

# The SHORT WAVE Magazine

3s.

VOL. XX

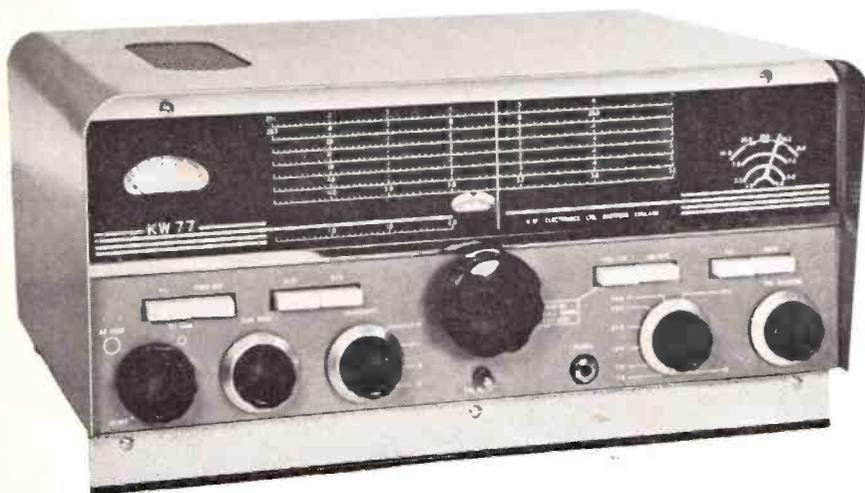
DECEMBER, 1962

NUMBER 10

## THE **KW77** A NEW STANDARD IN COMMUNICATION RECEIVERS FOR THE RADIO AMATEUR

### Awarded Silver Plaque

International Radio Communications Exhibition · London 1962



The KW77 is in use at many stations at home and overseas, and has already received world-wide acclaim, particularly for its fine C.W. and S.S.B. performance.

Price, complete with 8 crystals £120, carriage extra,  
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*Easy terms available in U.K.*

- ★ Triple Conversion
- ★ Geared Precision Drive
- ★ Slot Filter
- ★ Covers all Amateur Bands  
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- ★ Sideband Selection
- ★ Audio Filter
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and 0·5 kc
- ★ AVC Two Speeds
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### RECEIVERS

	£	s.	d.
G.E.C. BRT400K purchased new 5/7/61. 150 Kc.-480 Kc. and 590 Kc.-30 Mc/s. ...	100	0	0
HALLICRAFTERS SX110. 540 Kc.-32 Mc/s. ...	55	0	0
AR88D. Brand new 540 Kc.-32 Mc/s. 100-240 AC input	75	0	0
AR88LF/E rewired with PVC 75-360 Kc. and 1.5-30 Mc/s. 100-240 AC input fitted with 'S' meter and IF gain, etc. ...	40	0	0
AR88LF standard ...	35	0	0
MOSLEY CMI as new. 80-10 Mtrs. Xtal controlled front end ...	65	0	0
MOSLEY CMI. Brand new ...	86	0	0
MARCONI CR300 with power unit. 15 Kc.-25 Mc/s.	20	0	0
HAMMARLUND HQ170E. 160-6 Mtrs. amateur bands. Maker's guarantee ...	150	0	0
EDDYSTONE 680X. 480 Kc.-32 Mc/s. 100/240 AC input ...	75	0	0
EDDYSTONE 840A. 480 Kc.-32 Mc/s. 100/240 AC/DC input ...	35	0	0
EDDYSTONE 840. 480 Kc.-32 Mc/s. 100/240 AC/DC	30	0	0
EDDYSTONE 670. 540 Kc.-32 Mc/s. 110/240 AC/DC	20	0	0
EDDYSTONE 870. 140-380 and 510-24 Mc/s.	30	0	0
EDDYSTONE 640. 1.8-30 Mc/s. 200-240 AC input	25	0	0
MARCONI CR100/B28. 60 Kc.-30 Mc/s. 200/240 AC input. Noise limiter ...	18	10	0
MARCONI MERCURY. 15 Kc.-4 Mc/s. Double conversion 85 Kc./4.5 Mc/s. I.F. ...	60	0	0
BC348 unmodified To clear ...	15	0	0

	£	s.	d.
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CREED 7B TELEPRINTER. Fully reconditioned, with audio terminal unit ...	35	0	0
GONSET G66 RECEIVER. .6-2.0 Mc/s. and 80-10 amateur bands with PSU ...	60	0	0

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T.C.S. BFO UNITS ...	3	6	

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- First low priced receiver with double conversion and crystal controlled first oscillator.
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- First low priced receiver with selectivity, sensitivity and stability that equals receivers selling for upwards of £50 more.

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Diode detector for a.m. and product detector for s. s. b. and c. w.

Calibration every 5 kc. WWV reception at 15 Mc.

Selectivity: 2.5 kc. at -6 db. Automatic noise limiter.

Sensitivity:  $\frac{1}{2}$  microvolt for 10 db. signal-to-noise ratio on ten metres.

Stability: Less than 500 cycles drift after one-minute warm-up.

Less than 200 cycles change for 10% line voltage change.

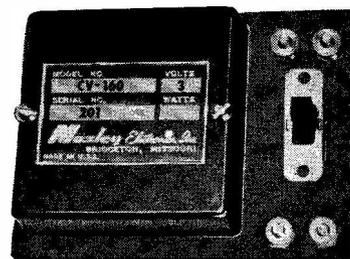
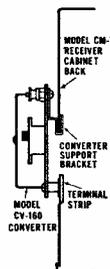
Image and i. f. rejection: 35 db. minimum.

Power consumption: 33 watts. (230 volts a. c., 50 to 60 c. p. s.)

Rear chassis accessory facilities: Transmitter relay terminals, accessory power socket, external speaker/VOX terminals.

Write for complete descriptive brochure and the name of the dealer handling the CM-1 in your area.

Net Price £86. (All crystals included).



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Converts the 160 metre band, 1750-2000 kc. for reception on most 80 metre band receivers. Transistorized, crystal controlled, printed circuit and self powered.

Designed to attach directly to rear of the Mosley CM-1 and adaptable to most other receivers.

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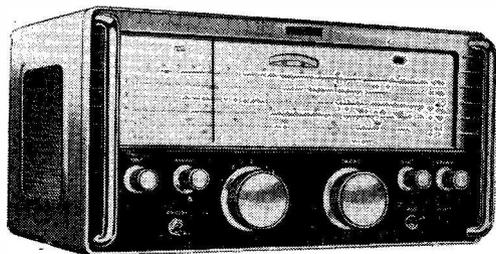
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VOLTAGE		CURRENT		RESISTANCE
D.C.	A.C.	D.C.	A.C.	First indication 0.5Ω Maximum indication 20MΩ
2.5V.	2.5V.	50μA.	100mA.	0—2,000Ω } using internal batteries
10V.	10V.	250μA.	1A.	0—200,000Ω } using external batteries
25V.	25V.	1mA.	2.5A.	0—20MΩ
100V.	100V.	10mA.	10A.	0—200MΩ
250V.	250V.	100mA.	—	
500V.	—	1A.	—	
1,000V.	1,000V.	10A.	—	
2,500V.	2,500V.			
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Dimensions : 8½ × 7½ × 4½ inches. Weight : 6½ lb.

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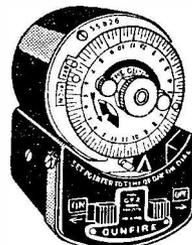
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*Ideal for the S.W.L. or  
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### SPECIFICATION

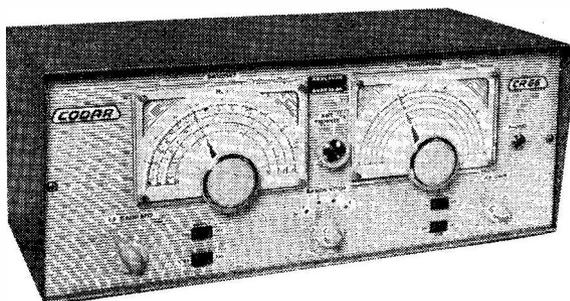
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Band 1 30 Mc-11.5 Mc.

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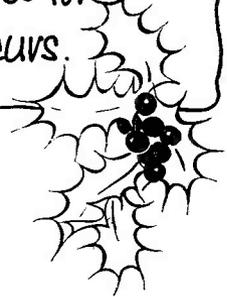
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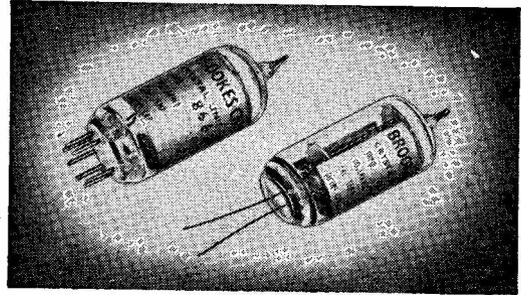
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# The SHORT WAVE Magazine

## Christmas

As each year passes, we are happy to have the opportunity, at this time, of offering our greetings for the Christmas season to all our readers, at home and in the far corners of the earth.

The re-opening of the DX operating season sees an upsurge of radio amateur activity all over the world. There are now something like three hundred thousand individual, privately owned and operated radio stations capable of virtually world-wide communication. This must make Amateur Radio potentially one of the great live forces for the spread of goodwill and the propagation of peace among all peoples. Would that it could be mobilised for those ends, for it is in the context of Amateur Radio that the true spirit of Christmas still lives.

Since last this message was written, the world has come through trying and dangerous situations, and always it has been radio (even if it was not our sort of radio) that brought the news of tension and anxiety. For the moment at least, the clouds have passed and once again we are able to express good wishes for their happiness and prosperity, and our thanks for their support, to all our readers — from Moscow to Alaska, and from the Arctic to the Antarctic. Many will not see these lines until well into the New Year, so to them we also say — Every Good Wish for 1963.

*From the Managing Editor and Staff of*

SHORT WAVE MAGAZINE

## ELECTRONIC KEYER WITH SIDETONE MONITOR

NEAT, SELF-CONTAINED UNIT  
FOR THE KEEN CW OPERATOR

B. M. SANDALL (G3LQK)

*Like the quest for better aerals, the search for improved ways in which to communicate by CW telegraphy goes on unceasingly. Whether to work difficult DX or to enjoy run-of-the-mill contacts on CW you need—as well as a transmitter and aerial system that radiate and a receiver capable of producing the QSO's—a keying system which is smooth and comfortable to operate. The unit described in this article takes the basic electronic keyer a bit further, and will be of interest to all CW operators.—Editor.*

IN the October issue of SHORT WAVE MAGAZINE details were given of the construction of a precision paddle for use with electronic keys. If the best use is to be obtained from such a device, the electronic circuit itself must obviously be beyond reproach. Some time ago, the writer felt the need for just such a keyer, and it is now in use with a paddle similar to that described. The basic circuit of the keyer is to a design by W6DPU, published in CQ some years ago; as built by the writer some modifications were introduced, and the complete design is illustrated and discussed here.

### General Arrangement

The unit was required to be as small as possible, and therefore a miniature layout was adopted. It was also felt that the inclusion of a tone oscillator and small output stage would be desirable features.

A fault of many of the available circuits for electronic keyers is the use of a large number of controls for the setting up of the unit. This may be felt to be a necessity by some, but with the circuit described here, only two controls are used for the initial setting-up, and they are such that, once adjusted, they can be left for long periods without further attention.

One of the reasons for this type of balanced circuit going out of adjustment is drifting of the settings with changes in the mains supply voltage. The HT supply is therefore stabilised, and this aspect of the matter must be looked upon not as a luxury but as a necessity for good performance.

It will be seen from Fig. 1 that the circuit uses six valves, although the rectifier may be a silicon type if desired. V1 and V2 form the keying circuit proper, V3 is the combined tone oscillator and output stage, V4 and V5 are the miniature stabilisers, V6 being, of course, the rectifier.

### Circuit Action

V1A is a cathode follower, the grid voltage of which may be reduced to earth potential by putting the paddle to the "dash" position. On doing this, V1B is cut off, and the relay RL1 in its anode circuit is de-energised and the contact A1 is broken, disconnecting the paddle from the cathode circuit network at V1A; this allows the .01 capacitor C1 to recharge *via* the control VR1, marked "speed," from the cathode voltage of V1A. When C1 is again fully recharged, the grid of V1B is restored to normal voltage, and the valve current re-energises RL1. Thus the circuit is ready for its next operation. This process is actually the procedure for the production of a dash and its space following.

For a dot, the action is slightly modified. On putting the paddle over to the "dot" position, C1 is discharged as for a dash, but this time instead of discharging it fully, it is brought to the voltage at the slider of the "dot" control, VR3, and so the condenser does not take so long to recharge, thus giving the timing for the dot.

In order that the dot-setting potential at the slider does not alter during the production of a series of rapid dots, the 8  $\mu$ F condenser C2 stabilises this point against sudden variations of voltage. V1 may thus be regarded as the control valve of the unit.

The fall of voltage at the cathode of V1A during the keying operation is also used to control the grid of V2A. It cuts off the anode current of V2A during the action, causing the voltage at the anode of the stage to rise; this in turn drives the grid of V2B very positive. The 680K series resistor R8 avoids excessive grid current in V2B when this happens, and V2B anode current increases, energising the relay, RL2, which keys both the external circuit of the main Tx (*via* B1) and also the AF oscillator for the sidetone signal, through B2 contacts. A further control of the

### Table of Values

#### Circuit of the Keyer/Monitor Unit

C1, C9,	VR1 = 2 megohm, speed control
C12 = .01 $\mu$ F, 500v.	VR2 = 10,000-ohm, space control
C2 = 8 $\mu$ F, 450v.	VR3 = 10,000-ohm, dot control
C3 = 150 $\mu$ F, s/m	VR4 = 0.5 megohm, gain control
C4, C5,	VR5 = 100,000-ohm, tone control
C10, C11 = .0022 $\mu$ F, cer.	RL1,
C6, C7 = 32 $\mu$ F, 450v.	RL2 = GPO type 3000 relays, contacts to suit
C8 = .001 $\mu$ F, cer.	S1 = 3-pole, 3-way
R1, R2 = 470,000 ohms	T1 = 250-0-250v. 60mA, LT's as required
R3, R5 = 100,000 ohms	T2 = Output xformer, 10K/3 ohms, or as required
R4 = 4.7 megohm	V1, V2 = 12AU7
R6, R18 = 2 megohm	V3 = 12AT7
R7 = 20,000 ohms	V4 = OB2
R8 = 680,000 ohms	V5 = OA2
R9, R12,	V6 = GZ34, or similar (or silicon diodes)
R16 = 120,000 ohms	
R10 = 150,000 ohms	
R11 = 15,000 ohms	
R13 = 1 megohm	
R14 = 10,000 ohms	
R15 = 1,500 ohms	
R17 = 500 ohms	
Ch. = About 10-Hy.	
1,500 ohms	
RFC1,	
RFC2 = 2.5 mH, 100 mA RF choke	

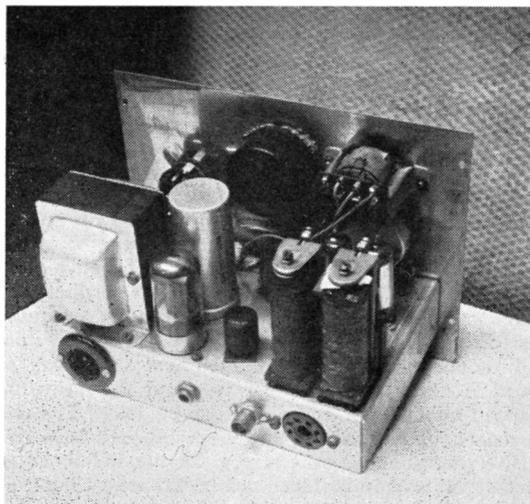
NOTES: Relay RL1 should be single-contact, energised open; RL2, double-contact, energised close. S1 connected to give "off" in posn. 1, "key only" in posn. 2; "keying with monitor" in posn. 3. Paddle is G8RQ type.



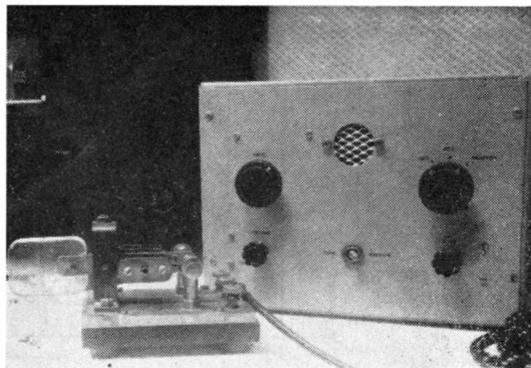
applications of the unit can be extended to such uses as Morse practice and keyer monitoring. The oscillator circuit is rather unusual, being a cathode coupled phase-shift circuit, and it is "tuned" by the choice of resistor and condenser values to a nominal 1000 c/s, although the panel control VR5 gives a broad variation in pitch, and will be found useful for giving a change of note to avoid fatigue during long operating sessions. The HT supply to the oscillator is keyed, and it may also be disabled by a selector switch on the panel so that the transmitter can be keyed without the oscillator, for use when monitoring the actual transmission. The oscillator tone is fed *via* the volume control VR4 to the output stage which, at first glance, may be considered rather small; however, it must be remembered that the *sine* wave generated by the oscillator is in practice much more penetrating than normal speech or music, and using a low-impedance single earpiece (4 ohms) for the speaker, it is very seldom that the volume need be more than half-way up. The anode of the output stage is also taken *via* a coupling capacitor C12 to a socket on the rear of the unit, and this may be used for a variety of purposes, e.g. directly to feed high impedance phones; to couple into the audio stages of the associated Rx; for tape recording slow Morse programmes; or even for testing the audio sections of modulators, amplifiers and audio equipment generally.

#### Power Supplies

A small transformer-type power supply is built in, and gives on load 255 volts stabilised, together with the normal 6.3 volts for heaters. As all the valves in the unit are of the centre-tapped 12.6-volt heater variety, a 12.6 volt winding could be used in place of the 6.3 volts, if to hand. To obtain the required 255



Showing general layout and construction of the electronic keyer described in the article. The relays are the GPO-3000 type and will follow at up to 50 w.p.m. (if you can do 50's). In apparatus of this sort, layout is not at all critical, and the circuit could be built up in any form that might be convenient.



The complete electronic-keyer assembly, with incorporated monitor, as designed and described by G3LJK. The audio side of the unit can be used separately for general test purposes. The paddle was constructed by G3OKX.

volts stabilised on load, the HT should be in the region of 300 to 320 volts at the rectifier cathode, this then giving reliable starting of the stabilisers, while allowing for the necessary voltage drop across the limiting resistor, which in this circuit is partly made up by the smoothing resistor R17. The supply does not need to be extra well smoothed, and the only adverse effect to be observed with too little smoothing would be modulation hum on the tone output. If the original example is taken, and an old earpiece used for the monitor speaker, there will be no trouble with hum, because the speaker will not reproduce it. It is unnecessary to use too large a speaker, say more than 3½ ins., as otherwise the clicks from the keying of the audio oscillator will thump in on the speaker.

#### Construction

The complete unit, if made with the miniature series of valves, can be assembled on a 7 in. x 5 in. chassis if care is taken with the space. The device is then readily portable for giving demonstrations or for field-day operation.

The utmost in space economy can be obtained by bolting the front panel to the chassis, so that the speaker and switches can be mounted just above such items as the smoothing and limiting resistors, these being fitted to tag strips at chassis level.

#### Setting Up

After checking that the stabilisers are lit, giving proper voltages to the circuit, the keying relay RL2 should be depressed by hand with the tone control VR5 set about half-way and the volume full up. The oscillator should be clearly heard, and it will be found that the oscillator will only work over a limited range of the tone control. This is quite normal and is the result of using a circuit which cannot be shifted over wide frequency limits. It does, however, make the oscillator more stable when keyed. The actual limits of variation depend on the exact tolerance of the oscillator components.

Next, with the paddle connected, a dash can be

tried, and the speed-control VR1 set to give a reasonable speed for testing. At this stage it will probably be found that the ratio of dash-to-space is incorrect, and the *space* can be adjusted relative to the dash by the "space" control, VR2. Do *not* proceed further until this seems satisfactory. Then put the paddle over to the "dot" position, and adjust the *dot* with respect to the length of the *space* by the dot-control, VR3.

It will be found easy to make the setting-up adjustments. It is advisable, after applying HT for the first time, to leave the final setting-up adjustments for half-an-hour, so that the components reach operating temperature. The setting-up on the author's own model varies very slightly in respect of dot-to-space ratio for the first few minutes after switching on, but the unit does not go "haywire" in any way,

and the setting-up controls have not been touched from one month to the next.

The sequence given for the setting-up is most important, as it will be seen that there is no direct adjustment for the length of the dashes. Thus, the dash must be the *first* to get right (by setting the speed control), and the others then follow as explained. Once the ratios between "dash," "space" and "dot" have been found, the speed control VR1 may be set anywhere in the normal range of speed without resetting the space or dot controls. The latter are, therefore, made preset controls inside the box, leaving the speed control as the only one to be adjusted for actual speed change. Finally, there are no critical circuits in the instrument as regards wiring layout, and three or four different layouts have been used with complete success.

## FORTY YEARS ON TOP BAND

### An Historical Note, Covering Forgotten Facts of DX Achievement and Results

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

A DETAILED and documented history of "Top Band" would fill an entire volume of SHORT WAVE MAGAZINE and would entail research into logs and archives spread all over the world. Probably an impossible task, now that so many years have gone by. But, for the benefit of the hundreds of newer operators who derive a lot of pleasure from 160m. without knowing much of its past history, this highly-condensed story has been dug out of old logs, old periodicals (including the pre-war volumes of SHORT WAVE MAGAZINE) and all other sources that can still be tapped.

Forty years ago the BBC was just starting operations. The amateurs had been swept off the popular 440-metre band (in theory a spot frequency, in practice a spread from 300-500 metres!) and their own slice of the spectrum was 150-200 metres. Nowadays we should say 1.5-2.0 mc, but in 1922 few would have known what that meant.

Local working, over ranges of 100 miles or less, was the main interest. The term "DX" meant "my distance from you" and really long-range contacts were only a dream. British amateurs used CW and telephony in roughly equal proportions, the telephony exponents as often as not putting out short programmes of gramophone records as tests (acoustic sound-boxes, carbon microphones, perhaps grid modulation!)

Gradually the realisation came that fairly long ranges could be covered on this new "short-wave"

band of 150-200m., with quite low power—their capabilities were altogether better than those of 440 metres, although many had surmised that the amateurs were being handed a piece of the spectrum that would be no good to anyone.

Contacts between the North and South of England, after dark, began to increase in numbers; maps and rulers came out, and the first DX rat-race had started. Somewhere in the records one could doubtless find the dates of the first contacts between England and Scotland, England and Wales, and so on. But we cannot begin to give a detailed record in the space available.

### Foreign DX, 1923

The logs for 1923 show many contacts between England and France (no prefixes yet, but all Frenchmen were 8's); calls like 8CS, 8CZ, 8AQ, 8BV, 8AW appear, all with strong but horrible-sounding signals around 160-175 metres. Holland showed up with the calls PCII, PCTT and the like—amateur stations despite the calls—and, later, the now familiar zero came in for Dutch stations, with ØNY, ØLA, ØAW and so on.

Somewhere around this time (the winter of 1922-23) the first Top-Band Trans-Atlantic contacts were made, but by stations using powers of the order of 500 watts under special licence—2DX, 2KF, 2NM, 2OD and the early stalwarts all took part in this, the very first example of real DX . . . but we are dealing here with the normal use of the band by ten-watters, so will merely give all credit to these early pioneers, whose achievements were quite god-like to the humble beginners who could only listen and marvel.

A few facts that may surprise readers, though—before the end of 1924 the following countries had all been worked on 150-200 metres by the normal stations with 10-watt licences: France (8's); Holland (Ø's); Belgium (4's); Denmark (7's); Finland (2's); Sweden (SMZZ, SMZY and so on, working backwards); Switzerland (9's); and Germany (4's).

By 1924 the call-sign business had become really confusing and unofficial prefixes were being used. But the number of countries worked on Top Band

is the main point of interest, and those who would go crazy to-day if an LX station appeared on the band might like to know that G6QB worked LØAA (Luxembourg Radio Club) on March 7, 1924!

Things went on with very little change until around 1926, by which time amateurs had "discovered" the bands right down to Twenty. The interest in LF-band DX fell off abruptly when licences were issued for 115-130 metres, on which band even the low-power types found they could work into the U.S.A. So 180 metres became a "local-natter" channel and stagnated seriously.

### The Awakening, 1931-32

In the winter of 1931-32 a group of British amateurs were beginning to notice that European stations, when they showed up, could be worked quite as easily on the 1.7 mc band (as it was by then) as on 7 mc. For instance, a very well-known call was OK3SK, who used 3 watts and used to work every G who showed up on the band and had a good receiver. This led a group of enthusiasts to get together with a view to organising some Trans-Atlantic tests—a project which would have been so much derided by the majority that the keen types kept it very quiet indeed. These were staged in December 1932, and no G's succeeded in getting across, but a few W's were heard, among whom WIDBM was outstanding and consistent. (He had a very favourable QTH and used 500 watts to a full-wave aerial).

Two important facts emerged: First, that the peak period seemed to be 0530-0730 (the tests had gone on all night, from midnight onwards); and secondly, that the dates chosen were too early in the season.

A repeat performance was organised for February 1933, and this time success came. G6FO (none other!) was the first across, working WIDBM, though using only 10 watts and a simple aerial-counterpoise system with 66-ft. wires—his Tx consisted of a pair of P650's in a crystal-locked TPTG, with 230v. HT from DC mains. G5WU was also heard on the other side, and the following season still more G's managed to make it; within a few years the list included G2II, G6YQ and G2PL.

All these events, together with sporadic contacts across the Pond during the succeeding years, led SHORT WAVE MAGAZINE to arrange a series of Trans-Atlantic Tests on 1.7 mc for February 1938. These were described in the issue of April 1938 as "A Flop"; plenty of stations were active on both sides, but no contacts were made. Our good friend Stewart Perry, W1BB, was on the ball and was well received over here, but nothing else much resulted from this series of tests.

### The DX Breaks at Last

Obviously the *Magazine* had backed a loser in the way of conditions, on that occasion. However, January 1939 saw a beautiful opening, with W1BB, W1AW, W1ERX, W1KUW, W8PK, VE1EA and others all working into the U.K. Calls prominent on this side include G2PU, G5RI, G5QY, G6WY, G2MI, G6RB, G6GM, G2PL, and quite a few more. Even

FA8BG showed up on the band!

Special Tests were arranged by the *Magazine* for the period February 4-16, 1939, on alternative days, from 0430 until 0730 with a system of alternate calling periods. These, in contrast to the previous year's efforts, were tremendously successful. W1BB made ten contacts with four different G's—G2DQ, G2PL, G3JU and G6GM. G6WY was also heard. W1BB's 500-watt transmitter was working into a most curious aerial for the purpose—an 80-metre Zepp with 45-ft. feeders!

Other very successful W's were W2CAY, W1ME (he had twelve European contacts); W2JZR, who was heard on phone over here; W8LCN and a number of others who were received, and in some cases heard some of the G's, but did not make contacts.

Among the G entrants one of special interest was G3JU, who, with 4 watts of batteries to a crystal oscillator, worked W1BB, 1ERQ, 2FGK, 4FAZ and 4FLF. Other calls prominent in the list of successes were G2DQ, 2PL, 5MP, 5RI, 6GM and 6SQ.

Present-day country-chasers on Top Band will be frustrated to know that among the participating stations were three FA's, two HA's, three OZ's, two SM's, two HB's and an F!

