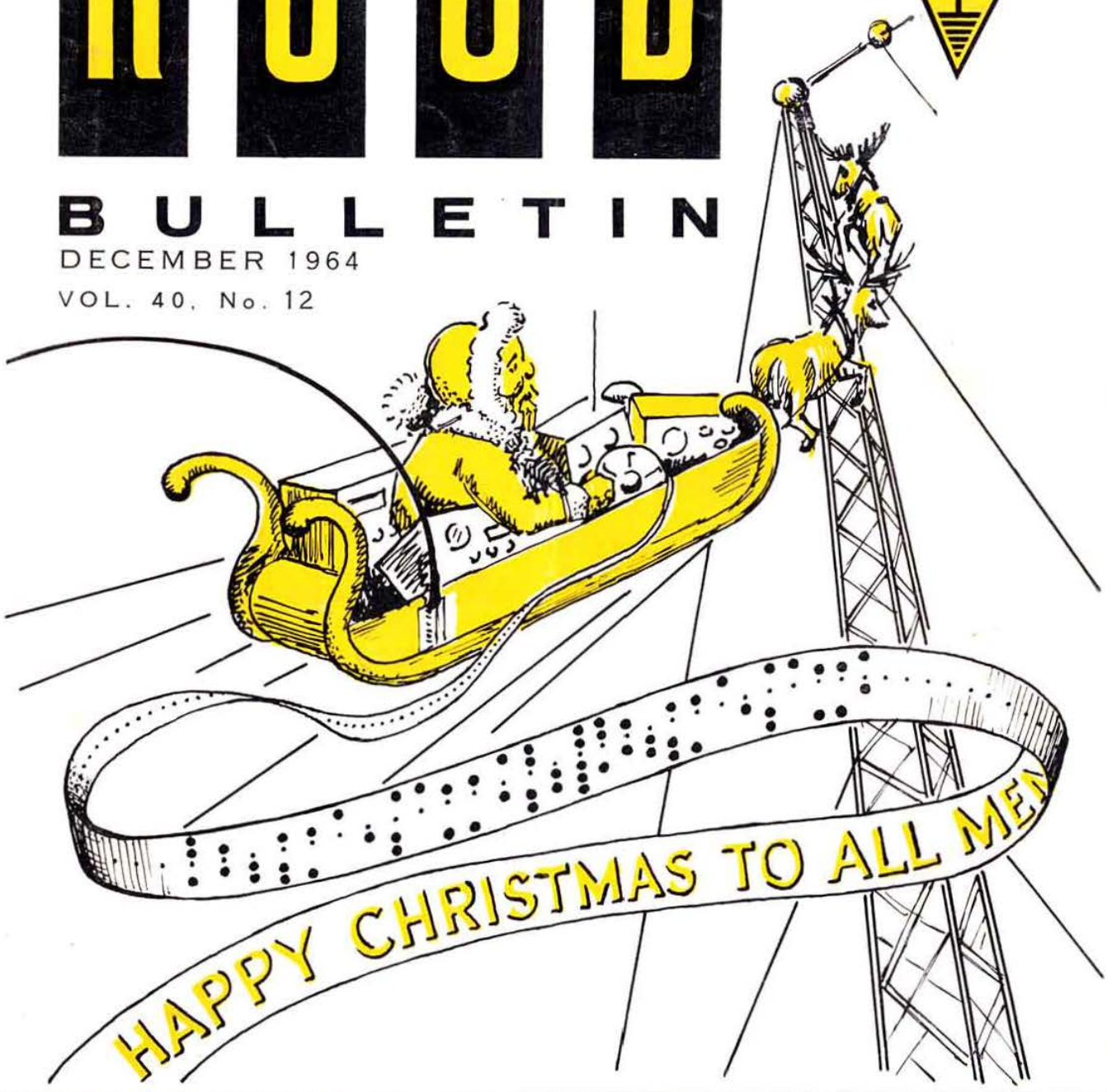
RSGB

BULLETIN

DECEMBER 1964

VOL. 40, No. 12



JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Volume 40 No. 12

December 1964

3/- Monthly

RSGB BULLETIN

CONTENTS

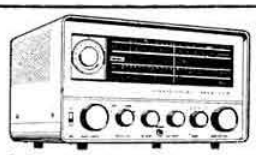
EDITOR:
John A. Rouse, G2AHL

EDITORIAL ASSISTANT:
T. R. Preece, G3TRP

EDITORIAL OFFICE:
RSGB Headquarters, 28 Little Russell Street, London, W.C.1.
Telephones: HOLborn 7373
HOLborn 2444

ADVERTISEMENT MANAGER:
Mrs. P. D. Harvey,
Sawell & Sons Ltd.,
Ludgate Circus, London, E.C.4
Telephone: FLEet Street 4353

The RSGB Bulletin is published on the first Wednesday in each month by the Radio Society of Great Britain as its official journal and sent to all members.
The closing date for copy for the next issue is December 9.



NEW LAFAYETTE COMMUNICATION RECEIVER

A SUPERB RECEIVER FOR ONLY £27.10.0
Carriage 10/-

MODEL HA-63
7 VALVES
Plus Selenium Rectifier
4 BANDS
Covering 550 Kc/s - 31 Mc/s

● Illuminated 'S' Meter ● 1.5 Microvolt Sensitivity ● Electrical Bandspread ● Aerial trimmer ● Noise limiter ● B.F.O. ● R.F. stage ● Big slide rule dial ● Output for headphones or 4/8Ω speaker ● Modern steel cabinet size 13in. x 7 4/5in. x 10in. ● Operation 220/240 volt A.C. Supplied Brand New and Guaranteed with instruction Manual. Matching speaker in Cabinet **55**/- S.A.E. for full details.

Full Range of other Lafayette Receivers in Stock.
MODEL HE-40, 4 Bands, 550Kc/s-30Mc/s ... ... **£19.19.0.**
MODEL HE-30, 9 Valves, 4 Bands, 550Kc/s-30Mc/s. Semi-kit £27.10.0. **£35.**
Each receiver supplied brand new and fully guaranteed complete with manual. Carriage 10/-. All models for operation on 220/240V. AC.
S.A.E. for illustrated leaflet—generous part exchange allowances.

HALLICRAFTER RI949 RECEIVERS

V.H.F. aircraft receivers covering 27-143 Mc/s AM or FM. Incorporates 2 R.F. stages, 'S' meter, B.F.O., A.N.L., etc. Output for phones or speakers. Power requirements 250V H.T. and 6.3V L.T. Supplied in excellent condition, fully tested and checked. **£17.10.0.** Carriage 10/-.

AERIAL CHANGEOVER RELAYS

12V D.C. dp ceramic insulated **10/6** each. Postage and packing 1/-.

CLEAR PLASTIC PANEL METERS

First grade quality, Moving Coil panel meters, available ex-stock. S.A.E. for illustrated leaflet. Discounts for quantity. Available as follows. Type MR. 38P. 1 21/32in. square fronts.

2mA	..	22/6	10V. DC	..	22/6
5mA	..	22/6	20V. DC	..	22/6
10mA	..	22/6	50V. DC	..	22/6
50mA	..	22/6	100V. DC	..	22/6
100mA	..	22/6	150V. DC	..	22/6
150mA	..	22/6	300V. DC	..	22/6
200mA	..	22/6	500V. DC	..	22/6
300mA	..	22/6	750V. DC	..	22/6
500mA	..	22/6	15V. AC	..	22/6
750mA	..	22/6	50V. AC	..	22/6
1-0-1mA	..	22/6	150V. AC	..	22/6
1A. DC	..	22/6	300V. AC	..	22/6
5A. DC	..	22/6	500V. AC	..	22/6
3V. DC	..	22/6	"S" Meter 1mA		29/6
50μA	..	38/6			
100μA	..	29/6			
200μA	..	27/6			
500μA	..	25/-			
50-0-50μA	..	29/6			
100-0-100μA	..	27/6			
500-0-500μA	..	29/6			
1mA	..	22/6			

POST EXTRA Larger sizes available — send for lists.
ILLUMINATED "S" METER. 1¾in. square front. Cal. in 8 units. 6V. lamp. **29/6.** P.P. 1/-. Ditto 2 5/16in. square **39/6.** P.P. 1/-.

SILICON RECTIFIERS

250v. P.I.V. 750mA	3/-	400v. P.I.V. 500mA	3/6
400v. P.I.V. 3A	7/6	200v. P.I.V. 200mA	3/-
200v. P.I.V. 6A	5/6	95v. P.I.V. 3A	5/6
1000v. P.I.V. 650mA	7/6	70v. P.I.V. 1A	3/6
800v. P.I.V. 500mA	5/6	150v. P.I.V. 1A	1/-

Discounts for quantities. Post extra.

TRANSISTORISED FIELD STRENGTH METER

3 bands 2.5 to 57 Mc/s, permits easy tune up for max. transmitter output. Earphone jack to monitor audio. 200μA meter cal. 0-10. Supplied complete with battery, telescopic aerial. **£7.7.0** each. P.P. 2/6.

MS-435 SEMI-AUTOMATIC 'BUG'

Super speed morse key. Seven adjustments for speed and comfort. Speed adjustable 10 wpm to as high as desired, weight scale for reproducible speed settings. Precision tooled, anti-rust nickel plated brass and stainless steel operating parts. Size: 6¼in. x 3in. x 2¼in. Brand new **£4.12.6,** post paid.

R.C.A. AR88 RECEIVERS

"LF" excellent condition **£35**
"D" as new **£65**
Carriage 30/- each.

350 MA R.F. METERS

2in. Round. Plug-in type. **8/6.** P.P. 1/6.

LONDON STOCKISTS OF CODAR EQUIPMENT

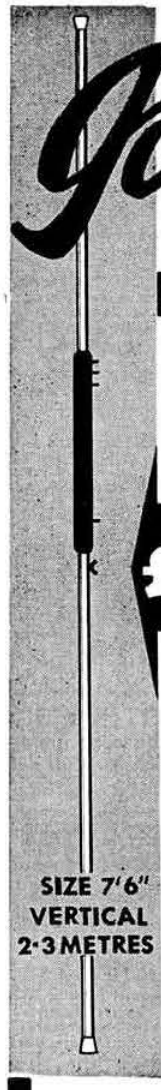
G. W. SMITH & CO. (RADIO) LTD

3-34, LISLE STREET, LONDON, W.C.2

Phone: GERRARD 8204/9155 *Cables: SMITHEX, LESQUARE*

OPEN 9 a.m.-6 p.m. EVERY DAY MONDAY TO SATURDAY

Send 1/- P.O. for full catalogue and lists.



THE UNIQUE

Joystick

VARIABLE FREQUENCY ANTENNA

*The DX aerial for **any** QTH*

Hear and work that spicey DX with the Joystick - lift yourself out of the frustration of 'lump of wire' local contacts - pump out a real beefy signal - yes even from inside a flat or bungalow.

ONLY £3'10'0 COMPLETE

SIZE 7'6" VERTICAL 2·3 METRES

A life time of experience and aerial "know-how" has gone into the development of this revolutionary principle of a Variable Frequency Antenna on which World Patents are now pending. Possessing the unique property of an even performance over all frequencies between 1·5 : 30 Mc/s, the Joystick's special matching facilities and associated A.T.U. ensures efficiency on any frequency. Peak performance for transmission and maximum voltage for reception—the Joystick is a major break-through for ardent SWLs and all licensed stations.

Over 1,500 stations all over the world are already equipped with a Joystick.

INSIDE INFORMATION!

You wouldn't use a sledge-hammer to crack an egg . . . Why then annoy the neighbours with unsightly outdoor long wires when the indoor "JOYSTICK" does a better job??
(See "JOY" News No. 4)

A poor QTH is now no excuse for a weak signal - act . . .

ORDER YOUR JOYSTICK NOW

Full "money-back" **guarantee** if you're not completely satisfied.
Not convinced? Still complete the coupon below for a detailed brochure and showers of testimonials!

PARTRIDGE ELECTRONICS LTD.,
7 Sowell Street, Broadstairs, Kent. Tel: THANET 62535

Please supply "JOYSTICK" (tick appropriate box)
☐ Standard model £3 10s. 0d.
☐ De luxe model (all copper RF elements) £4 10s. 0d.
☐ "JOYMATCH" type 3 for receiving £2 1s. 0d.
☐ "JOYMATCH" type 5 for transmitting £1 2s. 0d.
Enclosed is cheque/M.O./P.O. value £.....
☐ Please send brochures and testimonials

Name..... (Call sign).....
Address.....
Town..... County..... (R3)

Radio Society of Great Britain

(Incorporated 1926)

PATRON

H.R.H. THE PRINCE PHILIP, DUKE OF EDINBURGH, K.G.

COUNCIL 1964

President

G. M. C. STONE, A.M.I.E.E., A.M.I.E.R.E., G3FZL

Immediate Past President and Honorary Treasurer

N. CAWS, F.C.A., G3BVG

Executive Vice-President

E. W. YEOMANSON, G3IIR

Ordinary Elected Members

J C. FOSTER, G2JF R. C. HILLS, B.Sc.(Eng.)., A.M.I.E.E., A.M.I.E.R.E., G3HRH E. G. INGRAM, GM6IZ A. O. MILNE, G2MI
L. E. NEWNHAM, B.Sc., G6NZ R. F. STEVENS, G2BVN J. W. SWINNERTON, T.D., B.Sc.(Econ.)(Hons.), A.I.L., G2YS
LOUIS VARNEY, A.M.I.E.E., A.I.L., G5RV

Zonal Representatives

H. A. BARTLETT, G5QA L. N. GOLDSBROUGH, B.Sc., M.A. (Oxon), G3ERB J. C. GRAHAM, G3TR
R. H. JAMES, A.M.I.E.E., A.M.I.E.R.E., GW3BFH A. D. PATTERSON, B.A.Sc., GI3KYP F. K. PARKER, G3FUR

General Manager and Secretary

JOHN A. ROUSE, G2AHL

REGIONAL REPRESENTATIVES

Region 1.—North Western. B. O'Brien, G2AMV, 1 Waterpark Road, Prenton, Birkenhead, Cheshire.

Region 2.—North Eastern. J. R. Petty, G4JW, 580 Redmires Road, Sheffield 10, Yorkshire.

Region 3.—West Midlands. W. A. Higgins, G8GF, 33 Cedars Avenue, Kingswinford, Brierley Hill, Staffs.

Region 4.—East Midlands. F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.

Region 5.—Eastern. S. J. Granfield, G5BQ, St. Luke's, 47 Warren Road, Cambridge.

Region 6.—South Central. L. W. Lewis, G8ML, 34 Cleevelands Avenue, Cheltenham, Gloucestershire.

Region 7.—London. P. A. Thorogood, G4KD, 35 Gibbs Green, Edgware, Middlesex.

Region 8.—South Eastern. Norman D. Mattock, G2DFG, "Brackstones," 185 Cheriton Road, Folkestone, Kent.

Region 9.—South Western. R. E. Griffin, G5UH, 13 Alexandra Road, Uplands, Bristol 3.

Region 10.—South Wales. C. H. Parsons, GW8NP, 90 Maesycoed Road, Heath, Cardiff, Glamorgan.

Region 11.—North Wales. J. E. Thornton Lawrence, GW3JGA, "Perranporth," East Avenue, Bryn Newydd, Prestatyn, Flintshire.

Region 12.—North-East Scotland. G. B. Woffinden, GM3COV, 5 Rockwell Crescent, Thurso, Caithness.

Region 13.—South-East Scotland. G. P. Millar, GM3UM, 8 Plewlands Gardens, Edinburgh 10.

Region 14.—West Scotland. D. W. R. Macadie, GM6MD, 154 Kingsacre Road, Glasgow, S.4.

Region 15.—Northern Ireland. J. William Douglas, GI3IWD, 21 Wellington Gardens, Bangor, Co. Down.

Region 16.—East Anglia. P. J. Naish, G3EIX, 6 Mildmays, Danbury Chelmsford, Essex.

Region 17.—Southern. L. H. F. Southwell, G3JLS, 15 Hollybank Road, Hythe, Southampton, Hants.

The annual subscription rates to the RSGB are as follows: Corporate Members, Home and Overseas—35/- ($5 U.S. or Canadian). Associate Members under 21 years of age—15/-. Application forms may be obtained from Headquarters on request.

A Christmas Message from the President

THIS year, instead of looking back over the past 50 years of the Radio Society of Great Britain, as we did during the Jubilee Year, we have been looking forward embarking on a vigorous programme which I feel sure will form a sound beginning for the next half century. Of the many issues tackled by the Society this year two of supreme importance stand out. These are International Friendship and Education.

The greatest value of all that Amateur Radio has to the community is to promote international friendship and goodwill. I shall remember 1964 for my visits to Brussels, Paris, Geneva and Dublin —not to mention those in the United Kingdom—and the warmth of the welcome that I received. I shall remember 1964 for the Belgian visit to London in August, the reception for overseas visitors at the RSGB International Radio Communications Exhibition in October—described by a very old friend of the RSGB as the best function ever run by the Society. But most of all I shall remember the outstanding progress made towards reciprocal licensing in this country which resulted in the first foreign civilian, René Vanmuysen, ON4VY, and his colleagues operating a British amateur transmitting station during the Belgian visit. This was most appropriate as ON4VY has done more than any other European amateur in this field.

Mr. G. M. C. Stone, A.M.I.E.E., A.M.I.E.R.E., G3FZL
President 1964

The culmination was what would have seemed impossible this time last year: permission for any licensed foreign amateur to operate the Society's stations at the International Radio Communications Exhibition—a facility enjoyed at the show by amateurs from many other countries. For this we must thank the officials of the General Post Office who have continued to show a very great interest in our affairs and who have been most sympathetic to our many requests during the year, as they have been in the past.

The RSGB Education and Training Committee was formed in January of this year and I have been privileged to be its first Chairman. One particular aim is to encourage Amateur Radio as a hobby amongst boys and girls and the first steps have been taken to give guidance to those wishing to form school radio clubs. But there is much more to do and the next few years will be vital. There is a particular challenge to those of our members already in the teaching profession and there is an urgent need for youth leaders who have a background in Amateur Radio. Can you help?

In this season of goodwill, and in the future, let us resolve by our individual efforts, and collectively, to show the world that Amateur Radio is one of the greatest forces in ensuring world peace.

Finally, may I wish you all the Season's Greetings and the very best of DX in the coming year.

A Wobbulator for Communications Receiver Alignment

By M. J. NETHERSOLE, ZS6AHX *

ALTHOUGH little information has been published concerning the application and construction of a frequency modulated oscillator for Amateur Radio purposes, it is, nevertheless, an extremely useful, although somewhat specialized piece of auxiliary equipment. Its main function is to simplify the task of aligning i.f. strips and bandpass filters to produce a clean, flat-topped, steep skirted response with minimum side lobes. Using a signal generator and v.t.v.m., the time consumed can be considerable, for a new graph has to be constructed following every major adjustment; but with a wobbulator and oscilloscope, the pass-band can be observed at a glance, and even the effect of an adjustment actually being made can be continuously monitored.

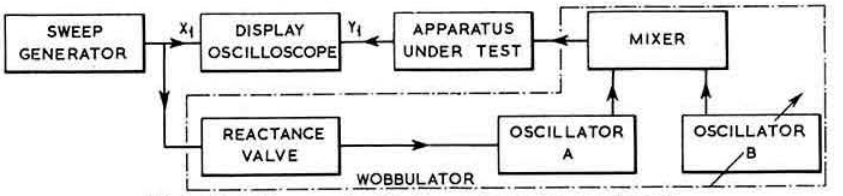


Fig. 1. Block diagram of wobbulator and associated equipment.

Circuit Description

As there are a number of different intermediate frequencies in general use, extending from 50 kc/s to 2 Mc/s and often beyond, a simple oscillator to cover this range would require several stages of coil switching. An alternative arrangement, however, was chosen which produces an output continuously variable over the desired range. This is accomplished by mixing the output of a 5 Mc/s fixed frequency oscillator with that of a 5 to 7 Mc/s variable oscillator. The process of frequency modulating the output occurs within part of the tuned circuit of the fixed oscillator, which ensures that the frequency deviation remains constant regardless of the output frequency, this being another reason for the choice of the particular method of generation. The maximum permissible sawtooth wave injection to the 6F33 reactance modulator (V1), Fig. 3, to produce a linear frequency deviation is able to shift the nominal 5 Mc/s by approximately 60 kc/s, which should be adequate for all normal purposes. In order to present a single display on the oscilloscope, the signal injected into V1 should be of the same repetition frequency as the X-scan on the oscilloscope, and also a clean sawtooth. The wobbulator has therefore been designed without the inclusion of a sweep-frequency oscillator, for the output of the timebase of the oscilloscope in use should be perfectly satisfactory. Indeed, any irregularities in the wave-shape become unimportant when the same oscillator is used in both cases. This method also eliminates the necessity for synchronization of oscillators.

The 6F33 (V1) was chosen as the reactance modulator because of its superior linear mutual conductance/suppressor grid voltage characteristic. It is important to see that both the anode and screen are adequately decoupled with respect to the sweep frequency.

* c/o Box 4164, Johannesburg, South Africa.

The oscillator (V2, V3) frequencies were originally chosen as a compromise between stability of output centre frequency and ease of obtaining the required tuning range. As the output frequency is dependent on the difference frequency between the two oscillators, 5 Mc/s was not considered unduly high for stability. As the oscillators are electrically similar, conditions causing a shift in one oscillator will similarly affect the other. The output should thus remain constant.

Should the necessity arise, the frequency range can be extended by the modification of one or both oscillators, with due consideration for unwanted mixing products.

The oscillator outputs are fed into the mixer (V4) and as more than sufficient output was available, the anode load of V4 was deliberately made low.

The instrument will work satisfactorily from an h.t. supply of 220 to 250 volts, and to avoid low frequency cyclic distortion of the display, the smoothing must be of a high order. A conventional capacitance input filter followed by a hum suppressor was found to give better results than two identical filter sections. The a.c. ripple is minimized by adjustment of the potentiometer in the cathode circuit of the hum suppressor, and in the case of the prototype was reduced to less than 2mV r.m.s. on full load (30mA) with no sweep voltage applied.

If the power supply is to be contained within the same case as the instrument, adequate ventilation must be provided.

The layout of the unit is flexible within reason, although a logical design ought to be adhered to as far as possible. Satisfactory operation was achieved without enclosing the oscillators in screening boxes, but they could be added as an additional precaution if desired. All the valves were, however, fitted with screening cans, and the entire instrument enclosed in a metal case.

Testing and Adjustment

Following construction, the wiring must be checked thoroughly. After switching on, the panel light and valve heaters should glow, and then, provided no components become unduly hot, the unit should be allowed to run for at least twenty minutes before beginning alignment. The oscillator frequencies must subsequently be corrected, and the hum suppressor adjusted with the aid of a valve voltmeter or sensitive oscilloscope.

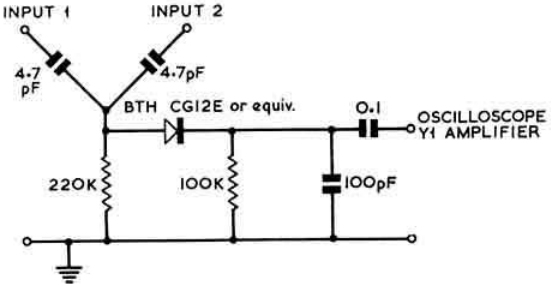
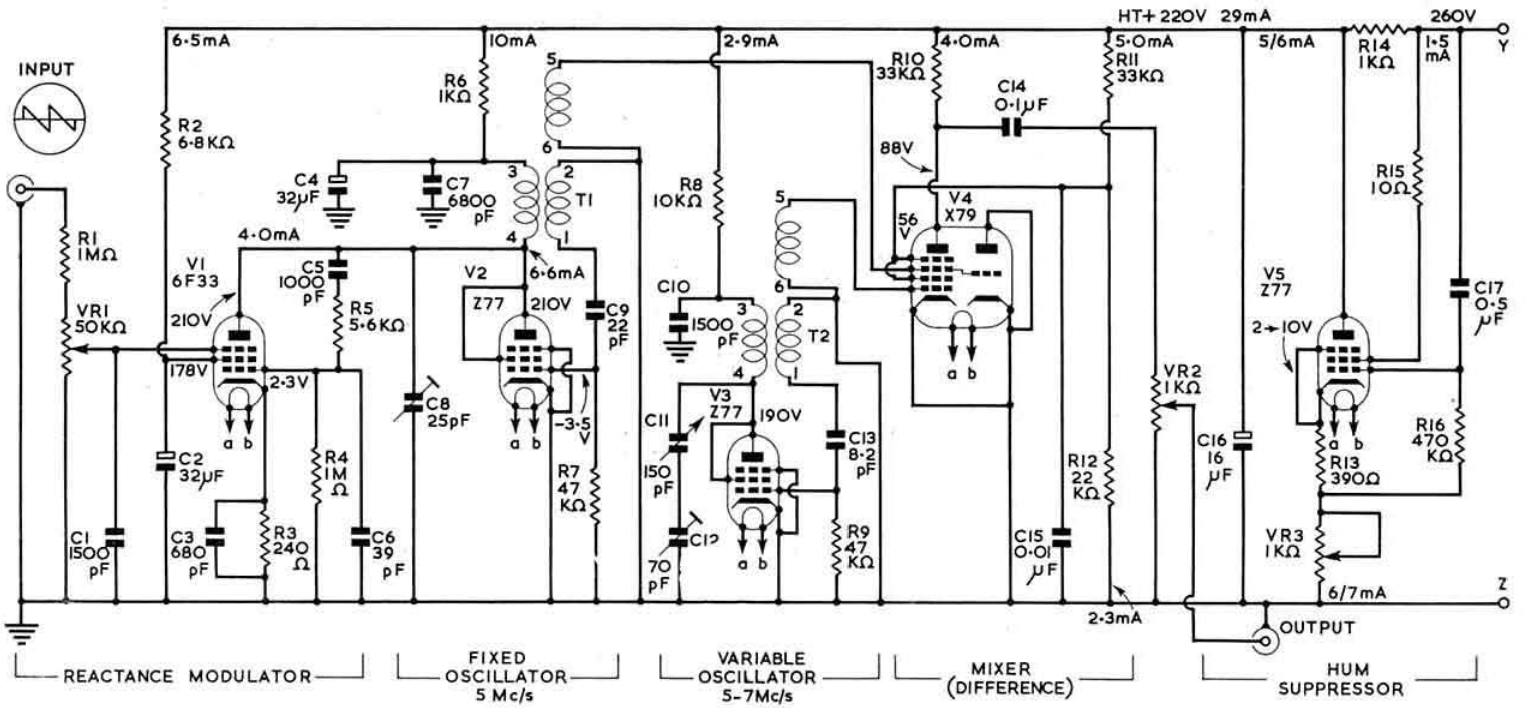


Fig. 2. A simple mixer for use when aligning the fixed and variable frequency oscillators of the wobbulator.

