment, stations, personalities or Club groups. They should be good quality prints, clear and sharp, and can be of any reasonable size, though post-card is preferred. Details should be on a separate sheet accompanying the picture and attached lightly to it—not written on the back of the photograph itself. All that we can use are paid for immediately on publication, and they should be addressed: Editor, SHORT WAVE MAGAZINE, BUCKINGHAM.

GETTING THAT BOOK—MAKE A NOTE

We can obtain for you any technical or scientific book, on any subject, in the English language, provided you can indicate (a) Its correct title, (b) The publisher, and (c) If possible the name of the author. This sort of enquiry usually demands a good deal of research, so all possible details should be given with any enquiry. There are tens of 1,000's of technical books published in English every year and, though we do not claim to be able to trace them all to source, we will certainly do our best for anyone with a firm enquiry in the radio-electronics field.
INVESTIGATING VHF PROPAGATION EFFECTS

AMATEUR INSTALLATION FOR
OBSERVATION ON TROPOSPHERIC
ANOMALIES, SPORADIC-E,
AURORA AND SOLAR FLARES

R. HAM

For many years it had been noted that the amateur and broadcast VHF bands can be disrupted by Sporadic-E and tropospheric scatter, so it was decided to make a study of the cause and effect of these disturbances.

These phenomena can occur at any time, so radio equipment to check the bands at a moment's notice must be at the ready. To receive the signals a tower supporting three Yagi beams for the four, two-metre and 70-centimetre amateur bands was installed near the radio room; short, good quality coaxial cables take the signals to three appropriate converters.

The three amateur-band converters are connected to communication receivers which perform as tunable IF amplifiers in the accepted manner. To enable broadcast stations to be monitored a Hallicrafters S36A with an independent aerial fixed north-east is used. An audio switch circuit is arranged so that the tape recorder can be connected to any receiver.

There are three main pointers to unusual VHF conditions, which can summon an observer to his rig, to start a long period of interesting listening, recording and logging.

First pointer is the TV service in Band I (41-68 mc); when the BBC pictures are disturbed one can look for Sporadic-E, and when the ITV pictures in Band III (174-216 mc) are disturbed or greatly increased in strength one can expect a tropospheric opening.

Second pointer is the beacon service, which has proved of great value to all who study propagation. A Sussex station can turn his two-metre beam through the compass and look for the beacons which are listed, with their respective distances, in the Table (to follow).

The beacon at Thurso (GB3GM) also radiates a signal on the four-metre band, and its aerial direction alternates every five minutes between North and South. For observers living in the South, the four-metre signal from GB3GM can be a good indicator of intense Spor-E. A welcome addition to the beacon service came in May 1969 when ZB2VHF was installed at Gibraltar, providing a signal on the 2-4-6m. bands.

The third pointer is the atmospheric pressure, which is measured by a barometer against a scale marked in millibars or inches of mercury. Over the years I have noticed that when the atmospheric pressure is above 30 inches and then rises, one can look for a tropo. opening at the point when the pressure starts to fall. This has been recorded many times and as a result signals on the two-metre band have been logged from LA to ON, DJ to EI and F to GM.

I have selected for an example the barograph chart (below) for the week February 27 to March 5, 1967. As will be seen, the week started with the atmospheric pressure at 29.9 inches and fell to 29.5, picking up rapidly to 30in. by midnight on Tuesday. Wednesday was an indecisive day, but at midnight the pressure started the important rise through Thursday to 30.3 inches and held this until early Saturday morning, when a slow fall started and turned rapid at 1400, continuing this sharp decline until 1600 on Sunday. The 144 mc Open Contest (March 4-5 started at 1800 to last for 24 hours until 1800z on the Sunday. Here we had the rare coincidence of the pressure making the vital change at the time of a Contest when the two-metre band would be activated over a wide

<table>
<thead>
<tr>
<th>FEBRUARY</th>
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<tbody>
<tr>
<td>Monday 27th</td>
<td>Tuesday 28th</td>
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<tr>
<td>30&quot;</td>
<td>5</td>
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<tr>
<td>29&quot;</td>
<td>5</td>
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<tr>
<td>28&quot;</td>
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</tbody>
</table>

Reproduction of barograph trace discussed in the text.
area of Europe. The writer's own log for this Contest was enough to prove the point that the band had opened! Some 126 stations were entered in the log, spread over 19 QRA locators—eleven in the United Kingdom, and eight on the Continent, signals from DJ, PAO, F, ON, GW and Northern G being RS-59. An additional 26 stations were heard, making the total up to 152 stations in 17 hours.

Sporadic-E

As a general rule Sporadic-E will bring DX between 30 and 100 mc, which makes the four-metre amateur band of particular interest as it lies almost in the centre of this frequency range. Continental radio stations up to 1,000 miles away using this same frequency area for their national broadcasting can be heard in Great Britain when the E-layer is disturbed. The Amateur Radio organisations provided two vital beacons to enable scientific observations to be made on the 4-metre band during the summer of 1969, these beacons GB3GM and ZB2VHF both being heard over fantastic distances during this period.

Many amateurs kept watch for sporadic-E during the summer period June 1 to August 31, 1969, and a lot of data is now in the logs. The writer, for his part, checked the frequency range 30 to 75 mc three times per day at approximately 0730, 1230 and 1900 hours, noting the maximum and minimum usable frequencies and recording Continental broadcast stations for later identification. The chart opposite gives the usable frequency range at these observational times when spor-E was present.

Most radio amateurs who enter a VHF Contest hope for the coincidence of unusual conditions like spor-E or extended tropo, so that DX can be worked. The contest on July 4, 1965, was enhanced by an extensive spor-E cloud centred over Europe, disturbing the two-metre band. It was a great surprise to those who took part to hear Hungarian amateur stations being worked from the U.K. The effect of sporadic-E is rare on the two-metre band, and had it not have been for the Contest this event would have gone by unrecorded, and many of us would not hold the rare QSL card of HG5KDQ/P, some 900 miles away.

Meteors

Leaving for the moment the DX possibilities under spor-E conditions, one can also use the four-metre band to watch for DX by Meteor Scatter. The earth during its annual orbit round the sun encounters meteor particles which strike the atmosphere and burn up, leaving an ionised trail from which radio signals can reflect. There are meteor particles entering our atmosphere all the time, and if one tunes to GB3GM, or one of the Continental broadcast station frequencies in the 4m. band, random "pings" from these stations can be heard. At certain times of the year the earth encounters large numbers of these particles—known in the astronomical world as a meteor shower—and a special watch is kept during April, August, October, November and December for these events. The visual astronomer during peak shower periods can estimate the hourly rate of particles entering the area of the sky which he can see. The Perseids each August, the Leonids in November and the Geminids in December are expected to produce the highest hourly rate, and can cause a high level of ionisation in the atmosphere. It is interesting to look back through the VHF reports in SHORT WAVE MAGAZINE and see how much DX radio amateurs have worked during these peak showers.

For the Perseid shower of August 1969 the four-metre beam was set north-east; the frequency of the

### Table I

<table>
<thead>
<tr>
<th>DATE</th>
<th>0730</th>
<th>1230</th>
<th>1900</th>
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<tr>
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<td>1</td>
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Table I. Minimum and maximum frequencies of sporadic-E as observed by the author from his station at Storrington, Sussex, during the period indicated.
broadcast station at Gdansk, some 850 miles away, was monitored and the signal fed via the equipment to a pen-recorder with a chart speed of 30 inches per hour. This Perseid observation took place each evening during 2000 to 2300z, August 1-16. This consumed 50 feet of triplex chart and 44.5 hrs. of equipment time. The result was an average of 82 pings per hour during my observational time, and the peak was on the 11th, when the rate was 130 to the hour.

Solar Observations

The years of these unusual VHF conditions inspired the building of a radio telescope to advance interest in both radio and astronomy. As an amateur radio astronomer useful work could perhaps be done for the British Astronomical Association and other interested bodies.

There is a multitude of radio stars in the Universe, but the star that puts the change into VHF is a minor star in our galaxy, which we on Earth call the Sun.

Radio astronomy is a new and growing science and a large part of the galactic and extra-galactic work is outside the amateur field because of the very large aerial systems and absolute accuracy required to resolve the minute signals which travel through space for millions of years before they reach Earth. The Earth is very hostile to minute extra-terrestrial radio signals, resisting them with its complex atmosphere and the large amount of electrical hash it generates daily.

The Sun is a different proposition. It is only 93 million miles from Earth and its radio signals only take 8 minutes to reach us. The Sun's radio spectrum extends from 30 to 10,000 mc. When it becomes active, strong bursts and noise storms are most prominent between 30 and 300 mc.

The writer's solar telescope is a full-power radiometer, working two hours daily between 1130 and 1330 UT, at 136 mc in which time 5 feet of recording chart is produced—see p.682. This aerial is home-built.

Equipment Notes

The reflector, measuring 10ft. by 6ft., is made of wood batten and covered with half-inch wire mesh. The aerial frame is hinged on its bottom rail so that the altitude can be adjusted about 5 times per year to keep the sun in the vertical beamwidth. The parts to construct the four Yagis were supplied by J-Beam Engineering, Ltd. who kindly made up the four folded dipoles to centre on 137 mc. The completed beam has an estimated horizontal beamwidth of 15° and a gain of 15 dB and was tested on a satellite signal to prove that it was working well. The aerial is carried through the Sun's path by Earth drift.

The solar signal from the aerial is fed to the 136 mc converter housed in a nearby shed. This converter is home-built using four AF139 transistors—one as RF amplifier; two in the crystal oscillator chain; and a mixer. The signal leaves the converter at 26 mc IF and is carried by coax underground to the radio room proper, where it feeds an AR88D tuned to 25.9 mc (for 135-9). This actual frequency was selected because it is just outside the satellite band and free from other
terrestrial signals. If one selected a quiet frequency inside the satellite band to observe the Sun you can bet your boots that XYZ-satellite would orbit with a + signal and draw a high-amplitude trace on your chart for some seven minutes and could be, if not audio monitored, confused with a solar burst. In general, radio astronomers use a bandwidth of at least one megacycle and would not select such a tight observational frequency as 135.9 mc. Using a wide bandwidth system one can see much smaller solar bursts, but in the writer's case the interest is in the large bursts and noise storms which can be correlated with VHF activity. The detector circuit of the AR88D is connected to a home-built DC amplifier using a double-triode valve with the pen-recorder (0-1.5 mA) connected between the valve anodes.

When the completed telescope was put into operation, RF gain control on the AR88D was set to a level such that the pen would draw a straight noise-line with the aerial disconnected, and so give a reference point to receiver noise level. The solar telescope switches on and off automatically for the period that the Sun is in the aerial beam.

It has been found essential to audio monitor whilst solar observations are in progress, to enable a comparison to be made between sound and pen deflections. Should any unwanted interference occur it can be noted and action taken.

One must not expect to record solar outbursts every day. Often there is only receiver noise on the chart, but when a solar outburst occurs there is no mistaking it; the pen makes a sharp deflection and through the speaker comes the "whoosh" or series of "whooshes," depending on the burst. Individual solar bursts have been recorded which have lasted from one to eight minutes and noise storms which have lasted several days.

Interesting Result

The largest solar noise-storm recorded using the equipment described took place at the end of October 1968 and showed the following pattern.

October 29: The telescope switched on at 1130 UT and the noise trace was quiet. A short time elapsed and the noise level slowly increased until the pen (which has a full-scale deflection of 1500 microamps) was peaking just over 700 µA and only reduced slowly as the Sun left the aerial beam at 1330 UT. The Earth then carries the aerial around for 22 hours before the beam is again towards the midday sun.

October 30: It was obvious from switch-on at 1130 that the storm had developed since the previous observation, but this time the intense noise was accompanied by bursts, the pen during this observation peaking at 1050 µA and was still very active at the end of the observation period.

October 31: At switch-on the solar noise level on the chart was only a little above receiver noise level although odd solar spikes were deflecting the pen to 650 microamps and there was every indication that the storm was passing. However, during the following delay period of 22 hours the storm revived to a new level.

November 1: As soon as the sun entered the beam the noise was terrific. The pen was peaking around 850 µA, the audio monitor was emitting sounds like the brushes on a drum skin—but this was "whooshes" on a speaker cone and the drummer was the Sun at 136 mc. The noise continued like this until the observation finished and the Sun was out of the beam.

By November 2 all was quiet and this storm was over. But these few days of massive solar disturbance had caused an Aurora and during the evening of November 1 two GI stations and one northern G were heard on the four-metre band with the characteristic Ar note. The Sun was the cause, the GI's via Aurora being the effect.

Toward the end of January 1969 another interesting solar storm developed and was recorded on several frequencies by amateur observers. For seven days from January 19-25th the solar charts showed only receiver noise, until on . . .

January 26: The little noise spikes increased in amplitude and were shortly accompanied by bursts deflecting the pen some 500 microamps, while through the speaker came the familiar solar sounds. During January the sun is low in the sky, so when it left the telescope the tower beams were directed south-west into the path of the setting sun. Bursts and noise on both the two-
and four-metre bands were recorded. When the sun set it was still very noisy and must have remained that way through the inactive period (of the equipment).

January 27: At starting time the noise level had increased to 650 µA and the two-hour observation included bursts one of two minutes and one of five minutes duration. At the end of the telescope observation the tower beams were directed for the second time into the path of the setting sun and again noise and bursts were heard on two and four metres.

January 28: The solar noise level had reduced the pen deflection to 400 µA, increasing on the 29th to 650 microamps; and on the 30th it reduced to 350 µA and gradually died out.