This surprising renaissance of Top Band as a DX vehicle led to much increased activity, and a series of tests was proposed for January 1940. Unfortunately the activities of an Austrian decorator (one Schicklgrüber!) put paid to these, and most of the gear which might have led to pleasant and interesting contacts was in the hands of the GPO, while the erstwhile operators were engaged on other more serious tasks.

### Post-War Arrangements

In March 1946 a new pocket-sized SHORT WAVE MAGAZINE made its appearance, but at that time the G's were licensed for 28 mc only (and very nice it was, too, with a sunspot peak just beginning to build up). However, on April 1 of that year we were granted our second band—One-Sixty, now known as the 1.8 mc band. Once more, a few contacts were made which would tantalise the newer users of Top Band. Italy on Top Band? Yes—with none other than G6ZO/I at the other end (worked by G6QB on April 3). Germany—probably unofficially—with D4ALG showing up. Norway—LA5XY, very much under cover. But most of the contacts were local, with a strong interest in GDY beginning to develop.

A few sporadic Trans-Atlantic contacts were made during the winters of 1948 and 1949 then, in January 1950, in came quite a number of reports of QSO's with VE1EA and VE1ZZ. This led to the announcement that we should certainly have to lay on a properly organised test for the winter of 1950-51. It was duly done, with the co-operation of W1BB, and it set the pattern for the tests which now take place each winter. The schedule-keeping period had become 0500-0800, and alternative Sundays were set aside during January, February and March.

The results, as might have been expected, were terrific, putting all pre-war efforts in the shade. Literally scores of W's were heard and worked by a dozen or more G's; and it is especially interesting

to note that veteran G2NM (the late Gerald Marcuse) was keen enough to come on and work five W's on February 11, 1951 . . . nearly thirty years after he had first achieved it in very different circumstances and with an extremely QRO rig.

One of the most successful stations on this side was GW3ZV; other familiar calls included G2PL, 3PU, 5JU, 6BQ, 6GM and 6QB. Conditions really were at their peak, although at the time it was hoped that the 1952 tests would prove even more exciting. This did not turn out to be the case; activity was high and enthusiasm likewise, but conditions let us down somewhat. The same old faithful calls appeared in the list of successes, augmented now by G2AJ, G3DIY and G3ERN . . . but it had been hard work.

The 1953 tests brought a pleasant surprise. The 1952 conditions had *not* indicated the general trend, after all, and the 1953 series were probably the most successful we have had up to date. Some "DX" W's were now getting into action, and QSO's were made with W9FIM, 9MFV, 9NH, 9PNE, 0NWX and many W8's. The list of successful G's had grown tremendously, but the old reliables were still there, with EI9J making an added attraction for the U.S.A. stations. Some unusually interesting contacts made in the early part of 1953 included W1BB/OH3NY, VE1EA/ZC4XP, and W5ENE/G5JU.

The winter of 1953-54 definitely did not cooperate in giving contacts across the Atlantic. Going was very hard, despite greatly increased activity. The list of stations taking part looked very exotic—KV4's, KP4's, KZ5DE, KH6IJ, VP7NM. VP4LZ made it look more like a 14 mc list. But there had been one big item of 160m. DX news . . .

### Working the Antipodes!

This was the extraordinary break in October 1953, when G6GM worked ZL1AH for the first-ever G/ZL contact on the 160-metre band—the QSO was repeated the next morning, October 17th, and again on the 21st. G6GM and ZL1AH made it. An outstanding and totally unexpected result, it was achieved by careful schedule-keeping and much patient work with aeriels. It led G6CJ, well known for his work in the field of propagation and aerial design, to devise and carry out, with ZL1AH, a series of special tests, carefully related to the time of year, the time of day and the light-to-darkness conditions over the long Antipodean path. The result was another success, G6CJ making contact with ZL1AH on three days running, October 13-15, 1955.

Actually, the New Zealand 160m. story started in March, 1951, when ZL1AH (who is *ex*-G3AH, and so was well versed in the ways of Top Band when he went out to New Zealand) heard G6GM for the first time—he also logged W1BB and W9VQ—but it was not until later that the ZL's were licensed for 160 metres. ZL1AH himself also holds, in addition to the ZL/G, the ZL/W and ZL/VS6 "firsts" for the band.

Since the 1954 season, there has been no break in the organisation of Trans-Atlantic tests. Every year some successful results have been reported. But the story, until recently, has been one of constantly

increasing activity and constantly deteriorating conditions. As the sunspot cycle soared to its fantastic peak, to the joy of the HF-band DX addicts, so Top Band DX became more and more tricky.

### Present Prospects

We have now travelled full circle, and this year's tests are likely to be as successful as any in the past; given good conditions, and the intense level of activity that prevails nowadays, the limiting factor is liable to be QRM rather than conditions.

World-wide DX is now available on Top Band. VK's and ZL's are working the W's regularly; the G's with good aeriels and equipment can snatch a W contact almost any week-end, and sometimes on weekdays too (without the QRM). W1BB has already worked 60 countries on the band, and hopes to make the century before he is 100 years old himself!

We shall continue, through SHORT WAVE MAGAZINE, (which initiated the first organised tests so many years ago) to give the fullest support and coverage to these efforts, which have a DX flavour all their own and attract so many who derive enjoyment from deliberately setting out to do things the hard way. Perhaps a word of advice would not be out of place as we close . . . Old Timers and newcomers alike would gain added success by listening more and transmitting less. There are far too many cases of G's busily calling CQ at the same time as the DX is putting out CQ calls which they could hear, and reply to, if only they weren't too busy doing the same thing themselves.

Likewise, if you are dashing into the fray this season—*please* don't call the W's on their own frequency. Goodness knows some of them are difficult enough to hear without having to break through a barrage of locals, together with other locals busily telling them not to be Lids, Clots and so forth. Call *above* 1825 kc, and listen from 1800 to 1825, if you want to stay popular. And that doesn't mean that you simply *must* be on 1825-005kc; the U.S.A. stations are quite capable of searching! Some of the most successful Cross-Pond contacts of recent years have been made with the U.K. stations between 1830 and 1835kc.

So . . . go ahead and enjoy the present state of One-Sixty, and we hope you have been stimulated by these reflections about its past.

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### THOUGHT FOR THE SEASON

It is often said—and not always by us—that one of the best and most lasting presents you can give anyone interested in Amateur Radio is a year's subscription to SHORT WAVE MAGAZINE. This costs 36s. for a year of 12 issues, post free to any part of the world. Send your remittance to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. Please make sure that we are given the correct address for the intended recipient, and ask for our receipt to be sent to you. As we handle a large number of such orders at this time of year, clear instructions avoid embarrassing confusions!

## ADJUSTING FT-241 CRYSTALS

### EDGE-GRINDING FOR ACCURATE PAIRING

D. A. BEALES (G3MWO)

**T**HERE must be many amateurs who, like the writer, are making the change to SSB and have been confronted with the problem of how to grind the crystals for the sideband filter.

It is laid down that the corresponding crystals in cascaded half-lattice filters should have resonant frequencies within 25 cycles of each other for optimum performance. The popular FT-241A crystals very conveniently provide the 1.85 kc separation required for the filter, when using any two having consecutive channel numbers, but when put to the test those having the same channel numbers seldom have identical frequencies. In fact, differences of 100 cycles are quite usual. If a double half-lattice filter is constructed using crystals which are not perfectly matched, the result will be a poor response characteristic with a "double-hump," instead of the required flat top between the crystal frequencies.

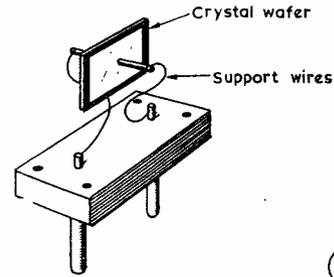
The problem, then, is how to grind the crystals to make matched pairs, bearing in mind their very fragile construction—an idea of which can be gained from Fig. 1, which shows how the crystal is mounted when the protecting cover has been taken off. From this it will be obvious that the actual crystal wafer cannot be removed from its mounting as any applied heat could produce permanent damage. Any attempt at grinding must therefore be carried out with the crystal in its normal mounting.

#### Technique

One answer to this problem is a simple jig in which to clamp the upper portion of the crystal just above the two central mounting wires. The jig consists of a wooden base through which is mounted a crystal holder with  $\frac{1}{2}$ -inch spacing, or an octal valvholder which will accept a crystal when using any two alternate sockets. Equidistant either side of the holder are fitted two blocks of hard wood, about 4 inches long and  $\frac{1}{2}$ -inch in depth. These should be set parallel to each other, as shown in Fig. 2. Fixed on these two blocks are two plates of Formica (measuring about 4in. x 2in.) which should be made to slide by means of slotted fixing holes until they meet. The edges which come in contact must be perfectly parallel and level as it is these which will clamp the sides of the crystal.

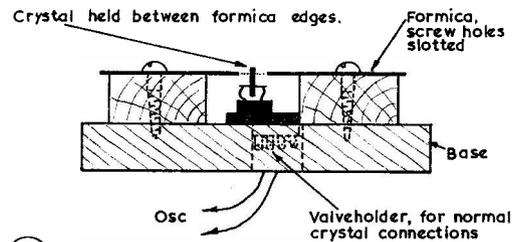
With its cover removed, insert the crystal carefully into the holder and slide the clamping plates so as to hold the crystal wafer firmly but without inducing any strain in the mounting wires. The four fixing screws should then be tightened while the clamping pressure is maintained.

The crystal can then be carefully edge-ground by means of a small, fine, carborundum stone; this is



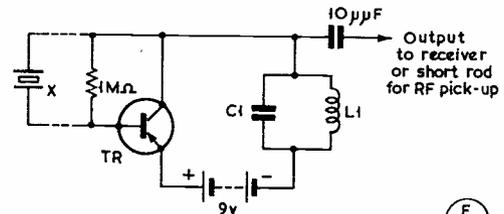
F 64

Fig. 1. Sketch to show mounting and general internal construction of an FT-241A type crystal. It is essential that the connections are not disturbed when handling the crystal out of its protective cover.



F 65

Fig. 2. The crystal clamping jig explained in the article by G3MWO. The holder terminals can be connected to the oscillator (for check purposes during the grind) through a hole in the base. The sketch is exaggerated to show the principle of setting up for edge grinding.



F 66

Fig. 3. A simple transistorised crystal oscillator for checking the crystal frequency, by beating the output against the receiver BFO. Any RF-type transistor will go off, and the circuit C1/L1 is the coil from a 465 kc IF transformer with its original parallel condenser.

stroked gently across the top edge of the crystal where it protrudes above the clamping plates, taking great care to keep the stone perfectly square to the crystal. Two or three strokes only should be made before the change in frequency is checked, as too much grinding can mean that the other crystal which was on the higher frequency of the pair is now lower! This can lead to an infuriating progression of grinding, first one and then the other, "chasing the frequency."

**Calibration**

A check can be made on the crystal frequency during the grinding process if the terminals of the holder are connected to a simple oscillator, such as that shown in Fig 3. A harmonic can then be located on the station receiver and the frequency measured—remembering to divide by the harmonic number to obtain the fundamental frequency. For the purpose of pairing crystals it is, of course, sufficient to grind the crystal with the lower frequency until the beat note between a harmonic and the receiver BFO is the same as that with the other crystal with which it is being paired—this can be done quite accurately by ear. It is advisable to set the beat for an identical note of about 500 cycles in the receiver, rather than to look for zero-beat, as with some receivers the

zero-beat is too broad.

Whenever the frequency is being checked with the crystal plugged in the holder it will be necessary to release the Formica clamps in order to allow the crystal to vibrate freely. It will also be necessary to clear any grinding deposit from the crystal with a small paint brush, as the presence of dust may prevent oscillation or produce a false reading.

This method of clamping has been successfully employed on a number of FT-241A crystals without any damage, as would surely have been the case had they not been rigidly held. Other types of crystals can usually be removed from their spring-loaded mounting, after which normal grinding procedure can be followed, using a sheet of plate glass and grinding paste, or by the etching method.

**MARKER CALIBRATION UNIT**

USING 100 KC BAR  
IN TRANSISTOR OSCILLATOR  
CIRCUIT

I. JACKSON (G3OHX)

ALTHOUGH this circuit is not original, it may be of interest to those who require a frequency marker, especially for portable or mobile use. Unlike most transistor oscillators, no tuned circuit is used and the cost of an extra transistor is probably less than that of the large coil that would otherwise be required. It is really an emitter-coupled multivibrator with the frequency controlled by the crystal.

If the crystal in Fig. 1 is replaced by a condenser, the circuit is that of a multivibrator, but the crystal allows the transfer of energy from the collector of TR1 to the base of TR2 only at its series resonant frequency. R5 is chosen to give greatest harmonic output without causing the frequency to become independent of the crystal, 10K being about the maximum practical value.

Series or parallel capacity is applied to the crystal to set the frequency at exactly 100 kc. In the writer's case maximum output was obtained with the addition of series capacity, then parallel capacity to correct the frequency—C1, C2, C3 in Fig. 1. This is probably a question of trial and error, depending upon the crystal.

With a two-battery supply as shown in Fig. 1, pips are detectable above 30 mc, but if output is not required at such a high frequency a lower voltage supply would be adequate. The writer uses a 9v. battery with potential divider, as in Fig. 2. Oscillation has been obtained using only a 1.5v. battery, with a good crystal. If a 9v. supply is used, the 4.7K resistors R1-R4 should be replaced by 3.3K. Beats are detectable above 17 mc and the circuit performs much better than the writer's valve oscillator.

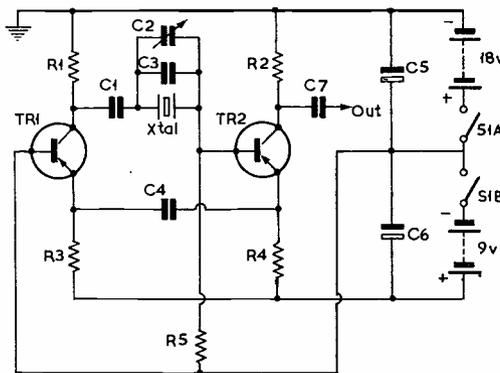


Fig.1

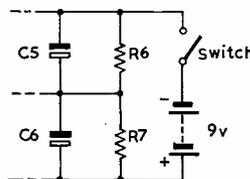


Fig.2

F 63

The 100 kc transistor oscillator which will give beats right up to 30 mc. Values are : C1, 100  $\mu$ F ; C2, 50  $\mu$ F ; C3, 150  $\mu$ F ; C4, .05  $\mu$ F ; C5, C6, 2  $\mu$ F ; C7 .001  $\mu$ F ; R1, R2, R3, R4, 4.7K ; R5, 10K ; R6, 56K ; R7, 82K. The transistors are OC44, and the crystal is a 100 kc bar.

**THE OLDEST AND THE YOUNGEST**

Two new callsigns issued to members of the very active Cornish Radio & Tv Club are G3RBS (Stanley Cowl, who has seen his 50th birthday) and G3RNG (Ian Graham, with but 15 years). The Cornish membership rightly claim this as some sort of a record—and our congratulations to both G3RBS and G3RNG.

“ Short Wave Magazine ” can be obtained to order through newsagents in practically all countries

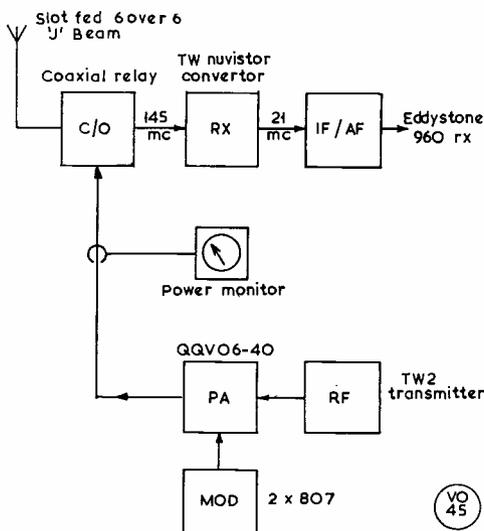
## WITH GM3IUB/P THROUGH NINE COUNTIES

THE BIRMINGHAM UNIVERSITY  
VHF EXPEDITION,  
SEPTEMBER 17-26, 1962

T. C. JONES (G3OAD)

**T**HE Radio Society of Birmingham University originated in the 1930's, but due to the fluctuating amateur population there, it has only been active for short periods during this time. Occasionally, though, there are sufficient students at the University to merit re-activation. One such period occurred two years ago when G3OAD mustered several licensed amateurs and others and the society was reformed.

Four members interested in two-metre operation—G3NAQ and SWL Blakeway of the Physics Department, with G3PLS and G3OAD of the Electrical Engineering Department—discussed the possibility of an expedition to Scotland. Undeterred by the magnitude of the task the four set about arranging the route, the sites, the accommodation, and the acquisition of equipment. The latter was largely borrowed from manufacturers and sincere thanks are due to them. The equipment comprised an Eddystone 960 communications receiver (all-transistor) loaned by Messrs. Stratton & Co., a Withers nuvistor converter and TW-2 transmitter, a J-Beam 6/over/6 slot-fed beam array, a mast loaned by



System diagram for the gear used on the GM3IUB/P expedition. Very good results were obtained throughout, the power supply being from a PE set with a 230v. AC alternator, thus enabling normal HT/LT packs to be used for the QRO PA and modulator. The machinery gave no trouble and started easily under all conditions.

G2ATK, the G3PLS high-power final, the modulator and power supplies of G3NAQ and a 1-kilowatt alternator *via* G3OAD. This apparatus was assembled as shown in the system diagram herewith.

Early attempts to modulate the 75-watt PA all ended in flashes, crackles and pops, and A3 was almost abandoned altogether. It was fortunate that we persevered with the modulator, as phone operation speeded up the proceedings enormously.

Operation began seriously, if that is the word, on September 17, from Bootle Fell, a very promising location in Cumberland. Five minutes before the first sked, four intrepid pioneers were nonchalantly drinking tea at 1,200 ft. when a short test showed that the tuning condenser had vibrated free of the PA anode lines. Panic! The soldering iron was produced and while Geoff got to work to produce Le QRO, the first few contacts were made using only 10 watts to the TW-2. One of these was with G3EHY in Somerset who gave us 449. Conditions were far from good and contacts were confined to CW even when the 75-watt PA was in commission. We were well pleased with the 21 QSO's we had on that, our first night. But it transpired that it was the leanest session of the tour.

### Into Scotland

The following night we crossed the frontier into Scotland and attained the next objective, Lowther Hill, a truly impressive location and what must surely be one of the best VHF sites in the country. Both Lanarkshire and Dumfriesshire meet here and it did not require much effort to walk from the best site in Lanarkshire 30 yards or so to the best site in Dumfries! It was here that modulation was finally restored, after literally a half-hour wait for the soldering iron even to melt the solder. (At 2,400 ft. just boiling a kettle is a major operation). In all, 88 contacts were made in two nights from this location, and it was a taste of what could be achieved with QRO portable equipment, where in consequence of high field-strength AM is made practicable, with the resultant high rate of traffic handling. We used CW, of course, to winkle out the weak ones, including G3JR in London who was only using 10 watts! To show what two-metre activity is like north of the Border, GM3LTJ was worked for his first QSO on the band in six weeks. A notable signal on Lowther was G3FAN from the Isle of Wight.

Conditions reached a peak two days later when the rig was fired up in Wigtownshire. By then phone had really established itself as the prime mode, and as a result 62 contacts were made in 4 hours, and in a 45-minute spell one new contact was made every two minutes. The location was a fairly good one at the foot of Galloway Lighthouse. Good signals were received from G3FUR/M and G3OJY in Cornwall. This was about the most hectic night of the entire tour (as our visitors GM2UU and GM3HMW would no doubt confirm) and at the busiest period the alternator ran out of fuel, the only time we ever forgot to refill it.

### Not So Good

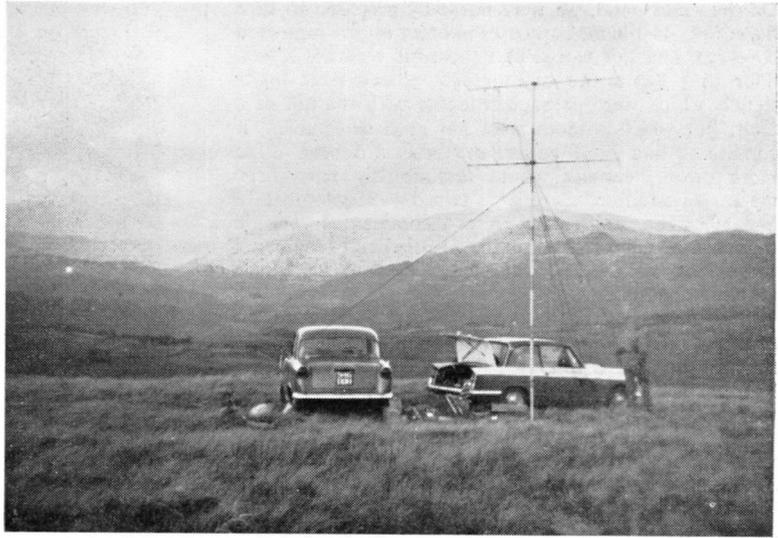
The next two locations, one in Ayrshire, and one on a lay-by on Soutra Hill in Mid-Lothian, were disappointing. At the former a smoothing capacitor

exploded without serious loss of life, and at the other the ignition QRM was appalling. The only bright spots that evening were a visit from two GM's and contacts with GM3MUT and GM3JFG who were both RS-59 over a very rough path from Ross-shire. From the next QTH, in Berwickshire, it seems we missed something. Reports indicate that conditions on this occasion, September 24, were very good for those in England but we took a careful look to the East without result, although during the evening we were heard by F8MX. Conditions in the North were so low, in fact, that we had to resort to CW even for G6NB!

The location in Roxburgh for the final night, September 26, was the brain-child of G3NAQ who selected it from the map. It proved to be an excellent site to the south-east, down a trough and over the Cheviots. Unfortunately the party had to finish early as we had to drive 80 miles to Coniston the same night.

### Results

So GM3IUB/P regretfully closed down, having worked finally a total of 391 contacts in 10 days covering four countries and 40 counties. The best contacts in terms of DX were with G3OJY, G3KMP, G3CO,



What the countryside of Scotland looked like to the GM3IUB/P VHF expedition last September. The party worked entirely from the two vehicles, with a knock-down 6/6 J-Beam assembly, operation being from the back of the car on the right.

G3FAN, and G5TZ. The strongest consistent signals were G6NB and our beacon G3BA.

The commercial equipment worked very well indeed. The only trouble with the J-Beam was when we were knuckle-headed enough to use a director as a reflector! Its windage was low, it was simple to erect and was not particularly critical in alignment. The Eddystone 960 receiver, though only used as an IF strip on 21 mc, performed perfectly; we particularly admired the crystal filter, a 100 c/s band-pass type, and found the drift and noise remarkably low. We were sorry it had to be returned to the makers! The Withers TW-2 was, of course, first-class. Critical reports confirmed that the modulation quality was perfect in every way and tapes of our contacts show clean keying even at 144 mc. The alternator, a 1 kW petrol-driven type, always fired first time, even at 2,400 ft. in heavy cloud. The regulator, once set, maintained the voltage very well, and the PA could be operated at the same time as a 1-kW electric ring with only 10 volts drop on the line. Even at the poor mean power-factor encountered, the fuel consumption was only one and a half pints per hour.

### Impressions and Reflections

After we returned home and listened to numerous interesting comments about the expedition from operators all over the U.K., several points emerge. The first is that contrary to the general opinion, high power *is* necessary on two metres when conditions are poor or only average. This leads to a consideration of the main complaint—that there were many operators, in the SE-S and SW areas of England in particular, who were hearing us well. Why did we not work them? The answer is, we believe, simply that they had a massive advantage over us, since they knew exactly where to look for us and where to beam. In addition they could use high selectivity and thus obtain a good signal/noise ratio.



At the Kirkcudbrightshire site, Gatehouse of Fleet, on September 20, with the GM3IUB/P beam up and ready-to-go. Left to right (so far as they are recognisable in the protective clothing!): G3OAD, G3PLS and G3NAQ.

On the other hand, we were normally prepared to tune the entire 144-146 mc band area in order to give improved coverage, and this would be impossible with the crystal filter in. Hence we undoubtedly passed over many signals which were perhaps readable with the aid of a filter, but which without were not even detectable. If conditions had been better, or these had been using more power, contact would undoubtedly have been made. In addition, there were two days (September 18 and 19) when interference from a commercial aviation radio station caused havoc in the bottom half of the band, presumably on the IF, making QSO's with the South all but impossible.

No comments will be made about the *pros* and *cons* of heavy sked traffic except to remark that by the end of the trip we had a nightly programme of 33 skeds to honour! Nevertheless, over half of our time was allocated to general working. For particular areas, for example GI/EI and GM, times were arranged during relatively slack periods when directional calls were made for their benefit, and we feel that this was appreciated by most operators.

Reports from all areas show that signal strengths did not vary by more than 3 S-points or so despite the extremes in conditions. The considerable short-term QSB showed that propagation was mainly of the usual random tropospheric type, indicating that the path from Scotland was not much better than average over most of the time. The interesting feature, however, was that with a very large number of English beams turned towards GI/EI and GM, many G stations report new contacts with these areas. There can be little doubt that if this were repeated more often, life for the hardy and enthusiastic VHF operators in Ireland and Scotland would be far more interesting. So, too, would it be for those G's who took the hint!

### BOOKS FOR CHRISTMAS

At this season of the year, we gently draw attention to the fact that the Book List published on p.506 of this issue contains a comprehensive selection of titles, ranging over the whole field of Amateur Radio. It is hardly for us to attempt to make suggestions, and it would be invidious to draw comparisons, but for anyone with a serious long-term interest in radio theory, design, construction and the art and practice of Amateur Radio, the new (16th Edn.) *Radio Handbook* is an obvious thought—and not because it is one of the most expensive books in the List! This edition of the *Radio Handbook* is a mighty tome of 800 pages, beautifully bound and printed, copiously illustrated, and covers just about everything. The *ARRL Radio Amateur's Handbook* is another thought in the same context, and is obtainable in a "library" or presentation binding; the *ARRL Handbook* (as it is usually called) has for nearly 40 years been the recognised practical guide to the subject.

For the DX man, maps and the *Call Books* are probably of particular interest—our own *DX Zone Map* is in a new printing, revised to October 1962; for quick reference at the operating position, the *Radio Amateur's World Atlas* is not only comprehen-



First things first — G3NAQ (left) and SWL Blakeway do a bit of cooking before GM3IUB/P goes on the two-metre air from the Kirkcudbrightshire site. During the ten-day trip, through Cumberland and nine GM counties, 391 contacts were made in four countries and 40 U.K. counties. The whole of the operating was done by G3NAQ, G3OAD and G3PLS, of the Birmingham University Radio Society.

In conclusion we wish to thank all those who gave advice and help at all stages. These include G2ATK, G3BA, G3GTN, G6UW, GM2UU and the keeper of Galloway Light! And renewed thanks to Stratton & Co. Ltd., the Ministry of Aviation, the BBC, Withers Electronics and J-Beams, Ltd.

sive, but also excellent value (this is what people who bought it at the Exhibition were saying, anyway). In addition to the titles mentioned, many others—for the SSB operator, the Mobile enthusiast, the VHF man, the SWL, and the modifier of Surplus—will be found on p.506. As we hold good stocks of practically all books listed, orders can be dealt with expeditiously; all prices quoted are post free anywhere in the world.

### REFER IT TO THE POSTMASTER

If you are on direct subscription, and in any month receive your copy late—it should be delivered by post on the Friday, almost anywhere in the U.K.—take or send the wrapper to your local head postmaster, and ask *him* for an explanation of the delay. He will look at the postmark, which will be dated the Thursday before publication. This proves that any delay in delivery is attributable to the Post Office, and not to us! In fact, all U.K. direct-subscriber copies are sent off in ample time on the Thursday morning, under arrangements agreed with the despatching office concerned. In the case of late delivery, it is for the addressee to initiate complaint procedure through the local G.P.O. Only if the wrapper is found to be postmarked later than the Thursday can we be held responsible. (And, of course, we see to it that it isn't!).