Establishing the correct nominal frequencies may be accomplished in one of three ways. After reducing the variable oscillator tuning capacitor to minimum, the fixed



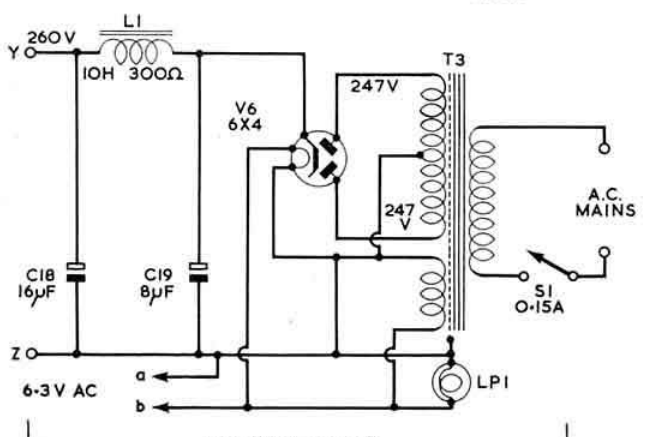


Fig. 3. Circuit of the wobbulator and power supply.

Details of Oscillator Coils

Fixed Frequency Oscillator

T1—$\frac{7}{16}$ in. dia. Aladdin F804/PP5892 former with dust core.

Main tank winding	34 turns of no. 32 s.w.g.
Feedback winding	16 turns of no. 32 s.w.g.
Coupling winding	4½ turns of no. 26 s.w.g.

All windings single layer, close-wound, enamel. Feedback winding on top of main winding near earthy end.

Coupling winding spaced $\frac{1}{8}$ in. from main tank winding. Main tank winding inductance approximately 17 μH, Q approximately 70

Variable Frequency Oscillator

T2—$\frac{7}{16}$ in. dia. Aladdin former with dust core.

Main tank winding	30 turns of no. 32 s.w.g.
Feedback winding	12 turns of no. 32 s.w.g.
Coupling winding	4¾ turns of no. 26 s.w.g.

All windings single layer, close-wound, enamel. Feedback winding on top of main winding near earthy end.

Coupling winding spaced $\frac{1}{8}$ in. from main tank winding. Main tank winding inductance approximately 15·6 μH, Q approximately 70.

TABLE I

Trace Deviation Linearity Measurements

Frequency (kc/s)	Trace Deviation (cm)	Frequency (kc/s)	Trace deviation (cm)
270	0·0	1850	0·0
280	0·7	1860	0·5
290	1·1	1870	0·9
300	1·4	1880	1·2
310	1·7	1890	1·5
320	2·0	1900	1·8
330	2·3	1910	2·1
340	2·6	1920	2·4
350	2·8	1930	2·7
360	3·1	1940	3·0
370	3·4	1950	3·3
380	3·7	1960	3·7
390	4·0	1970	4·0
400	4·3	1980	4·4
410	4·6	1990	4·8
420	5·0	2000	5·2
430	5·3	2010	5·6
440	5·7	2020	6·0
450	6·1	2030	6·4
460	6·5	2040	7·1
470	7·0	2050	8·0
480	7·8		

oscillator may be aligned by alteration of the slug of T1, and C8, together with any one of the following three methods of frequency determination.

1. Absorption wavemeter.
2. Zero beat with a receiver tuned to 5 Mc/s having b.f.o. on.
3. Zero beat with a signal generator tuned to 5 Mc/s, the outputs being mixed and displayed on an oscilloscope. The circuit of a suitable mixer is shown in Fig. 2.

The variable oscillator must be set to cover the range 5 Mc/s to 7 Mc/s. For 5 Mc/s, C11 should be positioned at maximum capacitance, and the slug of T2 adjusted for zero beat with the fixed oscillator. If, with this setting, C11 is not capable of tuning the full 2 Mc/s, alteration of the series padder C12 will improve the coverage, but the initial 5 Mc/s adjustment will have to be repeated.

Calibration

The variable oscillator capacitor is calibrated directly in terms of difference frequency, and hence "centre frequency" when a sweep waveform is applied. It is recommended that the process of calibration be attempted when the oscillators' outputs are not being mixed, as direct 5-7 Mc/s frequency measurement leaves less likelihood of unintentional measurement of spurious mixer products.

Calibration of the deviation control is the next step. With VR1 at minimum (zero sweep) the output can be mixed with a reference frequency from a signal generator, and tuned to zero beat. The combined output should, for convenience, be displayed on an oscilloscope. On variation of the generator frequency by, say, 10 kc/s, the zero beat pattern will immediately vanish, until VR1 is altered to resume the condition. The process should be repeated until the deviation control is at maximum, calibration marks being applied to the dial of VR1 at each step. The deviation will always remain constant, regardless of the centre frequency, since the maximum output frequency of the frequency modulated oscillator cannot vary.

Amplitude calibration of the output is unfortunately impracticable. The reason is that with variation of the centre frequency, the output voltage varies in sympathy. Reference divisions of from, say, 1 to 10 however, are very useful.

Conclusion

A CR150 double conversion communications receiver was successfully aligned using the instrument. There are few tasks which could not be tackled with it, for it can be classed as comprehensive and is admirably suited to modification, particularly with reference to the extension of frequency range. One useful point is that although the mixer has been described for the subtraction of one of two oscillator frequencies from the other, the additive output (10 to 12 Mc/s) would appear to be ideal for the alignment of v.h.f. f.m. broadcast receivers.

As an approximate test for linearity of the deviation, a number of horizontal graticule measurements were taken, corresponding to frequency steps of 10 kc/s, and these are given in Table 1. The deviation control was set at mid-position, i.e., approximately 200 kc/s.

Acknowledgments

The equipment described in this article was developed while the writer was a student at the Marconi College, Chelmsford, to whom grateful acknowledgment is made.

Mr W. H. Hodgson, G3BW, presenting a bouquet to Mrs J. Illingworth at the Mullard Award Presentation on November 7, 1964. A report appears on page 800.

The President, Council and Headquarters Staff send Christmas Greetings to all Members of the Society

The G3IAS Transistorized Electronic Keyer

Described by G. F. GEARING, G3JJG *

PERIODICALLY, most American magazines devoted to Amateur Radio publish designs for electronic keyers employing transistor circuitry. These circuits are not related to the well-known twin triode valve design, but rather lean fairly heavily in the direction of computer practice to secure sophisticated operation and make possible such desirable features as self-compelling dots and dashes, and " lock-out " of the operating paddle while the dots and dashes are being formed. Highly advanced designs go so far as to include memory chains which allow all the components of a particular character to be fed into the device which will then, of its own volition, produce a perfect Morse code symbol no matter how irregular or faulty was the operation of the paddle.

Living as we do in a push-button age, it is hardly surprising to find that one design in particular went the whole hog. In this, all that was required was for the operator to push a button engraved with the desired letter, the device then producing a perfectly formed Morse code character.

In terms of absolute fundamentals, the design of these sophisticated keyers is not too difficult to understand once one gets the hang of multivibrators, and the manner in which the Eccles-Jordan bistable multivibrator operates. Most of the problems associated with constructing the US designs in this country arise from circuit presentation, and the apparent inability of alleged " equivalent " transistors to operate in a satisfactory manner in the circuits themselves.

It is probably true to say that most keyers are related to the original design by W5LAN carried in *QST* for May 1959.

The design by A. M. Smith, G3IAS, to be detailed here belongs to the same general group, but it contains a number of important circuit features which substantially contribute to reliability of operation, and which in addition make it reasonably tolerant in respect of transistor types.

Basic Mode of Operation

In simplest terms, the circuit to be described operates in the following manner.

A multivibrator with a 1:1 mark-to-space ratio—that is its output period is precisely the same as its rest period—is used to drive a relay whose contacts will open and close in step with the multivibrator. If the contacts of this relay are connected to the keying circuit of a transmitter, since " dots " are composed of carrier and spaces in equal proportions, then when the multivibrator is switched " on," the transmitter will produce a string of " dots " for as long as the multivibrator is operating.

To produce a " dash," we require the relay to remain closed for three times as long as it is when making a " dot." It is quite possible of course to have a second multivibrator operating with an " on " to " off " ratio of 3 : 1, and use this to drive the relay. In fact some keyers operate in this manner. However, if the formation of the " dash " can be directly linked to the dot generator, then at all times the " dash " period will be controlled by the " dot " period, and, as a consequence, the relationship between " dots " and " dashes " will remain correct.

It is in the formation of the " dashes " that the Eccles-Jordan bistable multivibrator is used. Unlike a basic multivibrator, this circuit does not " free run " when it has power applied to it, but requires pulses applied to it to cause it to operate. The circuit may be considered as two switches which are linked together, one " on " and the other " off." When a pulse is applied to the circuit, the " switches " change-over, " on " to " off," and " off " to " on." When a *second* pulse is applied, then the " switches " again change-over, and the circuit is restored to its original state. Between the first and second pulses, the circuit is considered as " on," being " off " before the arrival of the first pulse, and " off " again after the arrival of the second pulse.

From this it is evident that fundamentally, the Eccles-Jordan circuit divides by a factor of 2. That is for every two pulses applied to it, it produces one output pulse.

This is all very well, but for our purpose, we require to divide the " dot " rate by three in order to produce our dashes, and not by a factor of two. The way that this is accomplished is by making use of the " dot " generator to hold in the keying relay for the balance of the " dash " period, and in effect to use the bistable circuit to hold in the keying relay during the off period of the " dot " generator. That is, for the period of the space between two adjacent " dots." Thus our dash is composed of the first " dot," plus the rest period, plus the second " dot." Since the mark-to-space ratio of the dot generator is 1:1, then the resulting " dash " is three times as long as a " dot," which is exactly what we require.

The " dot " generator and " dash " generator—more strictly pulse counter circuit—are linked together so that the action of the relay is that which we require, but more than this, through additional circuitry, provision is made to " lock-out " the operating lever of the keyer until it has fulfilled the function that it sets out to do. Moreover, if the keying lever is only just lightly touched on either the " dot " or " dash " side, then the electronics will, quite unaided, produce a perfect dot or dash. At slow speeds, this self-completing feature is quite uncanny.

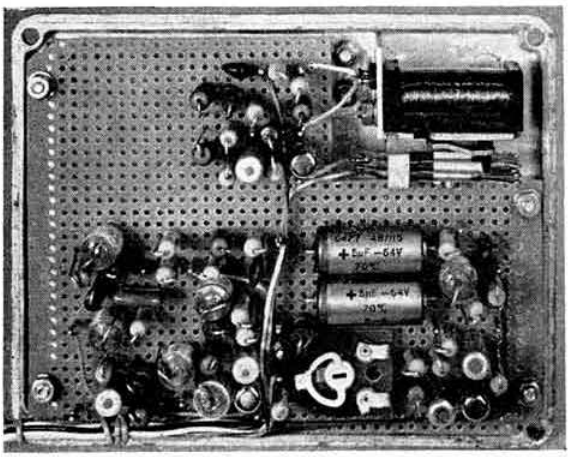
Stabilizing Operation

In the keyer circuit, all transistors operate as switches. In many designs transistors are switched " off " by the simple expedient of removing the potential fed to the base of the switching transistor. Due to variations in leakage current through different specimens of transistors belonging to the same type number, this method is far from positive in its action. The effect can be to modify the shape or amplitude of the pulse produced by the circuit containing such a transistor, and this in turn lead to erratic operation of subsequent circuits. The problems created by such leakage currents can be aggravated by changes in ambient temperature, for, in most cases, leakage currents can change quite substantially with changes of temperature.

In this design, G3IAS has made the switching conditions sensibly independent of leakage current and temperature by feeding a positive voltage to the bases of " off " transistors so ensuring absolute cut-off. This makes the switching action reliable, and, of particular importance, the circuit tolerant to quite wide variations in transistor types.

A few words regarding the use of a transistor as a switch: ideally, a perfect switch has zero resistance between its terminals when closed and infinite when open. A transistor in the common emitter configuration, with load resistor R_L, base current I_b, and collector current I_c, can approach the ideal as long as two conditions are satisfied.

* 65 Ringwood Close, Furnace Green, Crawley, Sussex. Member of Technical Development Sub-Committee.



Construction of a G3IAS keyer or Veroboard mounted on the lid of an Eddystone die-cast box.

Let the current gain be represented by β

(i) Base current I_b must exceed a value $I_b = \frac{V}{\beta R_L}$

when the switch is intended to be " on," that is, the transistor may be described as " bottomed."
(ii) When the switch is " off," the base must be made slightly positive with respect to the emitter.

In case (i), for a germanium transistor, the residual voltage drop between emitter and collector is generally less than 0·1V. In case (ii), only leakage current can flow.

In many designs, the pulses which are transferred from one part of the circuit to another, are coupled by capacitors or resistors into the base of the transistor concerned. Theoretically this should be satisfactory, and where transistors are selected with care, it usually is. However, in view of the spread in transistor parameters, the accent is ontransistor selection to secure reliability.

In this design, steering diodes are employed in pulse coupling circuits and these positively ensure that the cueing pulse operates only the intended circuit, and that there is no stray coupling to others.

Functional Analysis

Fig. 1 shows the block diagram of the keyer unit together with the various waveforms. The " dots " are formed by the multivibrator circuit employing transistors Q1 and Q2, and this circuit is activated by the switching transistor Q3. A built-in memory system derived from the d.c. amplifying transistor Q7 ensures that each dot is perfectly formed irrespective of the manner in which the paddle is operated. Transistor, Q8, which is fed from the d.c. amplifier Q7, has a high speed keying relay in its collector lead, and this operates the transmitter keying circuit.

In order to produce a " dash," which must be three times the pulse width of a " dot," the keying paddle is placed over to the right-hand side to switch on transistor Q6. This is the transistor which places the Eccles-Jordan bistable circuit in the " ready " condition. At precisely the same instant as Q6 goes " on," the supply is also fed to Q3 via CR9 and the multivibrator commences to operate. The leading edge of the first " dot " pulse is fed by CR5 to the flip-flop Q4, Q5, causing it to change its state and so hold Q7 " off "—Q8 now " on." This condition remains until the start of the second " dot " pulse.

At the start of the second " dot " pulse, the leading edge of this is fed to the flip-flop by CR4, which promptly reverts to its original state, and in so doing releases Q7 from its " off " position. However, Q7 does not in fact go " on," for it is maintained in the " off " condition for the duration of the " dot " pulse; upon the cessation of this it goes " on," and Q8, the transistor operating the keying relay, goes " off," thus allowing the relay contacts to open.

It will be appreciated that the " dash " pulse width was that of the first and second dots together with that of the space between. As the mark-to-space ratio of the multivibrator is set for 1:1, then, effectively, the dash has existed for the time of three dots.

Since all timing operations are a direct function of the multivibrator, if we vary the speed of the dot multivibrator, then the dashes will be altered proportionately.

Circuit Analysis

The complete circuit of the keyer is shown in Fig. 2.

Under idling conditions—key paddle central—Q1 is bottomed, that is hard on, and since Q3 is off, the collector of Q2 rises to almost −6V, and C2 becomes charged to this potential. Similarly, Q5 is bottomed, Q6 and Q4 off, with the collector of Q4 resting at −4·5V nominal. Both CR2 and CR7 are reverse biased permitting sufficient base current to flow in Q7 to saturate the transistor. The base of Q8 is biased slightly positive through R23 which holds it in the "off" position, and the relay is therefore unenergized.

When the dot contact is closed, current is fed to the base of Q3 via R22 and Q3 conducts, followed by Q2. The potential drop across R5 is fed to the base of Q1 as a pulse through C2, and this turns off Q1. As Q2 bottoms, the gate or steering diode CR2 closes, cutting off Q7 which in turn

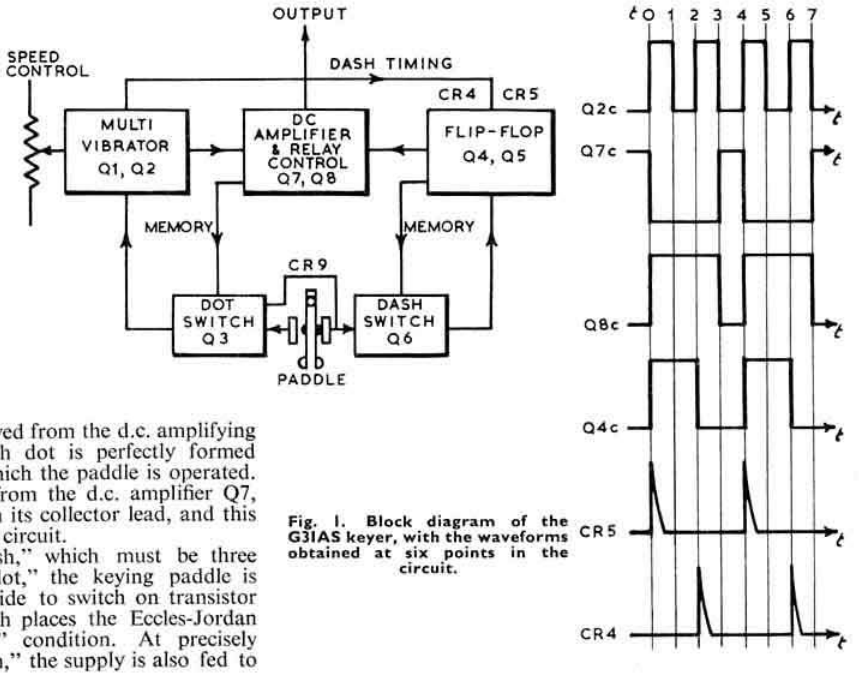


Fig. 1. Block diagram of the G3IAS keyer, with the waveforms obtained at six points in the circuit.

makes base current available for Q8, so overcoming the positive " off " bias. Q8 then conducts, and the relay closes.

C2 discharges through R4 and VR2 to a voltage point determined by the setting of VR1, this being the SPEED control. When the point is reached at which the base of Q1 again goes negative, Q1 switches " on." The fall in potential which occurs across R2 is transferred to the base of Q2 through C1. Q2 now switches off, reverse biasing CR2 and removing the feed to Q7, which promptly bottoms. As a result, Q8 switches off and the relay drops out, so ending the dot character.

If the paddle is retained in the " dot " position, then the cycle of events will repeat itself once C1 has discharged through R3. Should the paddle be released while a dot is in the process of being formed, the connection from the collector of Q7 through R6 to the base of Q3 ensures that the dot will be correctly completed.

The control VR2 governs the mark-to-space ratio of the multivibrator by adjusting the relative rate at which C1 and C2 discharge.

Closing the dash contact by moving the paddle over to the right-hand side initiates the dot generator through CR9, while at the same time switching on Q6 which places the bistable in its " ready " state. A positive-going pulse from the collector of Q2 is passed through the steering diode CR5 and switches Q5 off. When Q5 goes off, Q4 comes on. At the end of the dot period, Q2 ceases to conduct but Q7 is held off—and Q8 held on and the relay kept closed—by Q4 and CR7. The next positive pulse due to the leading edge of the second dot from the dot generator is fed by CR4 to the base of Q4. This turns off Q4, which in turn turns on Q5, and thus the bistable changes its state, releasing the " hold " on Q7 via CR7. Once Q2 has completed its action for the second time, both CR2 and CR7 are reversed biased, as a result of which there is no " hold " on Q7 from either CR2 or CR7, and so Q7 conducts, turning off Q8 and releasing the relay.

The bistable circuit Q4, Q5, has filled in the space between two consecutive dots and so formed a dash. Self-completion of a dash is assured since Q6 is held on by Q5 collector through R18, R19.

The diode CR1 prevents C1 being charged in a reverse direction during idling periods; if this occurred, there is a possibility of the first dot of a series being shortened. CR8 and R11 which are placed across the relay coil are to limit the inductive spike produced by the relay coil as Q8 turns off.

Using a unit of this type, it is quite possible to have full break-in keying facilities by employing the negative and positive going pulses from Q7 collector (A) and Q8 collector (B) respectively to operate further transistor switches. Under such conditions, the relay coil in Q8 would be replaced by a resistor of the same value.

Component Notes

Unless you wish to court trouble, and become involved in fault-finding fun, do not use components of unknown quality or vintage. Trouble in this sort of keyer may well be a piece of cake for a computer shooter, but it is no joke to the average constructor—with all due respect to him.

C1 and C2 should be 25 volt working, and be within 25 per cent of each other in capacity. If the capacity tolerance is not met, then it will be found impossible to set VR2 for a mark-to-space ratio of 1:1. All resistors should be of 5 per cent tolerance.

While this design is widely tolerant of transistor types, diffused base transistors such as the OC170 or ASZ21 do not perform in a satisfactory manner in this circuit and must be avoided. If a transistor tester is available, then a transistor with a gain of not less than 30 at a collector current of 10mA should be selected.

In five models made to the time of writing, various relays have been used. The most important parameter is that the relay must operate reliably with a coil current of between 2mA and 6mA. A Siemens high-speed keying relay and a

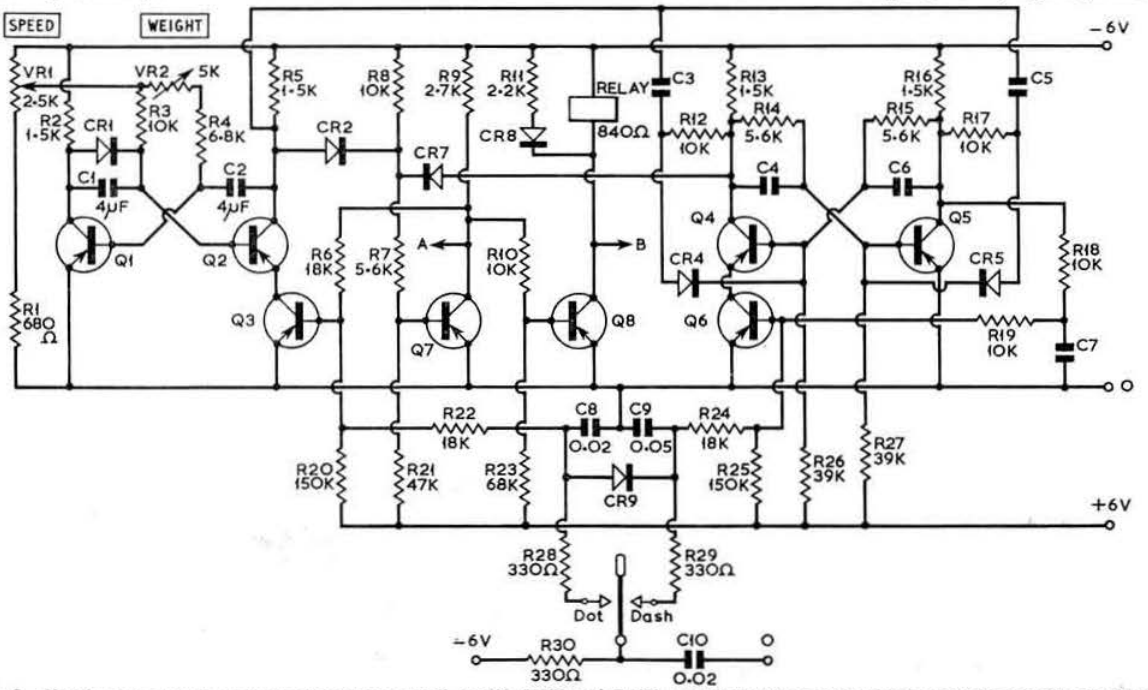


Fig. 2. Circuit of the keyer. For transistor types OC71, OC76, OC72 and OC77, capacitors C3 to C6 inclusive, and C11 and C12, should be 0·005 μF at 10 per cent tolerance. For transistor types OC42 and OC44, etc., these capacitors should have a value of 470 pF with 10 per cent tolerance. The transistors should have a current gain of 30 at a collector current of 10mA. See text for further information. CR1-9, OA81 or OA85.