Beam for 81 Mc

A second aerial has now been built to observe the sun at 81.5 mc—see below. This is at present a two-element Yagi mounted on a reflector 6ft. square, made of wood batten and covered with half-inch wire mesh, as before. The signal feeds a transistor converter in the shed, and the converter IF of 5 mc is carried by underground to coax the radio room to feed an AR88LF Rx, DC amplifier and pen recorder. This will enable the midday sun to be watched at two frequencies.

Some Concluding Notes

To conclude, let us look briefly at the Sun’s vital statistics: It is like millions of other stars in our galaxy, a nuclear furnace burning up hydrogen and converting it to helium. The centre core of the Sun where the nuclear reactions take place maintains an average temperature of 15 million degrees and, according to the latest astronomical literature, the solar core is burning up hydrogen at the fantastic rate of 500 million tons per second. This gaseous mass of energy is a minor star without importance in the galaxy and even less in the Universe but this, our Sun, has a diameter of 865,000 miles and its volume is so great a million Earths could be packed away inside it. Given clear skies, we can see the Sun from earth every day, and according to the mathematicians, the inhabitants of Earth will go on seeing it for millions of years to come before it finally burns up all its fuel and ends its life as an ember in the galaxy where it was born millions of years ago.

The human being on Earth can detect the Sun’s light directly with his eyes and the solar heat directly with his sense of feeling, but other emissions such as those in the radio frequency part of the spectrum can only be detected by instruments. Man’s radio instruments convert the solar radio outbursts into noise which the human ear can detect, and lines on a pen recording chart which the human eye can see.

The author’s radio telescope has been working daily for 20 months and has proved a most interesting addition to the VHF radio equipment. In his opinion the amateur radio astronomer will not make a major discovery, but he can by his daily observations provide vital information to all radio operators who are studying the propagation of radio signals.

During the preparation of this paper, the atmospheric pressure rose to 30in. and above for a few days and then fell on October 18, and on this day the two-metre band opened to GM, LA, DJ, PAO and F. The last week in October saw a giant spot-group move across the disc of the Sun, and for several days noise and bursts were recorded, also sporadic-E manifestation between 30 and 42 mc.
IN our MCC Report this time last year, we were
remarking that the handicapping system was at the
mercy of conditions; this year it would possibly be fairer
to say that aerials were at the mercy of weather and
wind; many log reports referred to aerials coming down,
or to arriving on site before the battle to find only the
wreckage of the skywire, so carefully put up for the
event. While operators of many stations risked life and
limb to get going again, if the number of logs is compared
to the number of identification codes allocated, it
becomes quite clear that others (possibly wisely under
their particular circumstances) decided to “give it
best.” And who could blame them?

Band Conditions

By and large, pretty fair, although in some parts of
the country, stations who were noted by the invigilators
as being apparently without receivers came up with
logs which indicated that rain static or local noise was
the prime cause of difficulty.

Disqualifications

It is most unfortunate to have to bring up such a sub-
ject in the MCC context—but the number of complaints
that were raised about the Verulam, G3VER, signal (con-
firmed by the invigilators) gave us no option but to
disqualify them. Their signal was very strong all over
the country, and would have put them into second place,
but regrettably it was also possessed of loud clicks which
were plattering well in excess of 10 kc, and appeared to
be worse if anything to LF of the marker. It was probably
due to no more than the gain (drive control) on their
KW-2000 being turned up too far for clean CW operation.
The pity of it is that G3VER would probably have been
warned if only a few honest reports had reached them in
the early stages. However, that is the way of it—we got
the complaints they should have had.

Maesteg nearly landed a disqualification, thanks to
a practical joker, so-called, who came up as “GIL,
Ilfracombe Radio” and ordered a QRT. This little
affair was also mentioned in more than one log. However,
a check with GW3UUZ, who at first was much disturbed
over the business, revealed that in the first place GIL did
not order them to QRT (and was prepared to say so
in writing) and in the second local stations were able
positively to identify the offender from a most opportune
tape-recording. This Swansea pirate is also known to have
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in writing) and in the second local stations were able
positively to identify the offender from a most opportune
tape-recording. This Swansea pirate is also known to have
called G3KMO, but without success, on the same fre-
quency, about 5 kc away from the Ilfracombe channel.

While on the subject of disqualifications, every year
we have requests for “disqualification for excess power,”
usually made by backmarker stations. This time the

The Results

This year Kirkcaldy, GM3FXM, ran up a magnificent
770 points to take them up to the top—all the more
creditable when it is realised that with conditions and
scoring down on the 1968 levels all round, they managed
to scratch up more points—nearly a hundred more, in
fact—than last year, and that on a somewhat inferior
“bent-aerial” as compared with the one used previously.

As already indicated, Verulam would have made
second place but for misfortune. However, Maesteg,
GW3UUZ, filled the bill beautifully with a massive
624 points from Nash Point, Glam., in spite of the alarm
and despondency created by the joker already mentioned.

Only a hair behind at 617 points came the Veteran
Operators Club for Telegraphists, G3VOC, from the
Southern Zone, although it is not quite clear exactly
where they were located, nor what is their constitution
and membership—points that we must look into as far
as the Rules are concerned for next year. They gave your
conductor a chuckle just when he was on the point of
bursting into tears at the sight of 90+ logs on the door-
mat; a correction letter read “delete OA4ALY, 1 point,
insert OK4ALY 1 point—never did work Peru!”

To all these three, our heartiest congratulations; and
to show it all for the statistically minded, Table II shows
the placings and scores of the first six stations this year,
last and 1967.

Some DX Stations

Here there were several of note. Although the GM
participation was down this year, Clubs were on from
GI, EI, and GC; among the single-point contacts one
noted the leaders piling up quite large tallies of OK/OL’s,
while PA, DL, DJ and HB stations added to the sport
for those who were able to work them.

Check Logs

Here, oddly enough, the weather helped—this simply
by way of the fact that several stations who were put out
by aerial troubles send in their logs to help the checking
work. In addition, as for so many years past, we had the
one from SWL Law (Leicester), who over the years has
become part of the very fabric of MCC from the point
of view of those of us who have the review to write up.
Apart from the fact that he misses little or nothing of
what goes on, SWL Law has the gift of being able to
see the funny side of things, and to express these in a
word or two.
The Equipment

Considering the leading stations, Kirkcaldy seem to have won with the same gear that has served them so well for years, consisting of a home-brew transmitter ending in a 5763 as PA, Eddystone S.750 receiver and, this year, a bent dipole at 25 feet in place of the more potent antennas of earlier years, since they were operating from the warmth and comfort of GM3FXM’s shack.

G3VOC also used a home-built rig, this time with an HRO receiver, and for aerial a half-wave wire firing over a natural salt bed, alleged to be of density 698 tons 12 cwt.

At Maesteg, they had an end-fed horizontal half-wave at 90ft. as main aerial, with a “quarter-wave plus” near-vertical against earth as the backup system. At the shack end, there was an HQ-170 receiver plus a Heathkit DX-100U combination with spare receivers and transmitters stacked at one side in case of accidents.

* * *

Running on down the logs, one is sad to note the almost complete eclipse of the HRO on the receiving side, with various versions of KW-2000 in the majority, a couple of RA-17s, some home-built outfits, kit RA-

### TABLE 1

**Positions and Scores, Twenty-Fourth MCC**

<table>
<thead>
<tr>
<th>PLACE</th>
<th>CLUB</th>
<th>CALL</th>
<th>REGION</th>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kirkcaldy</td>
<td>GM3FXM</td>
<td>GM</td>
<td>770</td>
</tr>
<tr>
<td>2</td>
<td>Maesteg</td>
<td>GW3UUZ</td>
<td>GW</td>
<td>624</td>
</tr>
<tr>
<td>3</td>
<td>Veteran Operators</td>
<td>G3VOC</td>
<td>S</td>
<td>617</td>
</tr>
<tr>
<td>4</td>
<td>Maidstone</td>
<td>G3TRF</td>
<td>S</td>
<td>599</td>
</tr>
<tr>
<td>5</td>
<td>Kings Norton</td>
<td>G3VW</td>
<td>M</td>
<td>596</td>
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<tr>
<td>6</td>
<td>University College of South Wales</td>
<td>GW3UWC</td>
<td>GW</td>
<td>595</td>
</tr>
<tr>
<td>7</td>
<td>Govt. Communications Cheltenham</td>
<td>G3SSO</td>
<td>S</td>
<td>573</td>
</tr>
<tr>
<td>8</td>
<td>Guildford</td>
<td>G3KMO</td>
<td>S</td>
<td>563</td>
</tr>
<tr>
<td>9</td>
<td>East Barnet</td>
<td>G3RFS</td>
<td>S</td>
<td>556</td>
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<tr>
<td>10</td>
<td>Nottingham</td>
<td>G3EKW</td>
<td>M</td>
<td>556</td>
</tr>
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<td>11</td>
<td>Southampton University</td>
<td>G3KMI</td>
<td>S</td>
<td>554</td>
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<td>Radio Club of Scotland</td>
<td>GM3RCS</td>
<td>GM</td>
<td>532</td>
</tr>
<tr>
<td>13</td>
<td>Cambridge University</td>
<td>G6UW</td>
<td>S</td>
<td>515</td>
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<tr>
<td>14</td>
<td>Staffs. Coll. of Tech.</td>
<td>G3VZI</td>
<td>M</td>
<td>501</td>
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<tr>
<td>15</td>
<td>Surrey</td>
<td>G3SRC</td>
<td>S</td>
<td>477</td>
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<tr>
<td>16</td>
<td>Vange</td>
<td>G3YCWA/A</td>
<td>S</td>
<td>475</td>
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<tr>
<td>17</td>
<td>Hereford</td>
<td>G3HIX</td>
<td>M</td>
<td>473</td>
</tr>
<tr>
<td>18</td>
<td>Crawley “B”</td>
<td>G3TNO</td>
<td>S</td>
<td>460</td>
</tr>
<tr>
<td>19</td>
<td>Leyland Hundred</td>
<td>G3GGS</td>
<td>N</td>
<td>455</td>
</tr>
<tr>
<td>20</td>
<td>Salop</td>
<td>G3SRT</td>
<td>M</td>
<td>455</td>
</tr>
<tr>
<td>21</td>
<td>Bristol</td>
<td>G3TAD</td>
<td>S</td>
<td>454</td>
</tr>
<tr>
<td>22</td>
<td>Finchley</td>
<td>G3VPV</td>
<td>S</td>
<td>449</td>
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<td>23</td>
<td>Keele University</td>
<td>G3UKO</td>
<td>M</td>
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<td>24</td>
<td>North Staffs.</td>
<td>G4QD</td>
<td>M</td>
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<td>25</td>
<td>STC, Harlow</td>
<td>G3NIS</td>
<td>S</td>
<td>443</td>
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<tr>
<td>26</td>
<td>Wirral DX</td>
<td>G3VVA/A</td>
<td>M</td>
<td>430</td>
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<tr>
<td>27</td>
<td>University College of North Wales</td>
<td>GW3JCB</td>
<td>GW</td>
<td>429</td>
</tr>
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<td>28</td>
<td>Derby</td>
<td>G2DJ</td>
<td>M</td>
<td>427</td>
</tr>
<tr>
<td>29</td>
<td>Greenford</td>
<td>G3YEL</td>
<td>S</td>
<td>416</td>
</tr>
<tr>
<td>30</td>
<td>Addiscombe</td>
<td>G3VYI/A</td>
<td>S</td>
<td>405</td>
</tr>
<tr>
<td>31</td>
<td>Mid-Sussex</td>
<td>GSRV/A</td>
<td>S</td>
<td>401</td>
</tr>
<tr>
<td>32</td>
<td>Reigate</td>
<td>G3REI/A</td>
<td>S</td>
<td>401</td>
</tr>
<tr>
<td>33</td>
<td>Grimshy</td>
<td>G3XDYA</td>
<td>M</td>
<td>386</td>
</tr>
<tr>
<td>34</td>
<td>Torbay</td>
<td>G3NUA/A</td>
<td>SW</td>
<td>383</td>
</tr>
<tr>
<td>35</td>
<td>Sheff’ld</td>
<td>G4JW</td>
<td>N</td>
<td>383</td>
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<td>36</td>
<td>Jersey</td>
<td>GC3DVC</td>
<td>GC</td>
<td>380</td>
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<td>37</td>
<td>Wirral</td>
<td>G3NWR</td>
<td>M</td>
<td>373</td>
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<tr>
<td>38</td>
<td>Purley</td>
<td>G3TWJ</td>
<td>S</td>
<td>366</td>
</tr>
<tr>
<td>39</td>
<td>Crawley “A”</td>
<td>G3W5C</td>
<td>S</td>
<td>361</td>
</tr>
<tr>
<td>40</td>
<td>Gosport</td>
<td>G3R0K</td>
<td>S</td>
<td>361</td>
</tr>
<tr>
<td>41</td>
<td>Lincoln</td>
<td>G3XJH</td>
<td>M</td>
<td>354</td>
</tr>
<tr>
<td>42</td>
<td>Echelford</td>
<td>G3UES/A</td>
<td>S</td>
<td>351</td>
</tr>
<tr>
<td>43</td>
<td>N. W. Durham</td>
<td>G3UTS</td>
<td>N</td>
<td>351</td>
</tr>
<tr>
<td>44</td>
<td>Nunaton</td>
<td>G3XIU</td>
<td>M</td>
<td>350</td>
</tr>
</tbody>
</table>

At Maesteg, they had an end-fed horizontal half-wave at 90ft. as main aerial, with a “quarter-wave plus” near-vertical against earth as the backup system. At the shack end, there was an HQ-170 receiver plus a Heathkit DX-100U combination with spare receivers and transmitters stacked at one side in case of accidents.