# ABOUT RECEIVING SIDEBAND PHONE

## PRODUCT DETECTORS, AND THE SIGNAL SLICER

E. R. HONEYWOOD (G3GKF)

MODERN communication systems show a preference for the use of Single-Sideband (SSB) as a means speech working, and the adoption of SSB amongst radio amateurs is likewise becoming rapidly established, for reasons mainly of a technical nature.

In the many articles that have appeared in the Amateur Radio press on the subject of Sideband, it has long been felt by the writer that far too much stress has been put upon the necessity to realise perfection. However, it is not the present intention to decry the work of other writers in this respect, nor to contradict them, but one must be reasonably practical—especially when it is remembered that not all radio amateurs are electronics engineers with elaborate laboratory facilities at their disposal, and even fewer are millionaires!

### Some Generalisations

Proceeding from the basic assumption that the generation of either an AM or an SSB signal involves the heterodyning of the speech channel to a much higher order of frequency than the original mean frequency of the speech, the techniques of heterodyning used can apply equally to both systems—but only up to the point of the differences required in the end-product, AM or SSB. It is these differences that determine the receiving technique for either.

An SSB signal consists of a spectrum of speech-energy components positioned either above or below a non-existent carrier or reference frequency; in the first case it is referred to as an upper-sideband (USB)

signal, and in the second as a lower-sideband (LSB). This is really the only basic difference between AM and SSB when thinking of the receiver problem.

In the case of an SSB signal, straight rectification is not enough. It is a fundamental requirement in resolving SSB to provide, by generation locally at the receiving end, a "synthetic carrier," of exactly the same frequency and phase as the original carrier in the transmitter, against which to heterodyne the sideband signal. To avoid the effects of distortion due to apparent over-modulation (as when the local carrier is at too low a level for the incoming SSB signal), a convenient criterion is that the local-carrier voltage should be at least twice that of the largest SSB signal likely to be encountered.

Provided these conditions can be met, satisfactory reception of SSB should not present any serious difficulty. Where the difficulties do arise, however, is that most ordinary receivers fail miserably in respect of certain essential standards for the reception of SSB. This is particularly the case when the immediate solution of the problem of providing the local "synthetic carrier" is to use the receiver's own BFO. The defects are threefold: Insufficient BFO injection level, poor frequency stability, and inadequate BFO tuning range. It is one or other, if not all three, of these failings which account for unsatisfactory SSB reception when using the BFO technique with an ordinary receiver.

### Resolving SSB—Product Detectors

Naturally, there are more elegant and efficient methods for the reception of SSB, even when using a receiver intended for AM/CW only. The simplest modification consists of an adaptor unit, working as a

### Table of Values

Fig. 1. Pentagrid Product Detector

- |                               |                      |
|-------------------------------|----------------------|
| C1, C7 = 470 $\mu\mu\text{F}$ | R1 = 470,000 ohms    |
| C2, C9 = .01 $\mu\text{F}$    | R2, R5 = 22,000 ohms |
| C3 = 25 $\mu\text{F}$         | R3 = 220 ohms        |
| C4 = 0.1 $\mu\text{F}$        | R4 = 33,000 ohms     |
| C5, C6 = 8 $\mu\text{F}$      | R6 = 2,200 ohms      |
| C8 = 280 $\mu\mu\text{F}$     | V = 6BE6, or equiv.  |

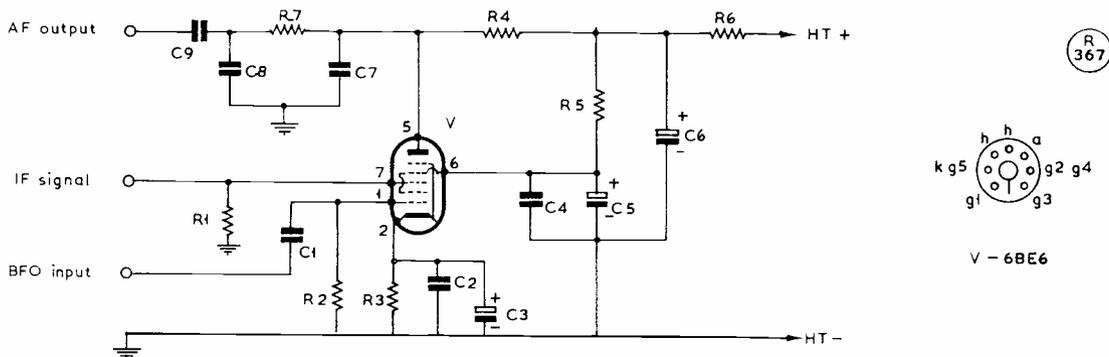


Fig. 1. Single-valve product detector, using a 6BE6, and utilising the receiver BFO. The circuit can be built into most receivers as a separate unit, to follow the last IF transformer, and substitutes for the existing second detector; it will normally give sufficient output to drive the final AF stage already fitted in the receiver. This circuit is worth trying by those interested in getting experience with product detectors.

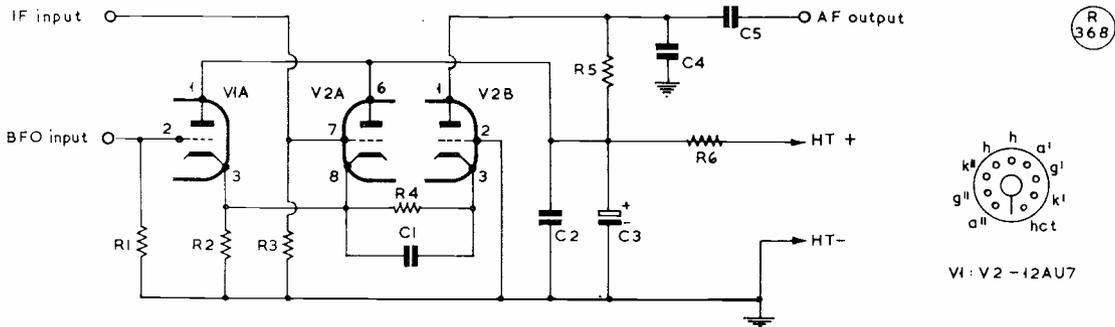


Fig. 2. A more refined version of the product detector, using three triodes, which function in the manner explained in the text. Like the circuit of Fig. 1, it takes the place of the normal second detector in a conventional receiver. The process of setting up is discussed in the article.

product detector, or "multiplicative mixer," using the receiver's own BFO for the local carrier.

The circuit of Fig. 1 uses a heptode-mixer, such as a 6BE6, a more refined arrangement being shown in Fig. 2 involving three triode sections obtained from two valves, such as 12AU7 twin-triodes. The latter is obviously somewhat more complicated, but the method of adjustment is the same in either circuit. The first step is to adjust the carrier (BFO) injection so that distortionless demodulation takes place with normal signal levels applied to the input. The second step is an adjustment of valve operating conditions so that there is minimum audio output when the BFO is switched off—this means making sure the valves (in either Fig. 1 or Fig. 2) are working under strict Class-A conditions.

Advantages to be expected by the use of either of these arrangements are:

- (1) Better detector selectivity due to reduced damping of the signal source,
- (2) Freedom from inter-modulation distortion or cross-talk between signals, thus enabling copy of weak stations in the presence of strong local transmissions.

Looking more closely at Fig. 1, the third grid of the 6BE6 is used as the signal-grid, and the first grid as the local carrier injection grid; adequate isolation is obtained provided the BFO and signal inputs are not so large as to over-drive the valve. A low-pass filter C7, R7, C8 is included in the AF output to remove any frequency components of higher order than the required audio signal. The bias resistor R3 should be adjusted to ensure minimum output in the absence of the BFO signal.

In the circuit at Fig. 2, V1A and V2A function respectively as BFO and signal cathode follower to give a common output across the cathode load R2; at the same time, they provide isolation between BFO and signal inputs. Mixing takes place in V2B anode, this triode being connected as a grounded-grid stage; frequencies of order higher than the desired audio output are by-passed by C4. Slight adjustment of R4 will be necessary, with the BFO switched off, to obtain the condition of minimum output with a

**Table of Values**

Fig. 2. Triple-Triode Product Detector

C1 = .005 $\mu$ F	R2 = 1,000 ohms
C2 = 0.1 $\mu$ F	R3 = 470,000 ohms
C3 = 8 $\mu$ F	R4 = 2,700 ohms
C4 = 500 $\mu$ F	R5 = 47,000 ohms
C5 = .01 $\mu$ F	R6 = 2,200 ohms
R1 = 100,000 ohms	V1, V2 = 12AU7

modulated input signal.

For both circuits, it can be seen that the setting-up adjustment is to obtain the correct balance between BFO and maximum signal input. And in both these circuits, the values have been chosen for an IF signal at 100 kc.

**Dual Exalted-Carrier Demodulator**

This is a much more complex arrangement and is shown in Fig. 3, the basic idea being due to W2KUJ, and christened the "Signal Slicer"; it was first discussed in *QST* for July 1948, so is in no way new, though it is somewhat unfamiliar in this country. It depends for its operation on correct phase adjustment.

If two identical demodulators are used, fed from

Fig. 3. Dual Exalted-Carrier Demodulator

C1, C3, C13, C14, C18, C25, C26 = .01 $\mu$ F	R5, R6 = 33,000 ohms
C2, C4, C24 = 25 $\mu$ F	R7 = 22,000 ohms
C7, C8 = 8 $\mu$ F	R8, R9, R28 = 47,000 ohms
C9, C10 = 470 $\mu$ F	R10 = 680,000 ohms
C11, C12 = 270 $\mu$ F	R11, R12 = 3.3 megohms
C15, C17 = 0.1 $\mu$ F	R13, R14 = 2,000 ohms
C16 = 500 $\mu$ F	R15, R16 = 7,000 ohms
C19 = 100 $\mu$ F	R17, R18, R22, R23 = 3,300 ohms
C20 = 200 $\mu$ F	R19 = 100,000 ohms
C21 = .001 $\mu$ F	R20, R21, R25, R26 = 220,000 ohms
C22, C23 = .002 $\mu$ F	R27 = 5,600 ohms
C27, C30 = 680 $\mu$ F	R29 = 10,000 ohms
C28, C29 = 430 $\mu$ F	R30 = 50,000 ohms
R1, R24 = 100 ohms, var.	R31, R32 = 820 ohms
R2, R3 = 180 ohms	V1, V2 = 6BE6
R4 = 5,000 ohms	V3, V4, V5 = 12AU7

**Table of Values**

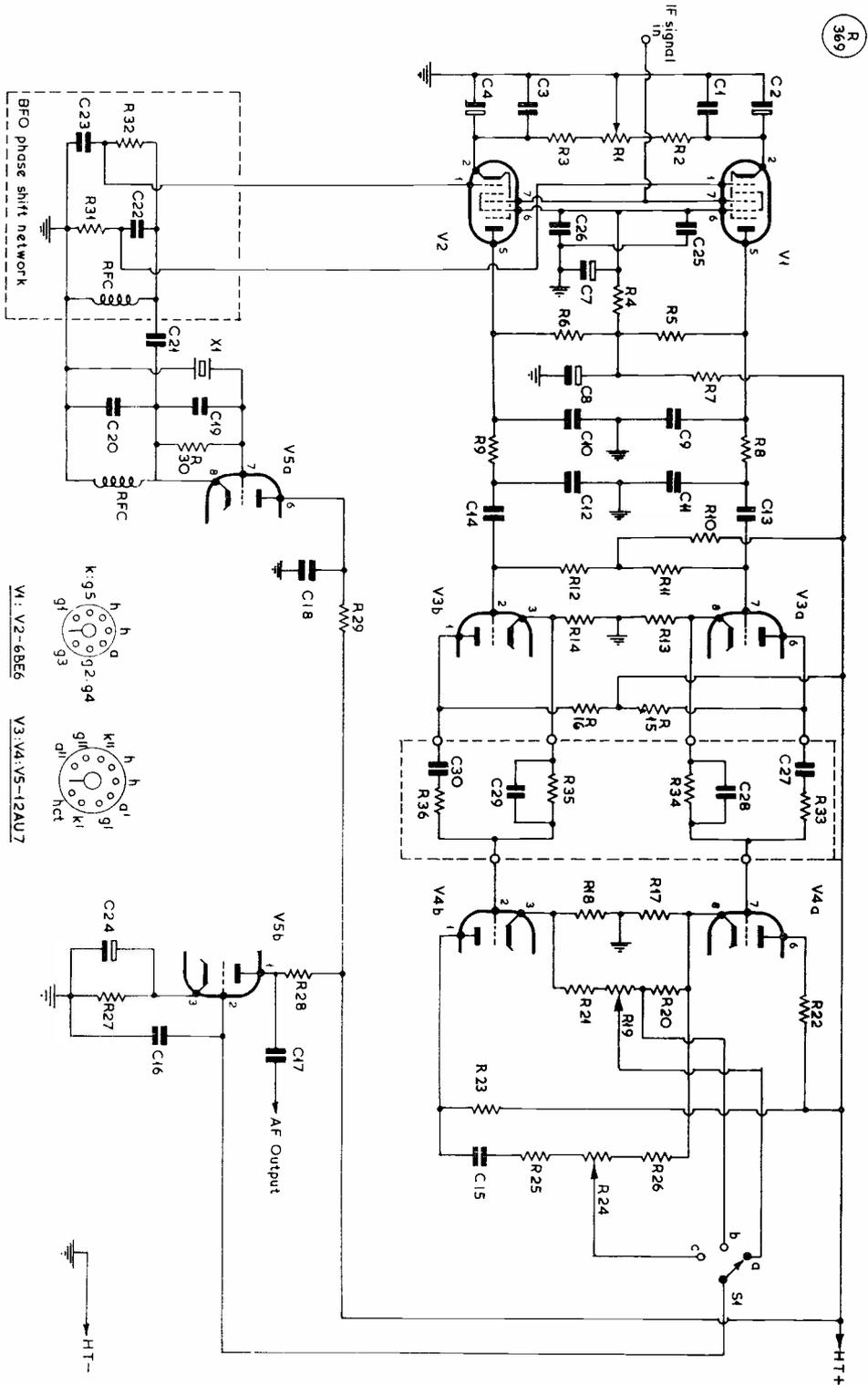


Fig. 3. The dual excited-carrier demodulator, which gives upper or lower sidebands, or both together, by selection on switch S1. This circuit is a good deal more sophisticated than those in Figs. 1 and 2 but, when properly set up (see text for discussion) — is capable of very excellent results, even with an ordinary receiver. The central dotted section, between the V3 and V4 stages, is a commercial AF phase-shift unit, the B & W ZQ4; this is supplied enclosed with terminal connectors. With the complete unit as built by G3GKF, and adjusted as explained in the article, an unwanted sideband suppression of 40 dB is obtained.

the same signal source but supplied with local carriers differing in phase by  $90^\circ$ , the two separate outputs will be out of phase by  $90^\circ$ , regardless of signal frequency. Furthermore, signals higher than the local carrier frequency will cause one output to lead the other by  $90^\circ$ , whilst signals lower than the local carrier will cause the same output to lag the other by  $90^\circ$ .

It is on this reversal of phase of one output channel with respect to the other when the signal changes position from one side of the local carrier to the other that the Signal Slicer depends for its operation. These two outputs must, of course, be suitably "processed" for the desired result to be obtained.

The first process is to arrange for a differential phase difference of  $90^\circ$  to be introduced in both detector outputs, whereby the two resulting outputs will be either in-phase or out-of-phase, depending on whether the signal is higher or lower than the carrier frequency. The second process is then to mix the outputs to provide a single output signal, the wanted one, which will be either (a), the sum, or (b) the difference, or (c) both outputs together. The phasing network must therefore have three functions, corresponding to lower, upper or both sidebands simultaneously for AM reception.

This flexibility of operation is a feature of the Signal Slicer alone. It does not involve altering the tuning of the receiver in any way, as would be the case should the same flexibility be required using other methods, such as filter systems. The BFO can be fixed in frequency, even crystal-controlled, and all tuning is done at the front of the receiver, as in ordinary AM reception.

### Practical Design

A dual exalted-carrier demodulator, embodying the foregoing principles, has been constructed by the writer to the circuit of Fig. 3, and has been in use very successfully at G3GKF for the last three years, giving an exceptional performance.

The circuit consists of five stages, their functions being: V1, V2, 6BE6, product detectors; V3A, V3B, 12AU7, phase splitter and phase-shift network drivers; V4A, V4B, 12AU7, second phase splitter and network driver; V5A, 12AU7 crystal-controlled BFO; and V5B, 12AU7, AF amplifier. The audio phase-shift unit is a commercial plug-in type, the B & W Type 2Q4. The BFO is made CC to ensure stability. Sections C9, R8, C11 and C10, R9, C12 form low-pass filters to eliminate higher-order components than the desired audio output. R1 is the balance control to ensure equal amplitude outputs from each detector. R13, R14, R15 and R16 must be close-tolerance.

Difference output is obtained from V4A, V4B cathodes via R19, which becomes the null control for rejecting the upper sideband. Sum output is given by V4A cathode and V4B anode via R24 which becomes the null control for rejecting the lower sideband. Hence, switch S1 in position "a" selects lower sideband signals. Position "b" on S1 selects a point off-balance along the potential divider R19, R20, R21 and therefore both sidebands will pass to the output. Position "c" gives the upper sideband.

### Adjustment

The preliminary adjustment of a Signal Slicer is of necessity complicated—especially if one has to construct the phase-shift networks. But as these networks can be readily obtained commercially, the procedure can be simplified somewhat.

Initially, the stages V1, V2 must be set up individually to operate as product detectors without regard to the BFO signal injected; this can be done by dealing with each stage in turn, as explained earlier for Figs. 1 and 2. Once this state has been achieved it then remains to adjust the balancing controls on the phasing networks to null the unwanted sideband. Assuming that the phase of the two BFO signals is approximately correct, it will be possible to find a minimum if some unmodulated signal is tuned in on the receiver and beaten against the BFO to produce an audio tone; this nulling is done on R19 and R24, for their respective sidebands. The third balance control R1 is to obtain equal output from each product detector, as already mentioned.

Having obtained minima with the selector switch S1 in both sideband positions, it then remains to adjust BFO phasing to achieve the greatest degree of rejection of the unwanted signal. Once the settings are found, they will hold good under normal operating conditions.

As with most complicated alignment procedures, the use of a frequency-modulated signal generator and an oscilloscope will greatly simplify the processes, but a very low sweep-frequency must be used on the CRO.

The unit as designed and built by the writer and discussed here is used with an IF of 100 kc; the crystal frequency is chosen to give parallel resonance at the centre of the IF pass-band. This frequency consideration also dictated the design criteria for the BFO phase-shift network R32, C23, C22, R31. With receivers having other IF channels, the crystal frequency and BFO phase-shift network will have to be designed accordingly.

Unwanted sideband suppression of the order of 40 dB is consistently obtained with the circuit of Fig. 3 and its flexibility and simplicity of operation makes it superior to other types of demodulator, not only on SSB signals, but also on AM.

*(Editorial Note: This article is based on a series of contributions by G3GKF appearing in the Purley & District Radio Club's Splatter, earlier this year.)*

### I.E.E. PROGRESS FIGURE

It is reported that by November 8, membership of the Institution of Electrical Engineers, which also covers the fields of radio communication and electronics, had reached 50,000. The I.E.E. was founded in 1871 with about 70 members; by 1939, the figure was approaching 20,000; the striking increase in membership in the last 23 years is a measure of the advance in technological development and knowledge.

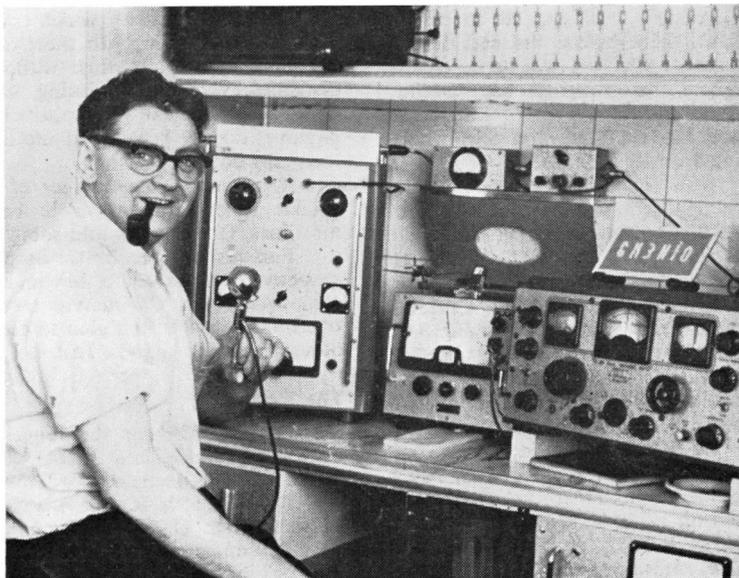
*See pp.553-560 for Small Advertisements*

# DX COMMENTARY

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

NO complaints about conditions this month—they have been patchy, but interesting. All bands have been active, and it is pleasant to find several letters about 28 mc. If only a few more would get down to it and use that vast expanse, which is much wider than all the other HF and LF bands put together, we should all benefit from it. Apart from the possible spot of DX (and it is very possible, even now), think of the room for short-haul nets which clutter up Top Band . . . and how much more stimulating it would be for mobile work. Join the "Friends of Ten" *now*—or we shall surely lose it. Even in the States, where the amateurs have good reason to feel pretty sure of themselves, they see the shadow of the Citizens' Band (27 mc) lurking around the edge of 28 mc. *Over a million* C.B. stations now use a narrow slice on 27 mc, and there is that great open space, 1700 kc wide, just adjacent to it. Small wonder that a slight nervous twitch is tending to spread. Moral: Use the band!

Last month's Operating Notes have brought forth many comments, all in agreement. Probably the Lids we were tilting at don't even read. The thing that seems to sting people on the raw more than anything else is childish talk on phone, with that unspeakable "dah-de-dah" top of the list. Under fire, too, are those who "stand by for a possible call" . . . many enquire what an impossible one would be like. And the long-winded ones who come back to a snappy "break" call with the full honours, callsign



GM3NIO

## CALLS HEARD, WORKED and QSL'd

three times, with and without phonetics, and sometimes QTH as well, come in for some caustic comment. As one correspondent justly remarks, "We can't double the size of our bands, but if we all talked half as much, it would have precisely the same effect."

Well, it's good to see that so many *do* appreciate clean and snappy operating, although it makes one feel that it is preaching to the converted. The problem is to reach the benighted ones and show *them* a gleam of light—and that can only be done by the people who work them.

### DX News from Everywhere

The incredible Gus (W4BPD) has been making the headlines again, with some very consistent operation, on all bands, from ZD9AM; he even worked an LA on 3.5 mc, although listeners in the U.K. couldn't hear him at the time. But unfortunately we shall be going to press before the biggest

*fracas* of the lot is due to start—operation from Bouvet Island, signing LH4C, a real "first"—there has never been any activity at all from that supremely rare spot. And as it was known that his stay could last only for four days, there is no doubt about world reactions! It will all be in the past when you read this paragraph—so you have already formed your own opinion. (*And* he may never have got ashore at all!)

Danny Weil should by now be active from Western Samoa, where he will stay until after Christmas; no new prefix having yet been announced, he may well be signing ZM6. . . Two others promised for late November (they may overlap December) are ZS6BBB and ZS6PC, both signing /ZS9; and VQ8BFA from Agalega, operated by Harvey, VQ9HB.

VP8EL (South Georgia) promises operation on 14063 kc most week-ends, around 1830

GMT. . . ZS5OA and ZS5RS promise SSB operation from ZS8-land, starting December 28. . . Likewise ZS6IF plans to work from ZS7, 8 and 9, opening around December 10.

HC1JU has an HC8 licence for Galapagos, and expects to be on from there before the end of the year. . . VKØVK will be on Heard Island for roughly one month, from mid-January. . . LA9RG/P and LA1IH/P promise SSB working from Spitzbergen.

Now for some "resident" DX, as opposed to these globe-trotters. CR8AC continues operation and is now on 7 mc CW. . . 5T5AI comes up fairly often on 21 mc CW (around 21090 kc). . . CN2AQ (Tangier) seems to be genuine, but Tangier now counts the same as Morocco. . . HL9KQ is being operated by HL9KH (it is a club station). . . TU2AP (Ivory Coast) is ex-FQ8AF, and on 21 mc and 28 mc AM. . . AP5JA (East Pakistan) is on 14070 kc CW most mornings. . . KS6AN is the former K5KOR/KS6, and is on 14 mc CW, mornings, 0600-1000; sometimes on 14300 kc SSB.

### More DX Briefs

W6AM recently sold 93 of his 120 acres of rhombics, and gave away another two acres for a road. He is now busy trying to "make do" with 25 acres! From his latest scores (320 on Phone/CW and 311 on Phone only) he doesn't seem to do too badly.

Nearly every week-end from January to June involves a contest of some sort (we will list as many as possible in the January issue). April 20/21 should be mighty interesting, what with the REF Contest (Phone), the ARRL CD Party (Phone), the CQ Worldwide VHF Contest and the Helvetia-22 Swiss Contest all booked. (Anyone else want that week-end?)

W5CYO, in the NCDXC's *Dx-er*, describes a Table-Top Antenna Farm and gives details of DX contacts he has had with such radiators as a four-foot microphone stand, a burned-out electric iron, an open umbrella and various coils and pieces of junk. However, ZE3JO appears to have scooped the pool with his artificial leg (*see*

## MDT (Magazine Daylight Test — October 21, 1962)

### TOP BAND, 1100-1300 GMT

This, the second of our Top-Band daylight tests (the first was on August 12 and was reported in the September issue) attracted a tremendous amount of activity, more than eighty stations being reported as consistently active during the period.

The distances over which contacts were made were much greater this time, the best falling just short of the 400-mile mark. Some stations even achieved this kind of range without being able to raise anything at shorter distances. Generally speaking, the Test seemed to indicate that everyone under-estimates the coverage of ten watts on 160 metres during the daytime, largely because of the habit of working local phone and turning the gains down.

If a comparable number of stations to those active during this and similar tests were known to be transmitting *and listening* on Sunday mornings, One-Sixty would soon become a GDX band during daylight.

For this very reason we do not propose to organise any further MDT sessions—at least for a few months—but would very much like to see some worthwhile CW activity on Saturdays and Sundays, when quite a few operators are only too glad to escape from the bedlam of some contest or other on the HF bands. Just call "CQ GDX" and see what happens!

### The Results

The honours for the longest hauls went to three Scottish stations (GM3OM, 3AEY and 3PBA) with, of course, their collaborators down South who made them possible (G3CHN, 3PQA, 2NJ, 3PLQ, 3PU and 3NXJ). GM3FSV (Orkney) was also on, but he didn't penetrate further south than to G3OHX (Northumberland); however, even this QSO was over 260 miles and not to be sneezed at. GM3AEY (Fife) worked G3PU (Dorset) and G3PLQ (Wilts.).

G2UX (Norfolk) had a surprising contact with GI3PDN (Londonderry) over 360 miles, but this was 15 minutes before the test started! G3CHN (Devon) who, with GM3OM (Stirling) made the longest-distance contact of them all (390 miles) made no other QSO's during the period. G3PQA (Essex) worked two GM's and heard two GI's without raising them; he is on CW (1825-30 kc) every Sunday morning at 1100, and has worked nearly 30 counties around midday; skeds welcomed.