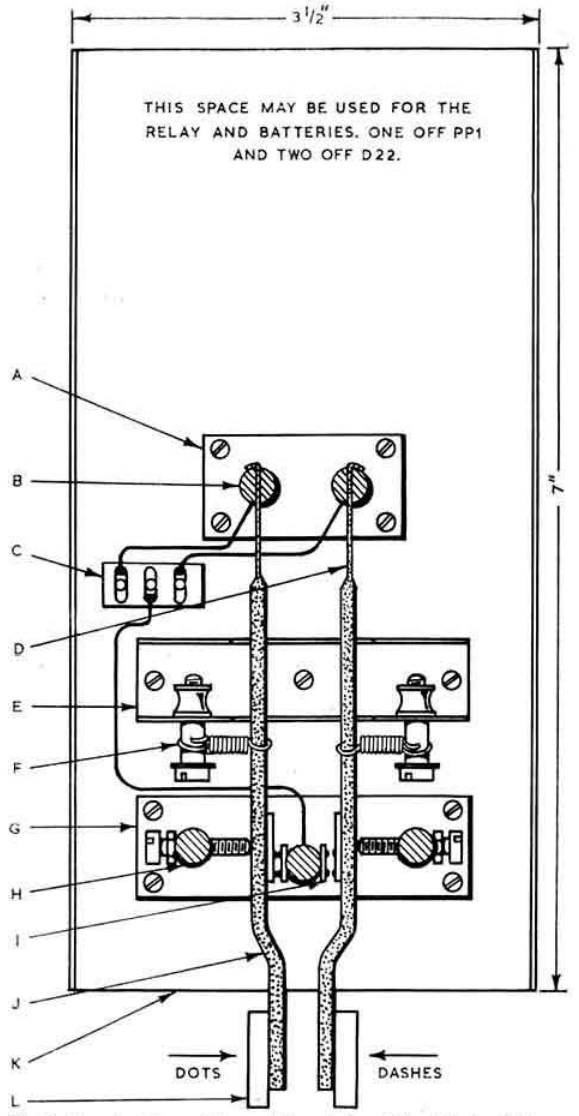


Fig. 3. Construction of the paddle. A, insulating block; B, brass rods, $\frac{7}{8}$ in. × $\frac{1}{4}$ in. diam., drilled and tapped 4BA in one end, and slotted at the top to anchor the spring; C, three-way terminal block —connections, left to right, are "dots," "paddle," and "dashes"; D, 24 gauge steel strip, $\frac{7}{16}$ in. wide, soldered to levers; E, right-angle plate, $\frac{1}{2}$ in. × $1\frac{1}{4}$ in. high, with two horizontal slots in vertical face to take the tension adjusters F; G, insulating block; H, brass rods $\frac{3}{8}$ in. × $\frac{1}{4}$ in. diam., drilled and tapped 4BA in end, and drilled and tapped 4BA in side to accept the contact adjusters; I, relay contacts soldered to side arms and centre brass pillar; J, $\frac{5}{16}$ in. wide, 16 gauge brass levers, with a $\frac{3}{8}$ in. hole drilled in each lever behind spring sets; K, 16 gauge aluminium baseplate with sides turned up $\frac{1}{2}$ in. for fixing to "U" shaped chassis containing circuitry; L, Perspex finger plates.

miniature Carpenter relay have both been used with particular success.

Construction

The layout of the keyer is not critical, and the electronics may be constructed on either a group board or a piece of "Veroboard."

Fig. 3 illustrates a relatively easily concocted paddle arrangement, and the diagram should contain sufficient information to allow it to be duplicated. This uses a twin paddle system, and, in the writer's opinion, is to be preferred. The twin paddle permits independent contacts to be used for the dot and dash, and this in turn obviates problems related to maintaining a single paddle precisely central—mechanically difficult to achieve with normal home workshop facilities.

The method of construction will vary from individual to individual; the writer preferred to include the electronics, paddle, a PP1 battery for −6V and two D22 batteries for +6V in one box, measuring about $3\frac{1}{2}$ in. wide, $2\frac{1}{2}$ in. high and 7 in. deep. The paddle levers extend about $1\frac{1}{2}$ in. Both d.c. supplies are switched and a third switch position, key down, shorts the junction of R7 and R8 to 0V, thus permitting tuning of the transmitter.

Conclusion

If, flushed with success, and spurred on by indiscreet enthusiasm, you do, with indecent haste, connect this keyer to your transmitter, your Morse is more than likely to be just "a dashed load of dots."

It is most important to really get the "feel" of a keyer of this type before inflicting it upon other operators, and to this end, no matter how good your c.w., a few hours with it connected to an audio oscillator will be time well spent.

The writer wishes to acknowledge the valuable assistance of A. Elliott, G3GBI, in the preparation of this article.

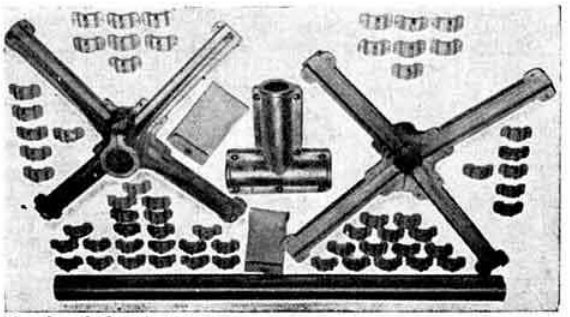
Canadian Cubical Quad Aerial Kit for 10, 15 and 20 metres

THE cubical quad is a very popular aerial system, and although electrically quite simple, it poses considerable problems from the point of view of sound mechanical construction.

The *Stenpro* cubical quad has been designed by H. Earl Thompson, VE1AA, to withstand the worst weather conditions experienced during Canadian winters, and several of these aerials have given trouble-free service in areas where winds reach 100 m.p.h. The radials are made of laminated ash coated with preservative and epoxy resin. All the metalwork is of corrosion resistant aluminium of a type used on naval craft. The complete assembly weighs approximately 65 lb.

Assembly instructions give full details of aerial lengths and feed systems. It should be noted that the kit does not include aerial wire, insulators, or radial stays.

The kit is manufactured by Steel and Engine Products Ltd., Liverpool, Nova Scotia, and the price is approximately £25 plus freight and import duty.



Metalwork for the VE1AA aerial which is of corrosion resistant aluminium.

QUA ASSOCIATES

conducted by "JIX"

THE 1964 Exhibition is over. Many old friends must have met, and, as I mentioned in the last *QUA Associates*, new ones made. I can vouch for both.

A large number of my old Amateur Radio friends came and had a word, but as I was on a stand I suppose I had some advantage. A very pleasant occurrence was the boys who came up and introduced themselves. Some had written to this feature, others said they read it and I thank them for their remarks and comments. It isn't really my page, but yours—although it falls upon me to keep it going. With so many boys showing such interest it is encouraging to meet them and hear first hand of their interests and hopes.

I think the members of the Roding Boys' Society should be justly proud of the enthusiasm they showed, not to mention the great effort they put into their exhibit, I know! However, I can't say too much on that point as I'm rather involved! Another piece of work that demands a special mention was Len Newnham's, G6NZ, working models on the RSGB stand, humorously showing the work of the Society. I'm sure you all will join me in congratulating Len and his team on the very good show they made. Many thanks also to those who helped on the Education and Training Committee's stand in the back hall.

And so, for another year the building and listening, the meetings and rallies will go on, then another Show to mark the progress made. A goodly increase in licence holders appears likely by then; you might be one of them!

Mainly Technical: Transistors

A few members commented on the two transistor reflex receiver design, and asked about transistor biasing in general. The problem is a little more involved than in the case of valves, mainly because of the temperature effects that upset transistors, and the need for *current* bias, not merely the voltage bias as for valve circuits. This is the basic difference between valve and transistor devices. Valves are operated by voltage changes at the grid, which controls the stream of electrons passing to the anode from the hot cathode. In the case of transistors a large current is controlled and varied by smaller current changes flowing in the base circuit. In fact, the number of times greater the collector current changes are, compared to the base currents is called the *current amplification factor*, α' (alpha dash). For ordinary small transistors such as the OC71, α' is about 50. In the case of a valve there is a *voltage amplification factor*, called μ (another Greek friend, *mu*). Before we get too technical, perhaps an example would be useful.

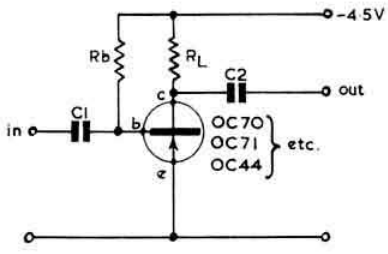


Fig. 1. A basic common emitter amplifier. Resistance values are calculated in the text, while the coupling capacitors will depend on the application.

If α' is assumed to be 50, what current (bias) must pass into the base of a transistor to produce a current of 1 mA in the collector circuit? Obviously (I think it is this time—although many books say "obviously" when the author wants to make a nice big jump, perhaps hoping the reader will not follow too closely in case the doubtful argument is discovered!), it is $\frac{1}{50}$ of 1mA, or 20 μA. So with 20 μA (μ also means "micro") flowing into the base we will have one milliamp flowing at the collector.

To design a simple amplifier using this information is fairly easy. Let's have a go.

We will assume that we have a 4·5 volt battery and the transistor mentioned above. What value for R_L? With one milliamp flowing, we require just half the available voltage to be "dropped" across this resistor. Bring in Ohms Law. Half of 4·5 is 2·25, and with 1 mA flowing,

$$R = \frac{V}{I}$$

$$\therefore \quad R_L = \frac{2{\cdot}25}{\frac{1}{1000}} = 2200 \text{ ohms or } 2{\cdot}2\text{K ohms}$$

to the nearest ordinary value. This means that the output signal can swing up and down equally without cutting off too soon in either direction. (Imagine the voltage at the collector sitting at 4 volts, it could only swing up $\frac{1}{2}$ a volt before cutting off.) What value for R_b? The voltage between the base and emitter of a working transistor is never more than a fraction of a volt, because of the very low resistance (the base emitter junction forms a *forward biased* diode, and offers a very easy path to current flow), therefore a voltage of about 4 to 4·25 will be present across R_b in this example. Applying Ohms Law again:

$$R = \frac{V}{I}$$

$$\therefore \quad R_b = \frac{4}{\frac{20}{1{,}000{,}000}} = 200{,}000 \text{ ohms}$$

or a resistor of 210K ohms, picking a standard value. This amplifier is now ready to be built and operated, so why not try it out? The circuit is not very good however, because of temperature effects, and other tricks have to be used to overcome these troubles. Things now become a little involved. We could discuss the stabilization against temperature techniques in a later article, but perhaps you have had enough. Let me know if you are game.

Postbag this Month

A very interesting development involving work carried out by a group of young people took place over the period July 11 to September 2 this year.

We received a report from **A2684** and his colleagues R. Wilkins and K. Fisher, concerning a receiving expedition to South Wales to study wave propagation in that area. A2684 and his "research team" are all members of Wandsworth School and they received a grant from the school authorities to carry out the project and write a paper on the

results. The base was set up near Pembroke, and a van was used as a mobile HQ. Equipment used involved an R208, R1155, a PCR2 and a Mohican, together with an Eddystone 2m converter. The aerials included a 34 ft. vertical, two 9 ft. whips and dipoles.

In all, 459 calls were heard, and reports were sent to 82 stations giving details of the signals received. Of these, 52 returned QSL cards, quite a good turnover!

A2684 wishes to express his thanks to all stations who have sent back information. A few local amateurs were contacted in person, and I'm sure a good time was had by all. The report ends with a note that the final analysis should prove interesting. We shall be pleased to hear about what was discovered.

The above report shows what excellent and challenging work can be carried out by the Youth Service, and I should be very pleased to hear about any trusts and industrial foundations, or any individuals for that matter, who will help to finance projects and expeditions of this nature for young people. Perhaps work for the Duke of Edinburgh's Awards can be carried out. I would also be pleased to hear from boys or groups who have a genuine scientific research project involving radio and who are keen to set up a small expedition to investigate it.

All this reminds me of the proposal about a camp or Amateur Radio weekend course for boys, but as only about one lad showed any interest, obviously members of RSGB are not active enough in this respect to make it a success. It would have to be set up with keen young people outside the Society (and my evidence shows there are very many electronics enthusiasts who are still not members).

Another interesting point is evidence, seen in my file of your letters, that the vast majority of interested active boys who write to this feature are boarding school members. Day school boys living at home have not had much to say. It seems they have little time to spend on their hobby. It is amazing to read some of the reasons; even lads, it seems, are rushing around or swotting up—with no time to enjoy life and do something for the hell of it! Is it that boys at boarding schools are encouraged to find out for themselves, while at home the television set is always warmed up?

I wonder how you started your interest in radio? It is always interesting to know about the early sparking off of interest and the other day while browsing in Islington Public Library I came across a pamphlet entitled *Young Authors No. 2.* Inside I read the following:

> " *Radio Constructing* "
>
> " I just started radio constructing about three or four years ago. I started to like it more and more every week, because I always go to the library every week or fortnight to get books on it.
>
> One week I told myself, ' I know quite enough about radio construction, why don't I make a radio?'—and I did. I remembered one book called *The Boy's Book of Crystal Sets* so I got it out and started to build. Every week I saved money to buy different parts, and the day came when all the parts were ready to be put together—and there was my first home-made radio."

That was written by Master E. Christofis, aged 13. What an exciting and thrilling moment it is to hear the first station after such a beginning. I think Islington Library staff should be congratulated on producing such an enterprise as *The Young Author.*

A2340, Barry Curnow, of Plymouth wrote a letter offering any help he could give in the way of talks etc. Clubs in that area of the country might like to take up A2340's offer. Also included was an article that Barry wrote in the school magazine some time ago. It was very good.

Geoffrey Ganiford, A4178, operating his receiving equipment. *(Photo by G2HR)*

I have heard again from **A3699,** Gillies Wylie of Renfrewshire. He reports results at his end, listening to the ARRL DX Contest. Apparently Top Band is dead at A3699's QTH. It would be interesting to hear the results obtained by any other listeners in that district.

A4325, John Briggs, of Birmingham has just joined the RSGB. Welcome to the ranks John. He says in his letter that there is " much more to the radio lark than meets the eye." We can all agree with that I'm sure. 20m is the band A4325 listens on mostly. It's good to hear GCE's are under way—the physics should help in RAE work quite a bit!

I met many members at the Show, among them Gordon Rolland, who wrote to me earlier, and Paul Gaskell. Paul sent a letter and a crossword. This *QUA* . . . . was a bit rushed and it was too difficult to edit it for publication. I would like another, perhaps a little more difficult, what say **A4035**? I also met Murray Wilson and his father; there was plenty to talk about with such a keen lad.

Jim Spencer, **G3GRA,** wrote to *QUA Associates* about the social visiting I mentioned earlier, and mentioned that some TV aerials are horizontally polarized, and look like 2m beams—so aerials on a remote farmhouse in mid-Wales may not belong to an amateur. G3GRA is quite right of course, but fortunately even though not amateurs, most farmers in mid-Wales are very hospitable, and I had one of the best high teas I've ever had, in a farm while Youth Hostelling there. Jim records thanks to all listeners who have reported his signals, but mentions the need for a stamp in order to reply.

A3969, Mike Johns, is at school in Yorkshire. The R107 at school requires the " knock treatment" to get it operating. Come on Mike, see if you can find that intermittent! Anyway, keep in touch.

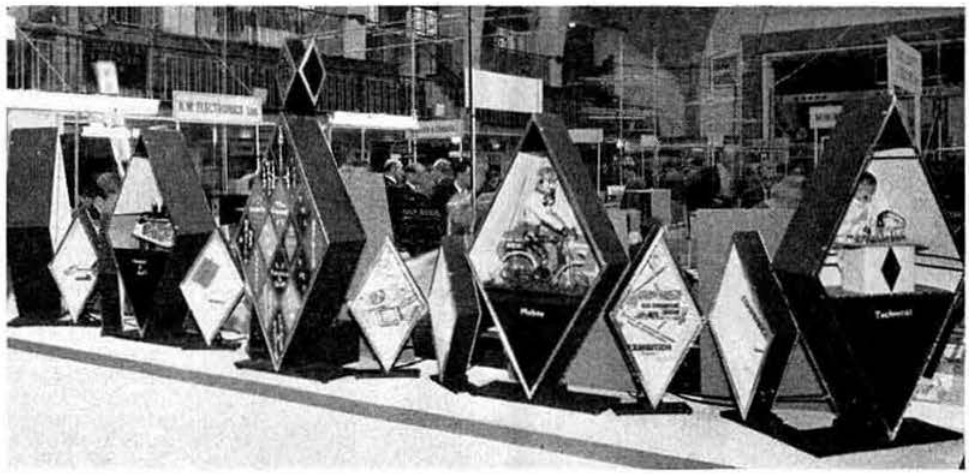
A3307, Bill Rollins, also has an R107, and he sent me a QSL. Bill says he has been interested in Amateur Radio for about four years now, so it looks as if a new call might be issued soon! A3307 has over 100 QSLs with perhaps the best ones from 9G1EU and ZL4LZ.

Philips Electronic Engineer Kit

By the courtesy of Philips Electrical Ltd, I have had an opportunity to review the above kit. Up to the present, only a preliminary examination has been possible, but with standard high quality components making up the kit, quite a good introduction to electronic wiring and circuits, as used in real situations, is achieved. The method of layout and

(Continued on page 788)

R
S
G
B



INTERNATIONAL RADIO COMMUNICATIONS EXHIBITION

A very good show indeed

THIS was the overwhelming opinion of those who attended the show, whether in the capacity of visitor or exhibitor; a show which saw record-breaking attendances on each and every day.

The exhibition was officially opened at noon on Wednesday, October 28, 1964, by Mr E. D. Whitehead, M.B.E., B.Sc., M.I.E.E., Director of Electronics Production (Radar), Ministry of Aviation, with a speech which was not only humorous, but which also gave those who heard it food for thought. On the theme of " Nation shall speak Peace unto Nation," Mr Whitehead expressed the opinion that Amateur Radio provided an ideal medium through which to foster respect and understanding between the nations of the world, and even if, in the final analysis, this were only limited to greater tolerance, then the world might well become a better place.

In his reply, the President of the Society, Mr G. M. C. Stone, A.M.I.E.E., A.M.I.E.R.E., G3FZL, acknowledged the remarks of Mr Whitehead, and made particular reference to the newly formed Educational and Training Committee, through which, in co-operation with licensed members of the Society engaged in the teaching profession, it was hoped to foster the interests of Amateur Radio in the younger generation.

By arrangement with the Post Office, visiting amateurs holding current transmitting licences in their own countries were allowed to operate the Society's Exhibition stations GB3RS and GB2VHF. This excellent and greatly appreciated facility was first used by W4WDR with G3TR providing information on the operation of the equipment.

Without exception, the standard of the commercial equipment displayed on the various stands was of the highest order, both in presentation and workmanship. After careful consideration, the Silver Plaque was awarded to Withers Electronics for their " Communicator." This compact package contained a complete transmitter and receiver for the 144 Mc/s band, and well illustrated how, by good design, the operation of valves and transistors can be complementary to each other.

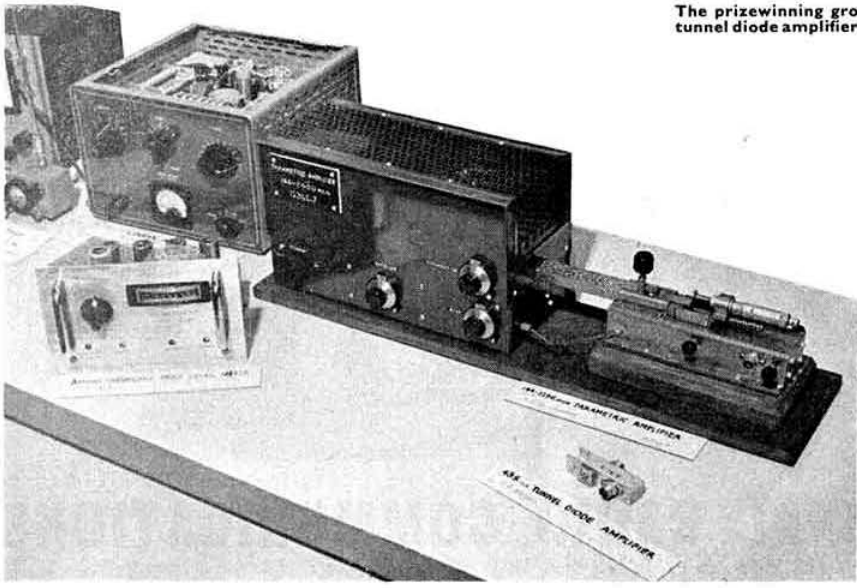
Like its commercial counterpart, the amateur-constructed equipment displayed on the Society's stand attained a superb standard, all the more laudable when one considers the limited facilities available to the average home constructor. No string, sealing wax, rubber bands or slap-dash throwing together here, but rather meticulous attention to detail from start to finish. Particularly noticeable, and especially praiseworthy, was the attention given to the panel layouts of complete equipment where operating convenience had obviously received special consideration.

The smallest item, no larger than a box of matches, was a tunnel diode amplifier constructed by G8ACC which might well indicate the shape of things to come.

That the Society's stand was to be a departure from accepted tradition was hinted at in the Preview in the October BULLETIN—and it certainly was. Throughout the Exhibition, prolonged guffaws were noted from otherwise staid members when they came upon the animated displays which guyed, with devilish accuracy and charm, certain aspects of Amateur Radio, and departments of the Society. The work which went into producing these displays must have been enormous as those of us who saw the complexity and ingenuity of their " innards " appreciated. A special word of thanks and congratulations are due to those who created these monsters of truth.

Commercial Equipment

Two new Top Band transmitters of compact dimensions were on display, one of which also included 80m facilities. While it seemed obvious that they had been designed primarily for mobile operation, and in this respect neither would disgrace a Rolls-Royce, both were eminently suitable for fixed station usage. The dual band unit, 160/80m, was shown by the **Codar Radio Company**, while the 160m only unit was shown by **Labgear**.



The prizewinning group: an audio peak level meter and a tunnel diode amplifier by G8ACC, and a parametric amplifier by G3LLJ.

Transceivers

Sideband was much in evidence. For the v.h.f. man who has a yen for s.s.b., **Green and Davis Ltd.** were showing a transverter for the 144 Mc/s band which was obviously capable of handing out quite a punch.

For those who wish to get their feet wet without becoming involved in high finance, **Heathkit** had on display a compact 200 watt p.e.p. transceiver available in three models for the 80/40/20m bands respectively. While primarily designed for the American market, and with their frequency coverage arranged accordingly, we understand that the frequency range of these units is being adjusted to match those in use in Europe. Even bearing in mind the limitation of single band operation, these units appear to offer good value for money, having a very acceptable watts per dollar rating.

Turning to multiband transceivers, **KW Electronics** have increased the sting in the tail of their KW2000. The new model, designated as the KW2000-A, maintains all the features of the original but runs 180 watts p.e.p. to the p.a.

Newcomers **Courier Communications** followed the now accepted practice of compact table-top design, but in addition to this, their CTR-1 transceiver which runs 200 watts p.e.p. on all bands from 160m to 10m, embodies the very useful feature of split frequency working. This allows the transmitted and received frequencies to be separately adjusted without variations in one reflecting upon the other. Whether such operation is used is under the control of the operator who may employ the equipment in the normal single channel manner.

Receivers

In the field of receivers, some particularly interesting ones were on show. The **National Radio Company** gave an object lesson on how to combine beauty of line with excellence of performanee. It was a pity the transistorized HRO never did materialize, having become " stuck " somewhere in the transatlantic pipeline, especially as nearly everybody wanted to look it over. However, the new NCX5 transceiver and NC2000 linear amplifier aroused considerable interest.

Ray Cross Engineering broke new ground with a receiver devoid of r.f. amplification which employed a linear balanced first mixer. This arrangement is claimed to virtually eliminate cross modulation and front-end blocking by high-powered stations adjacent to that which is required to receive. As if this were not sufficient, frequencies may be read off to an accuracy of 1 kc/s, and due to the very high stability of the oscillator system, a frequency shift of only 250 c/s in the transmitted signal easily determined. A receiver with this capability really sorts out the men from the boys.

Of particular interest to the " do-it-yourself " brigade was the **Heathkit** SB-300E receiver. Although obviously intended for s.s.b., the " mode " switch has positions for the reception of a.m. and c.w. transmissions, being provided with the normal diode detector for a.m. reception. A separate input socket is provided for v.h.f. converters.

Great interest was expressed in the fully transistorized receiver shown by **C & N (Electrical) Ltd.** Designed to meet the very rugged demands of the Services, and type accepted by them, here was real proof—if indeed proof be needed—that small size, strength and stability are all attributes of the transistor. Mind you, it was a bit heavy moneywise.

Through **Webbs Radio,** Eddystone equipment was shown to advantage. The newly-introduced panoramic receiver quietly working away caused much comment, and as was expected, the transistorized general coverage receiver, type EC10, found much favour, particularly in view of its smooth tuning.

The TW Communicator, which won the 1964 silver plaque for the best commercial equipment.

The Codar AT5 1·8 and 3·5 Mc/s 12 watt miniature transmitter.

Test Gear

In the realm of test equipment, **Salford Electrical Instruments** concentrated on their general-purpose multimeters, which, over the years, have proved their ability to take some unkind knocks—both electrical and mechanical—and still come up working.

For the constructor, **Heathkits** presented a complete range of test equipment in kit form. Particularly worthy of mention are the new 5 in. oscilloscope, a new valve-voltmeter, and the newly-imported Alignment Analyser which has been available in the USA for some time. The variety of these kits of test equipment is now most comprehensive, and there is no doubt but that they do make available excellent equipment at reasonable cost.