* * *

Running on down the logs, one is sad to note the almost complete eclipse of the HRO on the receiving side, with various versions of KW-2000 in the majority, a couple of RA-17s, some home-built outfits, kit RA-
1's and a sprinkling of others. The transceivers, other than KW-2000, included (at Kings Norton) a brace of Project '66 transceivers cross-coupled to each other, a single Project '66, and the odd home-spun "special." In separate transmitters, there were A.T.S.'s, TCS, and home-constructed rigs, the latter probably in the majority.

As for aerials, which, as far as equipment goes, is where the battle is really won or lost, the vast majority went in for half-waves, centre or end-fed to choice, the odd inverted-Vee dipole, and so on. The highest scorer with a quarter-wave was East Barnet, their aerial being up at 60 feet, and fed against an earth system which is the secret of their signal, and driven by an extremely talented array of operators and loggers.

Operating

Pretty good in general, with the netting most definitely better than last year. One or two stations were using outrageously long calls—for example, the character who sent 34 CQ's followed by one MCC and one call-sign! Anyone tangling with that particular chap took all of ten minutes to complete a QSO! However, later, the same station was going much better, and, oddly, it rather sounded to your scribe that the same operator was at the key, so clearly here was the training of a future good op.

Not so bright was the misuse, and in some cases downright neglect, of good operating practice and even of licence conditions. At least four stations were noted as not using correct procedure to the point where they were even omitting to send their complete call, let alone BK in their contacts. This is, to put it mildly, somewhat confusing to other, and relatively untrained, operators, and certainly cost its practitioners several points from lost QSO's and at least one lost place in the final results. An additional Rule will have to be added to cover this next time, and enforced rigidly.

Otherwise, it was clean and sporting, with very few people swishing VFO's around with the power on, pretty good Morse, and most of it as fast as could be regarded as reasonable—although, as ever, there were folk who got tangled up in their dots by reason of trying to drive bug-keys too fast. Some there were who were sending too fast for the slower stations and then found they were also going too fast for themselves when they raised one that came back at their own speed! But, as far as the vast majority at all levels were concerned, only a purist could cavil, and the sportsmanship was virtually one hundred per cent.

Here and There

We have already commented on the East Barnet station, who had G3RFS and G3RPB—both well known on the CW DX Top Band scene—as the spark-plugs, with another name well-known to Top Band DX-men logging, namely Rolf Rasp, whose SWL activities on the band from PY-land did much to raise enthusiasm for 160 metres in South America.

Another group, Royal Navy ARS, had G3RFH, who was in the winning Moray Firth side last year, assisting DJ6EK, G3VRY and G3YGM to put up their tally. Incidentally, DJ6EK is a member of RNARS and is at present in U.K. " on a course," as the Navy have it.

Kings Norton were a bit cross before the start at having being left out of the original Ident. list, due to an error on the part of one of the Magazine staff who, having spent his early years in Kings Norton, should have known better! However, they got their code all right, and settled down to the battle. A little time was lost on the second evening due to major aerial troubles—did anyone get off scot-free?—and then had the biggest shock of all when, on totting up the score they realised they had made exactly the same as last year! However, as the scoring generally was not as high as for the 23rd MCC, they move up to take fifth in the Table.

Changing tack a little, it was quite surprising how many stations missed the GDX calling them, in favour of something else a little nearer and louder. As for instance, this made things very hard indeed for GC3DVC and EI4LRC, both of whom were laying down a good signal at your scribe's aerial, but having considerable difficulty raising enough stations to make it worth while—which was tough, as both had had more than their fair share of technical problems to overcome. GC3DVC found a shortage of operators and assistants because of the gales, and so GC2LU (who for so many years was the leading light in Coventry) and GC3ULZ, aided by SWL Bottrel had to do it all themselves, while OT GC3GS did the coffee-brewing.

At EI4LRC, the boys were well equipped, with an HRO and Drake R4B as receivers, plus a Central Electronics Exciter as transmitter, all to a dipole which blew down and had to be put up again just before the start; but only the top-scoring stations seemed even to be aware of their existence. As there are only seven or eight EI's licensed for Top Band and at least two of them were out as "privateers," they must have had more than a fair share of organisational problems to cope with, too.

The Scoring System

As usual, there were comments, for and against. But it is an interesting thought that none of those who went in to win had strong feelings either way. There is a case possibly for changing the loading a little to make it easier for GC and EI. But when it comes to the crunch one doubts if there were others who could have run up the number of QSO's the winners made with a similar aerial system from any part of the country—they seemed to attract takers like a magnet, and were getting down to the Southern Zone from the word "go," albeit with a weak signal. It was quite uncanny to your scribe the way they seemed to sense where the callers were to be found and yet themselves to remain "in the clear" right down South.

However, many people seem to have the idea that scoring is biased against the Southerners; just how much so it is not can be gained by mentally inserting Verulam into the first four stations, and then looking how the Southerners dominated the picture, under the conditions of the Contest which were about par for the handicapping system.

However, between now and next year, your organisers will be doing some serious thinking about the whole business and maybe inventing a new twist to the game.
TABLE II

<table>
<thead>
<tr>
<th>Place</th>
<th>1967</th>
<th>1968</th>
<th>1969</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Burslem (641)</td>
<td>Moray Firth (625)</td>
<td>Kirkcaldy (770)</td>
</tr>
<tr>
<td>2</td>
<td>Moray Firth (598)</td>
<td>Manchester U. (698)</td>
<td>Maesteg (624)</td>
</tr>
<tr>
<td>3</td>
<td>Kirkcaldy (580)</td>
<td>Kirkcaldy (695)</td>
<td>Veteran Ops. (617)</td>
</tr>
<tr>
<td>4</td>
<td>Newcastle U. (561)</td>
<td>Spen Valley (661)</td>
<td>Maidstone (599)</td>
</tr>
<tr>
<td>5</td>
<td>E. Barrow (557)</td>
<td>Stourbridge (608)</td>
<td>Kings Norton (597)</td>
</tr>
<tr>
<td>6</td>
<td>Spen Valley (552)</td>
<td>Keele U. (604)</td>
<td>U. Coll. S. Wales (592)</td>
</tr>
</tbody>
</table>

NOTE: Figures in brackets are allowed scores.

PRIVATEERS

There were of course plenty of these. GM3UKG and E19J were laying about them with gusto, and appeared in many logs, GM3UKG indeed in most, which is not so surprising when one notes that he is up in Banff and probably had a hand in Moray Firth efforts of past years.

Both from Penzance, were G3XAR/A and G2JL who looked to have been on for most of the time between them (and it could be added that the call G2JL was used by West Cornwall to win MCC back in 1947). Others appearing in many logs included OK11Q, OL4AMU, OL2AIO, G6HD and G3AAQ. However, a tendency that disturbed your conductor somewhat was the large increase in the number of single-point contacts with stations whose calls appeared as loggers or operators of the club station.

There is nothing at all against press-ganging all the locals into coming on the band for a point, but it seems to be bending the spirit of things somewhat to slip home for a quick QSO while another op. is on the Club station!

COMMENTS FROM THE LOGS

Here, as usual, everyone came into their own. SWL Law's log, as always, was a model and many of his observations have already been embodied in the piece so far. The Kings Norton one displayed a drawing of 'Chad,' of hallowed memory to all older cartoon lovers and Service radio types, with a caption "Wot, no non-clubs?" on one page of Saturday's log, while on Sunday's the theme was set to music, followed by "Ah! here they come," a little later; the single-pointer signals then piled in quite fast until near the end comes the comment "Damn! Another one!" "Aerials took three weeks to prune and match" (Verulam)... "Bonus is stupid and ridiculous" (Maesteg)... "Some stations obviously lax in logging" (Veteran Operators)...

For some of us our late entry and let us in please (Maidstone)" — we did. "Found it great fun after some years absence" (Guildford)... "Operating standards showing slight improvement" (Nottingham)... "AR88D had to be carried on a moped!" (Southampton University)... "Sorry for the poor signal; someone had chopped 100 feet off the end of the aerial and left another 500 feet lying on the ground" (Radio Club of Scotland)

"Would have had a large vertical, but the hydrogen generator exploded with spectacular results on Saturday morning!" (Staffordshire College of Technology)...

"We prayed the aerial would not be carried away by the wind; prayers were answered" (Surrey)...

"Hope to get help next time" (Hereford)...

"Too many shortened numerals" (Crawley "B")... "Here's to the 25th!" (Leyland Hundred)...

"Too much QRM" (Finchley)...

"Look forward to next year when we hope to keep our 1000 feet of wire in the air and not about three feet up!" (Wirral DX)...

"An enjoyable contest; many absent friends, though" (Derby)...

"After putting pole back up, keying hand had to be thawed out in hot water for five minutes!" (Greenford)...

"Please excuse the couple of T7 reports on the first night; the VR-150 took off!" (Addiscombe)... "Near-calamity on Sunday but fortunately caretaker came back at 1700. Aerial got wrapped round tree first night so didn't get out very well!" (Mid-Sussex)...

"One contact took 15 minutes to complete!" (Reigate)...

"Apologies to those who called and were not heard; rain static was 40 over nine many times" (Sheffield)...

"At this rate should finish top in 1971" (Jersey)...

"Next year, a new aerial" (Parley)...

"One station, not a local, radiating clicks plus and minus 10 kc or more" (Gosport)...

"Dark Mutterings about next year already!" (Echelford)...

"Having dislodged our aerial from the apple tree, score on Sunday much improved" (Chester)...

"Many loggers!" (Cheltenham Grammar School)...

"Fundamentally wrong to use short figures in a mixed letter/number group" (Salisbury)...

"My thirteen-year junior op. logged for me throughout" (Dursley)...

"Guess which club is 90 per cent SSB!" (Stratford-upon-Avon)...

"At least our entry will not cause you time or trouble in checking!" (Maidenhead).

PERSONALITIES

As always, there is this thread of continuity that runs through the MCC story over the years. We have already mentioned several in this write-up, but one must not forget the performance put up by Mid-Sussex, using GS5VA/A, with the illustrious owner of the call

TABLE III

<table>
<thead>
<tr>
<th>Top Scorers in the Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Southern</strong></td>
</tr>
<tr>
<td>1. Veteran Operators (G3VOC)</td>
</tr>
<tr>
<td>2. Maidstone (G3TBF)</td>
</tr>
<tr>
<td>3. Govt. Comm's. (G3SSO)</td>
</tr>
<tr>
<td><strong>Northern</strong></td>
</tr>
<tr>
<td>1. Leyland Hundred (G3GGS)</td>
</tr>
<tr>
<td>2. Sheffield (G4JW)</td>
</tr>
<tr>
<td>3. N.W. Durham (G3UTS)</td>
</tr>
<tr>
<td><strong>Scotland</strong></td>
</tr>
<tr>
<td>1. Kirkcaldy (G3JFXM)</td>
</tr>
<tr>
<td>2. Radio Club of Scotland (G3BRC)</td>
</tr>
<tr>
<td><strong>Midland</strong></td>
</tr>
<tr>
<td>1. Kings Norton (G3GVA)</td>
</tr>
<tr>
<td>2. Nottingham (G3EKW)</td>
</tr>
<tr>
<td>3. Staffs. Coll. of Technology (G3VZI)</td>
</tr>
<tr>
<td><strong>Wales</strong></td>
</tr>
<tr>
<td>1. Maesteg (G33UZ)</td>
</tr>
<tr>
<td>2. University College of South Wales (G3JUWC)</td>
</tr>
<tr>
<td>3. University College of North Wales (G3UCB)</td>
</tr>
</tbody>
</table>
banging away as though the years had never been, and coping with all the things that go wrong even in the best-regulated circles when a contest is on. And it should be noted that G5RV, VHF big-shot G3HBW, G3BMY and others well-known in the MCC context did not make all the mis-reading mistakes so evident in some other logs—if some of the OK/OL boys could but see the logs they would laugh to see where they had been placed by bad code-reading.

The Regional Aspect
Table III shows how the regional battle went in all those areas where enough entries came in for separate tabulation, and shows the leading stations in each, ready for some one to try and dislodge them next year. And it is to be hoped that someone will try—going in with the will to win, whether regionally or nationally, is something a contest-minded gang should attempt seriously every once in a while. It was noted once or twice during MCC that there were, here and there, stations who, as one of the invigilators expressed it, “nipped out for a drink” while three or four stations were calling them, only to reappear several minutes later! On the other hand, stations who were known to be out to make mincemeat of the rest seemed to have just that little edge of decisiveness or snap which proved the mettle.

Conclusions
As always a hard and well-fought contest. For next year the thoughts to consider are possibly, from our point of view, some new twist to the theme (no promises!) and from the competitors, more accurate timekeeping, and close attention on the part of those operators using transceivers where a tone is keyed to ensuring that none of the contest operators of the group is allowed to wind up the drive to the point where a broad spectrum is radiated—we shall really jump on them next time!

And there it is for another year. Back to normal next month, with a deadline of January 9 for your news of February events, addressed as always to your “Club Secretary,” SHORT WAVE MAGAZINE, BUCKINGHAM.