GM3OM fired up at 1040 and worked G3NQF (London); at 1055 he raised GM3FSV, 225 miles to the North. Finally he was rewarded by that fine contact with G3CHN. . . G3PLQ heard three GI's, three GM's and a GD and was very pleased with his 364-mile contact with GM3AEY; he says that Northern and Midlands stations did not hear the GM's as well as the Southerners appear to have done. . . G3NHE, despite giving the nearest town (Sheffield) every time he signed, was persistently called by stations at under 100 miles. . . G3GGS (Lancs.) worked five countries, but only three QSO's were over 100 miles!

### THE LONGEST HAULS

#### Over 350 miles

GM3OM — G3CHN  
GM3AEY — G3PU, G3PLQ

#### 250 - 350 miles

GM3OM — G3PQA, G3NXJ, G2NJ  
GM3PBA — G3PQA  
GM3FSV — G3OHX  
GM3AEY — G3NXJ

#### 100 - 250 miles

G2AWT — GM3DZG, G13RJJ, GM3PQA  
G5JU — G3OQT, G3PQA, G3FTQ  
GW3PMR — GM3PBA, G13JEX  
G3OLU — G3CMJ, G3GRL  
G2NJ — G3CMJ  
GM3AEY — G13JEX  
G3FVC — G3ORG  
GW6GW — G3OXI  
G3GGS — G13PDN, G13RJJ, GM3DZG  
G3NHE — G2UX, G3ORG, G3OLN

### Elastic Rulers

Finally, a note about measuring distances. There is a kilometre scale on most maps. . . *please* don't use this to measure the distance in miles! Many claimed mileages had to be multiplied by  $\frac{5}{8}$ , and this was the obvious reason. (Some put in by GW3FVC in the October issue suffered in this way and slipped through unnoticed).

"Miscellany," p.538, this issue).

The new prefix for Sierra Leone, which we withheld from the last issue until confirmation was forthcoming, is 9L1. Cross ZD1 off your lists and substitute the newcomer.

Incidentally, WPX hunters will be interested to hear about 4X9CJ, a call which will be on the air for two months from November 29. It is activated from the Second Israeli Hobbies Exhibition in Tel-Aviv, with Bob Avigor, 4X4CJ as chief operator. All bands, CW, AM and SSB, with Hallicrafters equipment, electronic keyer, multi-band ground plane, special QSL cards and all. We shall see from the pile-ups how much the WPX business has caught on!

IT1TAI and IT1ZGY plan a trip to Jordan; look out for JY2TAI. . . A group of W's hope to operate CW from Turkey during late December or early January—but whether they will be legitimate or not, we don't know. . . ZL1ABZ should shortly appear from the Kermadecs, with ex-ZL4JF of Campbell Island fame in charge. . . KG6SA (Saipan) has not yet appeared, the promised sortie having been delayed.

The following *may* have shown up during late November, or may even be still with us: W8NWO, K8NZD and VP2KJ, from Montserrat. . . DL1TA and DJ0HZ, from Luxembourg as LX3TA. . . FB8WW, from Crozet (14 mc Phone and CW).

#### DX News from Readers

From *GM3JDR*: ZD9AM has put in a marvellous signal, long after the band is otherwise dead. One night, after he had issued his instructions—"5 dwn," a DL was heard making a long call to "ZD9AM5DWN"! Some of them never learn. . .

From *G3PEK*: G3PMO is now in Port Stanley, Falklands, and holds the call VP8HD; he should be on by now, with an LG-50 and a dipole or ground plane; mostly CW, between 1500 and 2300 GMT. QSL's via G3PEK.

From *G3RFH*: He is licensed for Maritime Mobile, aboard H.M.S. *Protector*, but for 28 mc only; hopes to be active shortly,



G3PQC is operated by D. Turk, 25 Whetstone Road, Cove, Farnborough, Hants., who was licensed at Christmas 1961. He started out on Top Band before building an all-band Tx based on a Geloso VFO unit. His receiver is a CR-100 and the present aerial is a 67 ft. doublet. Operation is CW, mainly on 160-40-20 metres. G3PQC, who is a member of the Royal Naval Amateur Radio Society, would like to hear from any R.N. types who recognise him here.

with a Heathkit DX-40U and VFO, looking for G contacts during passage from South America to Antarctica. G3RFH/MM promises consistent operation on 28 mc, which, he says, is open far more often than people realise.

From *G2DC*: It is now established that VQ9HB/MM was never ashore on Agalega (Harvey himself admits it), so *no one* has yet worked Agalega. Look out for VQ8BFA! Danny lost his linear (transformer burnout) at ZK1BY, so was not too easy to work from Europe; two replacements have been sent by air, and should reach him in ample time for the Western Samoa operation. He reached that place sooner than was intended, having found it impossible to get a licence at Pago Pago (KS6). VK5XK planned a vacation on Lord Howe Is. and was taking gear with him; he promised some 7 mc operation, but nothing has been heard. Finally, regarding Gus: The ship due to take him

to Bouvet was delayed for some days at Gough owing to bad weather. Various informed sources rate his chances of landing on Bouvet at about 4 to 1 against! Weather is the main reason.

From *W3CTR*: VR30 is looking for G's at 0700 GMT on either 3795 or 7095 kc, SSB.

#### Some Overseas Mail

VQ8BC (Vacoas) writes to confirm what many of us already realised—that Gus, W4BPD, was unlicensed when operating as VQ9A/8C. Apparently there was a most unfortunate muddle over the whole business, and he *could* have had a permit if he had known the right rope to pull. Whether this rules out the Chagos contacts for DXCC credit, we don't know, as we have come across quite a few non-legit. examples that have been allowed.

DL2DF (BFPO 30) is still active on 7 mc only, with 10 watts, and says he is re-learning how to

search among the funny creeping things on the band; but he's determined to stick to QRP and find out what can be done.

MP4BDV (Bahrain) runs phone and CW, all bands from Ten to Eighty, with a DX-40U and a Quad; he would like G's to look out for him.

G3RFQ is now one of the ops. at 5B4AK, the R.A.F. Club station at Akrotiri, where he says there are at least four keen operators; the shack is in a caravan on a car park, and so the aerial system is not too good—ground planes and dipoles are about the limit. But they are raising some good DX, and, better still for them, working G's within short distance of their own homes. A WAC on Top Band is the current project.

9M2AD (ex-SU1SS, MP4TAF, VS9ADL, MP4MAC, VS1LE and DL2BJ) has now added another call to his list—G3RKN! (He's going to find that the most difficult of the lot to work DX with.) Any outstanding QSL's will be honoured on request.

"Bing" Crosbie of 5A3BC (Benghazi) sends an interesting analysis of his first six months on the air: 5572 QSO's break down into nearly 2000 with Europe, 725 with North America and on downwards to 28 with Oceania. Among the more interesting figures for *different* stations worked are these: 670 QSO's with U.S.A., 475 with the U.K., 240 with U.S.S.R., 150 with SM and 130 with OK. Bing applied for and received his DXCC in just over ten months. QSL returns are noticeably bad from the U.K., standing at only 38 per cent. He hopes that some who read this will take the hint. . .

MP4BDG has now gone QRT and will be signing G3LOL from R.A.F. Stradishall by next March or thereabouts. (He returns to England in January.)

### Top Band Topics

W1BB's first bulletin of the season, dated October 15, was brimming over with DX news; but we have since received a rather disconsolate letter stating that DX in all directions, since October 1, has been extremely poor. Even

the normal European marker stations have only been heard for brief moments on the other side. Stew wonders whether it is possible that the Pacific nuclear tests have had anything to do with it; but others incline to the view that real "winter conditions" do not normally take over until December, and that the rash of DX in September was a welcome hang-over from summer conditions, rather than a herald of winter.

Lots of DX is lined up for the Trans-Atlantic Tests (dates December 16, January 6 and 20, February 3 and 17, 0500-0730 GMT). In addition to the normal crowd of G's we shall have, on this side, several DL's, OY7ML, EI9J, UB5WF and some of the OH's who are now on the band. **Europeans: Do not operate in the 1800-1825 kc sector . . .** if you do, *nobody* will get through to any W's or VE's!

Various correspondents report working a North African station on Top Band; we can only say that he is genuinely where his callsign suggests him to be, but as he is not officially licensed for the band we can say no more.

Following on the results of the two MDT sessions, GM3FSV (Orkney) reports that he is carrying out midday tests with G3CHN (Devon) on Sundays. He has already heard him on SSB at 1210.

G3PGN (Basildon) confirms that the real DX has not been very good, but hopes to arrange a sked with 9G1EB on the band. . . Claims still come in for contacts with UA3NB, but it is pretty well established now that his QTH was in the steppes of Yorkshire. People at the other ends of the country may have been taken in, but not those in the neighbourhood of Hull, where he was S9 plus-plus. . . OY7ML has shown up at last, on his fixed frequency of 1825 kc and with a rather poor aerial. However, he activated a real pile-up which showed that even the normally-polite Top-Band operators have a bit of the worst in them, waiting to be brought out!

G3NHE (Sheffield) is trying out a Ttx, with 200 milliwatts input, and has worked 7 counties, best DX being G3PLQ at about 160 miles. He thinks WABC with 200

mW "an attractive thought" but mighty hard work!

G3PLQ (Salisbury) has heard eleven DL's to date, and worked eight of them, as well as OY7ML. And he heard 5B4PB working an OK, but QRM prevented a contact. OH2NB has also been heard—in fact he was working G3MYI on two-way SSB. G3GGS (Chorley) is another who has raised North Africa and several of the DL's.

G3RBP (Abingdon) has already booked in 62 counties and just can't wait for the G3R-- ladder to appear in the New Year. He has been hearing most of the DX, and includes (rightly) GM3KLA in Shetland. GM6TF in Clackmannan is another welcome one.

GM3HBY (Glasgow) makes slow Morse transmissions on Sundays at 1200 GMT (1903 kc) followed by a sked with G13RCB; reports would be most welcome. He recently had a "599" from OK1AAI, but this was at 2300 GMT.

### TOP BAND LADDER

(G3O-- and G3P-- stations only)  
(Starting January 1, 1962)

Station	Counties	Countries
G3PLQ	88	12
GM3PBA	85	14
G3PRM	83	10
G3OLN	78	9
G3PHO	72	9
G3PDM	68	9
G3PGN	66	12
G3OWR	66	6
G3PPU	64	9
G3OQT	58	14
G3PSB	57	6
G3OXI	57	7
G3PEK	48	8
G3OLU	46	3
G3ORH	44	10
G3PJD	42	4
GW3PHH	32	7
GW3PPF	30	5
G3OHL	21	4
GW3PPF/A	20	3
G3PHS	15	1

(Note: This ladder will appear for the last time in our February, 1963 issue, carrying scores up to December 31, 1962.)

G3KMQ (Shaftesbury) has been making do with a very poor aerial but raised DL6OS and DJ2KS. Incidentally, the latter told G6QB in a QSO that he was using a 180-ft. steel tower as a ground plane—he has access to it at certain times, but normally it is used for research purposes. And what a signal he was putting out with it!

### Eighty Metres

Now that the QRM at the LF end seems to be thicker than anywhere else on the band, the SSB types are getting most of the DX. They have been working VK and ZL, both mornings and evenings. On a recent morning ZL4OD, SSB on 3790 kc, seemed to be the only DX signal on the band—certainly there was nothing at all in the CW line.

G3GGS reports ZL3FZ, working G's on CW around 0700, and says the W/VE stations often break through at a reasonable time (we assume he means before midnight). One W was using a kilowatt and a 3-el. beam—with a signal to match!

SWL D. Hayes (London, N.3) has logged some excellent 80m. DX, showing what can be done when you specialise in one band. From a terrific list we quote the following, with times: 3V8CA (2230), VP9CP (0025), PJ2AA (0120), HR3HH (0225), VR3O (0600), YV's (0700), VP7CU (0730). All these were on SSB, and W's, VE's, PY's and the like have been omitted. The most interesting note is that VR3O tried unsuccessfully to break into a QSO between G3FPQ and G13CDF one night at 2300 . . . he said the signal strength from Europe was better than in the early mornings. And another—VO1DN was copying Europeans at 1700 GMT on November 10. From which you will gather that Eighty is a DX band—but amateur activity is still pretty low.

### Forty Metres

G2DC raised ZD9AM for a new one, as well as ST2AR, SVØWZ, UL7LA, VK's, VP9BO, ZL and most W districts. His prescription is "patience and a little luck."

G3NFV (Ashted) worked

ZB1BX and 5B4IP (both CW). . . G3PGN was delighted to catch TG9AD (559 each way) around 0530. . . G3PEK, running 40 watts to a dipole, raised ZB1BX and 1CR, 5A3CJ, 4X4's, 5B4's, SVØWZ, W's, W6UF (0750), ZL2GS (0755), 5N2JKO (0455), OX3BZ and 3XU, and UF6DD.

G3LPS (Blackburn) has improved his ground-plane and finds things quite bright again. To prove it he cites HI3PC (0905), W7's (0800), UAØSE (1650), OY2H (0015), KP4, YV, UA1KAE/2 and ZD9AM (0030). HI3PC gave him his 200th country. VK's have been heard in the evenings, and VK and ZL in the mornings, which now seem to have changed over to W6 and W7 around 0800.

G3RFS (Barnet) worked CW with W's, OX3KC, TF5TP, CT3AB, UAØBZ, UN1BK and UF6's. He has found the W's coming up as early as 1930 GMT.

### Twenty Metres

The mixture as before, on this band—sometimes flat out, and sometimes just flat. What makes it interesting is the way signals crop up at the wrong times, and this month it has been especially unpredictable. (Who would expect to be called by a KH6 after working a local on a "dead band" at 1700 GMT? It did happen.)

Some of this month's lists are so long that we have had to reduce the filter to an even finer mesh than usual. Only the very best now get through! GM3JDR (Sutherland) worked SSB with BV1USF, EP2AD, KC4USV, KG6ALD, VS1JH, VU2NR, XT2Z, ZD9AM and 5R8CM. His CW connected with FB8XX, FY7YI, HS1T, SM5CGK/9Q5, TT8AL, VP8GB, 8GJ, 8GQ, 8GU and 8GV. VQ8AI, ZD9AM, 5R8AB, 5X5IU and 6W8CR. Note Scotland's affinity for those VP8's, who are quite rare in the South of England.

G3PEK, on CW, raised VP5XG, VP8GQ (2055), VK3AHQ (1500), West Coast W's and VE's and KV4AA. . . G3KMQ (Shaftesbury), also CW, worked ZD9AM, FB8XX, VP8GQ and 8GU, ZS3, VK and ZL. . . G3GDC (Plymouth) continues to uphold the cause of AM Phone, and collected



Some readers at least will recognise these two without having to be told who they are — on the left, Harold Merriman, G6GM, Holsworthy, North Devon, who for many years has been working the real 160m. DX, which means not only the U.S. but the ZL's as well (see "Forty Years on Top Band," in this issue). The photograph, which is quite a recent one, is from a colour print by GW5BI (Cardiff), who set the camera.

several ZL's in the mornings; evenings, around 2030, fetched in HI8AMP and 8MMN, VU2PP, OY2Z, VP2AF, EP3RO and "the usuals." Then he migrated to Fifteen—see later!

G3NOF (Yeovil) stuck to SSB, which brought him DJ1ZG/M1, HH2PW, VP2KP/A (Anguilla), VP5BL, W5JDX/VP9, 5N2NFS, VK's and ZS's. . . G3GGS, on CW, worked Gus when he was signing W4BPD/MM, and also as ZD9AM. ET3C was also raised.

G3FPK (London, E.10) worked SSB with CX2CO and 7CO, HH2PW, DJ1ZG/M1, PZ1AX, VE3FFW/SU, VS1JH, VK, ZL and 9M2CR. . . G3BHJ (Norwich) had SSB contacts with DJ1ZG/M1, FG7XT, HV1CN, KA2JL, KG1BO, K2QGC/KG6, OX, TF and 5N2HJA.

G2DC found nothing new, but on CW he raised AP5SS and 5CP, KC6CB, VR4AT, VR5AR, VK1-6, ZL1-4, ZK1BY and ZD9AM. G4MJ, the new secretary of the Ex-G Radio Club, has had many contacts with VR3O, who is an ex-

Londoner and has concentrated on working Europe. (Incidentally, with Twenty dropping off somewhat, he plans to work more on Forty and Eighty, around 0700.) G4MJ also managed CW and SSB contacts with ZK1BY. G3LPS raised ET3RC, one of the former ops. of ET2US—but he still gave his QTH as Asmara. G3RFS worked ET2US/2, VP8GQ, KV4CI, KG4AO, VK's and W's—all with 40 watts CW to a ground-plane.

### Fifteen Metres

This has been the best band during most of the month for reliable chats with W's and VE's; whether anything more exotic shows up from day to day is problematical, and you just have to watch the band closely.

G3ABG (Cannock) worked from his school station G6SW, and on AM phone he raised DU1AN, 9G1EE, CO3WR, HI8MMN, VP7NC, YN9MQ, YV1AC and 3CB—all between 1200 and 1225 GMT, spread over two weeks; the aerial is a 67-ft. doublet.

G2VV (Sunbury) was delighted to raise Mexico for the very first time in all his years on the air—giving him that WAZ at last. XE1PJ was worked around 1300, also YV5ANT and YV5BOA—all on CW with his indoor aerial.

G3BHI, on SSB, worked VQ4AA, XT2Z and 3V8CA. . . G3FPK, also SSB, raised KP4, VQ4, XT2Z, ZB1A, ZS6 and 5R8CM; CW accounted for ZD6JO. . . G3MBL (London, N.12) used AM phone and collected JA6BQC, 9Q5JR, 4S7NB, VE, VQ2 and UA9, all with 30 watts and a 2-el. beam.

G3NOF has both kinds of phone; his AM netted PY7AKW (Fernando), VQ2, VS9, XT2Z, ZD6, 5N2JKO, 9G1's and 9Q5FD, while SSB raised KP4BIQ, VQ4, ZB1, ZS and W's. G3NWT used AM to connect with VQ8AM, 9Q5JE, 5H3IW, VQ2's, TU2AP, CT2, 5N2's, ZE and ZS.

G2DC still finds the band interesting for CW and proves it with CO2AB, HH7ZT, KC6BD, KR6AG, XE1PJ, JA1-Ø, W1-Ø, ZD9AM and ZK1BY. Nothing new, but all pretty interesting.

G3NFV, on AM, worked CR6JL and VU2BK. . . G3IDG, on CW, raised CT2AI at 1007 GMT, but FG7XJ got away. . . G3GDC built himself a "mini-Quad" for the band and tested it out to the tune of 6W8AA, 9L1HB, PJ3AO, FG7XS and 7XL, VP4RS, DU1MR, 9G1's 5N2JKO, W's, VE's, PY's, YV's and so on—all on AM.

G3LPS, on CW, managed to raise ZD6JJ on 6JO, 6W8DD, CT2AI, UO5 and UL7.

### Ten Metres

News of this band, we are glad to note, is actually on the increase. And we hope that more and more interest will be taken in it, for reasons already mentioned in the preamble.

Reporting this month are G3FPK with W1FH, ZD9AM and ZE1JGO, all AM; G3NFV with XT2Z, TU2AP and VQ2KF, also AM; G3GGS, with VQ2EW, ZS6, W, CT and DJ—all on CW; G3MBL with CT1LN, UP2NCH, 5B4WS on AM (and VP8GO was heard but not worked). G3NWT with XT2Z, 9G1EE, VQ2 and ZS, also on AM. G3IDG raised UL7PF on CW, and heard HB4CT, UA, UB and ZE3JO—all same mode.

G3NOF was the only one to report SSB contacts on Ten, and these were with ZS6OY, ZS6WW and 5A2TZ; his AM netted KP4AEB, VO1DZ, VQ2's, ZE's, nine ZS's, ZS7L and 9G1EE.

Two interesting lists are also to hand from SWL's: I. M. Stewart (New Barnet) logged AM phone from CN8HP, VQ2MS, W4SAW/MM, 9G1CC, HC1WW (1700), 5N2JKO, VQ2BK, EA8CR, CR6AT, CX4CS, 5A, PY, LU, ZS and ZE. On October 20 WA4IKG was heard at S8-9 (1420) and some W1 and W2 stations were also getting over, but weakly.

R. R. Loe (Colchester) covered the period October 28-November 10, during which he logged CE4BP, CX2CO and 4CX, four LU's (all around 1630); VP8GO (1715), VK6RE (0835), VQ2JC, ZD6HK, ZE1, 2, 3, 8, ZS1, 2, 6 and PY's. He says that all signals noted were S8 or better, so the main difficulty with the band is

obviously shortage of activity.

G3FPK worked ZD9AM, a good signal on both CW and SSB, but by no means doing a roaring trade on this band. Gus remarked "I think I will only work ten metres SSB from Bouvet"—and he might have meant it, at that! On October 19, G3FPK raised W1FH, and found LU, ZE and ZS with much better signals than the prop-charts would indicate.

### Our Heading Photograph (p.529)

George Douglas operates GM3NIO at 10, Burdiehouse Drive, Liberton, Edinburgh, 9, and has been on the air since March 1959. The main Tx is an LG.300, with home-built power pack and modulator, and the receiver an SX-28 with a Geloso converter. His aerials are a 40-metre loaded dipole of 40/80m., and a Cubical Quad for 15m. The bands chiefly worked are 15-40-80 metres, using both CW and phone.

### Points from Letters

Among the "beamless ones," G2YS has worked 205 countries without one, and G3IDG has raised 92 with a maximum of 55 watts, mostly with a ten-metre dipole, now replaced by a 120-ft. wire.

G3IDG also reports on sundry matters, mostly covered elsewhere—the OH's on One-Sixty; the treatment of Lids (he tried to drum into someone the fact that he had key-clicks, but without much success); that strange station NERK, being called by NSS on 21 mc from time to time; and an account of a fine one-hour contact on CW with KN1VUP, a novice station operated by an Anglican priest who is interested in more than RST, name and QTH.

G3NWT has noted some good long-path openings on Twenty; on November 12 he copied a W1 who had an LP echo rather stronger than the direct signal, also some JA's and KR6's have been obliging. Concerning ten metres, he suggests that the universal drift towards the LF bands when the sunspots thin out is a bad thing. G3IDG adds that if the same number of amateurs, all over the world, were to give the same

amount of attention to One-Sixty and Ten, the latter would show more countries workable *throughout the sunspot minimum*. He concludes "Both bands are equally unsuitable, for reasons different in nature but roughly equal in number—and one motivation of any amateur worth the name is a love of the unsuitable."

#### Flash-Flash !

And stop the presses! This is to say that Danny Weil started up as ZM6AW from Apia around November 18; European contacts made on 7, 14 and 28 mc, but most active on 14275 kc, SSB, 0800-0900; on 21 mc, 1000-1100. W4BPD actually *en route* for Bouvet and signing W4BPD/MM

on November 21; he expected to arrive at Bouvet by the 25th, and possibly to be ashore in time to join in at the tail end of the *CQ* Contest.

The Ex-G Radio Club, membership of which has now reached the 90 mark, has had a change of secretary, the new one being G4MJ (1 Manor Abbey Road, Halesowen, Birmingham) who will supply all details on receipt of an s.a.e.

And so to the final sign-off for 1962, with special Christmas and New Year greetings to all those who help to fill these pages with news, views and snippets of all kinds. Especially to our friends in the *West Gulf DX Club*, the *Northern California DX Club*,

W4K VX and his helpers, and, of course, our many correspondents from all over the world. Some of them may not always have an individual mention, but we are always in touch, through the mail or on the bands.

In short—a Merry Christmas to all our readers. And, before immersion in the festive season begins, don't forget the deadline for the January issue, which is **first post on Friday, December 14**. Mind you catch it (mail delays will already have started by then, we fear), and address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London S.W.1. Meanwhile, 73, Good Hunting, BCNU and—MX.



General view of the Seymour Hall, London, W.1, where this year's Radio Communications (Amateur Radio) Exhibition was held. The total attendance for the four days was in the region of 7,000 and somewhat down on last year. This was a pity, because the venue was a good one, even if a little difficult to find — the Seymour Hall is spacious and well lit, and has good catering facilities, with ample lounge accommodation. The "Short Wave Magazine" stand is the second along on the right of the central aisle. A G3GMN print.

## RTTY Topics

### COMMENTS ON THE OCTOBER CONTEST—INCREASING RTTY ACTIVITY—SOME RTTY NEWS TRANSMISSIONS

W. M. BRENNAN (G3CQE)

*This feature appears in alternate months, and discusses operating news and technical matters connected with radio-teleprinter working on the amateur bands.—Editor.*

**T**HERE'S certainly nothing like a contest for really disorganising the shack for a few days. A RTTY contest is perhaps worst of all in this respect since a necessary by-product of such a 48-hour affair is a whole pile of printed copy. Those neat rolls of RTTY paper just about engulf the shack when they are gradually unravelled and torn off bit by bit in the heat of the fray. Add to this the lengths of perforated tape used for CQ's, message repeats and so on, and those ubiquitous "chads" that seem to delight in leaping out of the confetti box . . . well, they say you can tell a dyed-in-the-wool RTTY man by his prominent index fingers and the chads that gather in his trouser turn-ups! The total lack of RTTY activity for a couple of days after such an event is probably because it takes just about that length of time to get the paper sorted out!

Opinions differed as to propagation conditions during the October RTTY tussle. In actual fact, taking into account the decline in sunspot activity, the event was well blessed. Ten metres was open to Africa and South America and though it appears that no European RTTY stations took advantage of this opening, quite a number of QSO's were made between North and South America. Fifteen metres was very good indeed and RTTY contacts were made with most parts of the world on this band. There were some particularly good openings to the West Coast of the U.S.A. and signal reports of 589 were exchanged. Twenty metres was equally good, but is of course subject to a great deal more QRM than Fifteen—there's no doubt that G3BXI (Chigwell) must have had a hard time copying VK3KF through terrific short and long skip QRM at 1440 GMT! On the other hand, VK3KF says that signals from Europe were very good in Australia and he reports that G3KZI (South Woodford) was putting a really outstanding signal down-under. Perhaps the greatest disappointment of all was the lack of any activity from Asia during the Contest; in the past, KR6MF has been the mainstay of this continent; unfortunately, he was posted to Japan a

short time before the contest date and though he will shortly be active with a KA call, his absence during the Contest reduced the number of Continent multipliers available. Another surprise was the small amount of activity from Europe on Forty and Eighty metres; almost all participants complain of this. The reason is probably the number of European stations that were available on 20m. during the mid-morning period, this being the time when most G stations would normally operate on 80m. for some additional contest points. Whilst it seems that most people took a look at the lower frequencies, few actually bothered to re-tune the Tx and put out a call there. An exception was G6CW (Nottingham), who was rewarded by QSO's with PAØ, G and DL. G3CQE (Norwich) tried a short CQ on 3595 kc and back came DL4IA, DL6EQ and DL1WX—and it took only a few minutes to secure a 40m. QSO with IIRIF. As far as scoring is concerned, the same country worked on four different bands is worth just as much as four different countries worked on one band, and so it seems that some very easy points were missed by most people.

#### Prowess of IIRIF

Although all the scores have not come in (at the time of writing, there being two weeks yet before the closing date for entries) it is a fact that the leading station in this country is G3BXI, who made 50 RTTY QSO's with 16 countries in all the five continents that were available. This produces a grand total of 23,000 points—a very fine effort indeed. Undoubtedly, the European leader will be IIRIF, who should certainly be among the world leaders, if not actually at the top. His tremendous signal was well in evidence throughout the Contest and he was probably the only European with a powerful enough approach to enable him to park right in the middle of the fearful pile-up of U.S. stations and still be printable through the local QRM in the U.S.A. This is no mean feat, but once the trick is mastered it can be put to really good use in a Contest such as this! Apart from securing practically every American state available, IIRIF also paid meticulous attention to the task of collecting every country that appeared, at the same time making as much use as possible of the opportunity of claiming countries-on-more-than-one-band, as the rules allow. The logs show that IIRIF had worked four continents before most of the European stations had warmed up their rigs! His final score of 41,600 points is a remarkable achievement. IIRIF is rapidly becoming a byword in the RTTY world and many operators comment on the fine signal that comes from Milan. A couple of U.K. station quotes are: "Whenever IIRIF was on there was a strong smell of burning in my shack," and "Bruno (IIRIF) produces 0.2 amp. Rx Ae. current at my QTH." In spite of the suggestion of QRO, the secret of the strong signal lies purely in the aerial system and location since the RTTY transmitter at IIRIF is only an HT-32 running "barefoot." He is still waiting for the HT-33 linear . . .