Aerials

Aerials, always the subject of much discussion, were shown by **J-Beam Aerials Ltd.**, who erected what may well be described as a v.h.f. aerial farm. From 70 Mc/s and upwards, long or short, fat or thin, the variations in available arrays almost seemed to match the stature of those interested in them. An interesting addition to the range for the mobile enthusiast was an inexpensive halo aerial for 144 Mc/s.

KW Electronics introduced the new KW Vee-Vee beam for the h.f. bands.

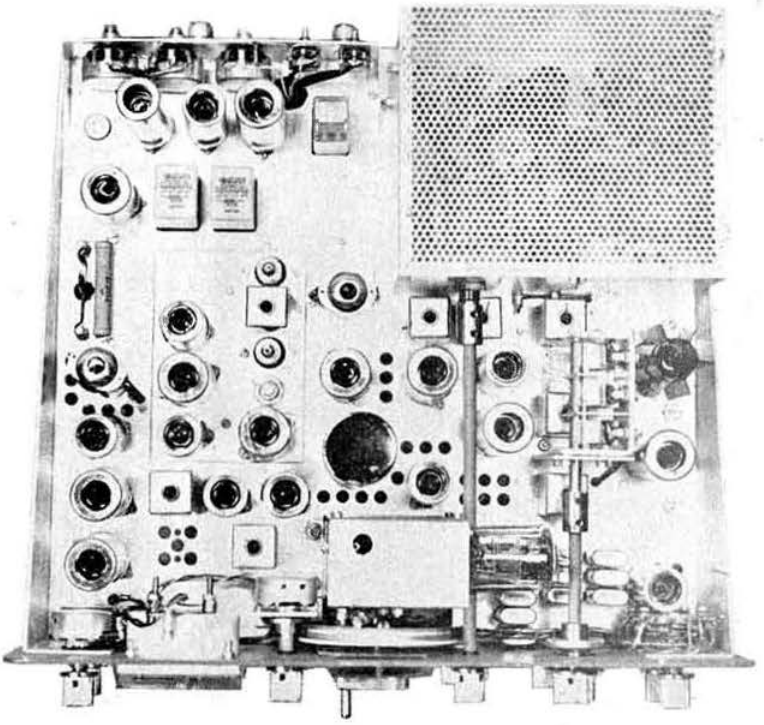
Labgear displayed a new concept in variable frequency aerials. Unlike the normal mobile aerial whose frequency is adjusted by either changing loading coils, or taps on a fixed coil, the frequency of this new aerial is changed by adjustment of the position of a ferrite/aluminium core moving in a base loading coil. By varying the inductance of the loading coil in this manner, the aerial can be resonated at any frequency in a specified band, and what is more, the base feed impedance maintained constant—in itself a useful feature.

The very popular US Bandspanner aerials were to be seen on the **Green and Davis** stand. In relation to these, the "who-cares-about-the-low-bridge" type spring mountings evoked favourable comment, mainly we suspect, from those who have had the bitter experience of having their aerials whipped off a bit on the smart side by low trees or inaccurate notices on low bridges.

Heathkit SBE-300E s.s.b. receiver.

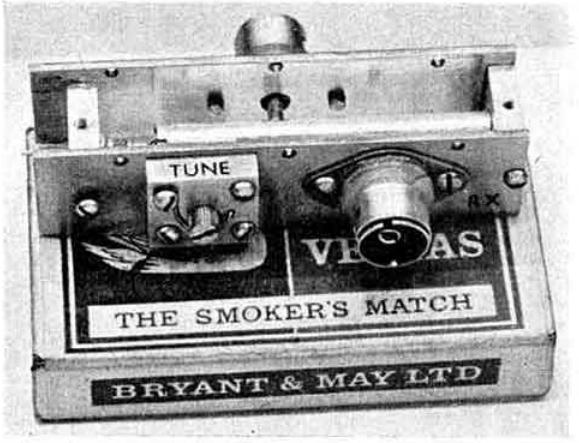
Special Displays

Two displays deserve special mention. The first, mounted by **Formica Ltd.**, was particularly informative about the manner in which printed circuit boards are produced. Knowing how they are produced should make us under-

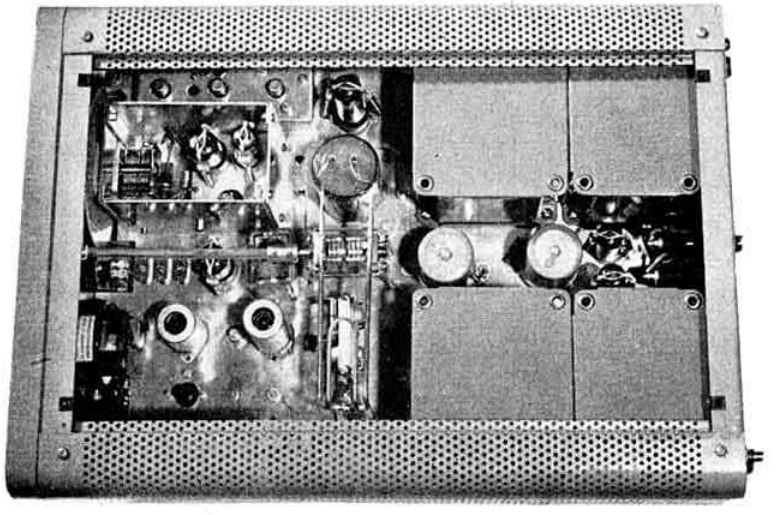


A higher power version of the KW2000—the KW2000A.

The new Labgear 160m transmitter.



The smallest piece of amateur constructed equipment—a tunne diode amplifier by G8ACC.



Interior view of the 20-2 sideband transverter by Green and Davis Ltd.

stand all the more why they require some care when they are being handled. The second was that of **Enthoven Solders Ltd.**, upon whose stand one found a mine of information on the technique of the deceptively simple art of soldering. There is a lot more to it than just persuading the wires to stick together.

In a review of this nature, it is not possible to treat in detail the contents of all the commercial stands, nor for that matter, in the space available, to even attempt to survey them all individually. This year, matters have been made even more difficult in view of the very high standard of all the equipment shown by the various companies. It is probably very near the truth to say that, so far as an intending purchaser is concerned, technical standard was so closely matched that the final choice would probably be dictated by

Heathkit HW-12 80m sideband transceiver.

choice of presentation, and conviction concerning service after sales.

Affiliated Societies

Turning to Affiliated Societies and other stands, the **British Amateur Television Club,** although plagued by some pretty fine examples of interference—which were *not* caused by amateur transmitting stations—gave its usual polished performance. It was rather nerve racking, however, to look at a TV set, vaguely recognize the peculiar body portrayed in a high angle shot, only to find that it was one's self—after which one departed with as much speed and good grace as one could muster. Whoever thought of putting that camera up on the balcony deserves a putty medal for cunning.

The Affiliated Societies stand manned by the Wirral Society, illustrated the practical benefits of club members getting together to mass-produce equipment for their stations and will no doubt have triggered off similar projects in other groups.

To those of us who have never dared to venture into RTTY, probably, if the truth be known, because of con-

The Affiliated Societies' stand manned by members of the Wirral Society. At the left are examples of the transmitters being built by members as a combined operation.

siderable uncertainty about our ability to deal with the mechanical side of this mode, the **RTTY** stand was an object lesson. No squeaks, pops, whistles or other accompaniment, just a quiet "clack"—"clack"—"clack" as the machinery printed out the text of the message insidiously converting the watchers to its way of operation.

In the preview it was suggested that one should have a look at the stand of the **Roding Boys' Society,** and those who did could not fail to be impressed. No leather jackets or flick-knives here, just honest-to-goodness keenness being well fostered and directed.

Mention must be made of the stalwart support given to the Society by those who manned the **RSGB** stand. This was no picnic. Record attendances created all kinds of problems which could not have been anticipated by the most astute organizer. For example, who could have imagined that the stand would run out of *Call Books*? Oh, what a panic—and what a rush when, in double quick time, new supplies came to hand. Talk about pandemonium!! Then there was the time that one of the cash registers became well and truly stuck—closed, of course.

* * *

So another Exhibition has come and gone. Old friends were met, and new bonds of friendship formed. Next year we shall all be just that little bit older, and perhaps wiser too, and in our increasing wisdom, cherish tolerance and respect for one another as the foundation from which our hobby draws its strength, and by our own example, foster the true "ham spirit."

Awards

The Horace Freeman Trophy for the most original piece of equipment exhibited was awarded to Sven Weber, G8ACC/G6SFW/T, for his audio frequency peak level meter and 435 Mc/s tunnel diode amplifier, pictures of which appear on pages 782 and 784.

The Silver Plaque awarded by Phil Thorogood, G4KD, for the best piece of home-constructed equipment went to H. T. Rogers, G3NHR, for his 1·8 and 144 Mc/s transmitter.

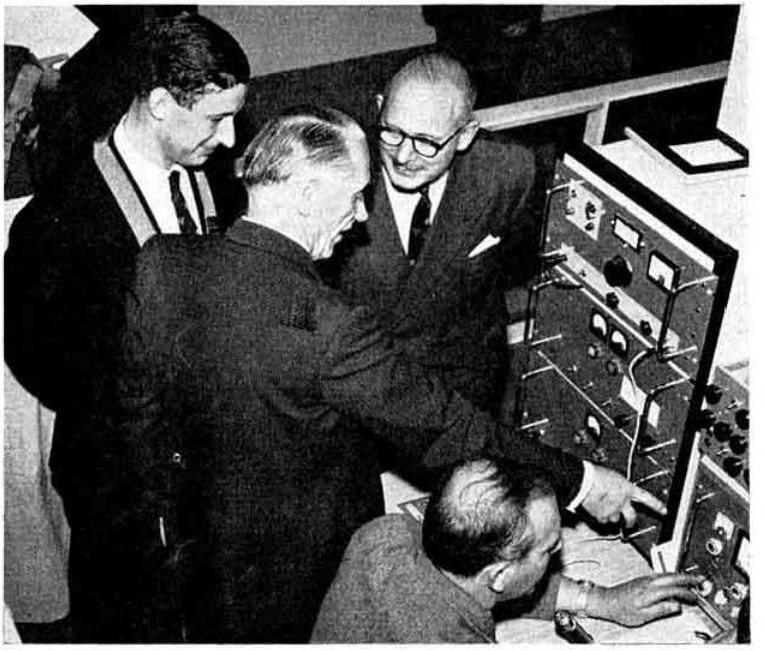
The first prize in the competition for members residing outside Region 7 (the London area) was awarded to M. D. Mason, G6VX, the second prize to Basil O'Brien, G2AMV, for his electronic keying unit. The special award for members not employed in the radio or electronics industry was won by L. J. Hodgkinson, G3LLJ, who exhibited a very fine 144/1296 Mc/s parametric amplifier.

The Junior Constructors' Competition for those under 16 was won by D. Humphries, for his multivibrator unit and the under 21 section by Stephen Gall, A4205, for his crystal calibrator.

David Moerel of Roding Boys' Society and W. Foster of Christ College, Finchley, were the joint winners of the essay competition with their papers on "Polarization" and "Semiconductors" respectively.

The Silver Plaque for the most interesting item of commercially-built equipment for the amateur exhibited was won by T. Withers (Electronics) for their new range of TW "Communicators."

The free draw for the HQ170A receiver was won by Horace Freeman, who organized the first All British Wireless Exhibition for the Society in 1922.



Mr E. D. Whitehead, opening the Exhibition on October 28, 1964.
(Photo by Tella Photography Ltd.)

RELAY SUPPLIES simple style

By ALEC D. VANCE

" . . . and G3ZZZ is standing by for you, Old Man."

Think.

Mute modulator. Mute transmitter. Change over superior low loss knife switch in aerial lead. Switch h.t. to receiver.

Strangulizing noises from receiver.

H——!! Who in the name of a pusseyfooted fandangle has parked his thumping great carrier slap on *MY* frequency?

Must be a local. Look at that " S " meter. 80db over 9—or it would be if the calibration went beyond the end-stop where the pointer has landed up. Receiver now making a highly disgusting noise which sounds like very rude hiccups.

How do I sort old G3YYY out from this lot?

Wind r.f. gain control right back. Cloth ears still 20 over 9—even after making allowances for the near right angled bend in the pointer. Hiccups now stopped. I will *M.U.R.D.E.R.* this guy.

Climb up to shelf and press ear firmly to speaker. No sign of G3YYY, only a faint hum. Shelf gives way. Language would do justice to a wind-jammer's deck-hand. Balance shelf with head. Grab all books within reach and wedge between top of receiver and shelf.

Collapse into chair. Count to ten. Top of receiver decidedly concave. Strong aroma of cooking newsprint scents the air. Why does this rx run so hot? Survey scene. Check spread of the menace. 200 kc/s either side of *MY* frequency receiver strains back to life. Confucius has a few choice sayings which fit this clot.

Clang . . . Clang . . . Clang . . . Oh verily hath I dropped a right old clanger. V.F.O. still on. Punch—literally—v.f.o. mute switch.

" . . . and G3YYY is standing by."

Shades of the not too distant past when to have a relay controlled station with single switch operation put one in the Rolls-Royce class.

When relays are used to perform the changeover functions in an amateur station, since they are usually operated by 12 volts d.c., a suitable supply has to be provided, and this can introduce an unwelcomed complication.

It is fairly common practice to use a specially constructed supply for operating the various relays incorporated in a particular station layout, and while this is generally satisfactory there are times when to have to link into such a supply can be a nuisance. Especially is this so where transmitter-receivers or otherwise complete equipments are involved, particularly when, for all other purposes they are self-powered.

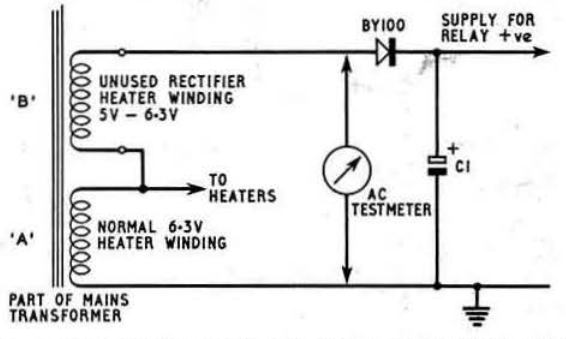


Fig. 1. Circuit of the simple relay supply. C1 is a Radiospares 2000 µF 25V capacitor rated at 750 mA ripple current.

In low and medium voltage power supplies the valve rectifier can be replaced by silicon diodes. This results in a considerable reduction in dissipated heat, allows a more compact arrangement, and provided that adequate surge limiters are employed, gives a worthwhile increase in reliability.

If silicon diodes are used in this manner with a standard mains transformer, then we shall have either a spare 5 volt or 6·3 volt winding. Using a legitimate wangle, this can be employed to secure a 12 volt relay supply. Fig. 1 shows how this is achieved.

It simply involves " sitting " the spare rectifier heater winding B on the top of the normal heater winding A in such a manner that their voltages become additive. The resultant output is rectified by a silicon diode, and a heavy capacity hung across the d.c. output.

Note that the windings A and B must be phased correctly. If this is not done, the a.c. testmeter will show practically no voltage. Should this happen, merely reverse the connections of the winding B.

In operation, it is the current from the capacitor which closes the relay(s) while the rectifier supplies the current which keeps the relay toggle held in. The current required to pull-in a relay is much higher than that needed to keep it closed, and the high capacity does this work. At the same time it reduces the a.c. ripple to a level which does not cause the relay winding to chatter.

This method of providing a supply voltage for relays has been used on a number of occasions and found entirely satisfactory. Requiring only two components, it is commendably " Scotch " financially.

Echo II Experiments

MR RAPHAEL SOIFER, K2QBW, Director of the Office for Satellite Scatter Co-ordination (OSSC) has now summarized the results of the attempts made by radio amateurs to communicate with one another by bouncing 144 Mc/s signals off the surface of the *Echo II* passive satellite.

Although hundreds of radio amateurs and observers throughout the world participated in the OSSC project all attempts to achieve communication via the satellite failed. Although results were negative the project aided in the development of 144 Mc/s equipment and operating techniques that should prove useful in other Amateur Radio space communication experiments, such as *OSCAR III*.

In a report to Mr George Jacobs, W3ASK (Space Communications Editor of *CQ*), Mr Soifer pointed out that original theoretical calculations predicted that marginal 144 Mc/s c.w. contact would be possible over a 1200 mile path using 1000 watts and aerial systems giving a gain of 18db at both ends of the circuit. Although communications were attempted with these, and somewhat higher levels of power, they were not successful due, it is believed, to the fact that the noise level observed on 144 Mc/s was higher than originally anticipated in the theoretical calculations. It now seems that a 13db increase in signal level would be required for successful satellite-bounce communications. This would bring the aerial gain requirement per station to approximately 25db which is substantially beyond the gain of the aerial systems available for the project.

More complete information on OSSC can be obtained by writing to Mr Soifer whose address is PO Box 308, New York, New York 10003. J. C.

Holiday in Northern Europe

By STAN HARLE, G3MEA*

EARLY in 1963, OH2TH suggested that I should spend my summer holidays with his family in Finland. At my request it was postponed until 1964, and because my forthcoming visit was often discussed with OH2TH (Willy) and his XYL Irmeli, OH2TJ, during our frequent contacts, Vlad, UA1CK, overheard some of the remarks and insisted that I should also visit Leningrad at the same time. I agreed, and so my holiday was arranged.

I received books and pamphlets about Finland, and a very helpful book entitled *Your trip to the USSR* which was sent

From left to right, OH2TH, OH2TJ and DJ8GB.
(Photo by G3MEA)

by Alex and Yuri of UA1KBW. I approached a travel agency, and although it seemed quite easy to visit Finland, a few difficulties arose when Leningrad was mentioned. Eventually I wrote to the Russian Intourist Office in London, obtained a letter from Vlad, the agents wired Moscow, and everything was fixed.

Helsinki

At 19.00 on June 18 I landed at Helsinki airport, and approaching the customs counter I could hear voices shouting "Stan." It was Irmeli, Willy, and their daughter Riitta-Leena, OH11142. We drove to their home and I had my first glimpse of the G8KW aerial 75 ft. high between two trees. The hamshack was a very large and pleasant room with one wall covered by contest certificates.

Next day was Friday, and the day on which all Finns celebrate Midsummer. In the morning we went to the headquarters of Finnish Athletics to meet Armass, OH2NB, and in the afternoon to the airport to meet Gerhard, DJ8GB, who was also to stay at Willy's home in Aurora. In the evening we visited the island of Seura Saari to witness the bonfires, fireworks display and community singing for the midsummer celebration. We returned home at about midnight, but it was still light and this was probably one of the reasons we never went to bed before 01.00.

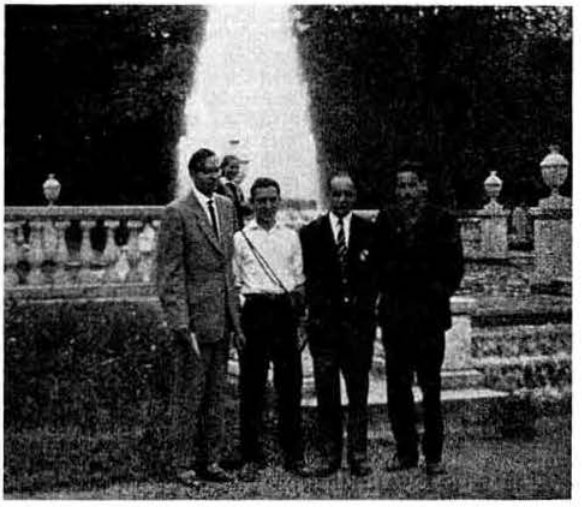
* The Bungalow, Whickham Highway, Dunstan, Gateshead, 11, Co. Durham.

On Saturday we went to the country, and saw miles and miles of typical Finnish scenery: forests and lakes with wooden summer cottages by the lakesides. When we returned in the evening Willy went on 2m using Gerhard's transistorized rig. We were all rather sceptical about the possibilities of making a QSO with such low power, and suggested that a telephone call to some 2m operators would be a good idea. The first call made was CQ ZS6 but to our surprise a report of S8 was soon received from Helsinki twelve miles away.

Sunday morning brought a 20m QSO with UA3CR who said he was going to Leningrad next day and would see me there. Rick, OH2MK, and Osmo, OH2KH, visited us and we then left for the summer house of Teppo, OH2XA. This was a very beautiful place and Teppo took Gerhard and me for a trip on the Finnish Gulf in his motor boat.

Leningrad

Next morning we went to Helsinki where I boarded the train for Leningrad. The attendant did not speak English and neither did the person with whom I was sharing the compartment for the next ten hours. At Kouvala the train stopped for ten minutes and John, OH5TM met me for a few minutes chat. The weather, as usual, was hot and sunny and the Russian tea served from time to time on the journey was very welcome. At Viborg we had a long stop and I changed money and ordered a meal from a Russian menu with some assistance from the waitress. First impressions of Leningrad from the window of the train were not too good, for it looked like a typical industrial town. On the platform at the station Vlad and I recognized each other from photographs, and he introduced me to the reception committee of Alex, Leo, Yuri, and Igor, UA1CC. They obtained permission from the Intourist Official to take me away instead of going through the usual channels, and off we went by underground train to the hotel. We were all very excited and they wanted to start my tour of the city at once even though the time was 00.15. We had a 20 minute walk



While in Leningrad, Stan Harle, G3MEA (second from right) met Alex (left), Yuri (second from left) and Vlad (right).
(Photo by G3MEA)

and I could see at once why Leningrad had been described as a beautiful city.

Next morning, Alex, Vlad, Yuri and George, a young student whom they had asked to act as guide, arrived at the hotel. We first went on foot and later by taxi to see the sights of the city. It was soon obvious that I had not brought enough film with me, for there were dozens of buildings and monuments which were worth remembering. The taxi took us to one of the development areas where blocks of flats were being built on a huge scale, and we visited some shops which are on the ground floor of some of the blocks. A radio shop had circuit diagrams on the walls for the young people to copy. The prices for radio parts were very reasonable. In the afternoon, Yuri and George took me to a museum. We spent nearly three hours there, but three days would be required to see it properly. In the evening it was to Vlad's flat for a party, and in addition to Vlad and his XYL Helen, there were George, UA1AB, Jack, UA1FA, Alex, Igor, Leo and Yuri. Vlad had only moved into his new flat a few days before, but the rig was already in action with a groundplane on the roof. We moved to the next room for the party and a very well laid table with plenty of bottles greeted us. The conversation was partly in English and partly in Russian, but I was kept in constant touch with what was being said; Alex was very helpful in this respect. It was a very happy party who walked to the underground at about 00.30, and I had to borrow Helen's shopping bag to carry the souvenirs that I had been presented with.

On Wednesday morning we went by hydroplane to a very large park about twenty miles from the centre of Leningrad. We spent over two hours there and then paid a visit to Valentin, UA1DK. He had a very good home made station and a new exciter was under construction. He accompanied us on the bus to the railway station, where once again I noticed that there were no collectors on Public Transport, and everyone is on honour responsible for taking his own ticket from a machine. After a quick lunch I booked out of the hotel and we went by taxi to the docks where my boat for Helsinki was already waiting. I changed my money, passed through customs and then chatted for a while with Alex, Vlad and Yuri. Shortly after I had boarded the ship, Leo, UA3CR, arrived at the quayside. The boat pulled out and we waved to each other until they were only specks in the distance.

Helsinki Again

The boat was nearly two hours late into Helsinki, but there were my friends waving as soon as we neared the dock. Martti, OH2KQ, who had visited me in England was also there. After lunch we were visited by Axel, OH5NW and later by his brother Peter, OH5NQ. Both had some very interesting tales to tell and Peter also entertained us on the piano.

On Friday we met Asser, OH2SS and received an invitation to his sauna bath next day. Martti then arrived to take Gerhard and me out for the day. We visited Tapiola Tower, the Marshall Mannerheim Museum and Martti's flat, where we saw his first class constructional work. We returned to Aurora for the evening party. and it was most interesting to meet OH2 HZ, QI, DX, KQ, WI, LX, NE, NB, KH, MK, RM, and SM4AMP. Gerhard and I were really pleased that so many of our friends had come to meet us, and were particularly grateful to Willy and Irmeli who arranged it. We went to bed at 02.00 and were very sleepy at 04.00 when Willy called us to go to the sauna.

Asser was waiting for us, and we went into the small room, which was already hot, and stayed there until the temperature was about 110°C. After that, one was supposed to jump in the lake, but I must confess to having let myself into the water rather slowly by means of the steps. Afterwards we ate sausages, drank beer and made a QSO with G3OWL who was to visit a few weeks later, and we told Ted quite a grim story of the sauna experience. In the afternoon we turned to Field Day, which is quite different to our NFD as they stay for a week and there is no contest. We helped to raise the TH3 beam and I collected some souvenirs in the form of mosquito bites.

Sunday, the day of departure, came too quickly. In the morning, Gerhard left for another part of Finland and in the afternoon I reluctantly said goodbye to Willy, Irmeli and Finland. The friendliness and hospitality both in Finland and the USSR were really wonderful, and I would urge any amateur to try these areas of Europe for his next holiday.

QUA Associates (Continued from page 780)

---

interconnection is very ingenious, and the circuits were a pleasure to wire up. Although a test of all circuits has not been carried out, sure fire operation without snags is certain.

The handbook supplied with the kit gives complete descriptions, and attempts to explain circuit action. It is very difficult to explain resonance, for instance, and the attempt may sound a little naïve, but best of luck to any lads who master such theory! That brings me to the point, most readers will be advanced beyond these very beginnings, but many amateurs may have young relatives, and, who knows, one of these kits may start off a keen interest in electronics or Amateur Radio. Let's hope Philips have produced a " toy " (they call it that, but it is a *real* set of parts) which will boost our movement.