CLUB SECRETARIES, PSE NOTE!
The “Clubs” feature will resume as normally with the next (February) issue, due out on January 30, for which the deadline for “The Month with The Clubs” is Friday, January 9. Any reports already received with details for the February activities are being held.
COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

The month under review has seen us dropping into winter conditions—in more ways than one! As far as those of us are concerned whose work keeps us away from the rig until the evenings (unless we are able to spend time in the shack before the day’s work begins), things seem to have been pretty flat as far as the HF bands are concerned. Indeed as this is being written, your conductor has dismissed Twenty in favour of a mite of background music on tape! However, the bands, as ever, have had their moments for those lucky enough to have been on the right times.

As far as G3KFE personally is concerned, matters were not exactly improved by the realisation that he had forgotten, in a moment of aberration, to include the deadline in the tailpiece to last month’s piece; with the result that this month there will probably be time for a more discursive approach to our subject!

Top Band

Anyone looking at this band of late, having not investigated it since the early part of the summer, would probably be amazed at the increased collection of funny noises which inhabits this part of the spectrum. Indeed, it seems to be the case that it is all but impossible to find an even reasonably clear channel on which to put out an SSB call. This thought was prompted by the realisation that a QSO started on what looked to be about the only clear spot around the 1875 kc mark had in fact found its way so close to Humber Radio that the latter found it necessary to request a QSY—a request which was couched in such pleasant terms that one has to salute his forbearance.

However, there is no doubt whatever that the CW end of the band is in far better shape, as G2DC (Ringwood) points out. Jack is, as we all know, far from being a part of the scenery of Top Band; indeed, he has only mentioned it three times during the period G3KFE has been conducting this piece. However, the converter tacked on to his receiver had to be tested last month, a “soak” to make sure it continued to operate, and out of the exercise came contacts with all the U.K. countries, also DL3FF, HB9IN, HB9NL, PA0VY and EI9J.

Cambridge University Wireless Society have a traditional trip out to some interesting spot each Easter; this year, they will be on from March 17 for a period of a week or ten days, using all bands, and signing GD6UW. Most of the operation will be SSB, and no skeds are planned, so as not to spoil the holiday atmosphere which is, after all, the main reason for going. Nonetheless, one hopes that among the ten operators concerned there will be some Top Band, and some CW. The VHF chaps will be up on a cold and windy hill-top, while the others hope to be using a spot near Port St. Mary. Among the gear will be Sommerkamp FL/FR-500, plus a home-built linear, a Heath HW-32A and a TA-32 beam, if all goes as planned.

SIX-BAND DX TABLE

(All-Time Post War)

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<tr>
<th>Station</th>
<th>Countries</th>
<th>28 mc</th>
<th>21 mc</th>
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Note: Placings this month are based on the “1.8 mc” Column.
Now to G3VLX (Sidcup), who for long has been pretty well exclusively Top Band, albeit he has threatened for long to attack the other bands. The reason was simply that he had a Mini-5 rig on the stocks, but try as he would, it would not behave itself on 21 mc, and the linear—passive grid—gave only fifteen watts of RF output for the eight it demanded of drive! However, Deryck now has a FL-200B to match the FR-100 already in the shack and so will not be such a steady Top Band operator as of yore. Indeed, this month, only two contacts are noted as worthy of mention, those with GM3BQA in E. Lothian for the 97th county, and G5PP, Coventry, during the Midland and Bristol Societies Contest.

Sad to say, G3PQF (Farnborough) was, as they say, horizontally polarised at the time of writing. Dave mentions seeing G3LXD, his competitor in the Tables, and says they hailed at each other like stage villains! An interesting contact was with G6LX, who was running 200 milliwatts to a transistor exciter—the interest in this one being that G6LX was in QSO with a GM who was completely inaudible at G3PQF. Other news is that G5XB will probably be back on the band during the winter for anyone who is really in need of an Oxford contact. Other QSO’s mentioned are with most of the U.K. countries, plus a new TV set.

November 30 was a good day for G3LXD (Church Crookham); an early morning session produced contacts with K1PBW at 0310, followed by K1JGD, who came back to a CQ. W2FJ was also consistently audible right up until 0520z, when a noise like a vacuum cleaner suffering from QSB(!) came up to S6 and obscured the DX signals. John is stuck, on the counties side, for Huntingdon, like so many more of the newer operators. In this context it is of interest that G3KPO (Eye) says Peterborough is now divorced from Northants and is part of the entirely new county of "Peterborough and Huntingdon." The point here is that G2NJ for one is now in the county and should be pretty easily workable—he is at the top of both Phone and CW sections of the Counties ladder, and for the second time round, to prove it!

During a recent Top Band contest GD was well and truly put on the map by "the maestro" himself, signing GD3SVK, thanks to some much appreciated help from GD5APJ. The site was the Albert Tower, on top of a 500-foot hill; an inverted-Vee was suspended from the flag-pole above the Tower, putting the apex at 65ft. above ground. Some 200 QSO’s were knocked up, CW during the contest, and some SSB beforehand. Sadly, G3KFE did not get wind of this effort till too late to make a contact. Incidentally, G3JSVK mentions the possibility that he may return to GD for the CQ WW 160 Contest; also that he has sent out a circular to most of the well-known county-chasers to ask what counties are wanted, so that he can plan his expedientary activities for 1970. One of his trips will involve landing on Stroma, in the Pentland Firth, with some Scottish counties being activated on the way up and back. Other news of interest is that Fred has been trying to get them at 4U1TTU on to Top Band again. If anyone still lacks a card from G3SVK in Rutland, there are some left.

A new entrant to the lists is G3YXM (Leicester) who complains that the G3KFE signal has not been heard on the band for ages—not quite true, even if it has to be admitted that your conductor has not been around on 160m. much lately. Dave uses a home-built sideband rig—good for him!—and an inverted-Vee with the apex at 25 feet, soon to be raised another ten.

Another one on for the Top Band contest was G3XAP (Stowmarket), who made a total of 89 contacts, which broke down to one EI, 9 OK/OL, a couple of DL’s, and an assortment of G stations. Nothing to write home about according to Phil, but nevertheless quite a good crop.

G3IGW (Halifax) returns to the fray, and mentions that during the night of the CQ Contest, he listened on 160 between 0200 and 0300z and found the band jam-packed with W’s, including WIEXI, WIWY, K1JGD, K1PBW, W2FJ, W3FE, W3MSK, W3MFW, K3MBF, W4BVY, W5CIJ and W9BKA—pretty nice for 160m.

As for Ted, G2HKU (Sheppey), he has had his regular sked SSB QSO with PA0PN, who has been down with 'flu but by now should be back on and dishing out CW QSO’s: and on the CW side, OLSMT and OK3TOA were both very consistent signals around 2300z.

Still on the Top Band tack, your conductor made one of his rare appearances on the band on the evening of December 7, to be told that various W’s had been worked during the early morning; that VP9GJ was on, but would be back in U.K. in three weeks from the date of the QSO, which means by the time this is in print; and that ZD9BM would be active on Sunday mornings, 0430-0630z, transmitting on 1827 kc and listening in the region 1800-1845 kc; this is a shame, because of the near impossibility of hearing him on this frequency, and it is understood that "representations" are being made to see if something can be done about getting him to try 1803 kc for his "transmit" channel to give the G’s a better chance at him. Other news from the same quarter included a buzz that G3RFS may not do his 6Y5 trip, and a rumour that a station signing HR2HH has been heard and worked in U.K. on Top Band.

Eighty and Forty

As always, neglected by reporters, but nonetheless carrying traffic on occasions, under the layers of drivel which so often constitute the upper three layers.

For the first few days of the period G3XAP tried 0600-0800z to operate 3-8 mc Sideband, a ploy which resulted only in a few W’s. However, one of the W’s was a little surprised to find Phil listening on 3807 kc with a KW-2000A. The method is really quite simple: Set the '2000A to 3804 kc; when transmitting use IJT and full clockwise on the "IT" knob—hard against the stop. Thus one always appears transmitting on 3798 kc. When receiving, swing to IRT and tune up the band on the vernier from say 3804 up to as high as 3810 kc. A little complicated, but capable of netting many W signals that otherwise would of necessity be passed up. Over to Forty, where G3XAP disliked the lack of countries in his scoring, and so spent a whole week of his
holiday setting up a quarter-wave vertical, trenching in eight radials, building an L-network to match it into, and getting the VSWR right down to unity at 7025 kc. This aerial is complementary to the existing dipole at 50ft. First impressions were that the dipole was probably better on reception, thanks to the lower static level and dipole polar pattern, but on the transmit side the vertical performed mighty deeds. The first evening found UA6, UO5, UB5, just to show it was radiating, then PJ2VD, W1FIR/3, all between 0100 and 0300. Catch up on some sleep, then enter the CQ Contest, CW end. On the Saturday morning in came sundry U’s and EU’s, followed by 4Z4BR, 4X4WN, 9Y4AA, TF2WLW, VE3WQ, PJ6CW and 3I assorted W’s, W7 being the only missing call area. The following morning saw the W total up to 72, another 4X4, PY, KV4FZ and also, significantly, G3XAP found himself at the business end of a pile-up, which made him feel more than sympathetic to some of those he has cursed in the past!

G3KMA (Woking) was confined to Forty for the month, as his beam rotator had to go away for repairs, and all that remained was the dipole. Conditions in the RSGB Contest were pretty poor, but the CW CQ Contest was rather better. In the former contest SSB raised CN8DW, EA8FF, EP2BQ, UA9KAX, VK2AYA, YV1BI and YV1EM. CW in the latter raised 64 assorted W’s, KV4FZ, PJ6CW, ZF1AN (who came back to a CQ call for a new country on the band), VE’s, 4X4 and assorted rarer U types.

As already mentioned, G3VLX (Sidecup) has broken out on Eighty, his first tentative exchanges raising DM, LA, GC, OF, SM5 and an F6 to prove things are “go,” though a VO and a 5Z4 eluded his grasp. As Deryck remarks, even if they are fairly common, it is good for the ego when a Continental station proclaims you to be the loudest signal on the band!

Eighty made a good start in November, in the opinion of G2DC, who found that between 0700 and 0800z at least three continents could be raised with ease; but later in the period things fell right away, even ZL3QG being inaudible. Two good ones that were workable every morning were CT3AS and VP9GJ, the latter around 3510 kc. A couple of new countries for the band pleased Jack mightily—he has been static for some time—in YN1CW and CT2AT, the former in the morning and the latter around 2120z. Others included OY6FRA, OH3XZ/OH0, ZL1CH and assorted W’s; one QSO that was pretty rickety to start with was with W6AM; it came to a sticky end underneath a G who called CQ. Forty yielded a couple of J’s at 1530z, EA8FJ, TF2WLL, PY4OD, all W call areas and VE1-4.

G3LZQ has been wearing his “other hat” as GW3LZQA, although not very often. Just 29 days of activity there has accounted for 92 countries in total; in the current month the 204ft. top, centre-fed, has accounted for W1-4 and OY on Eighty, and on Forty, PY’s, W1-4 and W8-0 were all “seen off.”

Quite a crop was rustled up by G3GW during the CQ WW Contest, including CN8PR, CT2AT, FB8ZC/FC, KV4FZ, PJ6CW, UA0AG, UL7GW, UI8KBA, UM8FM, VK3AW (at 2000z), VP9GJ, WO5NA, ZF1AN and 4X4MU; of these ZF1AN (who came back to a CQ) was the 100th country, with UM8FM as the last of the Russian countries. Heard, but not worked, included KR6NG (1530z), VK2EO (1630z), ET3USA, 5H3KJ, plus UD6, UF6, UH8 and UJ8. Known to have been around, but neither heard
nor worked, although they were getting into Europe, were HM1AQ, HM1AT, JA's, UK0AA, and XW8CR. Finally, just to prove how fast the sunspots are disappearing, Mike mentions that ON4UN worked ZL3GQ at 1604z and ZL1BHO at 1645z!

Incidentally, G31GW draws attention to the fact that, by tacit agreement, 3500-3510 kc and 3790-3800 kc are reserved for international DX'ing, the point here being that many stations having worked some DX have a distressing habit of then enjoying a local natter. A good point, this, and all the more shame that in this case it is often the DX-chasers who are offending, by not shifting far enough off the DX channel.

G2HKU found little of interest on Eighty, other than one signing OE3GEA/P3, in Moelding, near Vienna, who was a Technical College station with a special call. On Forty, at 2105z, EP2BQ was S9 plus, and OD5LX has been doing a roaring trade on CW, peaking 589 on some evenings.

G3VPS (Warling) mentions that 9H1BL has been hearing strong G's on 80 metres in the afternoon; and so they arranged a sked on CW at around 1600 clock, and made it 559 each way. SSB saw seven new countries booked in on the band, by way of TI, YY's, PY's, HK, EP, UA9, EA6, EA8, CN8, 9H1 and 9Y4, to make Peter well satisfied.

Finally, a note from G2NJ (Peterborough) mentions that he is still after the Maritime Mobiles, and heard another one on November 11, after the Maritime Mobiles, and bore (meaning this, and all the more shame that in this case it is often the DX chasers who are offending, by not shifting far enough off the DX channel).

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route at 1100, with North Americans from 1200, but the band has normally closed with the onset of darkness. In terms of SSB QSO's, the log shows DUSZAS, JA, MP4TDA, VK2AU, VK2AVT, VK2FA, VK3TG and VK2WX/VK9 (Papua).

The early closing of Fifteen is also commented on by G2DC, who nonetheless found conditions quite fair; Don says that once the noise and hubbub from North America has cleared it is well worth another look, for Central and South America, often quite clear and finding few takers. No new ones were booked in among (worked) FP8CS, HC2GC, HPIIE, KZSWJ, PJ0CW, OA4MS, LU5AQ, PY4OD, CE2AD, CX1CO, VK5FM, VO2KR, XE1ZV, YN1CW and a "4M5ANT" of doubtful ancestry.