### European Stations

GM3IQL and GM3ENJ again combined forces to operate GM3IQL throughout the Contest, and both much enjoyed it, though to quote GM3IQL, "For a while there seemed to be an invisible barrier around this QTH." They took the opportunity to try out a Drake 2B Rx with very pleasing results. The final score was a satisfying increase on that of the previous year. G2FUD (Hale) installed a new FSK keyer for his Heathkit DX-100U just before the Contest started and found to his dismay that it did not produce enough freq. shift! In spite of this, he did manage to get in some QSO's with several stations that (to quote his own words) "Must have had elastic-sided TU's!" G6CW came up with some good QSO's and with some equally good ones that got away. G2HIO also had his fair share of contacts and collected a new Continent when he worked OA4BR. G3FHL lost his 20m. aerial, but found that his 80-metre dipole worked on 20 metres. DJ4KW comments that the frequency restrictions imposed on DL stations (particularly the lack of 15m.) impose a severe handicap on operators in his country and that to have to listen to all the 15m. RTTY activity and not be able to join in it is very frustrating.

W6CG (DX editor of *RTTY Magazine*) reports that all comments about the rules of the contest are favourable, but that there are some complaints about poor operating practices. With 200 or more RTTY stations operating for 48 hours a few toes are almost certain to be trodden on at odd times. Several W stations would like to see a DX-only contest, one in which W-to-W QSO's are not allowed, or at least one in which W stations do not score bonus points for QSO's with the various States. This would of course reduce the W-to-W QRM, which prevents many U.S. stations from ever hearing the DX underneath it. Another suggestion is that the maximum operating time during the contest should be limited to 30 hours out of the 48; any suggestions are welcomed by W6CG and all will be carefully considered by the RTTY Contests Committee.

ZS6UR and ZS1FD were both kept very busy throughout the Contest period. The former encountered a real mystery when he worked a YU station who volunteered the information that he was using 8 kW to a rhombic! Both ZS stations wisely settled a few kc LF of the main pile-up and they could be worked in comparative comfort there. This tactic is well worth remembering for the future, since any attempt to segregate the W signals from the rest by some sort of freq. plan seems doomed to failure.

Some of the countries worked from Europe were: All W call areas; VE2, 3 and 4; OA, PY, XE, KZ5, KP4, YV, VO, KL7, KH6, ZK1, KW6, ZL, VK, ZS; I, LA, DL, PAØ, GM and G. As usual, all those taking part found it well worth while and several say they would like to see activity at a similar level all the time! (The paper-disposal problem might get out of hand, though.)

### Trend of Events

The end of the year is approaching and this seems to be a suitable time at which to take a look at the trends in RTTY over the past twelve months and also at what we may expect during the coming year. There has certainly been a marked increase in RTTY interest throughout the world and this in spite of the perpetual shortage of suitable machines in all but a few countries. New countries seem to be added to the active list at pretty frequent intervals, the latest newcomers being KH6COY/KW6 (Wake Island) and HH2P (Haiti) both operational on 14090 kc. There have even been signs of some sort of activity from the U.S.S.R.—this is at present only in the form of SWL reports, but these do quote brief extracts from the text of RTTY QSO's and of course these imply the use of a receiving teleprinter. An actual two-way RTTY QSO with a Russian station would really be news. Such a contact may raise its own peculiar difficulties, all of which no doubt every active RTTY man would be only too willing to tackle! It seems that more and more amateurs are beginning to investigate that short CW call which suddenly erupts into a prolonged burst of FSK. Probably the most important innovation in Europe during the past year has been the transmission of RTTY news bulletins in English by the V.E.R.O.N. Hq. station PAØAA; a successful and enterprising team consisting of PAØYZ, PAØLQ and PAØJMS has produced this bulletin every week now for several months and these days it is almost certain that practically every amateur-owned teleprinting receiver in Europe is tuned to 3625 kc at 2030 GMT on Fridays.

Norway is one country in Europe where there is little difficulty in obtaining a T/P and according to LA5LG the Norwegian National Amateur Society Hq. station will shortly be using RTTY too. In the States the A.R.R.L. Hq. station WIAW has been operational on RTTY for some time; they worked several U.K. stations during the Contest. The tremendous increase in RTTY operation in the States is reflected in the increasing number of RTTY articles appearing in *QST*. Commercial manufacturers of amateur gear are turning their attention to the RTTY field and there are now two commercially made TU's available to amateurs over there. A well-known manufacturer of radio kits for the amateur is expected to add a T.U. kit to their range very shortly. Several of the Telegraph Companies who have in the past released a large number of T/P's to amateurs at low prices (upon receiving a written undertaking that they will be used only for amateur purposes) are now disposing of even larger quantities at almost give-away prices.

Asia should produce a little more RTTY activity shortly as machines have been shipped out to VS1BU and XZ2AD. Also ex-KR6AK is on his way to Korea taking some RTTY gear with him.

IIRIF mentions that two more stations can be expected on from Italy in the very near future and also that he plans to do a little operating on RTTY from Sardinia during the coming year.

### The U.K. Scene

In this country some RTTY activity has developed on two metres, particularly in the London area and

in the Midlands. Until recently almost all RTTY on this band made use of AFSK (Audio Freq. Shift Keying). Although this is very easy to tune in and hold in the receiver, it is nevertheless inferior to FSK when received at low signal strength. It takes very little time to find that FSK will produce really good copy when a poor signal path renders AFSK almost useless. Moreover, FSK does not demand a modulator with a power input comparable to that of the PA. Several amateurs are adopting FSK for VHF work now and it seems certain that this trend will continue. FSK does require greater frequency stability in both Tx and Rx; components in the FSK keyer stage can be responsible for a great deal of drift, especially when the basic crystal frequency in a VHF Tx is multiplied by 18 in subsequent transmitter stages. Drift which is not normally apparent in the receiving set-up also begins to show up when receiving FSK. One solution to these problems lies in the use of Automatic Freq. Correction (AFC), which can be applied to both Tx and Rx.

On the HF bands, another innovation that is beginning to receive attention is the adoption of the

narrow-shift techniques. In recent years, commercial stations have been making increasing use of narrow-shift whilst amateurs have been making their own experimental transmissions. Apart from taking up less freq. space, NFSK allows the use of narrower bandwidth in the receiver, with consequent improvement in signal-to-noise ratio and greater immunity from QRM. The disadvantages are, of course, the need for greater frequency stability and more stringent T.U. requirements. The stability required is no more than is at present demanded for SSB work, and the T.U. problems can be met by the use of higher "Q" filter elements, which these days are readily obtainable at reasonable prices. Perhaps the real problem is to obtain some sort of agreement on the actual degree of shift to be used; 120, 160, 170, 340 and 440 c/s. are all figures that have been suggested after serious experiment. However, "Either 170 or 340" seems to be the general feeling at present.

And now it only remains to wish you the compliments of the season, and the best of luck for the New Year—*de G3CQE*.

## Miscellany

### INCIDENTAL INFORMATION, AND ITEMS OF TOPICAL INTEREST

*(A certain amount of eavesdropping will be evident from this month's offering)*

*Heard at the Show (1):* "When I first started up, on CW, my XYL thought I was a wizard. Then, mostly to please her, I went on phone, and all she said was 'Don't you sound a self-satisfied lot?'"

— • • • —

The DX-chaser, in bed and asleep at last, was prodded by the XYL—"Darling, I think one of the children is calling." Back came the grunted reply "All right, I'll go back to her; what frequency is she on?"

— • • • —

*Heard at the Show (2):* "I never worked this chap, but I thought I'd make a test case of it. So I sent my card and one dollar to his QSL manager—and back came the QSL. Seems an easy way to increase your total, doesn't it?"

— • • • —

Old Timer to Young Timer, on 14 mc: "I find that I was licensed just twenty years before you were born, and I still haven't worked as many countries as you have. This must go to prove that one *can* live without DX!"

— • • • —

*Heard at the Show (3):* "So I can see this blue glow from his window when he's got the TV on, and when I switch on the Tx I can either put it right out or make it twice as bright. I'm trying to find out which is best . . ." (the remainder lost in chatter QRM).

*Overheard on Top Band:* "QRZ the funny noise on this frequency." (*MARS "News Letter"*)

— • • • —

"I'm off to work now, with the old mobile. But I'll only be listening, not transmitting. On these mad-house roads you take your life in your hands all the time, without holding a mike."

(*W3HQO, on 14 mc SSB*)

— • • • —

*Heard at the Show (4):* "All I've done lately is operate the rig. I'm getting so bored I'll have to wreck some part of the transmitter, so I have to tear it all to pieces and rebuild it."

— • • • —

"Thanksgiving Week should see one of the biggest cat-and-dog fights on the DX bands in this decade—A no-holds-barred, Variac-nudging, TVI-spattered, burned-Teflon, back-stabbing battle that could make other tussles of recent memory seem like child's play." (This refers to W4BPD's operation from Bouvet Island, not to an outbreak of civil war.) (*"DX Magazine," W4KVX*)

— • • • —

ZE3JO, who has the misfortune to be on an artificial leg (*see* p.83, April, 1962), recently thought he would try loading it up, standing it against the wall. Having struck neons satisfactorily, he proceeded to work ZS, ON and DL "on the leg"; his report from DL1FF, on 21 mc, was 579! His ambition is now nothing less than WAC (or even DXCC) with his

"peg-leg aerial." It is expensive (£25) but is rotary and portable, unlikely to get lost, and only needs a grease-up now and again to keep it in full radiating condition . . .

— • • • —  
 "Receivers generally in use (at the BBC receiving station, Tatsfield) are the GEC BRT-400, Hammarlund SP-600, Racal RA-17 and the RCA AR88. The Racal has facilitated checking work enormously with its magnificently accurate bandspread, but the AR88 is still highly regarded." (Cray Valley "Newsletter")

— • • • —  
 "As usual nothing turned up for the editor to edit, so the last issue failed to materialise. The editorial department is now working on a high-power arm-twisting machine—electronically controlled, of course—to extort printable material from the West Kent membership." ("QLF," West Kent)

Question: "How are you copying Bill?"  
 Answer: "Which one is Bill?"

(Heard on 21 mc SSB, by G3IDG)

— • • • —  
 On 7 mc, and sometimes on other bands, there is a station which simply sends "C" at roughly two-second intervals. More than one joker has adopted the idea of slipping in a "Q" after each "C" . . . but nobody has yet managed to emulate the peculiar chirp of the "C." Funny, and quite ineffective.

— • • • —  
 "I couldn't care less these days if I do offend people radiating atrocious signals. Some rigs should never be put on the air at all, especially the Russian SSB ones, very few of which are decent. (The few good Russian signals are in fact produced by American equipment, although the operators dare not admit it.)" (Letter from G3FPK)

### BARGAINS FOR EVERYBODY

In this issue, pp.553-560, once again we have a considerable spread of reader advertising, with many attractive items on offer at very reasonable prices. We are often told by those who use our Small Advertisement pages that they begin getting enquiries the day SHORT WAVE MAGAZINE is published—it is certain that to corner a bargain you must get in quick. This also means, of course, that if you have anything worth selling at a fair price, you can be reasonably sure of disposing of it without difficulty through Readers' Small Advertisements. The cost is only 3d. a word (minimum charge 5s.). The advertisement should be clearly set out, using accepted abbreviations, and posted with remittance to: Advertising Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

### A.W.R.A.R.S./R.S.A.R.S. MERGER

The first Amateur Radio club group having a strictly Army flavour was the Army Wireless Reserve Amateur Radio Society, formed by members of 404 Signal Squadron of the Army Emergency Reserve—whose activities we have regularly reported over the years. On the formation recently of the Royal Signals Amateur Radio Society, which covers a far wider field than the Signals groups of the A.E.R., the A.W.R.A.R.S. wisely decided to sink their identity and merge with the R.S.A.R.S. However, the original body, 404 Signal Squadron—started years ago as No. 1 Army Wireless Reserve Squadron, Royal Signals, Army Emergency Reserve, with Major D. W. Haylock, G3ADZ, as their C.O.—will retain their amateur-band callsign

GB3AWR, which will be on the air during their annual camps of a fortnight or so during each training season. It is proper to say here that Army Signals in the Amateur Radio context first gained recognition through the A.W.R.A.R.S., which in turn was inspired by G3ADZ and GW8PG. (And we hope we have got the facts right!—Editor).

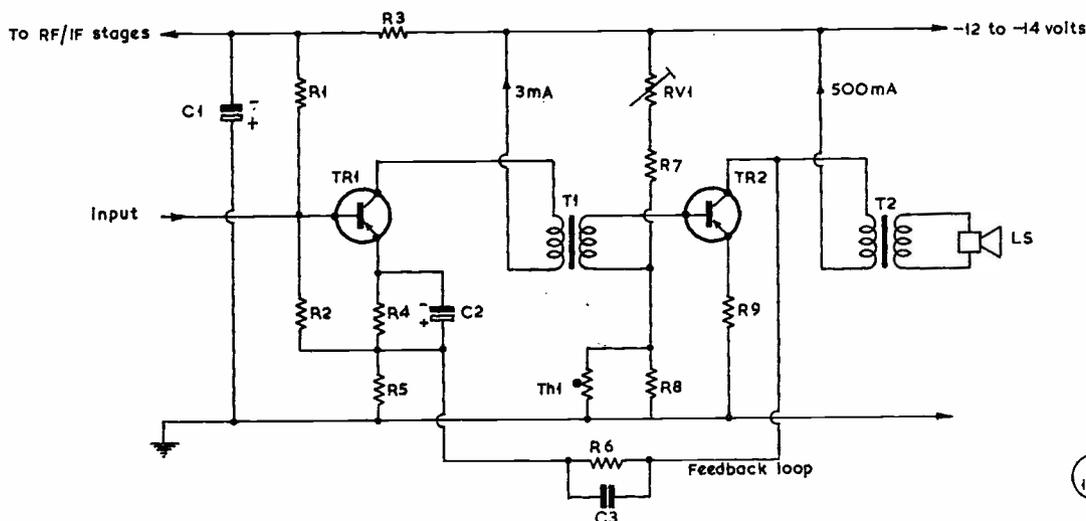
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 The concluding part of "Design for a Two-Metre Transmitter" will appear next month.

### INTERESTING SHARE OFFER

It was recently announced in the financial press that an ordinary share issue is to be made to the public by the well-known electronic component manufacturing firm of Painton & Co., Ltd., of Northampton, who do a world-wide business in the specialised field of resistor, connector, switch and moulded part production for the radio and electrical industries. It is understood that a proportion of the shares will be placed on the market during December.



A group of well-known /M's seen at the Exhibition — at left, G2HCV between G5UG and G2CDN (left foreground); far right, G3JFH, with G3ENG looking at p.468 of the November issue of "Short Wave Magazine" (in that photograph, it was G5UH who was making the presentation to G3JFH). A G3GMN print



The recommended circuit for the high-gain transistorised audio package LCR2, available from Mullards, and using their new AD140 transistor; the unit will give about 3 watts audio output. The driver is an OC82M which can follow immediately after the receiver detector stage. The value of R3 depends on the current taken by the RF/IF stages ahead of this audio arrangement. It can be seen that the AD140 is a very useful type for the modulator stage in /M equipment.

## AUDIO UNIT FOR MOBILE EQUIPMENT

### THE AD140 POWER TRANSISTOR

J. B. DANCE, M.Sc.

MULLARDS have recently introduced a new high-gain power transistor, the AD140, which is designed to meet the need for plenty of audio gain in car-radio receivers. It has good linearity and frequency characteristics and is of the alloy junction type. It can be obtained in the high-gain audio package, Mullard type LCR2, which also includes an OC82M miniature driver transistor.

The package is used as a Class-A two-stage audio amplifier in the circuit shown here. It can provide three watts of audio power when fed from the detector stage of an all-transistor receiver. The typical sensitivity of the

circuit, with respect to a one thousand ohm source, is 25 millivolts for full output.

The AD140 is appearing in some of the very latest car-radio receivers and should interest those amateurs who wish to obtain not only high audio gain from their mobile equipment, but also require a modulator unit for a 5-watt carrier.

#### TRANSFORMER SPECIFICATION

	T1	T2
Turns Ratio	16 : 1	2.9 : 1
Primary Inductance at 100 c/s	10H at 3 mA	45 mH at 500 mA
Primary Resistance (maximum)	200 ohms	1 ohm
Secondary Resistance (maximum)	1 ohm	0.3 ohm

#### LOADING OF AIR-CORE COILS

Dust-iron cores in the usual small-diameter formers common in radio work have the effect of increasing inductance, by up to twice compared with air-wound coils of the same size. Conversely, brass cores decrease the inductance, by rather more than half, compared with an air-wound coil of similar dimensions. Hence, by proper selection of slugs, you can alter the inductance of a given coil over a wide range, without touching the turns.

#### "MODIFYING THE G3BST RTTY CONVERTER"

In this article in our November issue, G3LLV draws attention to the fact that the value of R2 in Fig. 1 on p.469 should have been given as 470,000 ohms. This is the only change from the values given in the original design by G3NPF, on which G3LLV's modification is based.

#### Table of Values

##### Circuit of the Transistor Audio Unit

C1 = 100 $\mu$ F	R9 = 0.5 ohm
C2 = 500 $\mu$ F	RV1 = 250-ohm, var.
C3 = .012 $\mu$ F	T1 = Coupling xformer,
R1 = 27,000 ohms	see table
R2 = 5,600 ohms	T2 = Output xformer,
R3 = see text	see table
R4 = 470 ohms	TR1 = OC82M, Mullard
R5 = 2.2 ohms	TR2 = AD140, Mullard
R6 = 2,200 ohms	Th1 = VA1034 Ther-
R7 = 120 ohms	mistor, Mullard
R8 = 12 ohms	

# INDOOR BEAM ROTATOR

## USING GRAMOPHONE-MOTOR DRIVE

D. J. BEAN

AN aerial rotator for an indoor two-metre beam can easily be built in a short time and at little cost. The main requirement is a suitable electric motor. The one used by the writer was an old radiogram motor, complete with gear box, giving a spindle speed of 78 r.p.m., with a second output in the form of a  $\frac{3}{4}$  in. diam. gear wheel with a speed of about 18 r.p.m.; this originally drove the record-change gear, and was the drive used.

A suitable bearing was made on which to mount a 10 in. diameter plywood disc, horizontal to the wooden base. The bearing can be built up from a bolt, washer, piece of pipe and a flange, as shown in the sketch. The plywood disc is bolted to the flange and carries the beam assembly. In the original a three-element beam, also home made, was used.

The motor is mounted so that the small gear wheel runs on the edge of the plywood disc as a simple friction drive. This gives a further reduction in speed and in practice the beam rotates once in 70 secs.

As it was impracticable to make the motor reversible

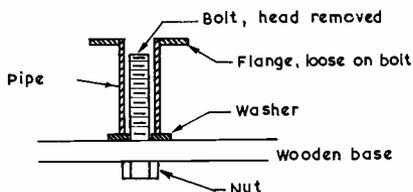


Fig. 1

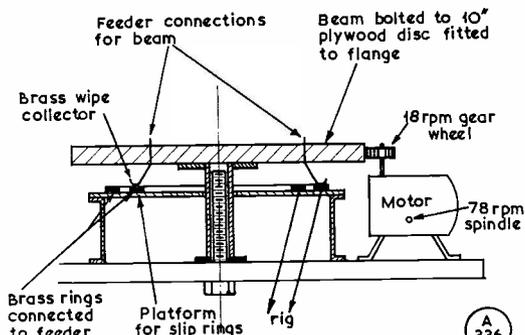


Fig. 2

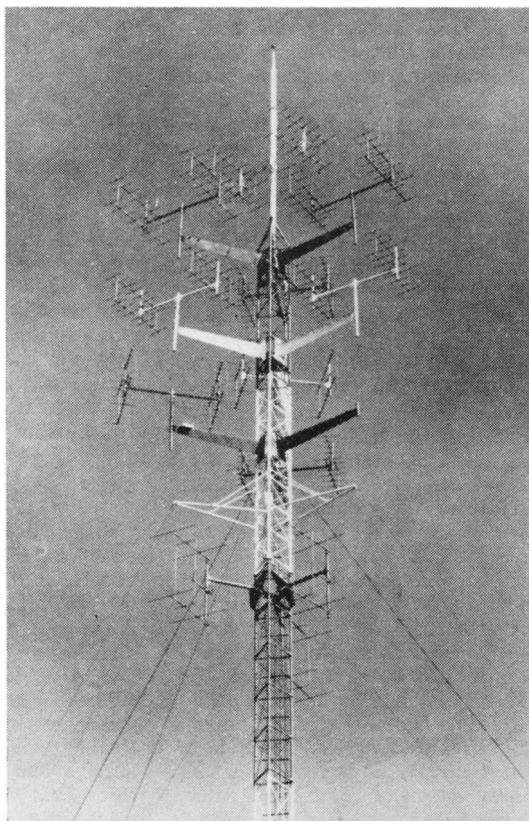
The record-change sprocket of a gramophone motor drives, by friction, a plywood disc on which an indoor two-metre beam is mounted. The feeder connections to the beam are through slip-rings, these being of brass, and concentric; contact with each slip-ring is by a springy brass collector. The feeder line is connected to the slip-rings.

a system of rings and collectors was used to carry the signal from aerial to feeder line.

Two concentric brass rings were mounted on a platform below the rotating disc, and two springy brass collectors were bolted to the disc and connected to the beam. Care should be taken to ensure a good rubbing contact between collectors and rings. The feeder itself is, of course, connected to the rings.

As the writer's indoor beam is in view it was not necessary to devise an indicator, but for a loft installation a suitable indicator could be made up using contact segments mounted round the rings and a further collector arranged to close the circuit, which would light low-voltage lamps on a suitable panel.

Owing to the difficulty of weatherproofing, this simple rotator is only suitable for indoor and loft use. Although the gear looks "home-brewed," it works perfectly, the motor being very quiet and free from interference, with no noise from the slip-rings; these should be treated with an electrical lubricant, such as the *Electrolube* preparations.



An interesting VHF aerial assembly, designed and constructed by J-Beams, Ltd. for the TV/FM relay station at Liege in Belgium. The tower is 150 ft. high and carries, for Band III, nine twin double-eight slot aeriels; three Band II double-four arrays; and two assemblies of double-eight slots for Band IV, 470-582 mc.

# VHF BANDS

A. J. DEVON

**D**URING the period now under review, the prevailing winds were such that no particular good was blown as regards VHF conditions—except perhaps for the date-area November 9-15 (when we had that delightfully cold spell) during which the glass crept up to nearly 30·5", or around 1030 mb. But however your barometer is scaled, pressure alone is only a pointer—the other signs must also be taken into consideration.

Unquestionably, the beacons remain the most reliable guide to VHF conditions. Though originally conceived as frequency markers, this has become of quite secondary importance compared with their usefulness as indicators of the state of the band. If the London-area stations can hear GB3CTC, then conditions are good from east to west over the southern part of the country; if GB3VHF is a loud signal in Lancashire, then the northern two-metre stations should be on, looking for contacts with the Home Counties and the south of England generally. The fact that GB3VHF is running *plus* or *minus* so-many cycles off the nominal frequency is of no practical importance whatever—for the reason that VHF frequency determination in the amateur context is taken from some crystal which is tied either to the markings

on its holder or is checked harmonically through a long multiplication chain. In other words, what matters is how you receive GB3VHF (or GB3CTC) provided you are far enough away from them for the average signal level to be of some significance. For stations right in the London area, GB3VHF is virtually useless and is merely QRM in an interesting part of the band when it is open for EDX—but to anyone with a two-button converter in Anglesey or Northumberland, GB3VHF is very important.

Going off on quite another tack, the tables are shown in full this time because in effect they take in what was achieved during the previous period—about 30 movements are recorded (with almost as many held for the Two-Metre All-Time, too big to include when we are tight on space). It would help your A.J.D. very much if any claim could *always* be made on a separate piece of paper, headed with callsign and table for which the entry is being put in—a vague statement in the course of a letter to the effect that "so that puts me up two more in the counties" involves a great deal of detective work as to which band and what table is meant, apart altogether from the fact that the claim itself can be missed—the point is that the exigencies of getting matter into print are such that the tabular matter and the narrative have to be dealt with quite separately—so, separate bits of paper, *please!*

Since we last met, there has been a very sad happening for the world of VHF in the U.K. Don Bradford, G3GBO (Denham, Bucks.) was killed in that shocking air accident on November 4, when a Beagle and a Chipmunk collided near White Waltham. G3GBO was a passenger in the Beagle, on a training flight for his pilot's licence, and was on home leave from East Africa, where he was employed in the Directorate of Civil Aviation. He first went out to Kenya in 1953, as a signals officer in the Police, and while in Nairobi he was a very active member of the Radio Society of

East Africa; he was responsible for the R.S.E.A.'s *QTC* and became president of that Society in 1959; his callsign out there was VQ4EV. In the amateur context, Don's chief interest was VHF; he first became known to us, many years ago, as an enthusiastic SWL correspondent to the VHF feature in the old *Short Wave Listener*, when Don himself was but a teenager. Among his contemporaries at that time (as VHF/SWL's) were those who are now well

## TWO METRES

COUNTIES WORKED SINCE  
SEPTEMBER 1, 1962

Starting Figure, 14

From Home QTH Only

Worked	Station
58	G3BA
51	EI2W, G3EDD
48	G3BNL
46	G3BOC
44	G4LU
41	G3CO
39	EI2A, G3JXN
38	G3OXD/A
37	G2AXI, G3PBV
35	G3FIJ
33	G3JWQ
31	G3OJY
29	G2BHN, G3HRH
27	G2DHV/P, G3DVQ, G3PSL
26	G3NUE, G5QA
22	G3PTO, G5UM
20	G3JHM/A, G3LQR
18	G3CKQ
17	G3NPF, G8VN
14	GW3ATM

*This annual Counties Worked Table will close on August 31, 1963. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. QSL cards or other proofs are not required when making claims. The first claim should be a list of counties with the stations worked for them. Thereafter, counties may be claimed as they accrue. Note: While new claims can be made at any time in the period from now to end-June 1963, all operators are asked to send in amended scores as often as possible, in order to keep the Table running up-to-date. After June 30, 1963, only amended scores from those already standing in the Table at that date will be accepted.*

known to us all as G3HAZ, G3HBW and G3LHA. At the time of his death, G3GBO was aged 31; he was not married, and when on home leave from Kenya, he spent his time with his family at Denham, Bucks. They will have the sincere sympathy of all who knew or will remember Don Bradford, G3GBO/VQ4EV.

Looking now at the two-metre news clip, the first letter is from EI2W, who mentions as new stations on the band EI4Q, EI6D, GI3HFA and GI3NFM, both Co. Tyrone; Harry himself is standing very well in the tables, and is keeping active. GM3LDU (Clarkston) has not been able to get on much during the year, but moves up three in the All-Time. Likewise G3DVQ (Purley) claims for the tables, and G3NPF (Southend) comes into the Annual with 17C. G5UM (Knebworth) can now show the princely total of 918 different stations worked on two metres—but of course Jack has been at it for many years.