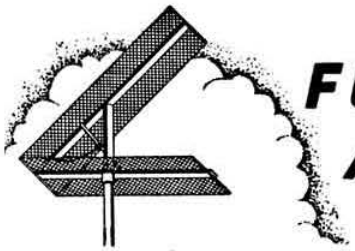
The components are all new standard production types and the price (£4 19s. 11d.) is fair. There is a supplementary kit to increase the range of experiments, but that has not been studied.

That's all for this month, so 73 and Happy Christmas, 1964.

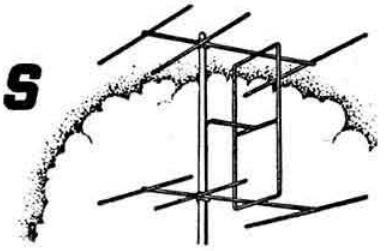
* * *

Reports for inclusion in this feature, which will be most welcome, should be sent direct to Ken Smith, G3JIX, 82 Granville Road, London, E.17.

The Roding Boys' Society stand at the 1964 RSGB International Radio Communications Exhibition.



FOUR METRES AND DOWN



By F. G. LAMBETH, G2AIW*

THE long looked for opening following the prolonged high pressure system finally appeared with a frontal system on November 8-9. These two days will be remembered by many 2m exponents as a period of good tropospheric propagation extending in a north to north easterly direction to approximately 600 miles and in an easterly direction of approximately 400-450 miles.

During the evening of November 8 the 2m band in the south was filled with continental signals, with the DL/DJ contingent appearing to dominate to the delight no doubt of all United Kingdom participants! Through this cacophony of sound the old-timers from Denmark, OZ5AB, OZ9NI, OZ3GW and OZ6ML were registering contacts as they usually do under such conditions. GB3LER in Lerwick was audible all day at varying signal strengths and GM3HLH was also an outstanding signal.

By next day, November 9, there appeared to be a slightly diminished representation of DL/DJ signals, and for one period it sounded as though something spectacular was about to happen from the north east, when OZ6JT, OZ2UN, OZ2KH, OZ7OZ and OZ1U were coming in at great strength, but disappeared after about one hour.

The Norwegian beacon station, LA1VHF, on 145·150 Mc/s was available all day in the south at varying strengths up to S9+. This station has an input of 25 watts and is fitted with an omni-directional aerial system. It is a strange fact that there did not appear to be any LA amateur activity on the band during the whole of the period that the beacon was audible; what is the explanation? GB3LER was also audible during the 9th but down in strength somewhat on the previous day levels.

During the two-day period PA0ACG had contacts with 84 United Kingdom stations, including GM3HLH and GM3EGW.

OH2HK (V.H.F. Manager SRAL) writes that a " once in a life-time " opening occurred suddenly on October 29 and lasted until the 31st when it seemed that at least half of the European v.h.f. stations were coming in during the best tropospheric conditions ever experienced in Finland. Masses of OKs, SPs, DLs, UAs, UQ, UP, UR, SM, OZ and UC2WQ were worked by Finnish stations. A partly identified UB5 (AW?) was worked on phone by OH2RK.

The power, type of equipment, or direction of aerial did not seem to matter—reports were nearly always S9! SM4UKV was coming in 599+30db during the time, and LA1VHF was heard at 569. There was horrible chaos on the 2m band.

This opening did not appear to reach as far as the UK; no British or PA or ON stations appear to have been heard. The opening also extended to 70 cm and OH2OK and OH2GY worked SM7BAE with S9 reports on phone, the distance being about 650 km. OH2OK only just failed to make a QSO with OK1VR at about 1300 km, but during their sked the signal level had already dropped by 30/40 db and they could not finish the contact.

This opening is also reported by OK1DE who characterizes it as the most extensive for a very long time. The period commenced on October 26. By the 28th the high pressure zone was centred over White Russia and OK1VHF/P, OK1QI/P and others were beginning to work OZ, SM and UP2 over distances of 800/900 km during the afternoon of the 28th.

OK1DE went portable on Kozakov (744m a.s.l.) near Turnov. After a great effort to get the station going (to say nothing of the 10-over-10 monster aerial) the first CQ brought OH2OK (589) through the bedlam of other European QRM, a new country and 1100 km distance. After that SM4CDO was worked, followed by SM5, OH1, 2, 3 and 0, UR2, LA6 and 8, between 18.00 GMT and 01.18 GMT. Altogether nine OH stations, 14 SM4, 5, 6 and 7, four OZ, four UR2, four LA 6 and 8 were worked by OK1DE/P. Most of them were coming through on c.w. just like locals, and some were even worked by OK stations behind the mountain barrier. For example OK1GA worked five countries, OK2WCG worked SM5, 6, OH0 and heard many others including UR2 and UP2. OK1AHO made the first s.s.b. contact between OK and OZ from a valley!

On the following evening things were less good but still remarkable. UQ2KGV was worked and the DX was pushed up to 1350 km with OH3TH. OK1VR/P was heard working UA1 stations. The remarkable thing is the number of stations operating, including many Soviet prefixes.

This opening was also good in Western Germany where DJ2BE (Hildesheim) worked OH0RJ, UR2CQ, SP3GZ and OH2OK on October 29, followed on the 30th by SP5XY, UA2DV, OH2RK, UR2CB, SP3HD and UA2TE. Several UR stations and OH2GY were heard, according to the VERON *VHF Bulletin*. The opening does not appear to have reached the Netherlands.

The 2m band was very lively; November 8 brought **G3LTF** QSOs between PA and GM and during both days conditions and operation were very good between the Midlands and PA/ON, both on 2m and 70 cm.

G3RMB (Coventry) also reports the opening of November 8 as exceptionally good, but although he received the Norwegian beacon, LA1VHF at 53/4 9, and worked a number of Continental stations on 2m, his outstanding work was on 70 cm which commenced with a 2m QSO with F9NJ. They went over to 70 cm and had a QSO with 5 7/8 reports on A3 both ways. There followed contacts with DL1JN, DL9LU, PA0GER and PA0KPO, all very strong signals free from QSB. Many more were heard, including several ON stations which, however were not raised. The input to the QQV02/6 p.a. is 8 watts (with a transistorized modulator) to an 8-over-8 slot fed aerial, while the converter has an A2521 r.f. and was built by G3BA.

* 21 Bridge Way, Whitton, Twickenham, Middlesex. Please send all reports for the **January** issue to arrive by **December 9.**

DX on 1296 Mc/s

The highlight of the opening however, was very definitely the happenings on the 23 cm band, when on the night of November 8 **G2CIW** worked PA0COB and **G3MCS** worked ON4ZK, at around 250 miles distance—very meritorious achievements, and congratulations to all concerned.

Moonbounce

Truly the v.h.f./u.h.f. picture is growing larger month by month, and events which in themselves were outstanding are liable to spark off efforts towards further and even more breath-taking happenings. This is evidenced by a letter received from **VP8AI** (Keppel Island, Falkland Islands) who is anxious to try moonbounce experiments and is asking for help in the form of the loan of a 70 cm transistorized converter for this purpose. Certain amateurs have already been approached direct, but if there is anyone who is able to help and to whom this is the first intimation, a note to G2AIW would be appreciated to get the ball rolling. Furthermore, it may be the prelude to another exotic u.h.f. QSO! A converter for 144 Mc/s is already being built, but VP8AI does not think his technical skill will rise to a 70 cm effort, hence the plea for a loan.

G2HCG points out, however, the various other aspects of equipment, e.g. aerial form, size and gain, power requirements and other difficulties which are enough to make this mode of propagation very difficult indeed for the average amateur. G3CCH agrees with this.

QRA Locator Maps

A limited number of QRA locator maps of Europe, published by the Belgian society, UBA, are available from RSGB Headquarters, price 5/- post paid.

Two Metre News

G3BDS (Worcester) operates fixed, mobile and portable. The home station is only about 100 ft. a.s.l. but some DX is worked when conditions are good. The interesting thing about G3BDS is that the portable/mobile efforts are usually in the rarish county of Hereford on Sunday morning between 10.00 and 12.30 GMT on 144·435 Mc/s. There will also be operation during the winter for anyone wanting Hereford who will make a pre-arranged sked. Operation mobile during rain or snow and portable if it is dry and not below freezing! It is hoped to do this on 4m as well, later on. Saturday afternoons are also operated /M, but portable can be arranged.

New stations worked at **G2JF** (Ashford, Kent) during the recent period included G5QZ, G3PQI, G3DMU, G3JEJ, G3PPO, G3THC, G3PZO, G3SMP, G5LC, G5DJ and special stations GB3UCL (University College), GB3FCG and GB3RSG, Boy Scout stations, and GB2VHF at the RSGB Exhibition. Of particular interest was the evening of October 25 when GW8UH, GW8NP and GW3FSP were contacted one after the other. The latter station is a newcomer to 2m, but is not unknown to G2JF who is reminded of the Top Band contest duels which took place in the early 'fifties with this station. Amongst a number of new Continental contacts during the past weeks, those with LX1CW (QRA Locator DJ41A), DL1JN (QRA Locator DK22B) are interesting and took place during some extended tropospheric propagation on November 1.

GB3LER was readable at 17.55 GMT on October 13 and discernible at 18.19 GMT on October 16 but there was otherwise no sign of it during the period under review.

G3LTF (Galleywood) worked GM3HLH and heard GB3LER (579) on October 3, as well as F9NT and F8KN (South of Paris, BI21J). On October 20 a two-way s.s.b. QSO with G3OCB (Truro) was very satisfactory. Meteor scatter skeds with YU1EXY were unsuccessful on October 22/24, although both calls were copied many times.

G3PBV (Northampton) is fully operational on 2m at the new QTH, running 100 watts with n.b.f.m. to a J-Beam 10 element long Yagi at 40 ft. The converter is an E88CC cascode converter feeding two R1475s in parallel at 4-6 Mc/s. On an earlier temporary aerial (4-over-4 slot) 7 ft. above ground F1CQ was worked. The site is quite a good one, especially to the East and is good round through South to West. So far seven countries and 41 counties have been worked. G3PBV and others have noticed that when the barometer is low, activity on the band appears virtually non-existent at times, and there appears to be a good case for re-instituting the Monday night activity period over the winter. Comments are invited.

GM3FYB (Dunfermline) adds a Scottish note to the opening of November 8 by reporting QSOs on 2m with PA0COB, JOP, JSK, MSH, TBE, ON4MU and ON4TQ. He says that GM3HLH was working PAs " like shelling peas." 70 cm tests were tried with PA0COB, PA0MSH and PA0TBE, but only the one with PA0MSH (Almelo, near the German border) was successful. This is believed to be the first GM/PA 70 cm contact, and the distance is about 460 miles.

Four Metre Activities

G3JMY (Bristol) recently converted a B44 Mk 2 with encouraging results and has worked G3YH (Bristol), G3PPG (Evesham), G3EHY (Banwell), GC3OBM (Guernsey), G3ICO (Yeovil), G2AOK (Stow-on-the-Wold), and G2DQ (Chelmsford). All except G2DQ were worked on a simple dipole on a 16 ft. mast, and GC3OBM was worked from a site 730 ft. a.s.l. Other amateurs in the Bristol area with B44 units are G4UZ, G3PFC and G3PFD who will be carrying out the necessary conversions shortly. G3KUF is on the band with about 25 watts to a home-built transmitter.

G3PMJ (Manchester 18) was at the fixed station QTH during V.H.F. NFD and his best 4m contact was with G8RW/P. GM6XW/P was heard and called many times without success, although G2OI was lucky. G3PMJ thanks G3PHG for the very good article on the B44 Mk 2, one of which he possesses, and offers notes on his own modifications. Firstly, V10 is replaced with a 6J6. (A 42 ohms 1 watt resistor is necessary to balance the heater current and should be fixed across the heater pins of V1.) One half is used as a 27·778 Mc/s crystal oscillator (overtone type), the other half doubling the oscillator frequency to 55·556 Mc/s, using L16 and trimmer C63. This now makes V2 a crystal controlled mixer. Secondly, V9 was made variable tuning over the range 8·5 to 9·0 Mc/s. The anode circuit (L18, C68) selects the second harmonic and via C11 feeds V3, which is now a mixer, with variable tuning.

The i.f. output to be tuned from T1, is for 70·0 to 70·8 Mc/s, equal to 17·069 to 17·869 Mc/s respectively. The local

V.H.F./U.H.F. BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emission	Aerial Direction
GB3CTC	Redruth, Cornwall	144.10 Mc/s	A1	North-East
GB3VHF	Wrotham, Kent	144.50 Mc/s	A1	North-West
GB3GEC	Hammersmith, London	431.5 Mc/s	A1	East

RSGB V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham, Kent, when measured by the BBC Frequency Checking Station, was as follows (nominal frequency 144.50 Mc/s):

Date	Time	Error
October 20	... 15.07 GMT	722 c/s high
October 27	... 11.43 GMT	51 c/s high
November 3	... 11.15 GMT	1368 c/s high
November 10	... 12.35 GMT	1300 c/s high
November 17	... 19.00 GMT	1120 c/s high

oscillator, V9, which tunes 8·5 to 9·0 Mc/s, gives the final i.f. of 2·625, with the second harmonic i.e. 17 to 18 Mc/s.

Here it is in simplified form:

Band edges plus 100 kc/s	70·000	70·800
Crystal frequency (X2)	55·556	55·556
First i.f.	14·444	15·244
Add the second i.f.	2·625	2·625
Divide by 2	2) 17·069	2) 17·869
L.O. to tune	8·5345	8·9345

Say 8·5 to 9·0 Mc/s

It may be necessary to damp the primary and secondary of T1 to give a " flat " i.f. band over which to tune.

G5CP (Chesterfield) is installing a modulator at his " hill station " and will shortly be on 4m and 2m phone again.

G3JKY (Beckenham) recently had a c.w. QSO of 40 minutes with G3IMV (Bletchley). He thinks more c.w. on the band would be very much appreciated. G3JKY ends by saying that he has " cannibalized " the 2m rig to make a QRO 4m effort which may run 35 watts.

G5UM passes on some comments received from **G3JHM** on the subject of a mobile calling frequency on 4m (these were received over the air during a duplex contact, 4m to 2m).

During the course of his travels over much of the country G3JHM finds that a calling frequency of 70·26 Mc/s is in such widespread use that there seems little point in advocating any other. In his experience there must be by now many hundreds of mobiles using this frequency as a national calling frequency: in any one area he can get a large number of replies from this channel alone.

Fundamental crystal frequencies required to produce it are 11·71 Mc/s and 7806 kc/s.

Both G3JHM and G5UM emphasize the importance of using 70·26 solely as a calling channel and not as a communication channel. A QSO should be transferred to another announced frequency once communication has been established on the calling channel.

First EI-GI on 430 Mc/s

EI2W tells us that he participated in the first EI-GI QSO on 70 cm on October 24 at 16.19 GMT with GI3KYP/P in Co. Down, Northern Ireland. Low power was used, 2 watts at each station and the reports were RS59 both ways. The barometer was high but weather conditions were not too good. This was the 24th " first " for EI2W on u.h.f./v.h.f. and was made after several tests with GI3KYP/P over the past few months. Congratulations to both stations.

G3LHA (Coventry) says that the 420 Mc/s Contest in October turned out " as usual, a drawn out affair " with poor conditions to start, improving late on the Saturday evening. In all 17 stations were worked altogether during an operating time of 3½ hours. Activity however continues to increase, as many of the old hands are reappearing. **G3BKG** (S. Leicester) is getting organized again, G2WS (Coventry) is regularly active, and G8 calls are appearing rapidly, e.g. G8ADM (Harrow), G8ACN (Saffron Walden), G8ABP (Birmingham), G8ACB (Wolverhampton) and G8ACD (Leicester), all worked during October. Welcome to all of them. The Coventry stations G3NBQ, G3KEF and G3RYB/T, all support Thursday night on the air with G3LHA, G2WS and G3SLG also on occasionally. Regular signals heard on these nights from outside the Midlands include G3KEQ, G3MCS and G3LTF.

G3LTF (Galleywood) worked OZ7SP on 70 cm on November 9, during a good opening (November 8/9) which was shared by, among others, G3JQI, G2CIW and G3ILD.

G3LTF says that he had a claimed score of 2545 points in the 420 Mc/s Contest, but activity was poor compared with previous years. QSOs at above 100 miles distance were with G2CIW, ON4HN, ON4LP, GW3ATM/A, G3BNL, G3OXD/A, G3ILD, G3MPS and G6GN.

Leading claimed scores in the 420 Mc/s Contest 1964, were as follows:

1. G3EGV/P	2720	6. G2CIW	2025
2. G3LTF	2545	7. G8ADM	1069
3. G3NNG/P	2466	8. G2RD	1434
4. G2XV	2285	9. G3ORL	1278
5. G3OXD/A	2094	10. GW3ATM/A	1051

G5UM writes: Could all those fireworks on November 5 have caused condensation of the upper atmosphere to produce the fantastic v.h.f. and u.h.f. conditions of two days later? Your theory is as good (or as bad) as mine; yet in many people's experience that weekend was the best ever so far as 70 cm was concerned.

Whoever said occupancy of our 432 Mc/s allocation was sparse ought to have heard the band during that first weekend in November. In particular all those new G8-plus-threes worked DX they could never have dreamed would pop up. (And what a boon it is to have this influx of keen new " Sound B " men to galvanize the band into more life than it has had in many a long year!)

During that weekend newcomers and old-timers alike, attempting to keep tab on new stations or counties worked, found their written records becoming out of date almost hour by hour.

G3MTI, remote from the Continent, worked into Germany on almost a 400 mile haul. So did several Greater London area stations. And a PA0 was heard telling G5UM " You are my eighth station worked on 70 cm tonight. I must get my dozen! " And he did.

V.H.F. Band Plans

All v.h.f. operators are reminded of the British Isles Two Metre and Seventy Centimetre Band Plans, which are sponsored by the Society. Observance of these plans will assist in DX working and in avoiding QRM to Service frequencies In the 144-145 Mc/s band.

Zone	2 metres	70 cm.	Area
1	144·0–144·1	432·0–432·1	Cornwall, Devon, Somerset.
2	144·1–144·25	432·1–432·25	Berkshire, Dorset, Hampshire, Wiltshire, Channel Isles.
3	144·25–144·5	432·25–432·5	Brecon, Cardiganshire, Carmarthenshire, Glamorganshire, Gloucestershire, Herefordshire, Monmouthshire, Pembrokeshire, Radnorshire, Worcestershire.
4	144·5–144·7	432·5–432·7	Kent, Surrey, Sussex.
5	144·7–145·1	432·7–433·1	Bedfordshire, Buckinghamshire, Essex, Hertfordshire, London, Middlesex.
6	145·1–145·3	433·1–433·3	Cambridgeshire, Huntingdonshire, Leicestershire, Norfolk, Northamptonshire, Oxfordshire, Rutland, Suffolk, Warwickshire.
7	145·3–145·5	433·3–433·5	Anglesey, Caernarvonshire, Cheshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Shropshire, Staffordshire.
8	145·5–145·8	433·5–433·8	Derbyshire, Lancashire, Lincolnshire, Nottinghamshire, Yorkshire.
9	145·8–146	433·8–434	All Scotland, Northern Ireland, Isle of Man, Cumberland, Co. Durham, Northumberland, Westmorland.

Two Metre Band Guard Channels: **The following frequencies in the 144-145 Mc/s portion of the 2-metre band are tabulated on the schedule to the Amateur (Sound) Licence to be avoided as they are allocated to Service use: 144·0, 144·09, 144·18, 144·27, 144·36, 144·45, 144·54, 144·63, 144·72, 144·81 and 144·9 Mc/s.** *Remember!* **The safety of aircraft and human lives depend upon the interference-free use of the channels.**

Even 1296 Mc/s was affected. The buzz went round that G2CIW of Birmingham had worked into Holland and that G3MPS at his new location deep in the heart of Somerset was working G8AL in N.E. London, all on " 23."

The fantastic 70 cm conditions extended over to the following Monday, and at least one Hertfordshire operator thought that an enormous signal on a northerly heading was a 2m harmonic from Stevenage, four miles away. It was G3ILD, Darlington, at 200 miles.

432-434 Mc/s ACTIVITY NIGHT SATURDAYS at 7 p.m.

First GM-OZ on 430 Mc/s

On November 10, **GM3FYB** took part in the first GM-OZ contact on 70 cm when he worked OZ7SP. He also worked SM6ANR the same day. On 2m, he made contact with OZ7HI, OZ3M, OZ3NH, OZ9OR, OZ5AB, OZ5HF and SM6CYZ. G3MPS was on 1296 Mc/s during this opening and succeeded in working G8AL in Essex.

G to GW Contact on 1296 Mc/s

At 00.40 GMT on October 18 **GW3ATM** and **G3MPS** made what they believe is the first G to GW contact on the 1296 Mc/s band. GW3ATM, who was operating /A from Chepstow with a power output of one watt on a.m., received a report of RS56 from G3MPS, 35 miles away in Ashcott, Somerset. G3MPS, who was radiating 25 watts, was given a report of RS59+. GW3ATM/A was on 1296·1 Mc/s and G3MPS on 1296·7 Mc/s.

G3LTF had a test with G2CIW on October 26 and gave a report of S1. On the 31st the report was S2/3, and it is found that whenever the 70 cm signal is up, 23 cm " will go." On November 3 signals were received from G3ORL at S9. The distance is only five miles, but a low power tripler was in use with the 70 cm stack. Such an aerial will perform very well in an emergency if carefully aimed, but side lobes are usually high. This depends somewhat on the matching system, but if results mean anything PA0COB has got over to G3LTF by similar means! G3LTF has recently improved his 23 cm converter by using forward bias on the mixer crystal 1N23E. Normally it runs at 200μA current driven by the oscillator chain but if current is increased by a d.c. bias that at about 350μA current the noise falls by about 1·5/2db and the signal is unaffected. If the current is further increased the signal falls also and noise starts to rise again. The polarity of the battery used depends on the type of crystal and the way it is mounted but this can easily be found by trial and error. This method gets 1·5-2db improvement in the noise factor of a 23cm converter depending on the diode. It must be emphasized that the n.f. of the i.f. preamplifier must be minimized to obtain best results.

French Band Plan

The French Band Plan for two metres has been amended, and is now as follows:

REGION 1 144·6-145·0 Mc/s (Seine, Seine-et-Oise, Seine-et-Marne).
REGION 2 145·0-145·3 Mc/s (Aisne, Ardennes, Eure, Nord, Oise, Pas-de-Calais, Seine-Maritime, Somme).
REGION 3 145·2-145·5 Mc/s (Calvados, Côtes-du-Nord, Finistère, Ille-et-Vilaine, Loire-Atlantique, Orne, Sarthe, Vendée).
REGION 4 144·4-144·6 Mc/s (Charente, Charente-Mme, Corrèze, Creuse, Dordogne, Gironde, Landes, Lot-et Garonne, Basses-Pyrenées, Deux-Sevres, Vienne et Hte-Vienne).
REGION 5 144·2-144·4 Mc/s (Ariège, Aveyron, Haute-Garonne, Lot, Hautes-Pyrenées, Tarn, Tarn-et-Garonne).
REGION 6 145·3-145·5 Mc/s (Aube, Marne, Haute-Marne, Meurthe-et-Moselle, Meuse, Moselle, Bas-Rhin, Haut-Rhin, Vosges).
REGION 7 144·2-144·4 Mc/s (Côte-d'Or, Doubs et Belfort, Jura, Nievre, Haute-Saône, Saône-et-Loire, Yonne).
REGION 8 145·0-145·4 Mc/s (Ain, Allier, Hautes-Alpes, Ardèche, Cantal, Drôme, Isère, Loire, Haute-Loire, Puy-de-Dôme, Rhone, Savoie, Haute-Savoie).
REGION 9 144·7-145·0 Mc/s (Basses-Alpes, Alpes-Maritimes, Aude, Bouches-du-Rhône, Corse, Gard, Hérault, Lozère, Pyrenées-Orientales, Var, Vaucluse).
REGION 10 144·5-144·7 Mc/s (Cher, Eure-et-Loir, Indre, Indre-et-Loire, Loir-et-Cher, Loiret).

144·0-144·2 Mc/s, 145·8-146·0 Mc/s, 432 Mc/s, 1296 Mc/s (Moonbounce, Meteor Scatter, Oscar).
145·0-145·2 Mc/s (French Stations in North Africa).

International V.H.F. Society

EI2W advises us that the Millan Silver Trophy for 1964 has been awarded to A. D. Patterson, GI3KYP, in recognition of his many portable expeditions in various parts of Ireland to increase v.h.f. interest. One of these expeditions was to the Aran Islands, situated off the West Coast of Ireland. Mr Patterson is RSGB Zone F Representative. He also holds an EI call.

* * * *

The writer wishes to thank the many members who have said many nice things about the " ten years," and wishes all a very happy Festive Season for Christmas and the New Year.

Bound Copies

A limited number of bound copies of Volume 40 of the RSGB BULLETIN will be available to members only early in the New Year. The price, including postage and packing, will be 25/-. In view of the limited number available, all orders will be dealt with in strict rotation.

Members who will require bound copies of Volume 41 (1965) are requested to place orders immediately.

Society Ties

The design of the Society tie is at present under consideration and Headquarters is unable to supply ties for the time being.

A further announcement will be made as soon as possible.

Correction

On page 743 of the November BULLETIN, G3RSB was inadvertently reported to be licensed /T and active on 23cm. The call-sign should have read G3RYB/T.