Another one to look at this band was GW3LZQ/A, who scratched around a bit and raised VK's, CR6, CR7 and ET3, to keep his score moving nicely along from the JA location. Our 21 mc king, GM3JDR (Golspie) found conditions pretty patchy, quite apart from the fact that the band up there is closing by 1830z. This means the end of the JA QSO's until the Spring—the last one was booked in during the early part of November. Even the morning session was considered to be such as to force a man to go to work(!), which leaves only the lunch-time session and the odd pick-up over weekends, all of which were on CW. Thus, we find PY7VOU, VP9GK, ZS5HN, VK3AUT, VK6SA, OX3ZO, ZS1ACD, CR6AI, CR7IZ, VK5DS, UL7JJ, JT1AD, 6W8GE, G5NX/LA/MM (near 6W8!), JA's, KR6NG, ODSNLX, UJ8AB, VK3MJ, ELOC/MM (in mid-Atlantic), UL7KAA, VS6FX, VK3RJ, PY1CPC, 9Y4AA, LU2JV, UA9CT, UA9OS, UA0SH, UA9BZ, UW9BB, UA9PP, UF6LA, UF6AM, UA9RR, UAI7T, 5H3KI, CV2AA, KV4FZ, ZS5VF, 4M55AT, 5H1LV, PJ0CW, TJ1AK, KP4AN, UH8KAA, U18KBA, all W call areas and their DX working.

Two Twenty-Metre Band

Broadly, Twenty has been quite good when it was open, but tended to close shortly after dark. Further, the cold snap towards the end of the period resulted, for your scribe at least (and probably for most DX-ers in urban areas) in a whole lot of electronic clicking noises, mainly ascribable to thermostats and central-heating gear. G3KFE is ashamed to admit that one, at least, was finally run to earth in his own shack heater—but that was far from being the only one! Just what one does when one's aerial system is in the field of the mains wiring of about half-a-dozen houses is difficult to explain.

G2DC found the early-morning period, which used to be so productive, pretty awful but contents himself with the philosophic reflection that perhaps it makes one scratch around a bit for DX on the other bands. Fair comment, at that. CW came up with KR6VX, PJ0CW, PY4OD, UK0A (Zone 23), UF6KPA, UL, UJ, UM, UH, VK1-9, W1-O and VE1-7.

For G3NOF the tale was broadly the same, with the exception of FK8BH from the Pacific area. However, SSB rang the bell with C21JW for a new country (hooked after a long search), K7UZV, JA, MP4TCF, TN8BK, VK, VP2EQ (Anguilla), W7APA, W7CHZ, ZD3K, ZL and 9G1GT.

On to GW3LZQ/A, still paddling his key, who found VK'S, ZL's, LU and PJ0CQ.

The activities of G3VPS have been directed to other than DX working; in the main, on Twenty. An interesting one was a three-way with I1ANE and I1AH0, both being in the same town; it transpired that I1ANE is blind, using a linear built for him by I1AH0. A new all-time country worked was CE3FI, around 1400 clock; again an interesting QSO, in that Rolf was beaming from CE towards WK when the QSO took place, which in the time-context makes it a little odd for a long-path contact. Others worked included 9M2 and UL7, both the latter being on CW.

Talking of odd propagation, G2HKU has noticed that weird things have been happening on his 0700 sked with ZL2KP, ZL3SE and ZL3JQ. "Beastly Summer
Time" has hit them, and signals change from S3 to S7 as dawn breaks—but at the precise period when the change comes, the SSB signals rise above the CW level. Explain that one away, you propagation and aerial types! Another G2HKU contact was with 9Q5MW, an ex-ZL missionary, 400 miles into the jungle, with only his XYL and one other white man with them—which must make the Amateur Radio quite a boon.

**Contests and Awards**

Taking things in back-to-front order, it is perhaps of interest to note that the first S-Band DXCC awards have now been taken up, the initial certificates going in order to W4QCW, DL7AA, W1EVT, W6GZ, W8BT, W4IC, W1AX and W4BRB. Interesting to note how many of these are old-timers and therefore capable and proficient operators.

RTTY enthusiasts should put a ring around the calendar for March 21-23. Starting at 0200z on the former, and going on till 0200z on the latter date is the BARTG Spring Contest. Any 36 hours of the period may be used for operating, provided rest periods are taken of two hours or more, with times on the air and off clearly marked. All bands 3.5-30 mc, working a station not more than once per band. Country status is determined by the ARRL Countries List, but KL7, KH6 and VO count as separate countries. The exchange consists of time in GMT, Message Number and RST. Points are scored at the rate of two for a QSO within one’s own country, and ten for a different country; all stations receive a bonus of 200 points per country worked including their own. Any country may be counted again if worked on another band, but Continents are counted once only. Scoring is as follows: For A, multiply QSO Points by Countries Worked; for B, multiply total country points by the number of Continents worked. Final score equals A plus B. Use one log for each band, and indicate any rest periods. Logs to show Band, Time in GMT, Message and RST numbers sent and received, and exchange-points claimed. All logs to be in to E. Double, G6CDW, QTHR, before May 25, 1970. Certificates go to the two top scorers in each country, and the final position in the results will be taken into account in deciding the “World RTTY Champion.”

And of course, not to forget the CQ WW Top Band affair, January 24-25, the details of which we gave on p.625 in this piece last time out; there were thirty countries on last time, and all but three U.S. States, not to mention several VE provinces, so there is plenty to go at. DL9KRA was second only to KV4FZ last year, which means that a G who is on and “loaded for bear,” as the W’s have it, is in with a sporting chance of collecting the silverware.

On the more local plane, the Chiltern Club are having a two-hour shindig from 1000 to 1200 clock, on Sunday February 1. Phone only, Chiltern members to try and work as many counties as possible, for multipliers, and stations. Top Band, of course, and, a good thought, players are specially requested to try to avoid creating QRM for those who don’t like contests. Non-members to work as many members as possible in the time. Details from, and logs to, G3IQF (85 Oxford Road, Marlow, Bucks.).

From W1WY we have a provisional list of claimed scores—not results—for the 1969 CQ WW DX Phone Contest, and we are sorry to see that among the top scores nary a G is to be found. LA0AD tops the all-band single-operator category, with 2,512,695 points claimed; the top multi-operator single-transmitter category goes to W9LKJ with 1,459,860; and the multi-op, multi-transmitter to W6VSS who pegs 4,700,000. Among the single-banders, 28 and 14 mc both took half-a-million to be top, with OZ3SK and KP4CL making the claims; 21 mc shows 250K from OD5FA, while on Forty the top claim was merely five thousand from CT1CD. Eighty showed up better with a top claim of thirteen thousand-odd from VE7BDJ. As for conditions, W1WY reckons that, by and large, they were good for the Phone weekend, but a bit rough during the CW leg. A pity the G stations who played did not put in their entries because, on the basis of the claims noted here, it is quite certain that those who are known to have entered would have shown up very well.
The Tables—
and Other Matters

Thanks to that silly boo-boo your scribe committed in forgetting to put in the deadline last time, the final entries for the Tables for 1969 will go down in the February issue—that is, taking in all the offerings up to the deadline for that piece, which is January 12 latest, and including any which filter through too late for this time.

GW3AHN (Cardiff) has a few pertinent comments on the size of an aerial farm: He does not envy W6AM his mammoth stack, which, Tom feels must take up much time in routine maintenance. To make his point, GW3AHN mentions his own aerial system—an “X” beam for Twenty, a rotary dipole on Fifteen, and an indoor ground-plane for 28 mc. The beam is at 35 feet, which enables the pole to be insulated and used as a vertical on the LF bands. Power input is at the rate of 25 watts AM/CW or 100 watts p.e.p. output SSB. As to what it can achieve, GW3AHN has all the current countries worked and confirmed, an achievement matched only by G3FKM in the U.K. All this leads to a comment on the make-up of this piece, as seen from the viewpoint of one of the real top-notch DX operators in the world-context. Tom would very much like to see the Six-Band Table revised to include only current countries, which would give the new chaps a chance to fight on an equal basis with the experienced DXers. He would also prefer to see, associated with callsigns worked, details of times and frequencies, which are, quite definitely, very useful to the operator lying in wait for a new country.

However, GW3AHN would not, your conductor is sure, mind if at the same time we express another point of view—which is that by the time a month goes by, from issue to issue, most of the top-flight chaps will have found and worked the “new one” which has popped up from somewhere-or-other. However, the top-flight chaps are in the minority as compared with the much larger group who are only interested in DX if it comes up under their nose, and like to read and find out how the many others are doing. There are points for and against on both sides, and it will be of great interest to hear from readers as to their own views—after all, there is nothing like trying to please as many people as possible on an issue of this sort.

There is another point here, too, in that the majority of the regular correspondents who make this feature possible are themselves of such a calibre that G3KFE can find them little or nothing new—but on the other hand the majority of readers, the chaps who have followed CDXN for years, rarely or never write in with news of their own doings unless it is pretty earth-shattering, and so give us little or no lead as to what they would like to see.

As far as your conductor is concerned, he would prefer to keep the “communications” aspect well to the fore, in that he has never forgotten that memorable first QSO with “Joe Blow down the road,” or his first W, or the first time he “retired hurt” from a pile-up, and he suspects that most amateurs feel the same.

Thank You!
This point, while turning over the pile to look at the odd bits, is as good as any at which to record G3KFE’s thanks to all those who rushed out to the post in response to his agonised yell for help, and by doing so made the piece as here presented possible. No doubt about it, some of these DX wallahs may play rough in the pile-ups, but they surely “came good” when it was a matter of producing news at about an hour’s notice! Thanks. Chaps.

Sign-Off
By the time this comes out, our GM readers will have celebrated their night-of-the-year, and the rest of us will already be wearing off the effects of our excess celebration, and creeping back to the shack to see what DX 1970 will bring. To all of you, wherever you may be, may it mean good DX, an adequate challenge to bring out the best, and a Happy New Year in every way. Deadline for next time, January 12, addressed to CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM. Till then, good hunting, and don’t work too many TV sets. 73 de G3KFE.

MOBILE RALLY FIXTURES

Though at the moment of writing it is bitterly cold and snowing, next summer will come and already there are some Mobile Rally dates fixed, as follows:


June 20-21: Anglian Mobile Rally, at the Anglian Show Ground, Ipswich.


We will be glad to have notification of such other dates as may already be decided. Later, we will as usual be publishing details of individual events, to appear about two months ahead of the date of the Rally. Organisers who want publicity are reminded that they should send us information well in advance.

“LIGHT-ACTIVATED CHANGE-OVER SYSTEM”

In the circuit of Fig. 1, p.609 of the December issue describing this device, it should be noted that coil L1 is not directly connected to the Tx lead but merely presented to it, in the manner of an RF probe, or “sniffer.” The proximity is adjusted for the required degree of pick-up.

CLUB MOVE—BANBURY

We are asked to say that plans are in hand for the formation of an Amateur Radio club to cover Banbury (Oxon.) and the neighbourhood. There are already about a dozen prospective members, and premises are being sought. Others who may be interested are invited to get in touch with: Pete Moore, G3TUW, 79 Nursery Drive, Banbury, Oxfordshire.

TILL then, good hunting, and don’t work too many TV sets. 73 de G3KFE.
VHF BANDS

A. H. DORMER, G3DAH

Conditions—*Ugh!*

**VHFCC Awards**

**POSSIBLY** due to the attractive callsign, Jack Butrovich, G15ALP, has achieved a QSL return rate for his two-metre activities which is rather higher than average, (165 QSO's and 100 QSL's), and this has earned him the Award in what must be the record time of just about six months. He runs SSB and CW on two metres with an NCX-200 transceiver on 14 mc into a Swan TV-2B transverter, with about 240 watts p.e.p. input. The first contact was made in May of this year using a dipole antenna, and that was followed by an eight-over-eight J-Beam, which was used for about 45 days and then replaced with a Cushcraft 20-element Colinear/Yagi, which seems to give a better gain than was suggested by the published data. From his early SWL days, Robin has used a Nuvistor converter, and a tunable IF strip at 4-6 mc, but under pressure from "pundits of transistors" he has now constructed a dual-gate MOSFET job with a TA7153 in the RF stage, a 3N159 as mixer and BF194's in the oscillator and doubler stages. The original beam, a six-over-six slot, fell to pieces, and the present radiator is an 8-ele Yagi at 40ft., the QTH being 45ft. above Thames level. Next Spring it will be joined by a second eight-over-eight in phase. So G3TDR gets the two-metre Award.

From Ashstead in Surrey, G8BTF, Vic Caley, gains his VHFCC Certificate for operations on two metres. He runs 25 watts input to a QQV03-20A. The receiver is a Nuvistor converter with an IF of 2-4 mc feeding into an AR88. The antenna is a six-over-eight slot at 15 feet, rotated by a cow-gill motor, and the QTH is about 50ft. a.s.l.

Congratulations to them all.

**G2JF—Jim Foster**

There must be few two-metre operators, in this country or in Continental Europe, who have never heard of G2JF, and now that he has just worked his 5,000th different station on two metres, this seems an appropriate time to congratulate him, and further inform readers on what has led up to this remarkable achievement.