**FOUR METRES**

**ALL-TIME COUNTIES WORKED LIST**

Starting Figure, 8  
From Home QTH Only

Worked	Station
26	G3EHY
21	G3JHM/A
22	G5FK
19	G3BNL
18	G5JU
17	G3OHH
14	G3NUE, G3OKJ
12	G3LQR, G3PJK, G5DS
9	EI2W
8	G3AYT
5	G3PTO

*This Table records Counties Worked on Four Metres, on an all-time basis. Claims can be made as for the other Tables, e.g. a list of counties with the stations worked for them, added to from time to time as more counties accrue. QSL cards or other confirmations are not required.*

Installed in a more convenient flat, G3JXN (London, N.W.8) finds he is getting out much better, using a slot-fed 6/6 at 55 ft., the gear at present being his /M rig, with a 6CW4/E88CC converter into an HRO-MX tuning 4-6 mc; a higher powered Tx is in hand. G3JXN remarks on the greatly increased level of activity in the London area—he worked 72 stations in a month, using no more than an indoor halo. G3PSL (Loughborough) has changed from a 5-ele flat-top to a 4/4 slot and, still with only the 10w., the counties-worked score stands at 31C in 6 months. GC3OBM (Guernsey) goes up one—he worked GC2TR over in Jersey. G3PBV (Wolverton) had a nasty road accident which kept him off the air during the recent openings—in fact, his skull was fractured—but he is now on again, and mentions that since starting on two metres in July of last year, he has had 892 QSO's with 311 different stations.

G8VN (Leicester) made 73 contacts in 17C for his first claim for the Annual, and—having spent a little time on our recent MDT on Top Band—thinks that a similar test period on two metres, CW only, might be a good thing. So do we, and in fact have had it in mind for a trial in February, running a couple of hours on a Sunday morning, and another similar period the following Saturday evening—just to see what happens. In the meantime, those who may have other ideas about this might like to let us know their views, remembering that it will be CW-only, and not a contest.

G3GVV (Haywards Heath, Sx.) remarks that “generally, it has been a bleak period,” but he did raise F2XO and ON4KJ. And he says “if only more people would use CW. . . !” Well, we can see how much interest there is in key-work when the February tests come up.

Still right on the ball down there in Penzance, G3OJY has got his 8/8 back up again, and is running a regular sked with G3BW (Whitehaven, Cumb.); stations recently heard and called include G2JF and G6NB, the GDY worked being GI3FJA and

**SEVENTY CENTIMETRES**

**ALL-TIME COUNTIES WORKED**

Starting Figure, 4

Worked	Station
39	G2XV
35	G2CIW
33	G3JHM/A, G3JMA, G6NF
32	GW3ATM
31	G3JWQ, G5YV
30	G3KEQ, G3KPT
28	G3HAZ, G3HBW, G3LHA, G3NNG
26	GW2ADZ
24	G3LTF
23	G3BKQ, G6NB
21	G3IOO
20	G3LQR
18	G5UM
17	G3BA, G3MPS
16	G2DDD, G3MED
15	G2OI, G4RO
14	G2HDZ, G3FAN
13	EI2W, G6XA
12	G5BD
11	G3AYC, G3BYY
10	G3HWR, G3IRW, G5DS
9	G3BNL, G3NJO/T, G5QA
7	G2HDY, G3JHM, G3OBD/P
6	G3FIJ, G3KHA, G3WW
5	G3FUL, G3IRA, G3IUD, G3LTN, G5ML
4	G3EKP, G3JGY

*On working four Counties or more on the 70-Centimetre band, a list showing stations and counties should be sent in for this Table, and thereafter new counties worked notified as they accrue*

GI5AJ. G3OHC (Birmingham, 18) claims for his firm's club station G3OXD/A (Rowley Regis, Staffs.), where they are nearly 900 ft. a.s.l. with a good take-off in all directions; the G3OXD/A gear consists of a QV06-40 PA running 90w. on phone and 120w. on CW, with as Rx a 6CW4 pre-amp. into a cascode converter and a CR-100 tuning 4-6 mc; the beam is a slot-fed 7/7. The total of different stations worked from G3OXD/A (ops. G3NZS, G3OHC and G3PXZ) is 194, so they are doing

well. G3OHC says they are all keen on VHF and intend to get gear going for 4 metres, 70 centimetres and 23 centimetres by the summer.

G3CO (Dartford) has found things quiet since the October burst; however, stations new to the band are appearing regularly, so there is usually somebody to work. G2AXI (Basingstoke), in claiming 37C for the Annual, says that all his contacts have been made using NBFM, with the PA running 100w. in a parallel-line tank circuit; he is now experimenting with FM discriminators. Arnold, G3HBW (Bushey, Herts.) is able to add eight more for the All-Time, six of them being GM counties which accrued by reason of the operations of GM3IUB/P.

A batch of reports on 70 cm. activity includes letters from G3LTN (Weyhill, Hants.) who gets into the table with 5C, his best DX so far being G3LQR for Essex. G3PBV is making ready for 430 mc, and will give Bucks. G5UM is getting on well, and has now worked 77S on 430 mc—which might surprise some people. From down Exeter way, G5QA reports G3KFD (Staffs.) and

G3LHA (Warks.) worked for additional counties; Herbert has a new PA for 70 cm., consisting of a QV03-20A taking 28 watts. G3NJO/T (Hoxne, Suffolk) is able to claim G2FNW for a new county, and explains that though his postal address is "Diss, Norfolk," the QTH is actually in Suffolk. For the 70-centimetre contest in October, G3OBD went /P near Swanage, Dorset, and raised 11 stations in five counties; the gear consisted of a QV03-20A tripling to drive another as PA to 12w. input, the beam being a 16-ele stack; his Rx is an A.2521 RF stage with the xtal mixer, into an HRO. From away up in Newcastle, G3BIK reports 70-cm. contacts with a number of stations, including GM3FYB, but his best DX is G3LTF; a local on the band is G2BDQ. G3LHA (Coventry) sums up his contest impressions as "Activity good; Conditions excellent; Receivers poor"—and has some hard things to say about London-area stations who were getting out well, but were apparently unable to receive; G3LHA himself worked 30 stations, and heard about 20 others who failed to respond. G3EKP (Blackburn) is on regularly, and keeps a nightly sked with G2OI (Eccles) who himself says that he would welcome more schedule arrangements (*QTHR*). Jack, G2CIW (Birmingham) is creeping up in the 70-Cm. All-Time, and is well out in front in the Annual; for the contest, he worked 40S, including EI2W; the latter was only on for a short time, but Harry raised seven GDX stations.

Now as regards four metres; G3PTO (Wolverhampton), with G3GJQ, will be in Shropshire over December 8-15, working CW only and looking for contacts and skeds (*QTHR*). The Manchester group keep 4m. activity going, and G3PJK, who has now worked 32 different stations on the band, remarks that "the Sunday morning QRM is quite something." For Lincoln, G3OSB is on, with a better beam, and has heard or worked quite a lot—he would like Sunday-morning skeds (*QTHR*).

## TWO METRES COUNTRIES WORKED

Starting Figure, 8

- 20 G3HBW (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP)
- 19 G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OK, ON, OZ, PA, SM, SP)
- 19 G3CCH (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, OE, OH, OK, ON, OZ, PA, SM, SP)
- 18 G3LTF, G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP), ON4BZ
- 16 G3GHO, G3KEO, G5MA, G6RH, G6XM, PA0FB
- 15 G2XV, G3AYC, G3FZL, G4MW, GM3EGW
- 14 G2CIW, G2FJR, G2HDZ, G3BLP, G3FAN, G3HAZ, G3IOO, G3JWQ, G3KPT, G3WS, G5BD, G6LI, G8OU, OK2VCG
- 13 G2HIF, G2HOP, G3BA, G3CO, G3DKF, G3DMU, G3DVK, G3GPT, G3NNG, G5DS, G6XX, G8VZ
- 12 EI2W, F8MX, G3EHY, G3GFD, G3GHI, G3JAM, G3OBD, G3PBV, G3WW, G5CP, G5ML, G8DR, GW2HIY
- 11 G2AJ, G2CZS, G3ABA, G3BDQ, G3GSO, G3HRH, G3IUD, G3JZN, G3KUH, G3LHA, G4RO, G4SA, G5UD, G6XA, OK1VR
- 10 G2AHP, G2AXI, G2FQP, G3BK, G3BNC, G3DLU, G3GSE, G3KQF, G3LAR, G3MED, G3OSA, G5MR, G5TN, G8IC, GC2FZC, GW3ATM, GW5MQ
- 9 G2BHN, G2DHY, G2DVD, G2FCL, G3BOC, G3BY, G3FIJ, G3FUR, G3JHN/A, G3JLA, G3LTN, G4LX, G5UM, G8GP, GC3EBK, GM3DIQ, GW3MFY
- 8 EI2A, G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKK, G3GBO, G3HCU, G3HWJ, G3JXN, G3KHA, G3MPS, G3OHD, G3OJY, G3OXD/A, G3VM, G5BM, G5BY, G8SB

## Conclusion

Once again, it is for your A.J.D. to offer all who follow the VHF trail his good wishes for the season of the year, and his thanks for their support to those many readers who keep him up to the mark with their VHF news, views and comments. This feature would be as nothing without them. For our next meeting, in the New Year, the closing date must be **Monday, December 17**—by which time the mails will be running late and we shall all (or most of us) be getting immersed in the Christmas schemozzle. But such is the inexorable pressure of the deadline and the calendar that for your A.J.D. it means work as usual. (Well, he had the Christmas before last off and a week's leave earlier in the year, so what's he complaining about!—Editor.)

## 70 CENTIMETRES

### COUNTIES WORKED SINCE

SEPTEMBER 1, 1962

Starting Figure 4

From Home QTH Only

Worked	Station
26	G2CIW
18	G3KPT
14	G3BNL
13	G3LHA
9	G3LQR, G5UM
7	G5QA
6	G3BIK

This Annual Counties Worked Table is reckoned from September 1st, 1962 and will close on August 31st, 1963. All operators who work four or more Counties on the 70-centimetre (430 mc) band are eligible for entry. Counties should be claimed as they accrue, and otherwise the rules are as for the Two-Metre Annual Table.

# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Special Note: No Club Reports for Next Month — MCC Results only)

THE Seventeenth "MCC" was undoubtedly a huge success. These words are, of course, being written before any of the logs have arrived, but monitoring of the Top Band suggested that there may well have been as many as 100 Club stations taking part. Identification numbers up to the 120's were issued, and these went only to clubs which have been regular supporters of MCC in the past, or who applied for a number to be allocated to them this year . . . so we are sure that the entry was very large.

The cutting down of the operating times to one week-end obviously increased the pace of the Contest, and all stations apparently found that they were quite hard-pressed if they were to have a chance of working all the other participating Clubs within the three hours of each session.

Next month we shall be presenting the usual full report on MCC, which will occupy the whole of the available space; therefore all secretaries and scribes are asked to note that *we cannot accept routine reports at all for the January issue*. See panel p.547 for the next deadline.

Finally, a very Merry Christmas and a Happy and Prosperous New Year to all Club Secretaries, Scribes and members. May 1963 be a really successful year for *your* club!

## ACTIVITY REPORTS

These amount to something of a numerical record this month, so brevity must be the key-note. **ARMS** enrolled 73 new members at the Show, and now describe their society as international, since 15 per cent of the members come from outside the U.K. A lot of very interesting mobile gear was on show, and the safety angle was accentuated by the display and sale of ARMS's own first-aid kit.

**Burton-upon-Trent** are now running R.A.E. lectures on the first Wednesday of each month; recent events have included a Junk Sale, the Constructors Cup Competition and the Annual Dinner; next meeting, December 12, when a Film Programme will be shown. **Crawley** will have their third AGM on December 21 (West Green Centre, Crawley), and the judging of their Construction Contest will be held on January 3; the normal monthly meeting will be on January 23.

**Harrow** gather every Friday, 8 p.m. at Roxeth Manor Secondary School, Eastcote Lane. Talks, junk sales and film shows are held on alternate Fridays, with the practical nights and slow Morse classes on the intervening days. **Reigate** hold their Construction Contest on December 15, and the entries will

be judged by neutral representatives from the Crawley and Dorking clubs. The fourth AGM will take place on January 19 (The Tower, Redhill) and the Annual Dinner is arranged for January 26 at The Mill House, Salfords.

**Roding Boys' Radio Society** reports that membership is increasing, and film shows and practical work will now be arranged; lectures on radio theory will also have their part in the programme; meetings every Tuesday, 7.30 p.m. in Wanstead House. **South Manchester** have completed their move to the Rackhouse Community Association, Daine Avenue, Northenden, and meet there every Friday at 7.45 p.m. December 7 is the date for the Junk Sale; on the 14th, Uses of Oscilloscope; on the 21st, Activity Night and slow Morse; and on January 4 or 18, Closed-Circuit Television.

The **Midland Radio Contest Club** is an entirely new kind of club (for this country) whose aim is "to take part in all National and Worldwide Contests, both phone and CW; possible organisation of mobile contests (not rallies); the organisation of DX-peditions, U.K. and abroad." Negotiations for a club licence are under way; eleven keen founder-members form the basis of the club; and, most important, they have a permanent meeting-place, accessible by day or night, which is "a marvellous site from the radio point of view." Regular meetings will be held on the first Friday of every month, but members will have access to the premises at any time.

Having held its AGM—with Cdr. J. Pegler, R.N. (G3ENI) elected chairman for 1963—the **Royal Naval Amateur Radio Society**, with Hq. at H.M.S. *Mercury*, Petersfield, and G3BZU regularly on the air, is all set for a busy and productive season. Membership of the R.N.A.R.S. is open to all past and serving members of the Royal Navy and its auxiliary services, Admiralty civilians, and the Navies of the Commonwealth. Full details can be obtained from the Hon. Secretary, R.N.A.R.S., at *Mercury*.

**Clifton** recently discussed the rules for their club contests, and decided to make several changes for 1963; they meet for the annual Constructional Contest on December 14. **Cray Valley** recently heard a talk on AVO meters and equipment; next meeting will be on January 3, when G3FWI will give Part II of Audio Problems in the TV Studio.

**Derby** will hold a meeting which few other clubs could emulate, on December 12—the subject is "The Club in Retrospect—1911-1961"; in addition, slides of 1962 activities will be shown, and members are

invited to bring along any of their own. On the 19th they hold their Christmas Party, and on January 2 a Junk Sale will take place.

**Dudley** recently had their first AGM and elected G3MHS president, G3PWJ secretary and G3OMY treasurer; they gather on Fridays at the Priory Hall; note new secretary's QTH, in panel. The Christmas Dinner and Social will be held on December 21 at the Britannia Inn, Upper Gornal, 7.30 p.m. **Guildford** are running their Christmas meeting and dinner (at the Corona Café) on December 14. **Isle of Wight** report that they have changed their meeting place, which is now Wootton Holiday Camp, Church Road, Wootton. Within the next few weeks they hope to be on the air from this site with their own Club Tx.

**Lothians** will be hearing a tape-recorded lecture on Worldwide Telecommunications (by G8PP) on December 13; on the 27th they will hold a social. On January 10, the talk is on Machine Tool Control, and on January 24, there is a Film Show. Meetings are on the second and fourth Thursdays at the YMCA, 14 South St. Andrew Street, Edinburgh 2.

**Melton Mowbray**, who meet in the St. John

Ambulance Hall, Asfordby Hill, will be hearing about Transistors from G3FXP on December 20. Their next meeting, on January 10, will be a visit to the station of R. Winters at 245 Asfordby Road—callsign not mentioned. **Midland** are holding an Auction of Members' Surplus Gear on December 18—7.30 p.m. at the Birmingham and Midland Institute, Paradise Street, Birmingham.

**Norfolk** report another successful month with lectures and instruction by club members and a considerable amount of on-the-air activity using their own Club call, G3PXT. **Northern Heights** will hold their Annual Dinner on December 12; an Open Night on December 19; and a talk by a member of the Halifax Fire Brigade on January 2, with special reference to Fire Precautions in the Shack.

**Acton, Brentford & Chiswick** will be showing a collection of transparencies covering field days and other activities at their next meeting, on December 18 at the AEU Club, 66 High Road, Chiswick, 7.30 p.m. **Barnsley** will be at the King George Hotel, Peel Street, on December 14 to hear about Receiver Construction, from Mr. W. W. Williams; this is their

*Names and Addresses of Club Secretaries reporting in this issue :*

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, W.3.  
A.R.M.S.: N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.  
BARNET: F. Green, G3GMY, 48 Borough Way, Potters Bar.  
BARNESLEY: P. Carbutt, G2AFV, 19 Warner Road, Barnsley.  
BRIDLINGTON: P. O. Cartwright, G3POC, 55 Hermitage Road, Bridlington.  
BURSLEM: W. Luscott, 36 Rothsay Avenue, Sneyd Green, Hanley, Stoke-on-Trent.  
BURTON-UPON-TRENT: H. Harrison, G3ACR, 38 Baker Street, Burton-upon-Trent.  
BURY: C. Turner, G8NL, 56 Sunny Power, Tottington, Bury.  
CHESHAM: Capt. C. G. Stephenson, G3CLJ, 21 Lynton Road, Chesham.  
CHILTERN: H. D. Coltman, G3PVJ, 301 Micklefield Road, High Wycombe.  
CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley, Surrey.  
CLIFTON: E. Godsmark, G3IWL, 211 Manwood Road, London, S.E.4.  
COVENTRY: A. J. Wilkes, G3PQQ, 141 Overslade Crescent, Coundon, Coventry.  
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.  
CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.  
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.  
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.  
DUDLEY: R. W. Fisher, G3PWJ, 63 Swan Crescent, Langley, Oldbury, Worcs.  
ENFIELD: R. Langston, 54 Poynter Road, Bush Hill Park, Enfield.  
GRIMSBY: B. Walster, 47 Richard Street, Grimsby.  
GUILDFORD: D. Hobden, 121 Great Goodwin Drive, Guildford.  
HARROW: A. C. W. Biddell, G3GNM, 114 Kingshill Avenue, Kenton.  
HASTINGS: W. E. Thompson, G3MQT, 8 Coventry Road, St. Leonards-on-Sea.  
ISLE OF WIGHT: J. Smith, 7 Browlow Road, Lake, Sandown.  
KINGSTON: A. G. Wheeler, G3RHF, 22 Meadow Road, Ashford, Middx.  
LOTHIANS: W. T. Sutherland, GM3JWS, 47 Great King Street, Edinburgh 3.  
LOUGHBOROUGH: J. S. Davis, 12 Avondale Road, Loughborough.  
MELTON MOWBRAY: D. W. Lilley, G3FDF, 23 Melton Road, Asfordby Hill, Melton Mowbray.  
MIDLAND: C. J. Haycock, G3JDJ, 29a Wellington Road, Birmingham 20.

MIDLAND RADIO CONTEST CLUB: J. Lockyer, G3OVA, 153 Ivor Road, Birmingham 11.  
MITCHAM: B. Blandford, 1 Biggin Avenue, Mitcham.  
NEWARK: J. R. Clayton, 160 Wolsey Road, Newark.  
NORFOLK: J. D. Simpson, G3NJQ, 50 Vicarage Road, Norwich.  
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.  
NORTH KENT: B. J. Reynolds, G3ONR, 49 Station Road, Crayford.  
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.  
PORTSMOUTH: T. R. Mortimer, G3JZV, 72 Whitworth Road, Copnor, Portsmouth.  
PLYMOUTH: R. Hooper, 2 Chestnut Road, Peverell, Plymouth.  
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.  
R.A.I.B.C.: Mrs. F. E. Woolley, G3LWY, 10 Sturton Road, Saxilby, Lincoln.  
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.  
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.  
RODING BOYS: S. Wright, 10 Newton Road, London, E.15.  
R.N.A.R.S.: Hon. Secretary, H.M.S. *Mercury*, Leydene, Petersfield, Hants.  
SLADE: D. D. S. Williams, 117 The Boulevard, Wyld Green, Sutton Coldfield.  
SOUTH BIRMINGHAM: T. W. Legg, Flat 3, 80 Alcester Road, Birmingham 13.  
SOUTHGATE: R. W. Howe, G3PLB, 162 Victoria Road, London, N.22.  
SOUTH HANTS: P. A. L. Shoosmith, G3MDH, 7 Fairfield Close, Hythe, Southampton.  
SOUTH LONDON MOBILE CLUB: B. Negri, G3LXN, 17 Voltaire Road, London, S.W.4.  
SOUTH MANCHESTER: M. Barnsley, G3HZM, 11 Cemetery Road, Denton, Manchester.  
SPEN VALLEY: L. A. Metcalfe, la Moorlands Road, Birkenshaw (*acting*).  
STRATFORD-UPON-AVON: P. Robinson, G3MGJ, 43 Loxley Road, Stratford-upon-Avon.  
SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.  
W.A.M.R.A.C.: Rev. A. Shepherd, G3NGF, 121 Main Street, Asfordby, Melton Mowbray.  
WESSEX: G. J. Fowle, 138 Surrey Road, Branksome, Poole, Dorset.  
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral.  
WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.  
WOLVERHAMPTON: J. Rickwood, G3JJR, 738 Stafford Road, Fordhouses, Wolverhampton.  
YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.

last meeting of the year, and the 1962 syllabus should be ready by then.

**Burslem** get together on December 19, at the Town Hall, 7.30 p.m. Recent meetings have included a talk on the Harvey UHX-10 transmitter, by G3UD, and a film lecture on Memories of the Trentham Mobile Rally, by G3MGG. **Bury** held a dinner instead of their normal October meeting; on December 11 they have a Junk Sale at which the surplus gear of G2CDB, who has left the district, will be auctioned. G3PVG is running an R.A.E. course at Bury Technical College, every Friday at 7.30 p.m. in classroom B3.

**Chesham** have stepped up their already vigorous training programme, and now run Morse classes every Tuesday (7.30-10 p.m.), together with Basic Electricity and Magnetism, and Practical Construction. On Fridays (7.30-9.30 p.m.) the R.A.E. Theory lectures are given; and Practical Operating is under way on Sundays at 10.30 a.m. This enterprising policy is vindicated by a 600 per cent. increase in membership over the past year, and the use of five rooms in the Club headquarters, where only one was necessary a year ago.

**Chiltern** normally meet on the last Thursday of the month (on November 29 the subject was Amateur Closed-Circuit TV), but the December meeting will be on the 13th and will involve "the true Christmas spirit." British Legion, St. Mary Street, High Wycombe, at 8 p.m.

**Civil Service** continue their enthusiastic operation of GB2SM, and the station was kept on the air for the whole of the CQ Worldwide DX Contest (phone section) by members. A separate club station was set up for MCC. Visits have been arranged to London Airport, the PLA radio station, ITV Studios at Denham, the Ford works at Dagenham and other places. The only December meeting after publication date is on the 18th for a Christmas party and "general festivities." On January 1 there will be a lecture-demonstration on Hi-Fi and Stereo by Messrs. Lowther Acoustic.

**Plymouth**, who recently held the competition for the Ernie Hilyard Trophy, awarded it to Colin James for his RTTY Converter. Second was John Fallon with a Stereo Amplifier and third was E. Fallon with a GDO. On December 9 the club will be paying a visit to their neighbours at Torbay for the latter's Open Night; a Dinner and Social Evening will be held in Plymouth on January 19, and it is hoped that some of the less active members and their friends will attend on this occasion.

**Purley**, meeting on December 7, describe the gathering as "Here and There"; there will be no



Neat Hq. station of the Royal Naval Amateur Radio Society, G3BZU, at H.M.S. "Mercury," near Petersfield, Hants. Equipment consists of a K.W. Viceroy SSB transmitter with matching Linear PA (these being the two items on the left), a Racal RA-17 receiver, a BC-221 frequency meter, and all the necessary ancillaries. The main operating schedule is 1230-1315 and after 1830 daily on 3720 kc, and Wednesdays are devoted to DX on 14 mc. AM/CW/SSB can be worked in the appropriate section of any HF band, and contacts are looked for with AT station operators interested in the Royal Navy.

meeting on December 21, but on January 4 they hope to organise an evening of Constructional Hints. **Reading**, having heard about Transistors for VHF and UHF (G3NNG) on November 24, will have a talk on Transistor Rx and Tx for 160 metres (G3OLA) on December 29; their AGM is booked for January 26. All meetings at The Palmer Hall, West Street.

**Slade** announce an evening of "Fun and Games" for December 14; on the 28th they return to serious business with a talk on Radio Fundamentals (Part IV) by G3JZF. Their normal Wednesday meetings will, as always, include informal discussions, Morse classes, and operation of the Club Tx, G3JBN. The **South London Mobile Club**, meeting at Clapham Manor Baths, S.W.4, at fortnightly intervals, had a talk on Two Metres (G3MNR) for their December 1 meeting. On the 15th there will be a Film Show, with the usual ragchew to follow.

**Spenn Valley** have only one meeting during December, when they hold a Film Show on the 13th; January 12 (Saturday) is booked for their Annual Dinner, at the Park Café, Batley. **Stratford-upon-Avon** continue their series of talks on The Use of Valves; G3OOQ will deal with Detectors on December 14, and Norman Smith with Frequency-Changers on the 21st. No meeting on the 28th.

**Surrey** (Croydon) break new ground with a lecture on Lasers and Masers, by Dr. J. Walling, Ph.D., B.Sc., of Mullard Research Laboratories, on December 11. This will be at 7.45 p.m. at the Blacksmiths Arms, South End, Croydon. **Torbay** move to their new location with the December meeting, which will be on the 15th. Thereafter they will meet on the

#### CLUB SECRETARIES—PLEASE NOTE

As in previous years, the entire "Clubs" space in the January issue will be taken up by our detailed report on MCC—the recent Magazine Club Contest. The normal reporting of Club activities will be resumed in the February issue, for which the closing date is January 11, 1963.

second Saturday of the month, at the Club Hq., Belgrave Road, Torquay, and not at the Y.M.C.A.

**West Kent** are holding an Equipment Demonstration on December 14, at which "some devices recently built by members will be encouraged to work"; on January 11, G4IB will talk about HF-Band Transmitters; both meetings at the Kent County Council Adult Centre, Culverden House.

**WAMRAC** report a successful "Wamfest" and have arranged two projects for the future—a WAMRAC Activity Week-End (May 24-26) and the operation of an exhibition station (GB3MYA) at the Methodist Midlands Youth Association in Peterborough (June 28-30).

**Yeovil** is another Club reporting a change of headquarters—henceforth they will meet at Park Lodge, The Park, and not at the British Legion; their station, G3CMH, will be installed there, and meetings will take place as usual—7.30 p.m. on Wednesdays. **Crystal Palace** had two speakers for their November meeting—G3LUB on the G2DAF Receiver, and G3COX on Aerials, masts, fittings and supports. December 18 is the day for their Junk Sale and Christmas Supper. There is an attempt to form a club in the **Dereham** area of Norfolk, and readers in that district are asked to get into touch with Mr. H. Gray at Eleven, Swanton Drive, East Dereham; some support from a transmitting amateur would be particularly welcome.

**Loughborough** held their AGM in October—note change of secretary's QTH, in panel; recent happenings have included a VHF talk by G3PSL, a visit to the Show, and the operation of a Jamboree station, GB3RAL, for which the QSL's will be sent out as soon as they are received from the printers.

**Mitcham** heard G8TB on Transistors at their November meeting; on December 14 they hold their special Christmas meeting, with a draw and the judging of the Constructional Contest, also the award of other society trophies. **Peterborough** held their AGM and elected Mr. S. Hunting president, G3HXR

#### CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of the following Club publications: **Cray Valley** (Newsletter, October); **Crystal Palace** (Newsletter, No. 84); **Dudley** (Local Oscillator, November); **Guildford** (Natter, November); **North Kent** (Newsletter, No. 61); **Purley** (Splatter, November); **Slade** (Contact, October); **Southgate** (Newsletter, November); **WAMRAC** (Circular Letter, No. 24); **Mitcham** (Newsletter, November); **RAIBC** (Radial, November); **Coventry** (News Letter, November); **South Birmingham** (QSP, November); **Reigate** (Feedback, October); **Enfield** (Lea Valley Reflector, November); **Surrey** (SRCC News, November); **Wolverhampton** (Newsletter, November); **Wirral** (News Letter, Vol. 16, No. 1); and **ARMS** (Mobile News, October, 1962).

chairman and G3KPO secretary. **Portsmouth** will be putting G3DIT on the air every Wednesday evening from the Twyford Community Centre, where they meet nowadays; the HF bands and One-Sixty will be covered.