Receipts

Receipts for subscriptions paid by cheque, bankers' order or postal order are not now issued unless specially requested.

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS, G2BVN *

THE latest solar information indicates that this, the last month of 1964, will probably coincide with the trough of sunspot cycle No. 19. Whilst the passing of the minimum will not immediately lead to any startling alteration in propagation conditions, there is at least the consoling thought that the improvement will take place at a much faster rate than the decline through which we have been passing during the last three to four years.

The current month usually yields some small increase in sporadic *E* propagation on 21 and 28 Mc/s, particularly the latter band, and this will afford the opportunity of making European contacts without the constant QRM of 14 Mc/s. The Society's experimental station at Lerwick, GB3LER, will continue to transmit 24 hours a day on 29,005 kc/s, and will afford an indication of unusual conditions over the North-South path. Reception reports of GB3LER will be welcomed for inclusion in the *IQSY* observations and may be sent to Headquarters.

In response to requests it is intended to recommence the *Commonwealth Call Areas* table inaugurated by G3AAE several years back. Details will be found towards the end of *MOTA* and we look forward to an enthusiastic response.

The writer expresses his thanks to Dr G. Lange-Hesse, DJ2BC, of the Lindau Ionospheric Institute for his continued co-operation in connection with the *Propagation Predictions* which have become a valuable part of *MOTA*. Also, appreciation to the numerous correspondents who have consistently supported the writer, particularly G3AAE, G3HCT, G3HDA, G8JM and BRS20317.

Although this will appear, for UK members, in advance of the festive season, G2BVN offers his best wishes for the Yuletide and continued DX during the New Year.

News from Overseas

A notice appearing in the *Times of Swaziland* for October 23, 1964, gives instructions for holders of amateur licences who are to apply for new call-signs in the series prefixed VQ6. As **ZS7R** points out, this change has caused considerable confusion as this prefix has already been used for Somaliland. ZS7R operated as VQ6R during the *CQ* Contest on the weekend of October 24/25, but was subsequently told to revert to the original prefix of ZS7! At the time of writing further developments are awaited.

A note in the MARTS *Newsletter* asks "where is **VS4RS**?" and the mystery was rapidly solved by a note from Ron who is now on leave in the UK reverting temporarily to G3IHP. He will be at his home address of 7e Mayplace Rd., East, Bexleyheath, Kent, until the end of March, when he expects to return to 9M6 or 9M8. Ron would be pleased to meet any of the DX fraternity during the coming months, and will be pleased to reply to outstanding QSL requests upon receipt of details and an s.a.e.

The latest news from the Korean Amateur Radio League shows the number of **HM** stations is now 60, with the greatest concentration (37) in the HM1 area. Well-known s.s.b. operator Sung now has the call **HM1AQ** after a move of QTH from Chunju to Seoul, and his full address will be found in *QTH Corner*. HM1AA was one of the first operators to take advantage of the provisions of the new US reciprocal licensing arrangements when taking up residence in Harvard for a period of several years.

5N2JKO, during a six-week visit to Thailand, has been off the air but found mouth-watering DX coming through on 14 and 21 Mc/s from the Pacific area, in addition to many Filipino and Malaysian stations. Mike found Bangkok very noisy due partly to the fact that the Thailand capital boasts 3,000 more taxis than London! By the time this is read 5N2JKO will be back on the air from Zaria.

Amongst the new prefixes to be now heard on the bands are **9J2**, *Zambia*, replacing VQ2 w.e.f. October 24, whilst **9M6** and **9M8** indicate North Borneo and Sarawak. The **9M4** prefix for Singapore has now been in use for some time.

DXpeditions

With the cancellation of the trip by VQ8AM to Rodriguez the next outstanding event on the DX calendar would appear to be the W4QVJ/W6UF foray to **Easter Island**. Bearing in mind that DXpedition arrangements are exceedingly prone to last minute changes, the latest information is that **CE0AJ** and **CE0AK** will be on the air during the second half of December, the exact date being dependent upon the weather

HB9RAS, the station at the Swiss National Exhibition in Lausanne, which was operated by visiting amateurs from over 25 other countries. A short report appears on page 799 of this issue.

* Please send all items to RSGB Headquarters to arrive not later than December 9 for the January issue and January 13 for the February issue.

QTH Corner

CE0AJ	E. Cushing, Box 8045, Jacksonville, Florida 3221, USA.
DL9LJ/MI	via DL1CF, 32 Hildesheim, Mellingerstr 13, West Germany.
FO8JL	via K2HWL, PO Box 601, Huntington, LI, NY, USA.
HM1AQ	Park Sung-Kun, Mapokoo Ahyun-4-dong 470-9, Seoul, South Korea.
K7LMU/3W8	via K6EVR, 9861 E. Estrella, Temple City, California, USA.
KG6IF	via K7CAD, 6080 SW. Burma Rd., Lake Oswego, Washington, USA.
TN8AL	S. Besse, Telecoms, B.P. 298, Brazzaville, Congo Rep.
VP2KI/ VP2VI	via W2YTH, Yardley Rd., Mendham, New Jersey, USA.
W5HWR/VP9	Box 275, Hamilton, Bermuda.
ZD8DM	via K4HCX, 1037, N.W. 29th Street, Miami, Florida, USA.
ZM7OL	PO Box 215, Cosmaria, Tokelau.
5W1AZ	G. W. Ashton, Falcolo Airport, Pte. Bag, Apia, W. Samoa.
6W8AJ	L. Gilbert, SRCMA, B.P. 1408, Dakar, Senegal.
ex-9G1FB	G3LOF, A. A. Blythe, via RSGB Bureau.
9M8EB	E. Brogden, c/o BLDC, Simanggang, Sarawak, Malaysia.
9Q5CM	PO Box 178, Coquilhatville, Rep. of Congo.
ex-9M4LU	G3JPQ, via RSGB Bureau.
ex-9M4LJ	GM3RKO, via RSGB Bureau.

* * *

RSGB QSL Bureau: G2MI, Bromley, Kent.

and plane schedule. An eight-day stint is being planned using Hallicrafters equipment and a two element beam. It is hoped that propagation conditions to the UK will be more favourable for this operation than during previous efforts, and it is anticipated that the most favourable times for 14 Mc/s will be between 08.00 and 11.00, with 17.00 to 19.00 as a possible. 21 Mc/s may yield results between 12.00 and 15.00, but at this stage of the sunspot cycle this is an unpredictable band. QSLs should go to W4QVJ whose address will be found in QTH Corner.

Following the W4QVJ trip, VE3DGX promises to operate as **CE0AG** from Easter Island for a period of several weeks commencing early in the New Year. VE3DGX is providing communication facilities for a Canadian medical group who are to undertake research on the island.

The trip by **VU2NR** to the **Andaman Is.** has been put back to the first week of December. Via G3MVV information has come that VU2NR has built a new rig for 7, 14 and 21 Mc/s to be used on the trip, which is expected to last eight to ten weeks. It is hoped that Rao, VU2RM, will join in the activity around Christmas time.

After the cancellation of the VQ8AM trip to **Rodriguez** comes the rumour that **VE8CO** will undertake a trip, sponsored by Hammarlund, and lasting about eight weeks from the beginning of January, 1965.

A joint Services Expedition to **Socotra Island** will be undertaken between December, 1964 and February, 1965, and the amateur radio operator will be ex 5B4JF who expects to operate under the call of **VS9SJF.** The transmitter will be a DX-40 together with an AR88 receiver, operating on 7, 14 and 21 Mc/s c.w. for as long as the generator availability periods will allow. Socotra Island counts as Aden for DXCC, short of a new country by about 7 miles!

A scientific research party arrived on **Heard Island** in the middle of November to carry on the work of previous groups. The party includes a communications officer but the amount of Amateur Radio activity, if any, that will transpire is not yet known. Heard Island lies in the South Indian Ocean between Australia and Africa and some 1,000 miles from the South Pole. The island is raked continuously by freezing snow laden winds with velocities of around 100 m.p.h. The island is small but precipitous and volcanic. At the turn of the century an American expedition set up an industry taking oil from seals and penguins, and this work was carried on until the island's natural animal life was decimated. Between 1930 and 1954 a weather and scientific station was operating in co-operation with the Antarctic stations. (Tks **VK4SS**).

Norfolk Island will be the scene of a month's activity by VK3TL and covering the whole of January, 1965. The call to be used will be **VK9TL** and operation will be on all bands between 3·5 and 21 Mc/s. QSLs may be sent to the home QTH or via the VK QSL Bureau, VK3TL mentions that the 7 Mc/s band has been open frequently during recent weeks to the UK and that he has made a number of two way s.s.b. QSOs with G stations.

W9WNV, Don Miller, reports that the total number of QSOs from XU and 3W8 was in the region of 15,000, of which about 8500 were with the USA. Despatch of the QSLs commenced in mid-November and if the contributions keep his financial loss within reasonable proportions W9WNV will make further trips to rare countries.

There have been rumours abounding, mainly overseas, that the **RAFARS** will shortly commence an assault on **Rockall.** Whilst the society has for some time had in mind a DXpedition to this inaccessible spot, there are certain practical difficulties which will need considerable ingenuity to resolve, and for the time being the motto is wait and see.

Top Band News

The annual **160m Transatlantic and Worldwide DX Tests** will be held on the following Sunday mornings: **December** 6 and 20; **January** 3 and 17; **February** 7 and 21. The Test (not contest) period will be between 05.00 and 07.30 on each of these days. It is hoped that all 160m operators will be active, and (most important) will subsequently report their results. Full details appeared in *MOTA* for November, 1964 (page 730).

A note from **G3PAI** says that he will be active from **Sark** during the *CQ* WW 160m Contest which will run during the weekend January 30-31. It is hoped that UK stations will continue to give this popular event their support.

GM3TMK is active on c.w. from the rare county of Ross and Cromarty on most nights around midnight, and on Sunday mornings after 05.00 until the end of DX propagation. The aerial now in use is a 260 ft. end-fed type at a height of 40 ft. on a site which is 100 ft. a.s.l. The latest issue of the *160 metre DX Bulletin* from W1BB reports the appearance on the band of **VP2AV**, a new country on 160 and providing W1BB with his 82nd country. It is expected that VP2AV will be regularly active during the coming months. Another new one on the band is **OX3DL** active on 1,826 kc/s using 10 watts to a 45 ft. vertical wire. After working W1BB (how did you guess!) OX3DL QSOd **G3OLI.** It is believed that the permission to operate on 160, together with the construction of the transmitter and erection of the aerial, caused considerable trouble, but obviously all the difficulties were successfully overcome.

Band Activities

Sunspots may be sparse these days, but even so a great amount of DX continues to be worked and heard from the UK. The biggest stir appears to have been caused by K7LMU/3W8 who has been worked on s.s.b. and c.w. on 7, 14 and 21 Mc/s. A more limited tumult greeted the advent of sundry 9J2 gentry on the bands from newly independent Zambia, while the WPX chasers had cause to be grateful to YV9AA who has been reported on four bands this month.

Now, without further chitchat, straight into the most comprehensive survey for some time thanks to G2FRY, G3AAE, G3HCT, G3HDA, G3PEK, G3SML, GM3ITN, BRS20317, BRS25429, BRS25901, A1798, A2498, A3699,

Stuart Meyer, W2GHK, Founder-Director of " DX-Pedition of the Month," accepts honorary membership in the British Columbia DX Club from Vic Clark, VE7ALR, at the Pacific Northwest DX Convention in Vancouver, British Columbia, on August 1, 1964.

A3942, A4035, A4062, A4110, A4124, A4254 and G8JM, all of whom took time off to pass along their results for the benefit of other members. Will *YOUR* call-sign be in the list next month?

3·5 Mc/s C.W.: JA6AK (22.10), PX1LX (00.05), UA1KED of Franz Josef Land (22.20), VE1ZZ (22.40), VK5NO (20.00), VQ2DT (20.05), YV9AA (06.55), ZL2AUA (06.20), ZL3GC (07.50), ZL4LM (07.05) and 4X4AS (19.40).

3·5 Mc/s S.S.B.: UW9AF (22.30), VE1ER (06.20), VE1ALQ (06.25), VO1DN (23.00), VP7CX (07.25), YV5AKU (06.33), YV5ANS (06.25), YV5BPJ (06.05), YV9AA (07.00), ZL2BCG (06.25), ZL4PG (06.23) and 4X4AS (22.50).

7 Mc/s C.W.: BY1PK (23.00), BY9SX (00.30), CE8BF (06.10), CM2EJ (08.20), CR4BB (20.45), CR6AI (23.10), DU1TA (14.30-15.15), EP2AS (18.10), EP2RC (19.35), JA4BJO (16.00), JA6AK (21.45), JA6YG (14.15), JA7ACM/MM off Australia (08.00), KC4USK (06.20), KR6OJ (22.35), KV4CI (22.10), MP4BEQ (19.15), MP4QBF/MP4T (19.00), MP4TBJ (18.55), OR4VN (20.50), OY4M (19.00), UA1KED (06.55), UA0YE Zone 23 (18.00), UM8AV (23.15), UM8KAA (17.35), VE1AJR/SU Gaza Strip (20.15), VK2.3.4.5. (15.15-20.15), VK6CL (21.45), VP1TA (08.32), VP2KA Anguilla (23.30), VP8HU (22.50), VQ2DT (16.45), VS9MG (20.30-23.00), VU2JA (16.00), YN1JM (06.25), ZL2.3. (06.20), ZL4 (14.00-19.00), ZL4JF Campbell Island (06.25), K7LMU/3W8 (21.15-22.30), 4X0WF Dead Sea Expedition (22.00), 5R8AB (18.15), 6W8BF (20.40), 9G1MR (21.30), 9M2LO (18.00), 9M4LP (22.35) and 9Q5AB (21.50).

7 Mc/s S.S.B.: CN8GB (05.55), CX3BH (07.20), EP2RC (21.05), EP3HS (21.15), HC2JT (04.30), HK4EB (04.45), JA1INJ (15.45), JA2BTV (15.52), KP4CKU (08.50), KR6LJ (16.55), KZ5AX (08.10), LX1BW (16.25), LX1RK (14.40), LX3JV (12.55), MP4BBW (19.45), MP4BEQ (21.20), OA4KY (05.35), OA4OS (07.15), OH0NI (06.10), OX3JV (07.05), TI2SS (06.55), TI0RC (07.15), UD6BR (20.40), VK2AVA (07.10), VK3ATN (18.25), VS9MG (22.35), XE1OE (08.15), YV5AKU (05.00), YV9AA (06.15), ZC4AK (21.30), ZL1AIX (07.00), ZL3UY (07.00), ZS1XX (20.30), K7LMU/3W8 (21.00), 5N2CKH (23.45), 6O6BW (21.45), 7X2SQ (06.45), 9J2WR (00.15), 9M2LO (17.35), 9M4LP (23.10) and 9Q5AB (04.00).

14 Mc/s C.W.: AP5HQ (11.50), CO2JD (18.45), CP5EQ (19.30), CT3AE (10.25), CT3AM (18.20), DU1GF (10.45), DU5DM (17.00), FB8WW Crozet Island (17.00), FB8XX Kerguelen Island (16.10), FG7XS (17.40), FG7XQ (19.25), FL8AK (15.30), FR7ZI (13.15), FY7YE (20.30), FY7YF (19.45), FY7YJ (19.30), HI3AGS (19.25), HZ3TYQ (10.35), KC4USX (19.50), ZS6AP/KC4 (18.45), KG6ALU (12.30), K3SWW/KG6 (09.40), KR6JZ (10.05), LU1ZC (08.00), LU6ZM (22.00), DJ6RN/M1 (08.30), MP4QBF/MP4T (19.35), OR4VN (15.50-18.00), PJ2ME (19.35), PJ2MI (20.30), TA4SO (20.20), VK9RB Norfolk Island (08.10-11.20), VP2KA Anguilla (11.40), VP2KJ Nevis (20.35), VP7NQ (19.35), VP8HJ (20.25-22.30). VP8HK (20.00), VP8HU (20.20), VP9BP (19.45), VQ9HB (16.20), VS6FE (12.40), VS6FK (14.35), XE1TQ (19.55), YA3TNC (13.15), ZD8FP (22.25), ZP5LS (18.00), K7LMU/3W8 (13.30-17.30), 5T5AD (18.30-20.05), 6O6BW (19.30), 7Q7LA (18.15) and 7Z3AA (13.25).

14 Mc/s S.S.B.: CE0ZI/MM (08.25), CP1BJ (19.50), CR7GF (19.25), CR8AR (18.10), DU1BSP (08.55), FG7XT (21.45), HK3AFB (18.55), HL9US (08.35), HP1JM (19.45), KA2EB (10.30), KA8FS (08.20), KC6BK (08.00), KG6AJB (10.40), KR6MU (08.25), KX6BQ (07.50), KZ5LC (17.45), DL9LJ/M1 (12.55), MP4TBJ (10.37), OD5AX (13.05), PJ2AA (18.50), PZ1BW (20.20), TI2HP (12.00), TI0RC (19.36), UH8BO (08.30), UI8CT (08.40), VK9NT (11.35), VP2KM (20.05), VP4VP (21.05), VP7NS (20.00), VP9FK (20.55), VQ1GDW (16.50), VQ6R Swaziland (17.40), VQ8AM (17.05), VS9MG (14.30-17.42), XE1AB (20.05), XE2FC (21.00), XE2LM (21.00), XW8AL (14.20), YN1LH (20.00), YS2SA (18.40), YV9AA (18.30), ZL1ABZ Kermadec Island (08.30), 3A2CP (16.00), K7LMU/3W8 (13.00-18.00), 4U1ITU (13.15), 4U1SU (12.45), 4W1E (13.20), 5T5AD (07.40), 6W8AG (20.35), 6Y5LK/5 (18.05), 7G1L (19.20), 7Q7PBD (16.25), 7Z3AA (14.40), 9G1CC (06.53), 9J2VB (16.55), 9K2AM (14.25) and 9M4LX (14.35).

21 Mc/s C.W.: CR4BB (11.40), CR7IZ (08.15), CR9AH (08.10-10.15), EA6AM (11.35), EL2AE (10.20), EL6E (15.55), FB8XX (11.15), HI8WSR (14.35), HS1X (08.30-13.45), KR6FG (08.05), LU1ZC (10.20), DJ9LJ/M1 (10.30), OD5AX (08.00), OR4VN (10.50), UH8AA (08.35), UI8AP (09.20), VK6RS (09.30), VK6RU (08.20), VK6SM (08.25), VS6EY (09.15), VS6FF (09.35), VS9AMD (08.15), VU2GG (08.00), YA3TNC (10.00), YA4A (08.40), ZD3A (11.45), ZS2MI (12.10), K7LMU/3W8 (08.20), 4S7NE (09.20), 5H3HZ (09.30), 6W8BF (11.50), 9J2BC (15.55), 9J2W (12.45) and 9M2LO (08.40-11.15).

21 Mc/s A.M.: CE6EZ (19.15), CO8JK (19.30), CR4AD, CR4AY (13.00), CR4BB (12.00), CR4BC (14.25), CR6GQ (15.50), CR6GS (12.50), CR6JL (15.40), CR7CO (07.30), CR7GX (13.00), CX9CO (14.30), EA8AE (12.50), EA8DG (13.10), EA8EJ (18.50), ET3USA (16.10), FB8ZZ (13.30), FH8CD Comoro Is. (16.25), FR7ZD (13.40), HI4ARM (15.25), HK3ET (19.05), KG4AN (19.30), KV4CX (13.05), MP4BFB (13.45), MP4DAA (12.10), MP4TBA (12.00), PJ2CZ (17.45), PZ1CP (19.10), SV0WFF Crete (08.55), TG9US (13.45), TN8AA (13.30), VK6QL (08.20), VP9DL (12.30), VQ2BC (16.50), VQ8AM (14.05), VQ8AZ (12.00), VS9ASP (10.40), YV1AB (15.50), ZP3AL (19.30), 5H3JI (16.00), 5N2RFB (17.25), 5R8BX (08.20), 6W8AE (13.15), 6Y5RA (18.55), 7X2BB (15.15), 7X2SQ (18.00), 9G1FF (17.15), 9G1FL (16.00) and 9J2JN (15.30).

21 Mc/s S.S.B.: CR6JL (12.10), CR7CK (15.41), CR9AH (10.15), CX3BH (11.45), EL6A (18.05), EP2AZ (10.00), EP2RC (11.15), ET3USA (10.45), FH8CD (12.40 and 17.05), HC1SM (19.15), HK1ASZ (16.24), HK3AUE (16.00), HK4EB (16.10), KP4AOO (11.15), KV4CX (12.05), KZ5AF (15.45), MP4TBJ (11.40), OX3JV (12.10), TG9KJ (14.40), TG9MP (16.10), TI2DLM (18.25), TI0RC (15.40), VK2NN (10.15), VK6RX (10.55), VQ2WR (14.55), VQ8AZ (14.30), VS9AAS (11.15), VS9PCZ Perim Island (09.45), XE1AB, XE1VW and XE1ZE (all 16.45-19.00), XE2WH (19.30), XW8AL (09.35), YV1AQK (16.30), YV9AA (14.55), ZP5OG (12.10), ZS2MI (11.10), ZS7R (17.00), K7LMU/3W8 (09.35), 5H3JR (15.20), 6O1KH (10.37), 6O6BW (11.55), 7Q7PBD (17.15), 7X2MD (16.45), 7X2SQ (15.00), 9J2BA (11.40), 9J2BB (12.10), 9M4LP and 9M4LX (09.45).

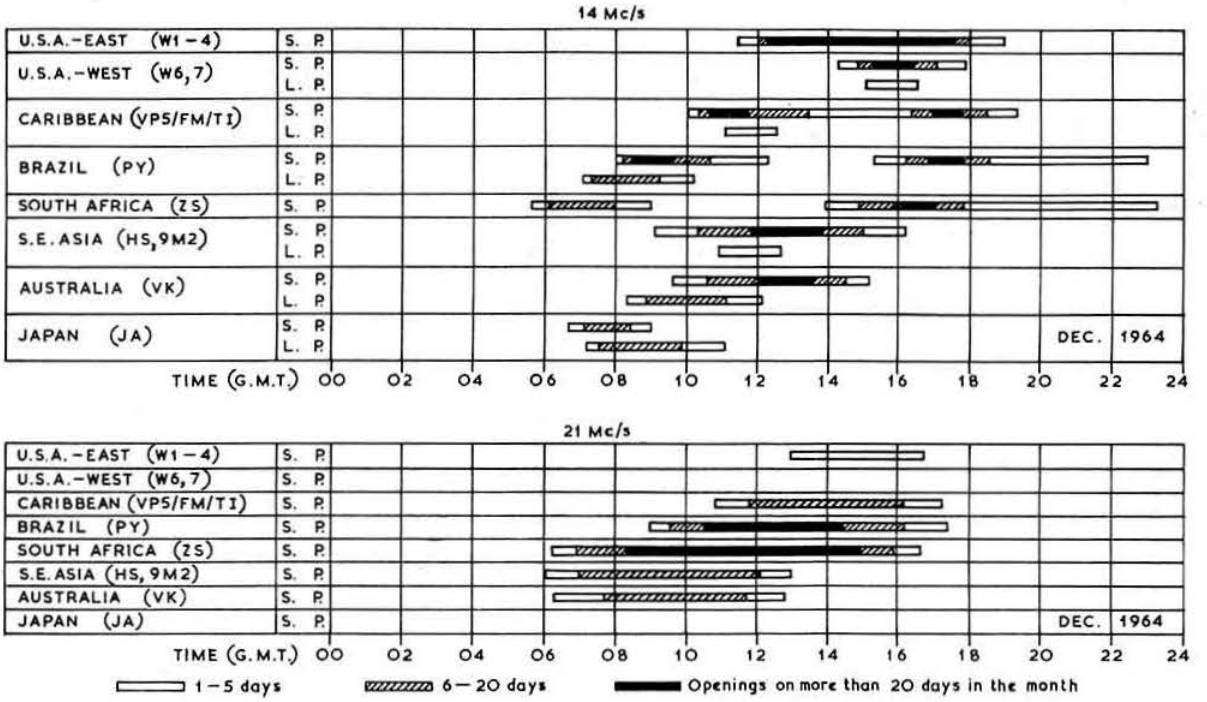
28 Mc/s C.W.: DJ4PP (19.50), OK1US (09.25), UB5DYD (10.05), ZE3JO (10.50) and 9J2GJ (09.45).

28 Mc/s A.M.: CR7CZ (11.00), CX1AAM (17.45), F2JV (10.00), I1CTA (09.45), LU1DAB (11.00), LU4DM (17.20), LU5MP (18.30), UL7APG (10.40), VQ2DT (15.20), ZE1AN (10.30), ZE1AS (11.30), ZE2JA (10.30), ZS1BV (10.50), ZS6AMO (14.30), ZS6AJH (14.35), 5H3JI (10.15), 5X5JK (10.25), 9J2DT (12.00).

28 Mc/s S.S.B.: 7Q7PBD (10.05) and 9J2WR (10.40).

Yes, certainly a lot of DX there, and just about equally split between c.w. and s.s.b., except on 21 and 28 Mc/s, where a.m. adherents continue to practice the ancient mode. It is expected that the highlight on the bands in December

PROPAGATION PREDICTIONS



During December and January the winter propagation conditions reach their peak. The short days reduce the periods for operation on the h.f. bands so that the average amateur has little opportunity for DX working in the evening on these bands. Because of the present low sunspot activity, 28 Mc/s will open only very occasionally between about 10.00 and 14.30 GMT to Africa and from about 10.45 to 11.30 GMT to South America. On 21 Mc/s regular contacts will be possible only with South America and Africa, and in general, DX opportunities will be better in Southern Europe than in countries further north. The early sunset means that DX traffic on 21 Mc/s will have finished by 17.00 GMT at the latest. The possibility of making contacts via auroral reflection after this time on 21 Mc/s (as well as on 28 Mc/s) will still remain, when there have been severe geomagnetic disturbances.