Jim Foster was first licensed in 1935 and operated from the North of Scotland on the HF bands and 112 mc, although QSO's on the latter band were a bit hard to come by at that QTH, and at that time! With the outbreak of war, transmissions ceased, and, after a period abroad with the Air Ministry Directorate of Works, Jim returned to this country and took up an appointment as the Maintenance Engineer at Wye College (University of London), near Ashford, Kent, a position which he still holds today.

In 1946, transmissions were recommenced, this time on Top Band, and such was his skill, that he won both the premier awards for operation on 160 metres—the Victor Desmond and the Somerset Trophies. In search of fresh fields of interest and activity, G2JF turned his attention to VHF, and it is in this respect that he is now best known.

It quickly became obvious that Wye itself was not much good for VHF, and negotiations with the local Water Board resulted in the acquisition of a site about 625ft. a.s.l. on the top of the local reservoir. There a hut was constructed, antennas erected, gear installed and Jim was very much in business with the results that we now know. Equipment currently in service comprises, for two metres, a pair of 4CX250B's, plate-and-screen modulated by TZ40's, with appropriate station on two metres, this seems an appropriate time to congratulate him, and further inform readers on what has led up to this remarkable achievement.

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70 cm, on which band he has been operational since January 1969.

Always a keen contest man, G2JF has on three occasions gained the PZK Trophy awarded to the winner of the IARU Region 1 September Contest on two metres, and in 1968 he won the overall Senior Trophy, the first time that this has gone to a British station under the present rules.

He is at present chairman of the South East UHF/VHF Group, and a member of the Radio Amateurs Old Timers Association and the First Class CW Operators’ Club.

For all this, Jim is still one of the most approachable of men, always ready to help his fellow operators, particularly the newcomers, and one would have to go a long way to better the example set by “The Kentish Beacon.”

TVI Points

Much TVI is due to radiation on frequencies other than that in use at any particular time—that is, harmonic or spurious emission, the latter embracing the former.

A good definition of spurious radiation might be to say that it is any radiation from a transmitter which is outside the frequency band normal for the type of transmission employed, including any component whose frequency is an integral multiple, or sub-multiple of the carrier frequency, spurious modulation products, key clicks, transient phenomena and parasitic oscillations. In other words, spurious radiation is any radiation other than the fundamental signal. So, if the station transmitter were absolutely clean, and if the TV receiver were clear of all built-in defects due to poor design, construction, or adjustment, and was fed from a suitable antenna, there would be no TVI unless one was radiating co-channel with the TV transmitter, a not very likely state of affairs. But, alas, life is never quite so simple, and thousands of words have now been written on the subject of TVI, its cause and possible cure, without hard-and-fast procedures being evolved which enable the operator to deal with every possible cause of this bane of Amateur Radio. The reason for this lacuna is not hard to find—there isn’t any general panacea.

Most of the fairly obvious cases
of spurious radiation which cause TVI have been described in current literature, and methods of obviating them have been suggested, and so the following paragraphs look only briefly at the perhaps less well-known aspects of this problem, and only at shortcomings at the transmitter end. 

First, the basic generator, be this crystal or VFO: Very rarely is the output of this device a pure sine wave, deliberately not if it is to be followed by harmonic amplifiers, and if it isn't, then harmonics must be present, which can cause trouble, even from quite high order multiples. The badly adjusted Squier, for example, has earned a quite unjustified reputation for drift and erratic operation, and as a very prolific generator of all sorts of nasties, merely because it is so often over-driven by the application of excessive potentials and/or too much

and grid feedback due to the selection of an incorrect tapping point on the coil. It is good practice to operate all oscillators at low DC levels, with just enough feedback to maintain oscillation, and to follow them with suitable buffer amplifiers. Put them in a screened box, and filter leads to and from it, except that carrying the output to the next stage. Feed-through capacitors are all right, but a suitable RFC in series, and a disc ceramic bypass with short leads, can reduce the unwanted output, which may be inadvertently radiated, by a factor of 100. Use as high a fundamental frequency as possible for the crystal oscillator stage, around 70 mc if you can. HC6U crystals on these frequencies are available at reasonable cost, even if they are a few shillings more than the FT243 type, and a modern, hermetically sealed crystal, correctly operated, in a suitable circuit, may save an awful lot of grief with the neighbours.

Direct radiation off the aerial of harmonics from high-power multiplier stages can cause a tremendous amount of trouble, and the cure, if you must use high power multipliers, is adequate screening of the whole transmitter and high-Q bandpass filters, but remember that it is no earthy use having a screened filter if the Tx itself is unscreened, because all that happens is that the unwanted RF nips smartly down the outer of the output link coax and bypasses the filter. Faraday links can also be a great help here. It is better practice to do all frequency multiplying at low level and then amplify the final frequency to the level required at the PA stage.

However attractive the idea may be in saving cost and space, and getting a bit more drive, capacity coupling between stages is not to be recommended. All the unwanted harmonic muck from earlier stages will get through. Double tuned, inductively coupled, circuits are infinitely to be preferred, and will considerably reduce the chances of TVI from this cause.

However efficient the screening afforded by well constructed metal housing for the Tx may be, and however good the lead filtering (including the going mains lead) is made, there will still be leakage through any large holes such as are
required for meters and dials. There isn't much that one can do about the latter in some cases, but the meters are another matter. Leads to meters should be run in screened cable and, where possible, the backs of the meters should be boxed in with an earthed screen and the leads filtered with some RFC and ceramic bypass capacitors. Try a GDO up against an untreated anode current meter some time, and see how much comes out! Cases have also been reported where radiation has been observed from pilot lamps on the front panel of a transmitter, so, if in doubt, leads to these should also be decoupled.

It isn't difficult at VHF—use a RFC consisting of about ten turns of 20g. to 1in. diameter and 1in. long, and a 1,000 μF disc ceramic capacitor.

Finally, an open chassis with a 3-20A on the far end is a menace, not only to the fingers of the careless operator, but also as a possible TVI generator. Professional-type cabinets can be expensive, and not always that good from the screening point of view, but it is a fairly simple and inexpensive job to make up a framework with aluminium angle, enclose it with some sort of expanded metal (rather like the stuff the old-fashioned larder door was made from) and bolt the whole thing to the Tx chassis, making sure that it is RF tight and that any external leads are adequately filtered where they leave the enclosure.

Of course, these comments only scratch at the surface of the problem and in certain instances are applicable both to fundamental and spurious radiation, but they may set a train of thought going which will help to alleviate, if not cure, some cases of TVI which have not yielded to other measures.

**Group, Guild and Club**

The South East UHF/VHF Group meeting on December 5 at the University of Kent was attended by some 50 amateurs who had come to hear Don Hayter, G3JHM, talk about operations on four metres. Don's lucid explanation of the propagation modes involved, both normal and abnormal, was very welcome, and it is to be hoped that it will lead to an upsurge of activity on that sadly neglected band, in Kent anyway. The next meeting of the Group is planned for January 23 at Wye College, University of London, near Ashford, Kent, when Captain Bill Ingle, G3OIZ, will be talking about VHF in Civil Aviation. Incidentally, although he cannot transmit, Bill finds that the VOR receiver in his aircraft will tune up nicely on two metres, and he has been hearing some reasonable DX on that band during some of his Sunday morning trips to the Continent. This meeting is also the occasion of the AGM of the Group, so it is hoped that as many supporters as possible will be there.

The City and Guilds of London Institute Radio Amateurs' Examination held on December 3 this year, looked pretty reasonable. Only two questions involved any calculation, and the remainder were answerable virtually on sight by anyone who had read the Licence Regulations and the first few chapters of the *Handbook*—Best of luck, chaps. One could wish that there were more operators holding G8/3 calls who would have a go at the Morse test, though. Not only would they get more fun out of operating, with a lot of DX to be had which is at present denied to them, but perhaps a few would then come on four metres and help to fill some of the large gaps there.

The South Bucks VHF Club has laid on a "Home Brew" display for their next meeting at Bassetbury Manor, High Wycombe, on Tuesday, January 6 at 8 p.m. R. Idiens is the hon. sec. and can be found at 77 Amersham Road, High Wycombe, Bucks.

**Four Metres**

EI4BK forwards the authentic dope on the four-metre beacon, EI4RF. It is an IRTS beacon, but the Limerick Radio Club were responsible for getting it on the air in time for the official opening ceremony, performed on November 15 last. Further details are: *QRG* 70-325 mc; *QTH* Mullaghanish, Co. Cork, by permission Radio Telefis Eireann; Lat. and Long. are 51° 59' North and 09° 07' West, which gives it a QRA of VLO5a. Height above sea level is 2133 feet.
and the four-element Yagis, one bearing North and the other East, are at 20 feet above ground. The keying cycle is: EI4RF (four times), a 22-second dash, EI4RF (three times) followed by a 33-second dash. Total keying time is two minutes and twenty-two seconds, and after the first dash the antenna beam heading is changed. Reports of reception will be welcomed by EI4E, Avenue Road, Killarney, Co. Kerry.

A good indication of how conditions have been on four metres this year comes from Mike Gibbings, G3FDW, a very well-known and successful operator on that band. Quote: “1969 was the worst year yet for me on four metres. Only one new county has been worked, Northumberland, for my last G county; no contacts with ZB2 compared with fifteen QSO’s last G county; no contacts with Northumberland, for my last G county; no contacts with ZB2 compared with fifteen QSO’s in 1968. The band has been very dead all summer with only the odd openings. Things were good for VHF/NFD, though, so that made up for a very flat year.” This appears to be the general view as far as your scribe can ascertain from talking to other operators and from personal observation, although there appears to be no facile explanation for such poor propagation conditions. Mike is still running 110 watts p.e.p. of SSB and 50 watts of NBFM or CW, but has recently gone for asymmetrical modulation, with negative peak clipping at the 95% level, and with positive peaks going up to 200%. The TX runs only 20 watts to a QQV03-10 in the PA, but it has produced one First, one Second and one Fourth in recent Contests. It attracts more attention from the home QTH than does the SSB rig, but the local TV sets don’t care awfully about it at the moment, although undoubtedly that problem will be licked. The glint in Mike’s eye is a 50-watt Tx and 60-watt modulator operating on the same principles.

**Firsts**

G3CCCH in Scunthorpe worked OH2BEW during the Perseids on August 14, so although the Table shows G3LTF credited with G/OH, and this was still the first extended tropo contact, Johnny appears to have got in with the first one by M/S, unless there are other claims. Many operators will have heard his regular weekly transmissions on two-metre CW which preceded this fine contact. He also got the first G/OY QSO on Two with OY2BS in the Faroes on November 15, 0300-0500z, and on November 16 he repeated it between 0830 and 1030. His two-metre total is now 25 countries worked, which by any standards is first class. G3CCCH is now concentrating on UP, UN, UQ, I and LZ for M/S contacts. Congratulations and good luck.

It is known that the late GD2ZCM/P worked both YU and HG during the great opening of July 1965, but no details of the other end of the contact can be found. Can any reader help?

**General**

As reported last month, GD2DZ is now QRV on 70 cm. He would welcome reports on his transmissions from stations over 100 km. distant. He has skeds on Tuesdays, Thursdays and Saturdays with PA0EZ and ON4HN, 1910-1930z, CW on 432-45 mc, and is, of course, open for contacts after those times. All reports and QSO’s will be QSL’d. It was with ON4HN that Arthur reached the fine DX contact on 70 cm. on October 10 last for a new “First.” Signals were five and 8/9 then, both ways.

G8AMG has produced a very stable VFO operating on 24 mc. It is transistorised and constructed on a p.c. board. The output, after suitable buffering, is 1 volt RF into 75 ohms. The whole thing is not only temperature compensated, but also temperature controlled. The frequency determining circuits are 2N3819’s, and details will be published shortly.

G5JO, QTHR, has a magnificent museum collection of vintage radio and TV equipment, both professional and amateur, and, fortunately, enough room to store and exhibit it. Among the rare items are the microphone and loudspeaker used by Gerry Marcuse, G2NM, for the first Empire broadcast. However, he lacks a good example of a pre-war crystal set, and would be very grateful if any reader could help.

For those who, like the writer, have wondered what had happened to G3JON in Sheffield, QTHR, who hasn’t been heard on the band for ages, the answer is that he moved QTH in April of this year, and has not yet got all the gear reinstalled. He has become an expert on the design and installation of domestic central heating, he says, and one hopes that this plumbing expertise will stand him in good stead when he comes on to the UHFs. He should be back on two metres in the New Year with his eight-over-eight from a site which has a good take-off, particularly to the South.

G2AXI (Basingstoke, Hants.) has been busy on a construction project which has now nearly reached finality. The NBFM system has been replaced by phase modulation, a mixer VFO has been built to cover the lower 500 kc of both the two and four-metre bands, and 50 watts are now available on Four, and 120 watts on Two. The separate exciter unit comprises the VFO on 2050 kc and a crystal oscillator on 5960 kc to give either 8 mc or 3-9 mc output from the mixer via a bandpass coupled buffer stage and treblers to the output of the unit. Phase modulation is applied to the buffer amplifier. The main RF deck has two complete transmitters taking input at either 24 mc or 11-7 mc, depending upon the desired radiated frequency. The two-metre final runs a QQV06-40A with a linear tank, and the four-metre PA is a QQVO3-20A with lumped C and L. The power unit includes all the necessary relay switching and variable high voltage supplies for the PA’s. Sounds a nice job.

**Contests**

Very good to see that the 70 cm. Cumulative are starting up again in this New Year. The first round is on January 16 and the second on January 29. The 144 mc SSB event is dated January 12, from 1900 to 2200 GMT, and the 144 mc CW Contest makes an early start, 0600 to 1200z on January 25.