**Barnet**, at two recent meetings, have heard G2FUX on his recent trip to the U.S.A., and G3AAE on the subject of Propagation. December 22 is fixed for their Christmas Party—at Hadley Memorial Hall, Hadley Highstone; tickets may be obtained from G3LXP. Normal meetings are at the Red Lion Hotel on the last Tuesday of the month (except December).

**Coventry** meet at 8 p.m. every Monday at their new headquarters in Little Farm Buildings, Littlethorpe, St. James Lane, Willenhall. They have just bought a new 150-watt Tx, which is being installed. Note new secretary's QTH, in panel. **Kingston** elected G3RHF secretary in succession to G3GVU, who has retired from the post after 13 years' sterling service. On December 13 they meet for a Junk Sale—at the Y.M.C.A., Eden Street, 8 p.m. All are welcome. **South Birmingham** also have a Junk Sale coming up, but on December 20; on Christmas Day they will hold their usual Top-Band net at 1100 GMT.

**South Hants**, at their November meeting, heard from G3GOY on The Use of Beats in Music, and from G3ION on The Noise of Jet Aircraft; December 8 is booked for G3NAE on SSB, and January 12 for a showing of films of 1962 activities; the latter will be in the Engineering Lecture Theatre of Southampton University, 7 p.m.—members and XYL's invited.

**Hastings** meet on December 18, when G3MQT will talk about "Chassis-Bashing in Aluminium." The programme for January onwards will be based on members' requests, taken in a poll at the recent AGM. **Bridlington** have moved into new premises in North Street and meet every Wednesday. They hope the improved facilities will attract more members. **Newark** are holding a Social on December 19 at the Robin Hood Hotel, when G8ON, from Worksop, will talk on Aerials.



The Northern Heights group laid on a station for the recent Jamboree-on-the-Air. Here we see some of the visiting Scouts, with G3OMM (Mrs. Mary Shaw) in charge. As usual, she was busy rigging the G3MVH aerials as well as supervising the operating.

**Wirral** have a Discussion Night on December 19; Radio Maths Part II on January 2, and G3LIS on TVI and BCI on January 16; the club QTH is now at Harding House, Park Road West, Birkenhead.

**Wolverhampton** will hold an R.A.E. class on December 10; on the 17th, Part II of SSB Techniques, by G3KFD; and on January 7 they have their New Year Party, at the Rose and Crown, Penn Road, Wolverhampton.

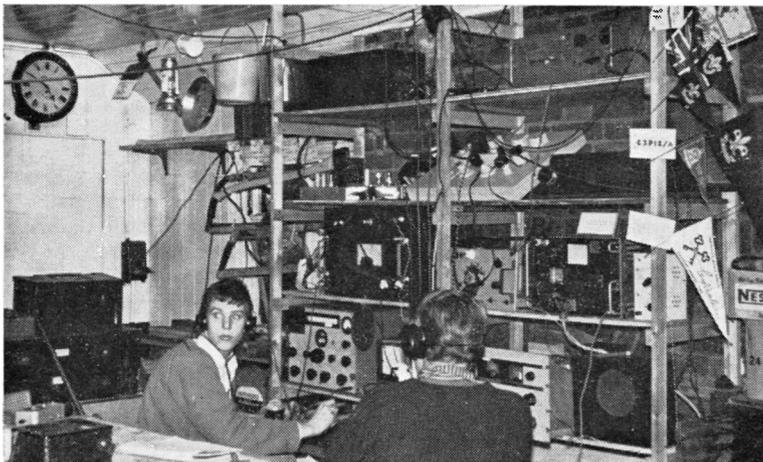
### SCOUT RADIO JAMBOREE October 20-21, 1962

In spite of generally poor conditions, many DX contacts were made between the 70 Scout stations on the air in the U.K. and similar stations in some 20 other countries. One of the most successful was GB2OLT (operated for the 1st Olton Scouts, Solihull) with a total of 34 overseas Scout stations worked, including VE7AM, also on the air for the occasion. The world Hq. station, VE3WSB in Ottawa, proved difficult to raise due to the pile-up on their 15-20m. channels. The W/VE's tended to spend most of the time working one another, but many Scout contacts were made between the U.K. and the American continent. The Iranian Scout Club station passed personal greetings from the Shah—and, conversely, some U.K. operators were called upon to explain to their Russian contacts not only what it was all about, but "what is meant by Scouts"!

For the U.K., the central station was GB3BPH, consisting of four complete amateur-band installations in the foyer of Baden-Powell House, Kensington, London, with G2CAJ in charge as chief operator. GB3BPH made 71 Scout-station contacts during the Jamboree period.

Other British stations participating in the Scout interest were: G3FUW (6th Hinckley Scouts); G3IKV (21st Barrow-in-Furness); G3JFW (3rd Hucknall); G3MBP (73rd Portsmouth); G3MVH (Halifax District Scouts); G3OGT with G3OHB (1st Madren, Penzance); G3PAW (Newark School troop); G3PXT (35th Norwich Sea Scouts); GB3BYW (41st Epping Forest); GB3HAR (Ilford East); GB3MSH (1st Morden); GB3RES (1st Royal Eltham); GW3IDJ (16th Cardiff); GW3KGD (1st Milford Haven) and GW3LXI (Pembroke groups).

Numerous Scout-group stations in Canada, U.S.A. and various European countries also took part, and the Commonwealth was well represented. This 5th Scout Jamboree-on-the-Air was probably the most successful yet in terms of international interest and support. We are informed that Participation Certificates are available from the U.K. Organiser: L. R. Mitchell, G3BHK, Katoomba, Tyneham Close.



Another station for the Scout Jamboree, October 20-21, was G3OJE/A, installed at the Scout Camp, Chalfont Heights, Bucks., with G3RDQ (left) and G3PIZ at the operating position. Many club groups up and down the country co-operated in making the Jamboree a success, one objective being to introduce Scouts to Amateur Radio as it is practised.

Sandford, Wareham, Dorset, for the price of a (large) s.a.e.—and we feel sure that one of these will go to SWL G. Phillips, of Salcombe, Devon, one of Britain's oldest scouts (he joined in 1912) who always monitors the event and sends in a meticulous check-log, every year.

### SECRETS REVEALED AT HARWELL

The A.E.R.E. (Harwell) Amateur Radio Club held a by-invitation meeting on November 18 at the Atomic Energy Research Establishment. Twenty-five guests of members, including a contingent from the Midland Amateur Radio Society, were shown round some of the research installations. These included the reactor BEPO; equipment for remote handling of radio-active materials; the thermo-nuclear experiment ZETA; and the 7,000 MeV proton synchrotron under construction in the Rutherford Laboratory. Tea was provided by members' ladies, and it was nearly 7.0 p.m. before the gathering dispersed, after a most interesting and much-appreciated visit. Membership of the Club, which operates its own station G3PIA, is open to any interested resident in the area on application to: C. Sharpe, G2HIF, hon. secretary, Harwell Amateur Radio Club, 20 Harcourt Road, Wantage, Berks.

### LOOKING WELL AHEAD

Mobile Rally organisers who may be turning over their plans for next year's Rally season might like to note that Sunday, August 18, 1963 is already booked—by the Derby & District Amateur Radio Society, for their well-known annual event. We shall be glad to record firm dates as far ahead as possible, for the convenience of all Rally organisers. During the past Mobile Rally season, there were several clashing dates that could well have been avoided.

# NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the U.K. section of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

- DL2BH**, W. Booth (G3RKD), Recce Sqn., R.A.C., B.F.P.O.16.
- G3PQT**, Mrs. P. Jones, 18 Mayhew Road, Irby, Heswall, Wirral, Cheshire.
- GW3PSM**, C. J. Thomas, (MP4BDK/MP4MAL/MP4QAU/MP4TAP/5BACT), 59 Maendy Way, West Pontnewydd, Cwmbran, Mon.
- G3PVS**, D. J. Hawkins, 17 Priory Close, Woodham Lane, Woking, Surrey.
- G3PVT**, K. Field, 4 Minworth Road, Water Orton, Birmingham.
- G3PYU**, P. Jones, 18 Mayhew Road, Irby, Heswall, Wirral, Cheshire.
- G3RBB**, R. B. Boughton, 11 Chaucer Way, Daventry, Northants.
- G3RBS**, W. S. G. Cowl, Mulfra, Vicarage Road, St. Agnes, Cornwall.
- G3RCY**, D. M. Norman, 44 Allingham Road, South Park, Reigate, Surrey.
- G3REO**, Dr. S. Darbishire, Little Arrow, Coniston, Lancs.
- G3RFC**, L. Ogden, 14 Westminster Avenue, Reddish, Stockport, Cheshire.
- G3RFQ**, A. J. Nadauld, 7 Dawes Road, Fulham, London, S.W.6.
- G3RFS**, N. E. Bethune, 98 Ridgeway Avenue, East Barnet, Herts. (Tel.: BAR 9421).
- G3RGB**, A. Moon, 6 Troon Close, Saltersgill Estate, Middlesbrough, Yorkshire.
- G3RGN**, L. Binns, 30 Stonefield Street, Moorside, Cleckheaton, Yorkshire.
- GW3RHC**, B. Vowles, 1 Star Row, Cwmgwrach, Neath, Glam.
- G3RHH**, P. H. Masterman, The Close, Boston Spa, Yorkshire. (Tel.: Boston Spa 3377).
- G3RHQ**, K. Vickers, 146 Mary Street, Scunthorpe, Lincs. (Tel.: Scunthorpe 4121).
- G3RHU**, M. F. Stanbridge, 35 Waterloo Avenue, Leiston, Suffolk.
- G3RID**, D. Nancarrow, 13 Morrab Place, Penzance, Cornwall.
- G3RIO**, J. E. Wade, 16 Nelson Street, Ryde, Isle of Wight.
- G3RIS**, F. W. Nash, 39 Bernard Road, Cromer, Norfolk.
- G3RIT**, A. Ball, 56 Wistaston Green Road, Wistaston, Crewe, Cheshire.
- GW3RIY**, A. Chapman, 10 Enid Street, Trealaw, Rhondda, Glam.
- G3RJA**, J. Avery, 5 Baker Street, Waddesdon, Aylesbury, Bucks.
- G3RJJ**, A. N. Cherry, Barnamaghery, Crossgar, Co. Down.
- G3RJX**, B. G. Elcocks, 223 Perry Wood Road, Great Barr, Birmingham, 22A.
- G3RKC**, W. J. Bryan, 99 Belgrade House, Corporation Street, Coventry, Warks. (Tel.: Coventry 21705).
- G3RKF**, T. Rieves, 29 Mill Lane, Broom, Alcester, Warks.
- G3RKJ**, N. A. Summers, 31 Chatham Road, Walthamstow, London, E.17. (Tel.: LARKS-wood 8167).
- G3RKL**, A. J. T. Whitaker, 22 High Trees, Dore, Sheffield, Yorkshire.
- G3RKZ**, B. R. Tibbert, 397 Uttoxeter Road, Derby, Derbyshire.
- G3RLA**, C. Phillips, 46 Ash Grove, Timperley, Altrincham, Cheshire.
- G3RLC**, Amateur Radio Society, College of Technology, Loughborough, Leics.
- G3RLF**, D. J. W. Price, 35 Wych Road, Droitwich, Worcs.
- G3RLG**, A. Collorick, 22-C Rutland Place, Wollaston, Stourbridge, Worcs.
- G3RLH**, R. C. Mathews, 22 Sayers Road, Holmcroft, Stafford, Staffs.
- G3RLI**, G. W. Lawrence, 44 Elizabeth Road, Leamington Spa, Warks.
- G3RLK**, J. H. Longhorn, A.M.I.E.E., 21 Mason Crescent, Penn, Wolverhampton, Staffs.
- G3RLM**, K. R. Belcher, Pine View, Savill Road, Lindfield, Haywards Heath, Sussex.
- G3RLN**, D. J. K. Chapman, A.M.Brit.I.R.E., 5 Penrice Road, Droitwich, Worcs. (Tel.: Droitwich 2402).
- G3RLP**, E. W. Derrington, 263 Kingsbury Road, Erdington, Birmingham, 24. (Tel.: ERD 6946).
- G3RLX**, N. R. Taylor, Three Firs, Bridge Hill, Belper, Derbyshire.
- G3RMC**, J. O. Minks, 6 Daines Way, Thorpe Bay, Southend-on-Sea, Essex. (Tel.: Southend-on-Sea 88382).
- G3RME**, V. E. Bear, 2 Hammonds Place, Gobowen, Oswestry, Salop.
- G3RMI**, B. L. Dawson, 16 Derwent Close, Dartford, Kent.
- G3RMP**, J. H. Holt, 39 Robert Street, Accrington, Lancs.
- G3RMU**, E. E. Walklett, Lee-Holm, Elder Avenue, Wickford, Essex.
- G3RMY**, J. M. Andrews, 117 Moulscobm Way, East Moulscobm, Brighton 7, Sussex.
- G3RNG**, I. Graham, Fairbank, Crantock, Newquay, Cornwall.
- G3RNL**, B. A. Watling, 46 New Cross Road, London, S.E.14.
- G3RNM**, F. W. Pallant, The Royal Standard of England, Forty Green, Beaconsfield, Bucks. (Tel.: Beaconsfield 382).
- G3RNV**, C. Galloway, 105 Dunbarton Road, South Reddish, Stockport, Cheshire.
- G3RNX**, W. I. B. Walker, Thirty Nine Steps, Old Pool Bank, Pool-in-Wharfedale, Yorkshire.
- GM3RNZ**, J. Cowie, 15 Ormlie Crescent, Thurso, Caithness.
- G3ROA**, A. M. Doig, 24 Spring Gardens, North Shields, Northumberland.
- G3ROB**, M. J. Moorhouse, Cadets' Mess, R.A.F. Technical College, Henlow, Beds. (Tel.: Henlow Camp 333).

## CHANGE OF ADDRESS

- G2HDR**, C. N. Chapman, 25 Belvoir Road, St. Andrews, Bristol, 6.

- G3BLU**, P. E. Stanley, San Felice, Hill Crest Close, Kingsley Holt, Cheadle, Staffs.
- G3GVT**, K. Drabble, 851 Unsliven Road, Stocksbridge, Sheffield, Yorkshire.
- G3GZA/A**, D. J. West, No. 2 Flat, 9 High Street, Wells, Somerset.
- GM3GZA**, D. J. West, Top Attic, 10 Burnbanks, Campbeltown, Argyll.
- G3HRP**, T. J. Wright, Plot 114, Trinity Road, Bottesford, Scunthorpe, Lincs.
- G3IAG**, R. F. Pilkington, 22 Ely Road, Littleport, Cambs.
- G3ITH**, R. D. Franklin, 2 Berkeley Drive, Kingswinford, Brierley Hill, Staffs.
- G3IUX**, E. Rose, 13 Catterall Gates Lane, Catterall, Garstang, Lancs.
- GM3IVZ**, W. E. Stephen, 43 Ryan Road, Glenrothes, Fife.
- G3JRJ**, F. Buckley (*ex-VQ4FU*), 24 Comboy Drive, Rudheath, Northwich, Cheshire.
- G3KSL**, D. G. Quarrington, 11 Mill Close, Strood, Rochester, Kent.
- G3LBG**, J. N. T. Willmott, 59 Green Lane, Eastwood, Leigh-on-Sea, Essex.
- G3LDO**, P. G. Dodd (*ex-VQ1HX/VQ4HX*), 21 Bower Road, Harrogate, Yorkshire.
- G3LLJ**, A. J. Hodgkinson, 30 Moorborne Crescent, Newcastle-under-Lyme, Staffs.
- G3LPH**, K. F. Moss, 9 Fairview Road, Timperley, Altrincham, Cheshire.
- G3NOO**, B. R. Jessop, 594 Fishponds Road, Fishponds, Bristol.
- G3NXB**, Dr. W. F. L. Fava, M.D. (*ex-DL2AX*), Kent House, Gally Hill Road, Crookham, Aldershot, Hants.
- G3NYQ**, J. A. Edson, 24 Wrenbeck Avenue, Otley, Yorkshire.
- G30AA**, P. Welch, 9 Brook Road, Oldswinford, Stourbridge, Worcs.
- G30UD**, F. S. Downs, The Woodlands, Grange Road, Biddulph, Staffs.
- G30VK**, J. A. Frearson, 148 Williamthorpe Road, North Wingfield, Chesterfield, Derbyshire.
- GW3PPF**, P. A. Schorah (*ex-G3PPF*), 11 Danygraig, Pantmawr, Cardiff. (Tel.: Cardiff 66310).
- G3PQG**, N. F. Cutter, Parsonage Farm, Colerne, Chippenham, Wilts.
- G3PWY**, D. M. Gresswell, 2 School Lane, Cookham, Berks.
- G5LH**, F. Thompson, 12 Lyndhurst Road, Benton, Newcastle-on-Tyne, 12, Northumberland.
- G6LN**, S. E. Dowding, 7 New Lane, Croft, Warrington, Lancs.
- G6RJ**, A. Robinson, Brown's Farm, Holbrook, Ipswich, Suffolk.
- G8TN**, L. Sanderson, Lawnswood, Tetney Lane, Holton-le-Clay, Grimsby, Lincs.
- G8VB**, H. S. Simmons, Kenilworth, Ameysford Road, Ferndown, Dorset.

## AMENDMENTS

- G3PFD**, R. Vowles, 74 Rookery Road, Knowle, Bristol, 4.
- G3PNC**, R. L. Jack, Huntington Court, Kington, Herefordshire.



Editors all, and no rude comments, please! Left to right: John Rouse, G2AHL, editor-designate, "RSGB Bulletin"; Austin Forsyth, G6FO, managing editor, "Short Wave Magazine"; John Wilson, G3BGP, editor, "Electronics Weekly"; John Clarricoats, G6CL, editor, "RSGB Bulletin"; and Frank Devereux, ex-5FA, editor, "Wireless World." The occasion was the opening of the Radio Communications Exhibition, Seymour Hall, London, on October 31, 1962.

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## SMALL ADVERTISEMENTS, TRADE—continued

**C**ATALOGUE NO. 15. Government Surplus Electrical and Radio equipment. Hundreds of items at bargain prices for the experimenter and research engineer, 2s. 6d. post free; catalogue cost refunded on purchase of 50s.—Arthur Sallis Radio Control Ltd., 93 North Road, Brighton.

**Q**SL CARDS AND LOG BOOKS, G.P.O. APPROVED. CHEAPEST, BEST, PROMPT DELIVERY. SAMPLES.—ATKINSON BROS., PRINTERS, LOOE, CORNWALL.

**N**ECKTIES featuring your own Call Sign neatly woven into the Tie in Gold or White on either Navy, Black, Wine or Green background. Minimum of two Ties in same colour at 31s. 6d. per pair post paid. Cash with order to Macaseta Ltd., Goodall Street, Macclesfield, Cheshire.

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## READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

**H**EATHKIT DX-40U and VF-1U completely new. Unopened kits, save ££'s, one only, first remittance of £41 secures; VFO, only £10. WANTED: SB-10U.—Box No. 2719, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**P**ANDA CUB, good cond., with LPF, £30.—GM3JOF, 23 Grieve Street, Methilhill, Methil, Fife.

**E**XCHANGE: Excellent Telefunken 85KL tape recorder, cost £83, for comparable Communication Receiver. Sale CR-100 fair condition, noise limiter, S-meter fitted. Three crystal calibrators, G.E.C. miniature, mains No. 10 and Class-D. All letters answered.—Read, 24 Broughton Gifford, Melksham, Wilts.

**S**ELLING UP: Receivers, Transmitters, signal generators, transformers, chokes, PU's, frequency meters, etc., s.a.e. for details.—Clarke, Williamson Avenue, Buxton, Derbys.

**S**ALE: Eddystone 640 Rx, mint condition, with S-meter, speaker, phones, recently re-valved and re-aligned, perfect working order, £22.—G2TG, 40 Netherburn Road, Sunderland, Co. Durham.

**S**ALE: R1155A, excellent condition (fitted tuning meter, xtal calibrator) with pp/speaker unit, £9. WS19 with AC p/pack for Rx, £3.—R. Miller, Coolreagh Road, Cookstown, Co. Tyrone, N. Ireland.

**F**OR SALE: BC-221 original cal. charts, £11. Top Band Mobile Tx with mod., less PSU, £10. Top Band Tx with mod. and AC PSU, £12. TU Series tuning units, £1 each. Offers: Blowers 24v. will run off 12v. OK; RF Amplifiers, contain 3/829B's, one blower motor, meter and host of components (ex. R.A.F. Ground Station).—Box No. 2720, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**B**RAND NEW HRO Senior, nine coils, PSU, FB Receiver, £25. Also brand new, Heathkit GDO 1-8-250 mc, £8 10s.; and BC-453, 12v. heaters, otherwise untouched, £5. S.640 in good condition, £18. Globe-King battery receiver, 10-100 metres, 50s. Geloso 4/101 VFO, with valves, built into cabinet of uncompleted transmitter, with pi-tank coil, etc., £6. Circuits, etc., supplied with all above equipment. BC-454, usual mods., 60s. PCR 12v. Vibrapack, 300v. 100 mA output, with leads, 15s. 373 IF unit, 10s. Two Pye "Reporter" mobile Rx/Tx, suitable 4 metres, with two appropriate xtals, £5 each. RF-26, 25s. 1-8 mc exciter in TU case plus PSU, 30s. Could possibly deliver Gloucestershire/S. Wales area.—L. Loveland, 73 Ogwen Drive, Lakeside, Cardiff. (Tel. 55309 evenings.)

**W**ANTED: Eddystone 888A late model, with S-meter, speaker. FOR SALE: HRO, also BC-453, 21 mc B/S coil, offers please?—Box No. 2721, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**T**F144G, £20. 92A TV Wobbulator, £12 10s. AVO Osc., £4 10s. 60 Current Service Manuals, £4 10s., plus carriage.—Burns, Mews Lane, Kirkcudbright.

**G**OING MOBILE? Briggs & Stratton Petrol Gen. 12v. 20A, excellent condition, £8 10s. Gardners 25H. 250 mA choke, £1. Woden choke, 25H. 150 mA. 10s. 3/1500v. working 2 µF (paper) condensers, 5s. each. RF-26 Unit, unmodified, complete with valves, £1. 100TH Eimac valve, new and boxed, 10s. Variac, input 210-250v., output 230v. 6-5A. 12v. tapping for auxiliary circuits, first-class condition, £4. All carriage extra. WANTED: Geloso or KW Geloso Signal Shifter.—Osborne, G4OV, Pucks Knoll, Lamberts Castle, Marshwood, Dorset.

**150**-WATT TRANSMITTER, 80, 40, 20, 15 and 10 metres, fully modulated, Class-B, exciter is band-passed. The whole including all power supplies, fully metered circuits, built into handsome 6ft. rack. A sacrifice. Transport arranged reasonable distance.—A. Clements, 5/150 St. James Road, Shirley, Southampton.

**F**OR SALE: Super-Pro with auto-transformer, £27. German ex-Army 12 valve battery Rx, 25-60 mc. £4, with circuits (London).—Box No. 2722, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**4ZU** BEAM, good condition, near £10. TCS-12 Tx, modified commercially, 10-160 metres. power pack to match, near £25. Two 42-foot ship masts, steel stanchions, all bolts, etc., near £20 each.—Crowther, 8 Beverley Close, Wrea Green, Preston, Lancs.

**S**ALE: Panda Explorer 150-watt transmitter. SAM/CW/NBFM, working FB, complete with Panda ATU and LPF, £45. Marconi CR-150 double superhet communications receiver, 2-60 mc, black crackle, product detector fitted, p.v.c. wired, excellent condition, power supply, handbook, £35. BC-221, built-in stabilised power supply, calibration charts, as new, £12. Carriage extra all items, prefer buyer collects.—Joslin, 13 Talbot Road, Skegness, Lincolnshire.

SMALL ADVERTISEMENTS, READERS—*continued*

**WANTED:** R.107 in perfect condition. also matching 15/10m. converter, state details and price.—N. Stickells, 45 Queens Road, Lewes, Sussex.

**SALE:** Grundig Tape Recorder TK45U, mono and stereo recording/playback, also multiple synchronous recording; 3 speeds, 4-track, twin 3-watt amplifiers, twin speakers, as new, £110. PR120V, good condition. £50. Will deliver up to 80 miles.—Davey, 42 Valiant Square, Upwood, Hunts.

**BC-221 FREQUENCY METER**, needs calibrating (meter and book different serial numbers), good condition, £9, carriage paid.—E. Sloan, 5 Anne Street, Enniskillen, Northern Ireland.

**MINIMITTER MR44** Communication Receiver for sale, modified to Mk. II by makers, as new, £35.—Woods, 531 Glasgow Road, Wishaw, Lanarkshire, Scotland.

**50-WATT Tx**, exact copy of "Vanguard," commercial cab., Geloso VFO, 807 mod. and PA, gift at £18, no offers, STC ball dyn. mic., £2. Dyn. mic. new, £1 5s. New 813 and htr. trans., £1 10s. Three tape deck motors, complete with new heads, large quantity of tape, spools and oddments, bargain at £2 10s.—G3EIM, 1193A High Road, Whetstone, London, N.20.

**WANTED:** R.206 in good condition for cash, or exchange HRO Senior with 9 GC coils, all in good condition, cash adjustment if required.—Jackson, 26 Swains Road, Tadley, Basingstoke, Hants.

**SALE:** Manuals (new) CR-100, Canadian 52 Set, BC-221, 15s. each, Newnes *TV and Radio Servicing*, 5s. each (6).—Box No. 2722, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED:** AR88 Cabinet, any condition case suitable. Elizabethan Tx mod xformer.—Bowen 31 The Crescent, Donnington, Wellington, Salop.

**FOR SALE:** Ellams Flat Duplicator, recently reconditioned, complete with ink and supply of stencils, £6 5s. plus 10s. carriage and packing.—Watts, 62 Belmore Road, Norwich. *NOR 72.T.*

**LG-300** with home-built PSU and Mod., £45. **AVO Model 40**, £5. **AR88D**, £30. **W.S. 36**, £8. 'Scope tube CU1522 plus case, 25s. 5AP1 plus case plus trans., £3. **K.W. LP Filter**, £2 10s. **PSU 234**, £2 10s. **PSU 247**, £3. **PSU 1200 volt**, £4 10s. **1155A**, £4. Crystals, chassis, IF's for G2DAF Rx, £8. 300 mA swinging choke, 30s. **RF-26 plus 27B**, 30s. each. Philips 6v. medium-wave portable, £4. Several partly completed chassis, £1. Many valves, e.g. 813, 30s. Buyer collects. **WANTED:** Sideband Gear, G2DAF Tx and Rx, or commercial.—R. W. Wilkinson, 21 Armour Hill, Reading, (Tel. Reading 67329.)

**MR44/11 RECEIVER** for sale, perfect condition as checked by manufacturers, £45 o.n.o.? Buyer collects.—G3JJC, 49 Dulverton Road, London, S.E.9.

**SALE:** R.1155A, excellent condition, D/F intact. Full literature, with power unit, £18.—G3END, 12 Mervyn Avenue, London, S.E.9.