In contrast to 21 Mc/s, the 14 Mc/s band should enable contacts to be made with all continents. However, because of the short days, the activity periods for the various DX zones will also be short. With few exceptions this band will generally close for DX at about 19.00 GMT. Between about 07.00 and 13.00 GMT is the best period on 14 Mc/s for working all continents, and the midwinter season favours contacts on this band via the long path to various DX zones, especially to South America and East Asia in the mornings. In the early hours of the evening South American and South African stations should generally come through well. QSOs will, however, be rather difficult, because the summer conditions in the Southern Hemisphere raise the received noise level at that end of the path. Between about 16.30 and 18.00 GMT on 14 Mc/s KH6 should be workable via the long path when exceptional conditions prevail. 7 Mc/s will become the main DX band after 19.00 GMT when 14 Mc/s closes. From about 19.30 GMT Eastern North America should come through on 7 Mc/s and South America from about 20.30 GMT. In the latter half of the night, and sometimes before midnight, North American traffic will frequently be interrupted by a too low m.u.f.

The 3·5 Mc/s band will, in general, be better than 7 Mc/s in the latter half of the night for North American traffic. The long winter nights and the decrease in the noise level, together with the low solar activity favour DX on this band. In the latter half of the night and sometimes before midnight, local traffic will frequently be interrupted by the dead zone, outside the area covered by the ground wave.

The provisional sunspot number for October, 1964 was 5·6. With the exception of the period October 6 to 11, sunspot activity was at a very low level. The predicted figure for January and February is 7 with 8 forecast for March and April, 1965.

will be the CE0 expedition to Easter Island, and that will cause some fun. Which will be the best band, long path or short path, at breakfast or teatime? For answers to these and many more equally breathtaking occurrences watch this column in the January issue! Meanwhile good hunting and remember that courtesy and good operating are synonymous.

Contests

First, the results of the **1964 *CQ* WW S.S.B. Contest:**

Single operator, All band		*Single operator, 14 Mc/s*	
DL3LL	388,315	HC2JT	354,522
ZL1AIX	321,750	SM5BLA	350,406
YV5BIG	273,969	VS1LP	227,040
G4CP	233,840	4X4LC	203,665
CX3BH	228,105	UW3UP	201,142

On 7 Mc/s G5HZ was fifth in the world wide single operator listings with 3619 points and on 3·5 Mc/s G13CDF was world wide leader with 21,070 points.

	Multi-operator, All band		
9A1ZG	349,002	W3MSK	267,460
GB3RAF	347,072	5A2TZ	250,432

The three leading stations in the **1964 Low Power Field Day** were: G3RBP/P, 145 pts; G3PIF/P, 91 pts and G3CGD/P, 89 pts.

The **TOPS Club 80m activity contest** will run from 12.00 on December 19 to 12.00 on December 20. This contest is open to any station operating on 80m. Points scoring: own country QSOs one point; QSOs with other European countries count 2 points, and all other QSOs count three points. Ten bonus points may be claimed for each completed WAC. The figures exchanged on each QSO will be the RST signals report and the serial number of the QSO, e.g. 579001. The total score will be the number of points multiplied by the prefixes worked. Logs should go to G3IRM, P. Lumb, 22 Hervey Road, Bury St. Edmunds, Suffolk, postmarked not later than January 12, 1965. Competitors are asked to mention when sending in their logs the time that they would find most suitable for this contest.

The full rules of the **OK DX Contest,** to be held between 00.00 and 24.00 on December 6, are contained in a leaflet which may be obtained from G2BVN.

Awards

The **British Counties Award** is offered by Chapter 8 of the Certificate Hunters' Club to any operator who can produce proof of contact with the required number of UK counties post World War II. There are three classes for this award requiring 50, 75 and 98 contacts respectively; UK stations must have used the 1·8 Mc/s band only; stations outside the UK may claim for contacts on any bands. Contacts with members of CHC # 8 may be used to count as: (i) the member's own county, *OR* (ii) any other UK county up to a maximum of five substitutions. The QSL cards are not required but a certified check list must be sent, together with eight IRC or 5/-, to C. R. Emary, G5GH, 133 Fairlands Avenue, Thornton Heath, Surrey. It is an unfortunate fact that an award similar to the *British Counties Award* has been the cause of considerable dissatisfaction, both in the UK and overseas, due to the sponsor not returning QSL cards belonging to claimants. It is understood that a number of the claims were not correctly submitted, but this is not an excuse for the retention of QSL cards, which an operator will have expended considerable time, trouble and expense to obtain.

The **Curacao Certificate** will be issued to all amateurs who send a log sheet showing that they have worked with at least

The new British Counties Award offered by Chapter 8 of the Certificate Hunters' Club.

five amateur stations on the island of Curacao (prefixes *PJ2C* and *PJ3C*) between December 15, 1964 and January 15, 1965. All bands and all modes are allowed. Claims will be checked against the logs of the Curacao amateur stations and it is therefore not necessary to submit QSL cards. Requests for the certificate should be sent to: VERONA, P.O. Box 383, Willemstad, Curacao, Netherlands Antilles, accompanied by one dollar or ten IRC. This certificate is issued in commemoration of the tenth anniversary of the new statute for the Kingdom of the Netherlands which will come into effect on December 15, 1964.

The **Directory of Certificates and Awards,** published by Clif Evans, **K6BX,** may be ordered through G2BVN at a cost of 18/6d, with a three ring binder costing an additional 7/6d. Stocks of the *Directory* are not held in the UK in order to ensure that only up-to-date volumes are distributed. The *Directory* is published quarterly from January 1 in each year, and will come to subscribers direct from K6BX.

DX Briefs

For those who have not been fortunate enough to have acquired one of the S9+ QSLs from **KC6BK,** it is now too late as Stan has left the Carolines for Japan. It is believed that some operators have had these QSLs laminated to avoid possible damage by eager, grubby fingers!

Dave Quigley, ex-G3PRI, DL2ZN and DL2PB, is now active using **MP4TBK** and looking forward to many UK contacts on 14 Mc/s.

9J2VB (Box 38, Mongu, Zambia) is now active on 14 Mc/s s.s.b. using an NCX3 and a rotary Vee beam of his own design. Neville, who has held many other overseas calls, may often be heard at 18.00 around 14,325 kc/s.

9M4LJ will be returning to the UK during December when he will sign **GM3RKO** from Morayshire. He hopes to be able, in due course, to activate some of the rare northern Scottish Counties on Top Band.

For those operators requiring mint overseas stamps for prepayment of postage on QSL cards, **GW8WJ,** holds stocks from many countries, and will be pleased to answer any enquires accompanied by a s.a.e.

John Copley, who held the call **VK4JQ** on Willis Island, has returned to the mainland, and is now operating under

the call VK2AVU from Flat 3, 22 Pavilion Street, Queenscliff, N.S.W., Australia.

5W1AZ hides the identity of former ZK1BV, who is now active from Samoa on 14 Mc/s c.w. His address will be found in QTH Corner.

VK9RB is very active from Norfolk Is. and has been well heard in the UK at the weekends around 10.00 on 14 Mc/s c.w.

It is noted from the *DX News Sheet* that WB6GVV is offering his services as a QSL manager for any UK station needing such assistance! Tune up the rig, Jeeves!

VK0PK is now on the air from Macquarie Island but mainly concentrates on 7 Mc/s c.w. with no European QSOs reported.

Commonwealth Call Areas Table

Readers are asked to send in (*postcards* please) details of their contacts with stations in the Commonwealth after **January 1, 1965.** The information should take the following form:

	1·8	*3·5*	*7*	*14*	*21*	*28*	*Mc/s Total*
G3AAE	0	0	10	25	15	4	44

Separate tables will be drawn up for transmitting stations and listening stations.

The call areas are those shown on the RSGB *Certificates and Awards leaflet* a copy of which is obtainable from HQ, or a request noted on a postcard entry for the Table will suffice. It is hoped that operators will take advantage of suitable conditions on 21 and 28 Mc/s to boost their scores rather than concentrate on overcrowded 14 Mc/s.

Comments from members on the Table will be welcomed.

* * *

Correspondents are thanked for their co-operation and acknowledgement is made to the West Gulf DX Club *Bulletin* (W5IGJ), the LIDXA *Bulletin* (W2FGD/W2MES), *DX'press* (PA0FX), the Florida DX Club *Report* (W4HKJ) and The *DX'er*. Please send all items to RSGB Headquarters to arrive not later than December 9 for the January issue and January 13 for the February issue.

International Hamfest

The Seymour Hall, bordering on London's West End, is often the Mecca for international events of all kinds, but it is doubtful whether even that famous Hall has provided a rendezvous for representatives from so many countries at one time as happened on the occasion of the 1964 International Radio Communications Exhibition.

During the evening of Friday, October 30, amateurs from upwards of a dozen countries, who had been visitors to the Exhibition, enjoyed the pleasure of an International Hamfest as guests of the President and Council of the Radio Society of Great Britain. Made additionally convivial by the provision of light refreshments the ragchew continued throughout the evening.

Surprise visitors were Robert Booth, W3PS/K4PS and Richard Baldwin, W1IKE, General Counsel and Assistant General Manager respectively of the ARRL. From Geneva came John Gayer, 4U1ITU/HB9AEQ, President of the International Amateur Radio Club who, professionally, is Chairman of the all-important International Frequency Registration Board.

That most famous exponent of DX-expeditions Gus Browning, W4BPD, whose various exotic calls would fill nearly a page of print, was there with his wife together with others who have given new countries to many thousands of DX enthusiasts. Harry Wilson, EI2W, whose own u.h.f. and v.h.f. achievements have earned for him world-wide recognition had the pleasure of seeing the Millan V.H.F. Trophy presented to his friend and countryman Barney Patterson, GI3KYP/EI4BC, in appreciation of his efforts to encourage interest in u.h.f. and v.h.f. work within the Emerald Isle.

From the Continent came representatives from Germany (DJ4BR), France (F7CL), Belgium (ON4OJ, ON5BX/9Q5LD), and the Netherlands (PA0AKA, PA0BEA, PA0DAX, PA0HJK, PA0PWA, PA0WX). Ian Cable, MP4BBW on leave from Bahrain was there to talk DX as were VU2IR and W5VVT. Towering above them all was Aarlund Uusher, for many years President of the South African Radio Relay League, but now rusticating as GD3TIU in the Isle of Man.

In his capacity as President of the RSGB Geoff Stone, G3FZL, extended a welcome to those who had accepted the Council's invitation and hoped that an International Hamfest would become an established feature of future RSGB exhibitions. All who were fortunate to be present will share that view.

G6CL

Council member R. F. Stevens, G2BVN, with Gus Browning, W4BPD, left, and Mrs. Browning.

Enquiries Regarding Bulletin Articles

Members who write to the authors of BULLETIN articles are asked to enclose stamped addressed envelopes if they require replies.

SAID FORTY YEARS AGO

"There is no doubt that important events of interest to the amateur will transpire during the coming year and much work lies ahead for the Radio Society of Great Britain.

"With the growing interest displayed by commercial companies, the Government and the Services, in the short wavelengths, it will not be easy for the amateur to retain his claim to the use of a short wavelength band for transmission, unless a good case is made out on his behalf."

The Wireless World and Radio Review
December, 1924

J. C.

Down Came the Barriers

By JOHN CLARRICOATS, O.B.E., G6CL*

FOR more than 40 years the Radio Society of Great Britain has sponsored or organized radio exhibitions. During the very first—the All British Wireless Exhibition held at the Royal Horticultural Hall, Westminster, in October, 1922—public demonstrations of the soon-to-be introduced public service of national broadcasting were given by the Marconi Company from Marconi House in The Strand. From there, on November 22 that year, the British Broadcasting Company began operations.

In more recent years RSGB Headquarters stations—using the special activity call-signs GB3RS and GB2VHF—have operated successfully from the hall used for the Society's annual Exhibition and amateurs in many parts of the world possess a QSL card confirming contact with one or both of the stations—but the operators in London have always been British subjects licensed by the Postmaster General, whose names had previously been submitted to the Post Office. This year an important development took place with almost dramatic suddenness—licensed foreign amateurs were officially permitted to operate the Headquarters stations at Seymour Hall.

First news of this change in Government outlook towards International Amateur Radio was given by the President (Mr G. M. C. Stone) during his speech at the opening of the Exhibition on Wednesday, October 28, 1964, but its full significance did not appear to be immediately apparent. Few could believe, as Mr Stone made the announcement in quiet tones, that at long last the barriers had come down in a big way.

Chet Lambert, W4WDR, F7CL, 9Q5WF, right, operating GB3RS while John Graham, G3TR, looks on.
(Photo by H. R. Preece)

Shortly after the Exhibition was declared open by Mr E. D. Whitehead, the President invited Mr Chet Lambert, W4WDR, F7CL, 9Q5WF to become the first non-British licensed amateur to operate a British Amateur Radio station from an RSGB exhibition hall. Contact was established with DJ8SW who thus helped Mr Lambert to open up another chapter in Amateur Radio history.

When, four days later, the Exhibition closed, the log books showed that, in addition to Chet Lambert, the following licensed amateurs from abroad had operated GB3RS or GB2VHF: R. Glaisher, DJ0BM, G6LX; R. J. McIntyre, PA0EO; F. C. B. Jordan, W3FIU; J. A. Stone, EI4Q; C. Hunter, EI9V; John A. Mooney, EI6AK; David J. O'Connor, EI6AL; Edgar Post, K6ODG; Bindu Madhav Rao, VU2IR; Don Wilcox, VE3DUF, VE1DUF, G3JSA; Pedro Luis B. Teixeira, CT1MC; H. L. Wilson, EI2W; G. J. Kooijman, PA0WX; Frits van Rossum, PA0BEA; Ralph Caro, ZS6BGS; C. P. J. Domisse, PA0CPD, D. A. v. d. Meyden, PA0DAX; Joe C. Wilson, W5VVT; Jan Anderson, SM5LQ; Peter Weber, DJ4BR; Robert M. Booth, W3PS/K4PS; Lavert A. Henley, WA6SZC; Gus Browning, W4BPD; R. L. Baldwin, W1IKE; John H. Gayer, 4U1ITU, HB9AEQ; G. Cassidy, EI8AP; J. A. P. M. Stierhout, PA0VDZ; Andrzej Maslag, SP5AHZ; Henryk Kotowski, SP5AHL.

* Honorary Official Historian to the Society, Secretary, IARU Region I Division.

Richard L. Baldwin, W1IKE, Managing Editor of *QST*, right, operating GB2VHF.

To complete the record the following is a copy of the letter sent by the Radio Services Dept. of the Post Office to the Society which authorized this further advance towards the day when it is hoped any qualified foreign amateur will be allowed to operate an Amateur Radio station while visiting the United Kingdom:

> *"You wrote on 29th September to ask whether foreign amateur licence holders visiting the International Radio Communications Exhibition could be permitted to operate the Society's amateur stations GB2VHF and GB3RS at the Exhibition under the supervision of the authorized operators.*
>
> *You will be glad to know that after very careful consideration of your request we are prepared, exceptionally, to allow foreign amateur licence holders to operate GB2VHF and GB3RS at the above mentioned Exhibition in the presence of and under the direct supervision of any of the authorized operators of those stations, provided that the Society forwards to us a record of the names of the foreign amateurs involved and the call-signs they are authorized to use in their own countries."*

Swiss Expo Station Lausanne encourages Amateur Radio

Organized by Radio Amateurs of Switzerland, an Amateur Radio station has operated throughout the past summer from the Swiss National Exhibition in Lausanne. Visited by many hundreds of radio amateurs, the Swiss Expo station, using the call HB9RAS, made thousands of DX and local contacts and did much to encourage interest in Amateur Radio.

Equipment used consisted of Marauder HX10 (150 watts) and Marauder HX 20 (80 watts) transmitters, RX1E and SB300 receivers, a 2BDT (40/80m) dipole and a TA 33JR beam (20/15/10m).

QSL cards should be sent to Serge Perret, 9 Ch. du Liaudoz, 9 Pully-Lausanne.

Presentation of the Mullard Award for 1963

" The courage which he has shown in overcoming his handicaps has been a source of inspiration to amateurs everywhere. By his knowledgeable advice and persistent encouragement over the air, he has helped many other amateurs to modify and improve their own equipment."

THESE were the words of one of G3EPL's nominees when putting his name forward for the 1963 Mullard Award. Later, on November 7, at the Abbots Court Hotel, St Bees, Cumberland, Mr James Illingworth, G3EPL, was presented with the award by Mr David Taylor, of Mullard Ltd.

The Award takes the form of apparatus or books to the value of £25 and a commemorative plaque, donated by Mullard Ltd. For his prize, G3EPL chose a Taylor Instruments Valve Voltmeter and associated probes.

Mr Illingworth, who was licensed in 1948, was at one time Headmaster of St Bees Primary School. He lost his sight in 1956 after an illness but returned to the air after only a short break.

At the ceremony in St Bees, the President, Mr G. M. C. Stone, G3FZL, outlined the terms of the Award and introduced Mr Taylor, who said he had needed no introduction to Mr Illingworth: as soon as he walked into the room he had recognized him as a " character," a remark greeted with applause by the many friends who had travelled from all parts of the UK to honour G3EPL. In his reply, Mr Illingworth paid tribute to his three pairs of very good eyes—his wife's, daughter's and son-in-law's—who help him to continue his hobby.

Mr David Taylor (Mullard Ltd.) with Mr James Illingworth, G3EPL, immediately after the presentation.

G3EPL surrounded by some of the friends who attended the presentation at St Bees on November 7, 1964

A bouquet was presented to Mrs Illingworth by Mr W. H. Hodgson, G3BW, who paid tribute to her support of her husband in his Amateur Radio activities.

Telegrams of congratulations were received, including one from Dr F. E. Jones, Managing Director of Mullard Ltd. A message from W3HQO, President of the Ex-G Club, gave G3EPL particular pleasure: he has a regular sked with W3HQO on 14 Mc/s s.s.b.

During the afternoon preceding the presentation, RSGB members toured the Windscale Atomic Energy Plant.

The arrangements in Cumberland were made by Mike Gibbings, G3FDW who had the support of a number of other local members.

Long distance visitors included GM3COV (Thurso), G3OSS (London), G2NH (New Malden, Surrey) and G3BA (Sutton Coldfield). The Society's Council was represented by the President, and the Headquarters Staff by the General Manager, Mr John A. Rouse, G2AHL.

FOR THE YEAR ENDING JUNE 30, 1964

Annual Report of the Council

THE Council has pleasure in reporting to members on the affairs of the Society during the year ended June 30, 1964. The year, which commenced with celebrations of the Golden Jubilee of the Society's foundation, was one of continued progress.

A Supplementary Report covering the period from July 1, 1963, to early December 1963, was published in the February 1964 issue of the RSGB BULLETIN and reported, inter alia, on the Golden Jubilee, the Society's highly successful exhibition at the Seymour Hall, a number of official regional meetings and the Space Radio Communications Conference held in Geneva in October 1963. The Golden Jubilee was reported on in detail in the August 1963 issue of the RSGB BULLETIN while a condensed history of the Society was a feature of the special Golden Jubilee issue published in July 1963.

Installation of the President

An Informal Social Evening was held at the Kingsley Hotel, London, on January 17, 1964, at which Mr G. M. C. Stone, A.M.I.E.E., A.M.I.E.R.E., G3FZL, was installed as thirtieth President of the Society.

Articles of Association

The new draft Articles of Association were discussed by the Council with the Regional Representatives at a meeting held in Birmingham in 1963. Subsequently, the draft was submitted to the Board of Trade for approval and an Extraordinary General Meeting called for June 27, 1964. On that occasion less than 50 Corporate members were present and the meeting was therefore adjourned to July 4, 1964, when the new Articles were formally approved.

Committees of the Council

During the year the following Committees of the Council were set up:

	Chairman
Contests	Mr W. H. Matthews, G2CD
Education and Training	Mr G. M. C. Stone, G3FZL
Exhibition	Mr E. W. Yeomanson, G3IIR
Finance and Staff	Mr E. W. Yeomanson, G3IIR
GPO Liaison	Mr L. E. Newnham, G6NZ
Membership and Representation	Mr J. C. Graham, G3TR
Mobile	Mr C. L. Fenton, G3ABB
RAEN	Mr G. A. Allcock, G3ION
Scientific Studies	Mr G. M. C. Stone, G3FZL
Technical	Mr R. F. Stevens, G2BVN
TVI/BCI	Mr L. E. Newnham, G6NZ
V.H.F.	Mr R. C. Hills, G3HRH

In addition, the Technical Committee set up a Technical Development Sub-Committee.

All Committees held meetings regularly throughout the year, usually at intervals of 4-6 weeks.

The only new committee was Education and Training which has already made considerable progress in developing a Society educational programme to further knowledge of Amateur Radio.

The Contests Committee was kept extremely busy throughout the period organising, judging and reporting on Society contests. Only those who have served on this committee can really appreciate the very great effort expended on behalf of members.

The Exhibition Committee was responsible for the Society's overall participation in the RSGB International Radio Communications Exhibition while Mr Fred Ruth, G2BRH, again acted most ably as Stand Manager. (A review of the exhibition was published in the December 1963 issue of the RSGB BULLETIN—*Editor*.)

The Finance and Staff Committee met very frequently throughout the year to deal with a variety of problems; not least those arising from the changes in personnel at Headquarters. The Committee devoted considerable time to work in connection with the new Articles of Association. Whenever possible meetings were held either the day before or the day after Council meetings.

The GPO Liaison Committee dealt with many problems relating to licensing and, as reported later, spent a considerable time examining the new draft licences sentence-by-sentence and clause-by-clause. (The conditions of the Amateur (Sound) Licence A with explanatory notes were published in the July 1964 issue of the RSGB BULLETIN—*Editor*.)

Membership and Representation devoted considerable time to work in connection with the Representation Scheme and Affiliated Societies. Towards the end of the year plans were made for a new campaign for new members including a pilot advertising scheme in Northern Ireland which produced encouraging results.

The Mobile Committee was responsible for the organisation of a number of excellent rallies during the year and also dealt with other matters of interest to mobile enthusiasts.

The RAEN Committee continued the good work of organising the emergency network throughout the country. The Committee also produced an excellent *RAEN Manual* which was distributed to all Network members.

The Scientific Studies Committee was heavily engaged throughout the year in work connected with the continuing analysis of results of the IGY and in connection with the IQSY. A particularly interesting development was the setting up of the experimental station GB3LER at The Observatory, Lerwick. (An article on Project Lerwick was published in the October 1964 issue of the RSGB BULLETIN —*Editor*.)

The Technical Committee again rendered great service to the Society on a variety of subjects but particularly in connection with technical articles and publications.

The V.H.F. Committee dealt with a wide variety of v.h.f. matters including the operation of beacon stations on 144 Mc/s and the administration of the "Four Metres and Down" certificates. The Committee was also responsible for the organisation of the Tenth International V.H.F./U.H.F. Convention held in London in May 1964. It was generally agreed the Convention was one of the best, if not the best, so far held and the organisers have set themselves a high standard for the future.

The TVI/BCI Committee advised a number of members on interference matters but an increasingly large proportion of the Committee's time was devoted to problems arising from refusal of planning permission for aerial masts. (A useful leaflet—for the information of members—is available from Headquarters.) An increasingly important problem is posed by the rapidly expanding wired television services

which have given trouble in a number of towns and cities, both as a result of radiation from the cables at frequencies in the amateur bands and by virtue of the susceptibility to pick up of transmissions within these bands. The problem is made more difficult by the unfortunate use of carrier frequencies within the amateur bands by some companies.

Membership

The upward trend in membership was again maintained as the following table shows:

Grade	June 30, 1963	June 30, 1964	Gain during year
Corporate members			
Licensed	7155	7748	593
Not licensed	3241	3274	33
Associates	1325	1382	57
Totals	11721	12404	683

The membership at June 30 was almost 2400 more than the figure four years earlier.

Of the Home Corporate membership 69 per cent held amateur transmitting licences compared with 60 per cent in June 1963.

During the year 1746 new members were elected; the difference between this figure and the net increase represents the number of members who dropped out. While the average for the period is comparable with that for recent years, the Council noted with satisfaction that in the latter part of the year the number failing to renew their subscriptions was steadily being reduced.

Nevertheless, the Society needs to increase its effective membership considerably if plans for the future are to materialise and the Council asks every member to lose no opportunity to enrol new members. There is considerable scope for an increase of several thousands.

Affiliated Societies and Clubs

Your Council is particularly pleased to report that 222 societies and clubs were affiliated to RSGB at June 30, 1964, compared with 191 the previous year. This increase is a sign of the healthy growth of organized Amateur Radio and particularly encouraging as further evidence of the unity of the movement.

The number of overseas societies seeking affiliation has been most satisfactory.

Licence Matters

During the year the Radio Services Dept of the Post Office completed the new draft amateur transmitting licences—the Amateur (Sound) A and B, Amateur (Sound Mobile) and Amateur (Television) licences—and submitted them to the Society for comment. The GPO Liaison Committee and the Council itself gave most careful consideration to the draft and subsequently members of the GPO Liaison Committee met representatives of the PO. Though a number of matters were satisfactorily settled during a long meeting at Post Office Headquarters, there remain several points on which the Society is not altogether happy and every effort will be made to obtain further liberalisation of the terms of licences to bring them more into line with present day requirements.