**Deadline**

Deadline for the next issue is January 10, 1970. The address for claims, news and comments is: “VHF Bands,” SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now, 73 and a very happy New Year from G3DAH.
SOME few months ago, J.C., it may be recalled, hung his preamble to this piece around the fact that most of the preceding month had been spent under the car, and drawing therefrom a moral of use to the SWL. Oddly enough, this ancient barouche has once again taken unto itself the role of Delphic Oracle, this time in the context of Ohm's Law.

With the onset of the cold winter weather, it began to protest, in no uncertain fashion, that if it continued to be neglected as to its routine maintenance, and its warm garage put to other uses, then it would protest by refusing to start until a handle were taken to it.

Three days of this treatment was enough to bring your conductor to terms, and a search began for the cause, in the midst of which exercise it was discovered that if the main lead to the electrics were removed from the starter to the battery terminal, with no other changes, the thing would start like a good 'un every time. The effect of moving the wire was to make the car—

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Contact?

Are there any SWL's around the Stroud, Gloucestershire, area? Jim Fawke has been a listener since back in 1924, but he only knows of Mike Quintin. He would be interested to hear from any others, young or old-timers—his address is St. Chloe Green, Amberley, Stroud.

Prefixes

As ever, we have our fair share of oddities to comment on: C. J. A. Morgan (Wallsend) found a type who was signing "HX1" during the CQ WW battle, claiming to be in the country of "Bhalnapur" in Zone 22. If that is a good one, then J.C. has a ZA1 callsign!

Talking of ZA, which must be quite the most pirated prefix in the book, R. Nichols (Narborough) found yet another, this time "ZA1LA"—just why ZA is so popular for pirating, Heaven only knows!

Still with the oddball prefixes, J. Haig (Hitchin) found a station signing KY5AEW; the prefix as such was quite definitely Ungood if it was copied correctly, but J.C. has a shrewd suspicion that John misread it for a quite legitimate prefix—the old problem of a gabbled callsign!

B. J. Gilbert (Tonbridge) has completely retyped his HPX list, to bring his total to 700, plus quite the largest list of phoneys ever to be sent in for our perusal—17 of them, and not a good one among the whole boiling! One suspect that it is in the nature of things that the SWL's spot the phoneys more readily than the licensed types, who so often pass them up instinctively without noting the calls down on paper or, sadly, are often so inexperienced, by the fact that they put off buying a receiver till R.A.E. is passed, that they are easy meat for any trickster.

Who is He?

Here we have to mention a letter from "a reader" who puts in a first entry at 203 in the Ladder, accompanied by a most interesting typed screed, addressed from Ruislip HA4-6BT—but this mystery-man forgot to sign his piece!

Changing tack somewhat, that paragraph last time discussing the "way in" the craft of SWL'ing and Amateur Radio through a casual hearing of an AM station on the BC receiver now being very rare (due to the widespread adoption of SSB), touched off an answering letter from F. G. Rayer (Upton-on-Severn), who, by way of his text for the R.A.E., Amateur Radio, has done so much to help get chaps to their ticket. G3OGR appeals to all those with AM rigs to fire them up as much as possible, just to give the new listeners a chance of hearing amateur telephony the easy way. J.C. is not at all sure he would go along with this, if only from the fact that ere long AM will be completely barred (as was spark in its time so many years ago) because of the pressing need for bandwidth conservation. However, G3OGR has a point worth thinking about.

Technical Points

Now to things technical. M. Williams (Seaford) is very pleased with his receiver, but has come to the conclusion that he needs to do something to the aerial to improve range. Maurice appears to be in "a bit of twist" in this context, for as he feels a Q-Multiplier might help—but the Q-multiplier is used in the IF strip to sharpen up the selectivity, and can do nothing to help the case of the signal that is too weak to impress itself on the first stage of the receiver. What is needed here is an ATU, or, if that is already doing its stuff in the shack, a better aerial—a rhombic, for instance!

It is pleasant to hear from an SWL happily getting into his first constructional project; H. Wright (Pontefract) is doing just this, by way of a pre-amp. for 21 and 28 mc, and a PSU. Harry, incidentally, has just become a member of the Wakefield club, and seems to be liking it.

That paragraph on the subject of counting frequency raised a doubt in the mind of R. Smith (Basingstoke), who is puzzled as to how one could measure the frequency of a single-sideband suppressed-carrier signal. Easy! One measures the frequency at which the carrier would have been had it not been suppressed! What this really means is that either one inserts a little carrier at the transmitter and looks at that, or, at the receiver one re-inserts carrier in the usual way and measures that.

The latter method is, of course, subject to all the limitations of the receiver. J.C. has a way out of this: Knowing the frequency of the BFO by measurement, and the actual frequency of the first mixer local oscillator, both by counting, one then does a simple sum and arrives at an actual signal frequency for the carrier one is looking at.

The advantage of the "counter" digital process over the "analogue" methods using a heterodyne wavemeter is simply the increased accuracy of the former.

J. H. Wrench (Kidderminster) has a problem in that the two-volt accumulator in his R.1082 needs replacement after Heaven-only knows how many years accumulating—sorry!—cobwebs in the loft and then being put back into service. The R.1082 is proving itself a very satisfactory performer.

Between starting and ending his letter, I. Poole (Leeds) has a visit from the postman, hearing his new callsign, G3YWX—congratulations! Ian has a transistor crystal-oscillator transmitter which uses a 2N706 at 300 milliwatts which can be pushed up to 380 on CW, the mode Ian prefers. With this is a change-over unit which covers all the assorted operations to make the station go from "receive" to "send," all ready for the first QSO, which should be accomplished fact by now.

John and Shelagh Singleton (Hull) are to be congratulated on the arrival of a son since last time round, an event which has resulted for them both in a change of listening habits; Shelagh only gets a look at the bands at nights nowadays, while John, in what spare time he has, is busy taking down aerials and putting up others. The interests of these two have extended to the reception of TV/DX—a subject on which a year or so ago we had quite a following.

* * *

A shamefaced S. Foster (Lincoln) wrote in after the deadline, but luckily J.C. had other commitments which
Robert Dinning, Blackholms Farm, Dunlop, Ayrshire, is a 17-year-old GM/SWL who has heard some 220 countries on three HF bands, running an HA-350 with Codar RQ-10X and PR-30X, also an HRO. At the time he wrote, he had passed R.A.E. and got his Morse up to 10-12 w.p.m. — with a ticket as a near-prospect. Robert is lucky in that he has amplescope for antennae. One of his other interests is MW/EC DX.

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delayed the processing of this piece a day or so, and that got S.F. into the pile. Stewart mentions Uruguay CW contest prefixes; OG as the one used by Finnish operators, also during the CQ Contest; and the ZM’s. 3Z is one which has been around for quite some time, but it is odd how people continue to query these quite ordinary SP (Polish) stations.

Incidentally, it should be noted that where a country allocates an odd prefix — as, for instance, with the ZL’s using ZM till the end of the Cook Bi-Centennial Celebrations, across the board, then the correct way to locate the actual station is to look him up in the Callbook against the equivalent ZL. In other words, ZM4BX is the same as ZL4BX — which answers the question of N. Crampton (Romford).

From N. Henbrey (Northiam) a welcome return to the fray — we thought Norman had sunk without trace — after a period when listening-time was very much restricted, due to gardening and a change of job. The EA-12 has gone to “Bandit Bill” and in return a Sommerkamp FR-DX500 is now occupying the place of honour in the shack, with an ATU being dreamed up to add in for the space between aerial and Rx.

Another lost sheep returned is J. Fitzgerald (Gt. Missenden), who has now come up from yet another “/A” location, this time in Finchley, where he is teaching. Incidentally, it is interesting to note John’s digs, are just about on top of the Finchley Club Hq. at the Cherry-Tree, Southgate (meeting every Friday evening).

Again in the way of special prefixes, one notes the 915 being used by the Zambian stations to celebrate the fifth anniversary of their independence; this one J.C. could hardly have failed to notice, as a colleague applied for a call in Zambia and much time was spent going through the detailed clauses to find out just what could, and could not, be done in that country, Amateur Radio-wise.

Listening with a purpose is D. Robinson (Birmingham) who has got himself the special log-book and is busily chasing the HAB award. As a matter of interest, many G stations are mentioning their HAB locations in QSO’s on Top Band without being asked, the reason being that any profits from the award fees are given to RAIBC, which renders the exercise doubly worthwhile. G3ABG is the man to write to all about this one — QTHR.

Still in Birmingham we have a first entry from R. Thompson, who recently upgraded himself to an RA-1 receiver, built from a kit, which he operates in conjunction with a 66ft. wire at forty feet, the anchorage being a most opportune beech-tree.

G. Dover (Nottingham) sent in a photograph of a very nice rig, which unfortunately was not quite of the standard that will permit good reproduction. Geoff has much to say in his letter about the “bit between the ears” of last month, as he finds that, as he works up the Ladder and gets more experienced as a listener, he is pulling more of the stuff out of the speaker; it is a knack of concentration and comes from experience of the noises the receiver makes.

QSL Cards

M. Fisher (Bradford) brings this one up. To get a reply, the report must be of use to the operator it is sent to, or convey the idea that it is based on some intensive listening and can tell said op. something of interest. For instance, a station calling CQ and finding no replies does not know either whether he is getting
out but not hearing replies; getting out but finding no takers; or just not getting out. An SWL report by direct mail, with an s.a.e. for the return card, will almost certainly touch the spot under such circumstances. On the other hand, an SWL across the road who sends J.C. a QSL card on half a QSO during which he was getting a 59 report from ZL, is not really being either helpful or interesting—in fact, such a report is a nuisance.

As to cards to send, they can be any design, although it is advisable to keep to fairly standard sizes if it is not desired to drive Bureau managers round the bend! Most SWL cards have nice designs but nothing like enough room for the information that ought to be conveyed to the recipient, overflowing on to the print or picture to make the whole thing look a mess. Frankly, J.C. would prefer SWL's to use a "report form," with enough room for all the gen. in comfort, which can be a lot bigger and yet foldable so that it can go in with the card.

One must avoid mis-reading a callsign; R. Carter did this with a station he copied as "904AA " in the West Indies; almost surely this should have been taken as 9Y4AA—the 9Y4 prefix being for the West Indies. A copy of the Prefix List, reprinted from a recent issue, is available for a few coppers from SHORT WAVE MAGAZINE (See foot HPX Rules Column, September), and is invaluable in sorting out these little problems, and giving some guidance on the country of origin of any new prefix which may appear.

On a completely different bearing, R. Berkolds (Chatham) finds the demands of the locals for his services on radio and TV repairs is an inroad on his time. Not surprising, as so few amateurs will charge the rate for work done, if they were honest with themselves they would realise that in many cases they are charging so low as to be actually paying for the privilege of doing an unwanted job. Other than the case of the pensioner, one should charge more than the local dealer would, and toll the chap what it is going to cost him before you take the $7 into your hands. Then you won't get him knocking on the door again!

* * *

An odd question comes from H. C. Bacon (Grimsby) who has recently 'found' the amateur bands; he discovered that with the coax outer braid not earthed, he gets a better signal from his Joystick. Possibly the aerial or its tuner is at fault, or (worth trying first) the earth lead may be some odd length which is having an effect. Often a capacitor helps here, a variable one, connected in series with the earth wire and adjusted for a signal peak, is the way to attack it—although on safety grounds it should be shorted at all times when not in use. It will probably only be needed on one band.

Another John Singleton—this will cause confusion for certain! Our second one comes from Blackburn, and he uses Heathkit RA-1 and Trio 9R-59 receivers into an inverted-Vee up in the loft, to make a first entry in the HPX Table.

C. Garcia (Worthings) used to have a 200ft. end-fed, and a 15ft. vertical fed with coax—but after the recent gales he now has an assortment of bits and a stump of cable. Such is life! It has to be admitted that J.C. was casting anxious eyes at his long-wire during the same gales, although by reducing the tension it was saved from more than a slight stretching, so that we were able to pull it down and use the wire as a "puller " to span out a new one after the winds fell a little.

**HPX LADDER** (Starting January 1, 1960)

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<td>N. Cranton (Romford)</td>
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(Notes: Listings include only recent claims. Failure to report for two consecutive issues of "SWL" will entail removal from the Table. Next list, March issue, for which the deadline will be January 16.)
The reference to Bob Iball last time round made H. M. Graham (Harefield) dig back into his memories to those halcyon days before Hitler's War when the only complaints about the state of the bands came from 'Uncle Tom' in the then T. and R. Bulletin each month—the same who for so many years after that War graced these pages in his own name, G6QB, and still displayed his sense of humour. H.M.G. comments in his letter on the odd fact that with all the years he has been DX-chasing on the bands he has seen some weird differences crop up—for example, he has never heard a DU in the post-war era, although in those earlier years they were almost ten-a-penny in his 'phones. Another similar case is that of Indonesia, albeit there they have only lately come back on after a prolonged official QRT.

How to connect a 33-foot vertical is a question that is taxing S. Palmer (West Wickham). Probably the best way is to feed it into an ATU at the bottom of the vertical, preset to give a good match to coaxial, which can then be run to the receiver. If peaked to mid-point on each band, the aerial trimmer on the receiver also being at mid-point, the latter should be enough to compensate for slight mistuning. However, the whole system must be fed against a good earthing system.

M. G. Toms (Ilford) gave his old receiver to his sister, and has found to his surprise (and, we suspect, mild annoyance!) that she is amassing almost as many QSL's as he, and that on an eight-foot whip.