**CT-53 SIG. GENERATOR**, £15. **S440B VHF Tx**, £3. Eddystone 1448 LF Rx, all coils, £3. **SCR-522 Tx's** complete all valves (2), 50s. each. Test set 1E-19-A complete, £5. 4E27 valves (2), 35s. each. 4X150A valves (3), 45s. each. **PSU 500v., 250v., 6-3v., 50s.** Gardners oil-filled trans. 480-0-480v., 213-0-213v., 6-3v. 8A, 80v. bias, etc., 50s. Carriage extra all items.—Scott, 369 Beacon Road, Bradford, 6, Yorks. (Bradford 73975.)

**WANTED:** Valve socket for Eimac 4X250 tube, socket type number SK600 or SK606.—G2DC, Morseden, Hightown Hill, Ringwood, Hants.

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## SMALL ADVERTISEMENTS, READERS—continued

**TOWER STEEL**, self-supporting, telescoping, crank up and down and tilt over, 50 feet high, complete with ground post and two winches. Hot dip galvanized, brand new, can be seen working, £120.—G3BXI, Farlow, 49 Mount Pleasant Road, Chigwell, Essex. (Tel. HA1 4546.)

**SALE**: 888A with mounting blocks, first-class condition, one owner, used in indoor shack since purchased, £80 o.n.o.? Brand new power unit Type 234A, 37s, 6d. Prefer buyer inspects and collects.—Crook, 39 Tonge Park Avenue, Bolton, Lancs.

**ELECTRONIQUES** Front-end 6 amateur bands. 1.6 mc IF with xtal for 85 kc 2nd IF, £6. Labgear W/Band Multiplier, £2. Labgear 50w. pi-turret, 30s. Bow Phase shift network, 30s. Four Denco 85 kc IFT's, 30s. UM2, £2.—Bates, 6 Gordon Road, Burton Joyce, Notts.

**FOR SALE**: Volumes 1 to 6 Newnes *Radio and Television Servicing*, £6 o.n.o.? plus postage.—G3RHJ, 12 Acton Lane, Sudbury, Suffolk.

**2 METRE GEAR** Tiger TR2MTX, £68; TW2 Tx and matching power supply, £28 10s. Also "K.W. 160" Top Band Tx. All brand new, mint condition, and almost unused. U.S. Air Force Valve Tester 1-177B complete with MX949 A/U Adaptor, manuals, etc., new, £10 10s. Owner going QRT due to business commitments.—Box No. 2724, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**SALE**: Mullard Oscilloscope Type GM3156; CRT SA41-G4; good cond., with instruction/circuit/spec. book, offers, photo full details s.a.e. Deliver 50 miles B'ham. R.1155L, 200-1500 kc, 1.5-18 mc, built-in power supply, external LS, good condition; also converter 21-30 mc, good condition but needs slight attention, £11.—Box No. 2725, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED**: Osc. unit Type 171 (Unit C) for R.1475 Type 88. Top price paid.—E. Livesey, 28A Ceylon Road, Westcliff-on-Sea, Essex.

**VHF** 350 watt Tx, p/p 4X150, complete with variable bias supply and variable power input control. Mod. TZ40 Class-B, control unit and all HV supplies, all in 6 ft. rack. Also Q-Max Q5/10 Rx in good condition. Equipping new Station. Offers all or part to—GM3DIQ, 6 Langside Park, Kilbarchan, Renfrewshire. (Phone 2876.)

**FOR SALE**: B2 complete, first-class condition, £15.—Box No. 2726, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED**: Top Band HRO coil; Labgear Coax switches E5039, E5039/A; Electronic keyer; GPO double-current key.—Box No. 2727, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WAVEMETER**, RCA Crystal Calibrated TE149. for Sale; perfect, with all spares untouched; instruction book, carrying case; nearest £8 10s.—G2AKT, 25 Walmington Fold, London, N.12. (HIL 4860.)

**TX/RX TYPE 18**; valves TZ40, VT79, VU508, 1GL-451, £3. **WANTED**: Army 62 Set.—G3DOP, 4 Woodlands Road, Binley Woods, Coventry.

**SELL**: BC-348 Receiver, mains PSU, ANL, S-meter, phones, speaker, spare valves, £12, o.n.o.? Buyer collects.—Taylor, 14 The Chine, London, N.21.

**LARGE QUANTITY** of books, magazines, British and American for sale, cheap to clear; s.a.e. details.—Burns, Mews Lane, Kirkcudbright, Scotland.

**HAS ANYONE** a working RF-27 for sale? Please state price to—Box No. 2713, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED**: National One-Ten receiver—condition, price?—Write Cross, 9 Moorbank Close, Sheffield, 10 (or phone 35140 after 7 p.m.).

**QV06-40A's**, new and boxed, 55s.; Handbooks, BC-1147A, 35s.; R1475, 20s.; TCS Rx N/L kits complete with all components and assembly instructions, new and boxed, 10s, 6d.; TCS speaker, matching transformers, 500 ohm-3 ohm, 8s, 6d.; all plus postage. **WANTED**: Top Band Command Rx. TCS Manual, and K.W. 10-80m. converter.—Box No. 2714, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED** by Collector: pocket miniature, or suitcase type, Rx or Tx, as were used by the Polish, French, Dutch resistance movements, "A.Mk.II, 3.Mk.I," etc., also handbooks, publications, relating to same.—Gee, 11 Whitehorse Lane, Stepney, London, E.1.

**88 VALVE CANS**, suit nine-pin miniatures, 50s. Manuals: CR-100, CR-300, 35s. each (send P.O.). £70 paid for Eddystone 940, £30 for 840C.—Box No. 2715, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**EXCHANGE AR88D** less case, with manual, for good condition R.1155B and 1154, no mods. please, or Panda Cub.—Call, 15 North Grove, Blandford Camp, Blandford, Dorset.

**MOHICAN COMMUNICATIONS RECEIVER**, factory-built, still on guarantee, only four months old, £30.—Flt. Lt. Sheppard, No. 1 Officers Mess, R.A.F. Farnborough, Hants. (Tel. 1009 evenings.)

**TCS-12 Rx** and power unit, £5. R.1155 and power unit, £4. R.1392, £2. VHF R28/ARC5, £2. Master Oscillator unit, £1 10s. 20m. SSB Transceiver, *Short Wave Magazine* design, 6146 PA, £10, 160m. Tx and PU, £5. Heathkit GDO, £7 10s. PU 234, £2. 34-in. motor launch for R/Control, £3 10s. Xtals 28.5 mc. 31.5 mc and others, valves, etc. Carriage extra.—Cain, 18 Oaky Balks, Alnwick, Northumberland.

**HALLICRAFTERS Sky Challenger**, suit SWL, £5 (buyer collects). New Brown 'F' Headphones. £1. 1000 kc crystal, 10s.—G8UA, 406 Brunshaw Road, Burnley.

**SALE**: EDDYSTONE 840C Receiver, little used. One year old, perfect condition, £40.—Durrant, 8 Parkhurst Road, Bexley, Kent.

**SALE** gear of late G2AX. SX-17 Super Skyrider, £15. Minimitter Amateur Bands Converter, LT u/s, £10. AVO Multiminor, £5. Raymart Bandchecker, 35s. Raymart Absorption Wavemeter, 10s. Collins TCS-9 Tx, modified output, £7. Modulation meter, 15s. Self-powered RCA speech amplifier in case, 12-watt, £3. Type 36 Tx 10-60 mc, complete with PS, £10. Xtal stick mike, 15s. M/C mike on table stand, 10s. 8KW multiband antenna, £3. Parmeko multi-ratio mod. trans, 360w., 30 lbs., 25s. All-Wave signal generator, 10s. Two L/S, one in grey case, 10s. Labgear low-pass filter, £2. 50 copies *QST* various dates 1949-61, 35s. Set 3 vols. *Modern Practical Radio & TV* (Caxton) 1950, £1. Grundig T/R 700L, £20. Ronson Electric Shaver, £3. Morphy-Richards Electric Shaver, £4. Highest offer above prices quoted secures. Carriage extra.—G2DFG, 70 Bouverie Road West. Folkestone, Kent.

**SX-100** in immaculate condition, used less than 20 hours; buyer collects if possible; offers over £100.—Cameron, Coombe Cottage, Pitchcombe, Glos.

**URGENTLY NEEDED**, please help, manual, circuit or information on R.M.E. 70 receiver; will buy, borrow or exchange; your needs? Any expenses paid.—Derek Griffiths, Oshima, Park Grove, Connah's Quay, Flintshire.

SMALL ADVERTISEMENTS, READERS—continued

**S**ALE: SWL7 Mosley Dipole Aerial, complete, perfect, instructions, £5 delivered, going rotary.—Longmere, Stanah Road, Thornton Cleveleys, Lancs. (Thornton 2363.)

**T**IGER 2-METRE nuvistor converter, IF output 7 to 9 mc, complete with AC mains stabilised power pack, £11. ASB8 Rx, 70 cm, complete with AC mains stabilised power pack, £6. P58, Rx tuning unit 300 to 650 mc, IF output 45 mc, 30s. 45 mc IF strip, 30s. Coax relays 78E and M Type. 6s. HRO gearbox 7s. 6d. Tx Variables .080-in. spacing, 250  $\mu$ F, 7s. 6d.; 150 and 100  $\mu$ F, 4s. TT21, 7s. 6d., 807, 2s. 6d., 6AG7, 2s., 1625. 1s. 9d., 6AC7, 1s. 6d. Tubes 5BP1, VCR-97, 10s. each. 0-2 amp RF meter, 5-in., 7s. 6d. Oil-filled potted xformers, 650-0-650v. 300 mA. Chokes 10H, 300 mA, 50 ohm. House clearance, your prices, hundreds of valves, Tx and Rx variables, ceramic and paxolin Yaxleys, ceramic ATU switches, coil formers, insulators, block condensers, chokes, xformers, units for breaking, etc. All carriage extra, s.a.e.—Write, call or phone (Trevelyan 8141 any time). Briscoe, 311 Eton Road, Ilford, Essex.

**M**ONEY NEEDED for eye operations. Selling M2-metre equipment: R.E.E. Tx-40 Transmitter, etc., complete, R.E.E. Receiver, Withers Transmitter, Converter, pre-amp, PSU, Eddystone Converter, Crystal Converter 3-6-5-6 mc. Also Transmitter 1-8-3-5 mc. Sundry Items for callers only. Transformers, Valves, etc., offers?—E. Banks, 23 Marett Court, Marett Road, Jersey, C.1. (Tel. Central 31447.)

**W**S19 Mk. III fitted with ATU, speaker output, with Receiver PU, in excellent order, also RF Amp.2 Mk. III to increase 19 Set output to 60 watts, brand new, the pair, £10. Would exchange for 1935-39 Austin 7 wanted for spares.—Hardcastle, Ripton Grange, East Keswick, Nr. Leeds. (Tel. Ripton Hill 205.)

**V**ICEROY Mk. II, extra filter, £110. Geloso 209R, 160-10m, £40. K.W.-Match, 70s. Pair K.W. Traps, 30s. Take £150 lot, as new cond., delivered Midlands.—Box No. 2716. Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**C**OLLINS TCS-12 Transmitter complete with power supply and modulator, £12 10s. Minimitter MR44/2 as new, few hours use only, £45. AR88D mint condition, £45. Philips Tape Recorder, perfect, £15. All can be seen working, prefer buyer to collect.—G3ORK, 15 Chesterfield Road, Ainsdale, Southport. (Tel. Southport 79131.)

**E**DDYSTONE 680X, practically as new, with matching speaker, £80. Also 358X in working order but rather shabby, £6 10s. SWL owner going mobile, will deliver West London. (Tel. Gerrards Cross 5038.)

**G**OING VHF, for sale complete 150-watt station: GAR88D with twin-triode Cascode RF Stage, Q5'er and power pack; Labgear LG.300, companion modulator with stabilised 6146 screens, spare 813, etc.; Labgear low-pass filter, monimatch, aerial coupler in cabinet, with coils; over 200 countries worked. First £85 secures, buyer collects.—G2CNN, Mount Pleasant Inn, Dawlish Warren, South Devon.

**H**EATHKIT VALVE voltmeter, little used, £10; 2m. and 4m. cascode, crystal controlled converters, £6 each; 80-metre high stability VFO, 3 buffers, £6; Post Office 3000 type relays, many types, s.a.e. details, 5s. each; large transformer, 350-0-350v. twice at 450 mA, 6-3v. 10A four times, 5v. 6A twice, £3 15s. 304TL, 6C21, new, 15s. each; 240-110 volt transformer, C.T. sec, 5 kVA, £12. Carriage extra.—B. M. Sandall, 21 Dale View, Ilkeston, Derbys.

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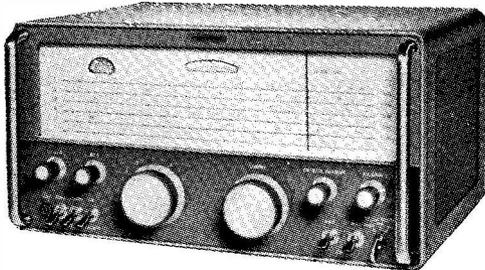
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**2-TR2002** self-contained 24v. 120 mc, brand new, £12. One Taylor 22A sig. gen., v.g.c., £12 o.n.o.? One Corsor Telecheck, mint, £17 10s. o.n.o.?—English, 182 Lewisham Road, Dover, Kent.

**JOHNSON VIKING INVADER SSB TRANSMITTER.** 200 watts SSB/CW, 90 watts AM, as new with manual and auto-transformer, cost £285, offers around £200. Collins 75S-1 Receiver, fitted additional 500 c.p.s. mechanical filter and matching BFO crystal, extra HF crystals, with manual and auto-transformer, speaker unit; offers around £225. SSB Transceiver, 7 mc band, on printed board. 14 valves including two 7360, 12BY7 output, Collins 4 kc filter, separate commercial VFO. £25. AC power supply for Transceiver and 100-watt Linear, £5. Vacuum variable capacitor. 5-100  $\mu$ F, 7500 volts, £10 or offer? Also crystals, transformers, etc., s.a.e. list.—G5RP, Old Gaol House, Abingdon, Berks. (Tel. Abingdon 380 evenings.)

**BRAND NEW BOXED MU14, EF22, EZ22, 2s. BECC81, EB91, EC91, EL32, 6J6, 6J5, 6N7G, 6SK7, 6SJ7, 1A3, 3s. 12AT7WA, STV-70/20, VR150/30, QS150/45, 807, U18, EC53, 5s. PT15, KT66, 10s. DG7/5, LSD3, 30s. Minimum order 20s., post extra.—V. Cedar, 2A Convent Hill, London, S.E.19.**

**SALE:** BC-348, £10 o.n.o.? ZC1 modified, 20 watts phone, £5 o.n.o.? SCR-522 Tx. 6V6's mod., £1.—Frew, 9 Hollybank Place, Bloxwich, Walsall, Staffs.

**COMPLETE STATION HRO-5T, 9 coils, PU. K.W. "Valiant" 160-10 metres, K.W. LP Filter, PU, ATU, Manuals, etc., £50, CR-300, £12. Buyer collects.—Sherlock, 8 Tudor Road, Canvey Island, Essex.**

**HRO-MX** with B/S coils on 3.5-7-14-28 mc, with power supply, painted grey, excellent condition, will deliver up to 30 miles, £22 10s. No offers.—Mayers, G3MGY, 128 Sundon Park Road, Luton. (Tel. 52097 after 7 p.m.)

**K. W. VANGUARD** for sale, works built Vanguard K. Tx. 80m.-10m.; this Transmitter is in excellent condition, first £30 secures, will deliver South Wales; reason for sale, gone QRO.—GW3MOP, 110 Duntant Road, Killay, Swansea. (Tel. 22322.)

**FOR SALE:** Class-D Wavemeter, £2 5s. B2 Tx. home-built PSU, series-gate mod, £2 10s. Labgear WBM unit, £2.—Haggart, 28 Firstview Drive, New Duston, Northampton.

**HALLICRAFTERS HT-30** Sideband Tx. £75 o.n.o.? or W.H.Y.?—Worthington, 43 Mount Road, Penn. Wolverhampton.

**FOR SALE** (going mobile): well engineered fully-screened table-top Tx (807 final, 6V6, and lamp, output monitor) switched xtal or VFO. WB couplers and pi-tank (80 to 10 metres), separate PU and modulator, £32 o.n.o.? Sell separately or exchange audio or tape equipment.—G3LYR, 136 Fouracre Crescent, Downend, Bristol.

**FOR SALE:** Minimitter Amateur Bands Converter, 5 switched bands—3.5, 7, 14, 21, 28 mc—can be used with any receiver that tunes to 6 mc; self-contained mains-unit, and complete with instruction booklet. Used with Eddystone S-640 receiver has resulted in 320 countries confirmed. Best offer around £10 to £12 10s, secures.—Watts, 62 Belmore Road, Norwich. NOR 72.T.

**70 CM Wavemeter** and test set TS-184A with manual, £4. 2-metre 18-watt phone Tx, S440B, complete with p/pack and spare Tx, £10. Corsor 3339 double beam scope, £8.—G3JLL, 13 Riverside, Hendon, London, N.W.4.

SMALL ADVERTISEMENTS, READERS—continued

**T**OP BAND Transmitter, built-in modulator, power pack and calibrated VFO, works well, £9.

**ZC1** Tx/Rx complete 80/40 metres, 12-volt mobile rig, complete with mike, £9.

**P**OWER PACK 1200v. 200 mA, completely smoothed and screened, relay controlled, ideal 813 or similar, only £5. All carriage extra.—G3HSC, 45 Green Lane, Purley, Surrey. (UPLands 2896.)

**G**ONSET G76, mint, new condition, Mobile/Desk Transceiver, matching AC power supply and speaker, also Mobile power supply, all cables and manual, cost £350, first-class mobile desk rig, nearest £175.—Write Box No. 2717, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**C**OLLINS 32S-1, used few hours only, brand-new condition (owner has KWM-2), listed £292, nearest offer to £175.—Box No. 2718, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**£60** OFFERED for DX100-U.—G3MKO QTHR.

**G**ONSET Mobile Super-Ceiver 3041, and Model D "Super 6" converter, xtal controlled IFT's, BFO and noise limiter, front antenna trim and variable impedance antenna, inputs for 6 or 12 volt operation, positive or negative ground. Built-in speaker, fully bandspread 10-80 metres.—G3PPK, Uxbridge 36989 (night); HAYes 5033 (day).—2 Fairfield Road, Uxbridge, Middlesex.

**I**MMACULATE GELOSO G-209R, bereavement forces sale, also large quantity of Magazines and books, s.a.e. list.—Box No. 2728, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**W**ANTED URGENTLY to buy, hire or borrow, manual for B.28 (CR100).—G3FHH, 37 Albert Road, Morecambe, Lancs.

**51** J-2 RECEIVER 0.5 mc-30.5 mc. R.D.O. S-27CA. AR88D p.v.c., £35. R-109T, £5. Power units; valves 807's, 4s. 12AX7's, 5s., etc., plus carriage, s.a.e. list.—Wright, 4A Nepal Avenue, Atherton, Manchester. (Tel. 991.)

**W**ANTED: Compact Multiband Phone/CW Tx; CR-100 manual; reasonable.—Merrett, Chace Guildhouse, Coventry, Warks.

**A**R88D, BRAND NEW and unused, in original transit case, complete with trimming tools, manual, £65. LM15 frequency meter, brand new, £14 10s. Minimitter Multi-Q, complete unit, with internal power supply, 70s. K.W. Converter 10-80m., internal V/S power pack, excellent condition, £13 10s. Hallicrafters HT-11A 12-volt mobile power supply, brand new, 50s. All plus carriage. TCS IF transformers, new, 5s. each; 12-volt 2 amp. selenium rectifiers, oil immersed in potted case, new, 8s, 6d. each. QV03-20A, new, 45s. FT243 xtals, 7100, 8000, 8025, 8100; FT241 454.2 kc (Ch.327), 3 available, all 7s, 6d. each.—Box No. 2729, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**H**ELP. Could some kind op. please help new owner of a Panda Explorer, handbook or circuit required, your price paid, alternatively would be happy to pay for loan, or forward deposit against return, in order to photostat.—G3GIQ, 271 Popes Lane, Ealing, London, W.5. (Tel. Eal 6389.)

**A**R88D or LF wanted, good condition with manual. Full details and price to—M. C. Green, 6 The College, Malvern, Wores.

**F**OR SALE: HRO Senior, 100 kc crystal calibrator, 9 coils, 10-15-20m. B/S, power supply and speaker; RF-26; No. 10 crystal calibrator, unused, £25 the lot.—D. Purkiss, 277 Wingletye Lane, Hornchurch. (Tel. Hornchurch 45455.)

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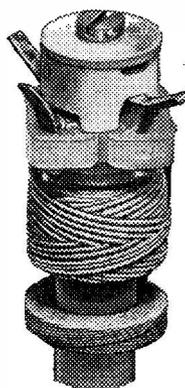
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## SMALL ADVERTISEMENTS, READERS—continued

**WANTED:** *Short Wave Magazine*, March 1957. Will buy, borrow or swap for *Short Wave Magazine* No. 2, April 1937.—R. Achilles, 30 Graham Mansions, Graham Road, Hackney, E.8.

**SALE:** Gear of the late G2AG. Eddystone 888 new, complete, £70. Eddystone 888 used, complete, £50. Mercury Tx, almost new, £65. Panda Explorer Tx, £35. Valiant Tx, new, £30. Minimitter mobile Tx, £10. Transistor p/pack, £10. Control box, £2. 7-band converter, £7. Whip aerials for 160, 80 and 40m., £3. Type 7 xtal calibrator, £5. Panda Antenna Coupler, £4. TR switch, £1 10s. 50 yds. Tx 52-ohm coax, £2. 45C Taylor Valve Tester, £15. Buyer collects, view by appointment.—4 De Maulley Road, Canford Cliffs. (Phone. Canford Cliffs 78439.)

**MANUALS WANTED** for AR88LF and LM14. **M**to purchase or borrow.—G3OZT, 10 Beverley Road, Hythe, Southampton, Hants.

**CRYSTALS** in B7G bulbs, freq. between 10,058.3 and 10,391.6 kc in steps of 33.3 kc, 3s. TR-1520 115-145 Tx/Rx, offers? Manual for BC-659 and PE-120, 15s. **WANTED:** American surplus manuals, W.H.Y.?—Clarke, 29 Leighinmohr Avenue, Ballymena, Co. Antrim, N. Ireland.

**WANTED:** STROBOSCOPE for Creed 3X Teleprinter, motor for Telewriter YB-02251. 7B page Teleprinter, also Audio RTTY Test Tape.—Robertson, 9 Holbeck Lane, Cheshunt, Herts.

**QRT REMOVED CLEARANCE** BC-342, Q5'er, Audio Filter, £9 10s. B2 Xmtr, p/p modulator, £3 10s. Twin 350/6.3/5v. p/pack, £1 10s. Woden UM2, 25s. Class-D Wavemeter, AC mains, 25s. GDO, 10s. 500/375v. p/pack, 25s. 6 ft. P.O. rack, 10s. Misc. DC/RF meters, 2s. each; over 40 Tx/Rx valves, £3. Twin RF unit 10/15m. converter, 15s. Dismantled Minibeam, incomplete, £1. Selecta Homemaster, £4 10s., xformers, condensers, etc., free to caller-purchasers above. Accept £22 lot.—(FLA 2248, London, S.W.3.)

**SALE:** Cossor 339A Oscilloscope, excellent condition, spare mains transformer, manual included, only £10. **WANTED:** UM2, UM3.—G3PZF. (Farnborough, Kent, 54512.)

**WANTED:** EDDYSTONE S.750 or S.640, good condition and reasonable, please; also 1090 coil former, Gelo 4/102 VFO or complete Tx.—Box No. 2730, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**EXCHANGE:** One brand new Minimitter "Top 2-7" Tx for one "Mohican" receiver, cash adjustment.—Koester, 57 Pashley Road, Eastbourne, Sussex.

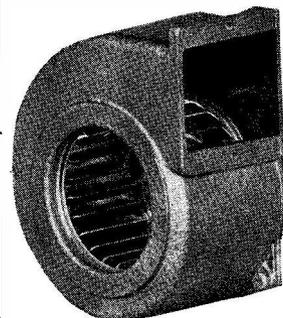
**PCR3 FOR SALE.** MW and 2-23 mc, perfect, fitted S-meter, BFO; needs separate PSU. £8 o.n.o.?—Beardsmore, 4 Prince's Corner, Harborne, Birmingham, 17.

**GOOD QUALITY** Morse Key urgently required. American M100, J47, etc. Your price.—Clark, 68 Abbey Row, Malmesbury, Wilts.

**FOR SALE:** 50 ft. steel mast (less guys, etc.) in 4 x 12 ft. screw-in sections, price £4 10s. o.n.o.?—P. A. Whitchurch, 66 Pettigrove Road, Kingswood, Bristol. (Phone: Bristol 673703 evenings.)

**WANTED:** Lustraphone Hand Microphone, H.54 series. **FOR SALE:** Eddystone Bug Key, 30s.—Walker, 15 Copse Road, Scunthorpe, Lincolnshire.

**SALE:** 150 WATT relay controlled luxury Tx (20 valves), worth estimated £200. Photo, description and demonstration, books and junk also included. Now QRT. £50 for quick disposal.—G3ANV, Bredon, Woodham Lane, West Byfleet, Surrey. (Byfleet 46009.)

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*Copy of letter received from G2UZ, Mr. C. V. Stead of Leeds as below. Leeds, 8th Nov., 1962.*

Dear Sirs,

I have now had my "Olympic" T150X Transmitter for over three months and have had time to give it the most exhaustive tests on all bands and I can now most heartily confirm all I wrote in my letter (which you used on your leaflets last June) when I placed my order with your firm, for the TX fulfils my most critical desires and the DX reports I receive are always of the best.

The lay-out and wiring of the three chassis I find really excellent, and the components used are of the highest grade obtainable, all well under-rated. I am sure this very fine TX will have a long and useful life and I shall not cease to recommend it to all my Amateur friends.

I must add that I saw Mr. Booth (G8FO) in Huddersfield last week (who owns an identical T150 TX, delivered about the same time as my own), and he also confirms what he wrote to you when he placed his order with your firm some months ago, and he considers it Excellent Value for money.

Yours very truly,

C. V. Stead, G2UZ.

G8FO, Huddersfield. After very careful consideration of ALL the other makes of Radio transmitter of 150 watts on the market today, I have no hesitation in giving my order to your firm for an Olympic T150 TX, which, in my opinion, is the only one which agrees with my views of what a REAL 150 WATT TRANSMITTER SHOULD LOOK LIKE, and I know that I shall be well satisfied.

G3OEH, Marlborough, Wilts. The T50X TX, which I collected from your Works last week is working splendidly, and all my Reports are excellent and the Speech quality is always reported as "first-class." I am delighted with it in every way and will most certainly recommend it to all my amateur friends.

GM3CHX, Perth, Scotland. I write to inform you that the "Olympic" T100 de-luxe Transmitter has arrived all OK. I have tried it out and am delighted with the results on all bands. It performs splendidly, and the overall RF efficiency is up to my very highest expectations. I must congratulate you on producing a first-class Transmitter which is beautifully built, with top-class components, and the workmanship is the best I have ever seen. I do not know how you can turn out such a fine piece of equipment at such a low price.

G2DML, Billingham, Co. Durham. I am glad to inform you that the "Olympic" T100 de-luxe transmitter has arrived safely and has now been tested out on several bands. All my reports have been excellent, the speech quality and real audio punch are always commented upon. I cannot fault this fine TX in any way and am delighted with it, and I really mean that. You are at liberty to use these true comments in any way you wish.

GM8SQ, Inverness, Scotland. Just to let you know that the "Olympic" T150 has arrived safely and has now been tested out. I like the appearance very much indeed and I am most impressed with the "innards" of this very fine TX. Its performance is tip-top and all my reports mention the excellent speech quality and the fantastic AUDIO PUNCH put out by this TX. In a few words, I am delighted with this very fine transmitter.

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