No such problems in the Hyder family at Southampton, where three HPX experts share a station. Lynne reports this time, with a formidable new collection of prefixes to keep the rest of the family on its toes.

QSL'ing as an interruption to rather than a facet of SWL'ing is the lot for the moment of C. Jones (Mold) who has the task of dealing with the cards for the GB3NEF exercise. However, some time was spent around the bands, as the Table shows.

Talking of interruptions, Jim Dunnett (Preston) has the burps of the new harmonic to add to the QRM from the burps which some stations seem to generate electronically on the bands!

From Rev. D. P. Brewster (Oxford) comes news of a very sharp reduction in the possible hours of listening time, arising from additional responsibilities. David has, however, managed to spend the odd few minutes listening round, and will no doubt be able to do so occasionally in the future—we hope so, anyway.

Long letter from W. H. Butcher (Towcester) gave your scribe a great deal of amusement with his—sadly, unprintable!—description of the funny noises to be heard on the bands, and his difficulties in extricating the signal he wants out of the sludge. On a more serious note, W.H.B. found a couple of phonies, also USARTEK; but the latter is perfectly OK and has been around for quite a time, though possibly rather less active than of yore.

**First Entries**

Quite a few this time, with Bert Glass (Plymouth) at the top of the clip. Bert did 25 years in the Royal Navy as an operator, and has now retired from the Civil Service; he now listens to the CW end of the bands using a Trio JR-500S and a multi-band trap dipole.

Sending in an entry may be provoked by all sorts of factors. May 13, it may be recalled, was a significant date for Malaysia, where F. Lt. A. T. Cheeles was and still is. To while away the curfew hours, a KWM-2A was borrowed, which relit the spark which had been out since the early post-war years. It led to the purchase of an FT-DX400, used with a four-band trapped vertical, a "SRV" being available as back-up. Conditions have been pretty fair out there, by and large, although, not surprisingly, both the static and the JA QRM have been a little fierce at times.

A. E. Bandy (Wimborne) has some pertinent points to make on the subject of earthing receivers and isolating
them from the aerials as a safety measure, and also brings up the TV dealers' gripes about transistor frontends in TV sets which "pop" the transistors every time there is a bit of aerial fireworks in the way of thunder- and-lightning to contend with. (And if you have a colour TV Rx, even on BBC-2, it is as well to have its aerial plugs out if you are radiating a few hundred watts on the HF bands off an aerial within a few feet of the TV array.)

Editor. The thing that matters is that the TV aerial be isolated from earth to DC, by way of the blocking capacitor in the TV. The safe answer is to earth the TV aerial feeder's outer braid somewhere en route from aerial to TV set, and to arrange a DC shunt from the inner to the outer—a highish value of resistor, fitted when the aerial is erected, from inner to outer of the feeder in the junction-box on the aerial is one way to deal with the problem.

Yet another first entry comes from someone signing "Stewart" with an Aberdeen address, who uses a Windom, and end-fed sixty-six footer, dipoles for Forty and Twenty, and a 15-metre beam, all hooked to an MR-44/11 receiver. All we need is a name to enter it against in the Table!

**Can Anyone Help**

S. McKinley (Kirby-in-Ashfield) has a 22 Set Mk. I, plus ATU and 50ft. of wire running N/S. He would very much like to lay hands on some data covering this equipment both from the point of view of servicing it, and as to possible modifications. Anyone able to help? If so, write to S.McK. direct, at 96 Forest Street, Kirby-in-Ashfield (2459), Notts. NG17-7DU.

Plenty of time for listening has been available to M. Bass (Nottingham) as a result of an operation for perforated appendix, and so he has come into the Table for the first time. Malcolm, who has passed R.A.E., is thinking about a G8 ticket, and wondering about the requirements for frequency measurement. No worse than on the HF bands, but not quite so direct. For instance, knowing the oscillator frequency of the converter, one knows its IF range; thus, one measures frequency at IF and expresses at RF. Taken in conjunction with some direct-reading marker arrangement, such as a 1 mc crystal "piper" as a cross-check, you can measure to as close accuracy as you are needing, and indeed quite as close as you can on HF.

Apart from a first entry, and a chatty letter, N.W. Mundy (Gloucester) raises a few problems. First he says he has an ATU which peaks the incoming signals but the S-meter doesn't show any improvement. Sounds like a good case for mending the S-meter or its associated circuitry—not forgetting the AGC line.

B. P. Livesey (Beckenham) comes in for the first entry in the Table, although it is not his first letter. Brian has a somewhat modified BC-348. He has just found three OK's, for the first time since the invasion, and wonders why? Luck, Brian, they've been around all the time, as a look in a few other logs, such as for instance the Top Band operators, would immediately show.

D. J. Lee (Hemel Hempstead) has been two years in amassing his 209 for a first entry, initially on a CR-70A, later on his brother's Sommerkamp FR-500DX and trap vertical; then, when the arrival of G8CQR resulted in him wanting his own receiver back, a return to the CR-70A, now hooked to a Joystick.

Always a keen correspondent, D. J. Browning (Bishops Stortford) wonders if there are any overseas readers who would care to exchange ideas on matters of mutual interest. Letters to Douglas direct, please: at 214 Stansted Road, Bishops Stortford. Incidentally, he mentions that he finds a shortage of G4 stations on the bands—which J.C. also notices, and wonders why. (The G4 licensing sequence was started just before the War, and there was not time to get many of them out! Editor.) Certainly, as time goes on and more and more gaps will appear in the ranks.

Afternoon activities on 4.85 and 6.62 mc using such calls as "Regency One" and "Delta X-Ray One" puzzled S. Lowe (Exmouth), as well it might. But, to judge by the fact that one of them admits to a 19 Set, they are almost certainly Army Cadet stations. D. J. Reynolds (Dudley) is all-of-a-dither about OF1VR and OG1VR, both as prefixes and as stations. No need to worry; OF1VR was OK and OG1VR was also OK!

Apart from giving 21 mc a whirl in the Contest, to the advantage of his score, R. A. Treacher (Elitham) seems to have become addicted to early-morning sessions on 3.5 mc before setting off for the office—which is far and away the best time to look at the band, unless one is prepared to sit up till the small hours when the pundits and other funny-noises go to bed and the DX (which was there most of the time) can be heard. For an alternative, a listen down at the CW end is well worth while—there are some very smart operators about on 80m. CW, from whom much can be learnt.

Although not yet ready to send in the first list E. Banforth (Oldham) wants to know how much information we want. Prefixes are the criterion, and so we must have them; but in the case of an "odd 'un" it helps to have just about everything you can tell us, so that we can compare with any other reports and puzzle out the truth. And, while we are on the subject of Heard Prefixes, the Table says you start at 200—a lot of people write and ask if we mean prefixes, Zone points and all sorts of weird things—even to the suggestion that it could mean a "credit" of 200 before you started! What we want, and what we generally get, is a first list containing a list of 200 or more Prefixes, with additional information as considered needful by the individual. Some, with a typewriter to hand, give us The Lot-band, date, time GMT, station in QSO with, reports, comments, and so forth. This is fine—but for those with writer's cramp we need just enough to establish the validity of the claim. And remember that 200 is the lowest score with which you can start.

**Deadline**

Which leaves us to thank you all for your letters and support during the past year, for its continuance this year, and to wish all readers of "SWL" a Very Happy and Prosperous New Year.

Deadline for next time is a little bit easier at January 16, addressed "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM. 73!
**THE OTHER MAN'S STATION**

G3ILO is the station owned and operated by Tom Spencer, 1 Field Lane, The Quarry, Cam, near Dursley, Glos. He started on the air in August 1952 and has been regularly active ever since—very few weeks have passed without the station being operational in one way or another.

Coverage is all bands 10 to 160 metres, AM/CW/SSB, and additionally AM/CW operation on two metres, running 12 watts and a 10-element beam at a height of 40 feet. With this equipment, at a QTH 350ft. a.s.l., some 12 countries have been worked on VHF.

On the other bands about 170 countries have been accounted for, with contacts taken as they come. The aerials for the HF side include a TA-33Jr. at 34ft., inverted-Veers for 40-80m., and a long-wire for Top Band, also worked from G3ILO—indeed, the station represented the local Club in the recent MCC fandango.

Receivers are an AR88D (not visible in this picture) and a Radiovision “Commander” which, though an early post-war type, has a number of interesting design features and is particularly effective for CW working.

On the transmitter side, a K.W. “Viceroy” is used for SSB on the 10-80m. bands, and a modified Labgear LG50 is also available for AM/CW. The rack to the right in the photograph carries a home-built “Elizabethan” Tx, put into service some 16 years ago, since when it has given something like 14,000 QSO’s. Also in the same rack are the two-metre Tx with its modulator.

Future plans at G3ILO include breaking out on the 70-centimetre band, for which an 18-element beam will be available.

Within the G3ILO household there is a junior operator who is interested in Amateur Radio and can already read Morse at about 10’s—so it looks as if a shared rig should be a possibility in due course.

As a footnote, it might be added that G3ILO is a “non-professional amateur,” in the sense that he is employed on the service side for a well-known local firm of diesel-engine manufacturers.
NEW QTH's

E14BZ, D. F. Moore, Communications Division, Haulbowline, Cobh, Co. Cork.

G3EDG, W. G. Pitfield, 36 Ecclesden, Grove Hill, Brighton, Sussex. BN2 2NG. (Re-issue.) (Tel. Brighton 683109.)

G3ZI/A, A. Senior, 18 Connaught Road, Harlesden, London, N.W.10. (Tel. 01-965 0997.)

G3VDO, I. Hacking, 9 Thornhill Avenue, Rishton, Blackburn, Lancs. BBI 4EZ. (Re-issue.) (Tel. Gt. Harwood 2059.)

G3YNZ, J. Bakewell, 23 Huntick Road, Weeke, Winchester, Hants. (Tel. 01-965 0997.)

G3XVR, R. Ellis, Chalcot, Pwllmelyn Road, Llandaff, Cardiff. (Tel. Cardiff 71577.)

G3YV, R. H. M. Outhwaite, 23 South Eden Park Road, Bckenham, Kent.

G3YVV, D. Hanley, 15 Thornton Crescent, Billingham, Tees-side.

G3YWH, F. Hill, 11 Goodwood Avenue, Blackpool, Lancs. FY2 OTT.

G3YWI, G. W. H. Grayson, 88A Kaye Lane, Almondbury, Huddersfield, Yorkshire. HD5 8XU.

G3YWN, K. Birchall, 61 Silk Mill Drive, Tinsill, Leeds. LS16 6DN.

G3YWP, P. J. White, Sycamore, Lower Lane, Freckleton, Preston, Lancs. PR4 1HJ. (Tel. 0772-879 486.)

G3YWQ, W. J. D. McClure, 7 Coulton Street, Barrow-in-Furness, Lancs.

G3YXR, W. Westmorland Radio Society, 24 Park Road, Milnthorpe, Westmorland.

G3YWT, P. Smith, 7 Vaughan Avenue, Linby, Notts. NG15 8ST. (Tel. Hucknall 2574.)

G3YXU, S. Fisher, Nestofirs, Leatherhead Road, Gt. Bookham, Surrey.

G3YXX, I. D. Poole, 41 Linton Rise, Leeds. LS17 8QW.

G3YXM, D. Pick (ex-G8CTM), 9A Long Lane, Billesdon, Leicester. LE7 9AL. (Tel. Billesdon 2579.)

G3YXW, P. J. Dunford, 2 Newton Road, Swannege, Dorset. BH19 2DZ.

G8DDJ, G. Shepherd, Berwyn, Runshaw Lane, Euxton, Chorley, Lancs.

G8DDM, R. E. Finch, 6 Cherry Tree Way, Tylers Green, Penn, Bucks. (Tel. Tylers Green 483.)

G8DEF, C. J. Leigh, Ravenstone, The Park, Cheltenham, Glos. GL50 2RP.

G8DEM, B. T. Willetts, 21 Chestnut Road, Oldbury, Warley, Worecs.

G8DAF, D. C. Hyde, 33 Hartford Road, West Ewell, Epsom, Surrey. (Tel. 01-379 7350.)

G8DFW, C. R. Adams, 89 Oakdale Drive, Heald Green, Cheadle, Cheshire.

CHANGE OF ADDRESS

E14LRC, Limerick Radio Club, c/o John Casey, 19 Elm Place, Rathbane, Limerick.

G2BCH, J. P. O'Brien, 11 Cheryl Court, Uplands Road, Clacton-on-Sea, Essex.

G2FSJ, E. Thorpe, 47 Rownhams Lane, Baddesley, Southampton. SO5 9HR. (Tel. Rownhams 2567.)

G2FSA, G. D. Davies, 35 Kensington Road, Stockton-on-Tees, Teesside.

GW2RV, S. Higson, Garnedwen Bungalow, Lixwm, Holywell, Flintshire. CH8 8JS.

G3AGF, R. L. Edginton, 92 Shurdington Road, Cheltenham, Glos.

G3BOR, D. W. Hudson, 21 Hallas Lane, Cullingworth, via Bradford, Yorkshire.

G3DAE, A. Cockayne, 9 Foresters Terrace, Teignmouth, Devon. (Re-issue.) (Tel. Teignmouth 3303.)

G3JXN, E. B. Grist, 37 The Shinnings, Boxgrove Road, Guildford, Surrey. (Tel. Guildford 60163.)

G3GSN, T. N. Reekie, The Skerries, Canada Road, Leominster, Herefordshire.

G3JFY, M. J. I. Lillington, 14 Kingston Caravan Park, Canada Road, West Wellow, Romsey, Hants.
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