The Amateur (Sound) B Licence, introduced as a result of representations by RSGB, permits phone-only operation on 420 Mc/s and above and while applicants must take the Radio Amateurs' Examination a Morse test is not required. Much interest was shown in the licence as soon as it was announced and it is anticipated that it will lead to considerably greater activity on the amateur u.h.f. bands.

The number of amateur licences again increased during the year, the total number in force at June 30, 1964, being 10,913 (including 167 television licences) compared with 10,253 in 1963. Although the number of licences continues to rise, the total is still far below what might be expected, judging by the number of amateurs per million of population in comparable countries.

It is a matter of considerable regret to the Council that the Post Office has not yet been able to extend the Amateur (Maritime Mobile) Licence to permit operation on the 14 and 21 Mc/s bands.

Since the end of the World War 2 the Society has made continual efforts to obtain licensing facilities for overseas amateurs visiting the UK and while those from Commonwealth countries normally have no difficulty, even in the absence of formal reciprocal arrangements, foreign amateurs still cannot obtain permission to operate. Great interest was aroused during 1963 and 1964 by the efforts of the American Radio Relay League, which enlisted the support of a number of Senators to have amending legislation passed to enable the Federal Communications Commission to allow foreign amateurs to operate on US soil. This bill, signed by the US President, on May 28, 1964, will prove a useful lever for the Society in obtaining similar privileges in the UK.

Throughout the year, the most cordial relations have continued to exist between the Society and the Post Office, and your Council wishes to place on record its appreciation of the help and assistance rendered to the Society by the officials concerned, not only in dealing with routine matters but also with more difficult and complex ones.

Two Radio Amateurs' Examinations, conducted by the City and Guilds of London Institute, were held during the period. The Society was again strongly represented on the Institute's Advisory Committee.

Intruder Watch

Throughout the period the members of the RSGB Intruder Watch continued their work of reporting unauthorized stations in exclusive amateur bands. Regular reports were submitted to the Post Office.

During the year Mr R. H. Farr, G8IJ, took over the duties of Honorary Organizer. To him and to all members of the Watch, the Council expresses its thanks on behalf of members.

Headquarters

Efforts to find a new Headquarters building continued throughout the year but without success. Really suitable properties seldom come on the market and when they do the competition is intense. As a result prices in the London area continue to rise. Meanwhile, the Society's lease on its present premises has expired and the building is to be taken over by the Ministry of Public Building and Works. Eventually, it will be demolished as part of the development plan for the British Museum. How long it will be before this takes place it is impossible to forecast. So far as the Society is concerned, the present accommodation is only about half the minimum size desirable.

During the year, a number of changes have taken place in the Headquarters staff, the most important being the retirement of Mr John Clarricoats, O.B.E., G6CL, from the office of General Secretary after more than 32 years' service. To mark his retirement a fund was organized with which a modern s.s.b. transceiver was purchased and presented to him. In addition, a cheque for the balance was handed to Mr Clarricoats by the President, Mr Norman Caws, at the Annual General Meeting in December. At the same time it was announced that Mr Clarricoats had been elected an Honorary Member.

The Council entertained Mr Clarricoats to dinner on the eve of his retirement. (A tribute to Mr Clarricoats was published in the June 1964 issue of the BULLETIN.)

It was with great regret that the Council received the resignation of Miss A. M. Gadsden from the Society's staff early in December. Miss Gadsden had been with the RSGB for 34 years. A cheque was presented to Miss Gadsden on June 27, 1964.

On January 1, 1964, Mr John A. Rouse, G2AHL, became General Manager and Secretary of the Society in addition to continuing his duties as editor of publications. Mr Rouse is supported by an excellent staff of eight of whom only three have been with the Society for more than 18 months.

Re-organisation at Headquarters consequent upon the changes in personnel has been a major task. On a number of occasions, the service has in some ways fallen below the standard the staff set themselves due to a greatly increased volume of correspondence, in particular, and to the considerable effort being expended in re-organisation.

Early in 1964 the Council, on the advice of the Finance and Staff Committee, decided to install a new combined stencil and subscription recording system by Elliott Business Machines. The new system, when it begins to come into service late in 1964, should prove most beneficial. The preliminary work in preparation for the change-over has however seriously taxed the resources of the comparatively small staff employed by the Society.

RSGB Bulletin

Several important changes have taken place in the RSGB BULLETIN during the period. First, Volume 39 ran to only six issues, covering the months July to December, 1963, so that future volumes will run from January to December in each year.

Volume 39 contained 392 pages, and the first six issues of Volume 40, 408 pages, a total of 800 for the year compared with 700 pages in Volume 38 and 616 pages in Volume 37. A number of issues contained 80 pages. The increased space available has led to a worthwhile rise in the number of technical and constructional articles published.

The present success of the BULLETIN would not have been possible without the excellent contributions from so many members and for the continuing work of the regular contributors: Mr F. G. Lambeth, G2AIW (*Four Metres and Down*), Mr R. F. Stevens, G2BVN (*The Month on the Air*), Mr G. R. B. Thornley, G2DAF (*Single Sideband*), Mr E. Arnold Matthews, G3FZW (*Mobile Column* and *RAEN Notes and News*), Dr A. C. Gee, G2UK (*RTTY*) and Mr J. P. Hawker, G3VA (*Technical Topics*).

The Council and Editorial Staff have been greatly encouraged by the number of members who have taken time to comment favourably on the policy adopted.

A new cover design by Jeremy Royle, G3NOX/T, came into use from the January 1964 issue. The reception given to this " new look " convinces the Council that the omission of advertising from the cover was more than justified.

The Editorial staff again had the valuable advice and assistance of the Technical Committee in the selection and preparation of material.

An important factor in the production of any magazine under present conditions is the support given by advertisers and the Council records its gratitude to all advertisers in the BULLETIN. Such support, coming as it does from all the leading manufacturers and distributors of equipment for the radio amateur in the U.K., is not only good business from both advertisers' and publishers' points of view but forms an important part of the content. The Council urges all members to mention the BULLETIN when writing to advertisers.

The Council intends to increase the number of pages in each issue to at least 80 as soon as possible. The main problem is one of cost and in this connection, a higher membership is an important factor.

RSGB Publications

Sales of all Society publications have continued at a satisfactory level. Many hundreds of copies have been despatched overseas, particularly to Commonwealth countries but it is a matter of considerable regret that the Society has been unable to obtain a distributor for the *Handbook* and *Radio Data Reference Book* in either Canada or USA. Nevertheless, due to the very high demand, a further printing of the *Handbook* was ordered.

The 1964 edition of the *RSGB Amateur Radio Call Book* sold extremely well and the print order for the 1965 edition has been substantially increased.

Publicity for Amateur Radio

The Society subscribes to a newspaper clipping service and the Council has again been most impressed by the excellent publicity for Amateur Radio secured regularly by many affiliated societies and groups throughout the country.

Such publicity brings Amateur Radio to public notice and creates a favourable impression of the hobby.

Mr Norman Caws, G3BVG, President during 1963, with trophy and award winners after the Annual General Meeting held at the Royal Society of Arts, London, on December 20, 1963.

RSGB News Bulletin Service

Throughout the year news bulletins were transmitted under the call-sign GB2RS on 3600 kc/s and on frequencies in the 145 Mc/s band each Sunday morning.

The Council records its thanks to the newsreaders and to all who contributed to the success of the Service.

RSGB Slow Morse Practice Transmissions

Slow Morse Practice Transmissions were transmitted every night of the week for the benefit of those learning the code. To the Honorary Organiser, Mr M. A. C. McBrayne, G3KGU, and those responsible for the transmissions, the Council expresses its thanks for their important service to members.

RSGB QSL Bureau

The Society's QSL Bureau, for the 25th year under the direction of Mr Arthur O. Milne, G2MI, again provided one of the most important privileges of membership, dealing with well over a million cards. Mr Milne was ably supported by an excellent team of sub-managers, all of whom are thanked for their many hours of work on behalf of members.

RSGB Recorded Lecture Library

Considerable use was again made of the Society's recorded lectures by affiliated societies and groups. The Council expresses its thanks to the Honorary Curator, Mr N. C. Ta'Bois, G3HWG, for his organization of the service.

Certificates Manager

The Society's Honorary Certificates Manager, Mr K. A. V. Hurrell, G3NBC, again dealt with a very large number of applications for certificates. Unfortunately an increasing proportion of applicants fail to submit correct applications resulting in much unnecessary correspondence and delay.

The Council records its gratitude to Mr Hurrell for his hard work in connection with claims.

Lectures and Meetings

Attendance at London Lecture Meetings held at the Institution of Electrical Engineers fell considerably below expectations, although an excellent programme had been arranged.

On November 8, 1963, Mr W. E. Sutton, G3FWI lectured on "Television Sound Production" and on March 13, 1964, Mr Frank Hyde lectured on "Radio Astronomy." "Aerials" were the subject of the lecture by Mr H. V. Sims on May 1, 1964.

Mr Hyde was also the speaker at the Region 16 Lecture held on October 1, 1963. The RSGB Merseyside Lecture was given by Mr Robert Auger of Pye Records Ltd. whose subject was "Commercial Tape Recording." Attendance at both regional lectures was excellent.

The Society was represented at the North West V.H.F. Convention, organized by the North West V.H.F. Group, held in Manchester on October 5, 1963, and at the Scottish V.H.F. Convention, organized by the West of Scotland V.H.F. Group, and held this year in Glasgow.

The South Wales Golden Jubilee Convention was held in Cardiff on September 14, 1963 and was reported in the November 1963 issue of the RSGB BULLETIN.

Official Regional Meetings were held in Folkestone on October 20, in Stockport on October 27, 1963, and in Great Yarmouth on June 14, 1964.

An innovation this year was a joint IRTS/RSGB Convention in Dundalk on April 18. The event attracted an attendance of over 200: the largest ever recorded for an Amateur Radio meeting in Ireland.

National Mobile Rallies organized by the RSGB Mobile Committee were held at Woburn Abbey (September 22, 1963), Texas Instruments Ltd. Bedford (April 5, 1964), Wethersfield USAF Base (June 28, 1964).

The Council records its appreciation of the efforts of the organisers of all these events which helped considerably to enliven the Amateur Radio scene during the year.

Future Prospects

Looking to the future, the Council confidently expects membership of the Society to continue to rise as more and more scientifically minded people have increased leisure time for worthwhile hobbies such as Amateur Radio. The speed at which membership increases depends however on continuing services at their present level and improving them wherever possible. It depends too on the efforts made by everyone of us to enrol new members.

In the international sphere, the Council believes the best defence of Amateur Radio lies in a strong and active International Amateur Radio Union. For this reason, the Society will continue to do everything in its power to encourage the setting up of truly national societies in the new and emergent nations and will continue to actively support the Region I Division of IARU. In this connection, the formation of a similar organization of Region II IARU societies is a most important step forward and augurs well for the future.

The next Ordinary Administrative Conference which will probably be held in Geneva in 1968 promises to be the hardest so far. RSGB has therefore already commenced preparing for it.

Mr E. D. Whitehead, M.B.E., B.Sc., M.I.E.E., Director of Electronics Production (Radar), Ministry of Aviation, opening the RSGB Radio Communications Exhibition on October 28, 1964.

Society News

Mr A. O. Milne, G2MI, elected a Vice-President

At its October meeting, the Council unanimously elected Mr Arthur O. Milne, G2MI, a Vice-President in recognition of his outstanding service to the Society as manager of the RSGB QSL Bureau for the past 25 years.

It was in September 1939 that G2MI first took over responsibility for the distribution of members' QSL cards. Since then he has seen the work of the Bureau expand year after year; today, it is handling almost 2,000,000 cards a year.

In addition to his work as QSL Bureau Manager, Arthur Milne has been a member of the Council continuously since before the war and was instrumental in the setting up of the Society's emergency network from which RAEN developed.

One of his greatest interests is International Amateur Radio and he has represented the Society at many Region I IARU meetings.

Non-transmitting Members

In future, new overseas Corporate members of the Society who do not hold amateur transmitting licences will be issued with ORS (Overseas Receiving Station) numbers for identification purposes. The new ORS numbers will take the place of the BCRS and FRS numbers, but members who already have the latter numbers will retain them.

Non-transmitting members in the United Kingdom will continue to receive BRS numbers.

RSGB QSL Bureau

Mr W. J. Green, G3FBA, the QSL Bureau Sub-Manager for call-signs in the series G3EAA to G3HZZ, has moved from Sidcup, and his address is now " Meadway," Links Avenue, Brundall, Norfolk, NOR86Z.

With the kind co-operation of the Post Office Radio Services Dept., the Society's QSL Manager is advised of the call-sign of the licensee of all GB prefix call-signs issued.

Cards which arrive at the Bureau addressed to such calls are automatically routed to the licensee's sub-manager, marked with his call-sign unless the Bureau is requested to do otherwise by the body to whom the GB call-sign has been issued.

Subscriptions to ARRL and QST

With effect from January 1, 1965, subscriptions to ARRL and *QST* will be handled only by member-societies of the International Amateur Radio Union. The individual membership subscription, including *QST*, will remain 43s. 6d. per annum.

Subscriptions to *QST* for institutions such as schools, libraries and laboratories etc., will be 50s. p.a. with effect from the same date.

UK Licences

The number of amateur transmitting licences in force in the United Kingdom at October 31, 1964, was as follows: Amateur (Sound) A, 10,952; Amateur (Sound) B, 124; Amateur (Sound Mobile) A, 1735; Amateur (Sound Mobile) B, 2 and Amateur (Television), 170.

African L.F./M.F. Broadcasting Conference Abandoned

The African L.F./M.F. Broadcasting Conference opened in Geneva on October 12, 1964. Four days later it was abandoned.

Political issues of an unconstitutional character were raised by certain of the African delegations which made it necessary for many of the European delegations to withdraw. The ITU then withdrew its secretarial services and the Conference collapsed.

As far as is known this is the first occasion an ITU Conference has been abandoned, although political issues have frequently been raised at past Conferences, beginning with Atlantic City in 1947.

It had been planned that observers from IARU Region I Division would be present at the Conference to discuss Amateur Radio problems on a long-term basis with Government delegates present from the new and developing African countries, but after taking advice from various sources the Executive Committee abandoned the idea.

Superconductivity

The annual Christmas Holiday Lecture for older schoolchildren arranged by the Institution of Electrical Engineers will be delivered this year by Dr D. H. Parkinson, D.Phil., of the Royal Radar Establishment. The lecture, which is intended for boys and girls of the fifth and sixth forms, will be given in the lecture theatre at Savoy Place on Wednesday, December 30, 1964, at 2.30 p.m., and will be repeated at the same time the following afternoon. Dr Parkinson will talk on " Superconductivity," and will illustrate his lecture with slides, films and demonstrations.

Admission to the lecture is free, and application for tickets stating for which afternoon they are required, should be made to the Secretary, The Institution of Electrical Engineers, Savoy Place, London, W.C.2. As accommodation is limited, parents are asked not to accompany their children.

Semi-conductor Diodes—New Mullard Film Strips

The Mullard Education Service has recently produced a set of three film strips in colour dealing with the principles of the semiconductor diode. Lecturers and those giving instruction leading up to the Radio Amateurs' Examination will find the strips of considerable interest.

Subjects covered include intrinsic, *p*-type and *n*-type semiconductors, the *p-n* junction, avalanche effect, Zener effect, tunnel effect, high frequency and thermal limitations.

Distribution is by Unicorn Head Visual Aids Ltd, 42 Westminster Palace Gardens, Artillery Row, London, S.W.1. The price is 25/- per strip including comprehensive teaching notes.

GB2RS SCHEDULE

RSGB News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.15 a.m.	Belfast
	10.30 a.m.	North Midlands
	11 a.m.	North West England
	11.30 a.m.	South West Scotland
	12 noon	North East Scotland
145·10 Mc/s	9.30 a.m.	Beaming north from London
	10.00 a.m.	Beaming west from London
145·8 Mc/s	10.15 a.m.	Beaming south from Belfast
145·30 Mc/s	10.30 a.m.	Beaming north west from Sutton Coldfield
	11.00 a.m.	Beaming south west from Sutton Coldfield
145·50 Mc/s	11.30 a.m.	Beaming north from Leeds
	12 noon	Beaming east from Leeds

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.

Affiliated Societies

The following Clubs and Societies are now affiliated to RSGB:

AMATEUR RADIO CLUB, RAF NORTH LUFFENHAM,
c/o Officer in Charge, RAF North Luffenham, Oakham, Rutland.

BURNAGE GRAMMAR SCHOOL RADIO SOCIETY,
c/o S. A. Wood, Burnage Grammar School, Manchester 19.

MORAY FIRTH AMATEUR RADIO SOCIETY,
c/o J. V. Robertson, Norwood, High Street, Fochabers, Morayshire.

RADIO SOCIETY OF ZAMBIA (formerly Northern Rhodesia Amateur Radio Society),
c/o PO Box 332, Kitwe, N. Rhodesia.

NEWARK SHORT WAVE CLUB
c/o G. Francis, BRS25019, 93 Balderton Gate, Newark, Notts.

RAF MUHARRAQ AMATEUR RADIO CLUB
c/o Cpl. R. G. McMurdo, RAF Muharraq, BFPO 63.

SIGNAL HOUSE AMATEUR RADIO SOCIETY
c/o H. Ward, G3EMO, 24 Manor Way, Woolton, Liverpool 25, Lancs.

UNIVERSITY COLLEGE LONDON AMATEUR RADIO SOCIETY
c/o D. J. Bradshaw, G3SUX, University College, Gower Street, London, W.C.1.

Representation

The following is an addition to the list of Area Representatives published in the December, 1964 issue of the RSGB BULLETIN.

REGION 1
Crewe & District,
B. Randell, G3ALE, Firs, Aston, Nantwich, Cheshire.

Receipts

Receipts for subscriptions paid by cheque, bankers' order or postal order are not now issued unless specially requested.

Silent Keys

We record with sorrow the passing of the following amateurs:

Rex Musgrave, G2JM, of Cheltenham
G. C. A. Collier, G3LBK, of Horsham, Sussex
Alfred D. Gay, G6NF, of Shirley, Surrey
J. P. Campbell, EI4B, of Dublin
G. H. McKenzie, VE1PA, of Nova Scotia, Canada

Obituary

H. S. Williamson, G2BYD

Croydon and District amateurs learnt with regret of the passing of Harry Williamson, G2BYD, at the age of 63, on October 24, 1964.

Harry had not enjoyed the best of health for just over two years, though he had managed to keep moderately active on the air until the beginning of September.

He was an instructor at the South London Wireless Club in the 'twenties, and since the war he had been a keen 10m man and played no mean part in furthering activity on this band amongst his locals. As member of the Surrey Radio Contact Club, he was a regular participant in the club's Monday night net which first started on Top Band in 1952 and moved to 10m some eight years later, where Harry could be regularly found until a few weeks ago.

Harry will be missed by all who at one time or another have spoken to him on the air and in personal QSOs.

To his widow and family we offer our deepest sympathy.

D. D.

RSGB QSL Bureau Sub-Managers

The following is a list of the RSGB QSL Bureau Sub-Managers showing the call-sign groups for which they are responsible:

G2:	J. W. Russell, G2ZR, 45 Shakespeare Avenue, Bath.
G3, 4 and 5 two-letter calls & GC:	E. G. Allen, G3DRN, 65A Melbury Gardens, London, S.W.20.
G6 and G8:	A. J. Mathews, G6QM, 62 Ashlands Road, Hesters Way Estate, Cheltenham.
G3AAA-BZZ:	C. C. Olley, G3AIZ, 157 Wanstead Park Road, Ilford, Essex.
G3CAA-DZZ:	C. A. Bradbury, BRS1066, 13 Salisbury Avenue, Cheltenham.
G3EAA-HZZ:	W. J. Green, G3FBA, " Meadway," Links Avenue, Brundall, Norfolk, NOR86Z.
G3IAA-KZZ, BRS and A numbers:	G. L. V. Butler, G2BUL, 995 London Road, Thornton Heath, Surrey.
G3LAA-MZZ:	C. Harrington, BRS2292, 91 Brabazon Road, Hounslow, Middlesex.
G3NAA-NZZ:	C. R. Emary, G5GH, 133 Fairlands Road, Thornton Heath, Surrey.
G3OAA-PZZ:	J. H. Brazzill, G3WP, 43 Forest Drive, Chelmsford, Essex.
G3RAA-RZZ:	K. Walden, G3OLN, 250 Gloucester Road, Cheltenham, Gloucestershire.
G3SAA-TZZ:	E. G. Allen, G3DRN, 65A Melbury Gardens, London, S.W.20.
GD:	T. R. Moore, GD3ENK, " Glyn Moar," St. John's, Isle of Man.
GI:	R. R. Parsons, GI3HXV, 45 Erinvale Avenue, Finaghy, Belfast.
GM:	D. Macadie, GM6MD, 154 Kingsacre Road, Glasgow, S.4.
GW:	J. L. Reid, GW3ANU, 28 Waterston Road, Gabalfa, Cardiff.
DL2:	4027469 C/T Griffiths, DL2OX, 212 Hohenzollern Str., Munchen Gladbach, Germany.

Cards must be sent to G2MI but envelopes may be sent to the appropriate Sub-Manager or to G2MI. Printed, gummed labels are obtainable from G2MI by sending an s.a.e.

The address of the QSL Bureau Manager (Mr. A. O. Milne, G2MI) is 29 Kechill Gardens, Bromley, Kent.

Postage, letter rate: 1 oz.–3d., 2 oz.–4½d., and 1½d. for each additional 2 oz. *There is no 4d. letter rate.*

Can You Help?

● F. W. Pollant, G3RNM, " Wheatley," Martin End Lane, Great Missenden, Bucks., who requires the manual for the Hallicrafters Sky Champion receiver?

● Ib Ussing, OZ8US, Torsvang 101, Lyngby, Denmark, who wishes to obtain a copy of the February 1964 issue of the RSGB BULLETIN?

● B. Gordon, A4107, 72 Coldshott, Holland, Oxted, Surrey, who wishes to borrow or purchase the manual for the CR100 receiver?

● R. Baldwin, G3WZ, 67 Ashmead Road, Maybush, Southampton, who would like any information concerning an electronic scaler marked: " Beckman, Berkeley Division, California. Counter. Model 5630-37."? He particularly wishes to know the connections to the 11 supply leads.

Society Affairs

A digest of the business discussed at the September, 1964, meetings of the Council

THE September meeting of the Council was held on September 14, 1964, and was attended by Messrs G. M. C. Stone (President), R. C. Hills, E. G. Ingram, R. H. James, A. O. Milne, L. E. Newnham, F. K. Parker, A. D. Patterson, R. F. Stevens, J. W. Swinnerton, Louis Varney, E. W. Yeomanson (Members of the Council), John A. Rouse (General Manager and Secretary) and P. C. M. Smee (Minuting Secretary).

Apologies for absence were submitted on behalf of Messrs H. A. Bartlett, Norman Caws, J. C. Foster, L. N. Goldsbrough and J. C. Graham.

Committee Recommendations

The Council accepted recommendations relating to the award of Society trophies (Technical Committee), the results of the 70 Mc/s Contest, the First 420 Mc/s Contest, and the Second 144 Mc/s Portable Contest (V.H.F. Contests Committee), and National Field Day (H.F. Contests Committee). A recommendation of the Exhibition Committee relating to a new design of Society tie was referred back for further consideration.

Membership and Affiliation

The Council approved 159 applications for membership (123 Corporate and 36 Associate). In addition, 18 applications for transfer from Associate to Corporate grade were also approved.

The Council unanimously waived the subscriptions of two members on the grounds that they suffer from blindnesss The Council also agreed to grant membership to a blind applicant and to waive his subscription.

Affiliation was granted to: Mount School Radio Society; Roding Boys' Society; RAF Steamer Point Amateur Radio Club.

Presidential Installation, 1965

It was agreed that the 1965 Presidential Installation should be on similar lines to 1964. (A formal announcement will appear in the January, 1965 issue of the RSGB BULLETIN. The date has been provisionally fixed for Friday, January 15.)

Society Trophies

The Council resolved to award the Calcutta Key to Mr G. M. C. Stone, G3FZL, and the ROTAB Trophy to Mr P. Pennell, G2PL. It was decided not to award the Founder's Trophy for 1964.

IARC Convention

The President reported on his visit to the International Amateur Radio Club's Convention in Geneva on September 9, 1964, and recommended that the Society should be represented at the 1965 Convention.

The Convention was not entirely a social occasion and serious consideration was given to many of the problems likely to face the Amateur Radio movement in the next few years. In addition to lectures and discussions, particular attention was paid to technical aid for radio amateurs in the newly emergent nations. It was pointed out that about a third of the population of Africa speak French and information must therefore be available in that language as well as English. It was agreed the basic aim should be to help people interested in Amateur Radio to help themselves. It was important to ensure that equipment described could be built from locally available components. Progress with reciprocal licensing was also discussed, and it was reported that the USA was already negotiating with a number of countries.

A meeting to discuss the proposed European Amateur Radio satellite, at which IARU was represented, was also held. The President reported on the plans to the Scientific Studies and V.H.F. Committees on his return.

Beacon Stations

During a discussion on the proposed Northern Ireland beacon station it was agreed that the frequency should be 145·985 Mc/s to avoid confusion with the experimental station GB3LER at Lerwick on 145·995 Mc/s.

Consideration was given to the rent assessed by the Ministry of Aviation for the use of the proposed site for the Scottish beacon station at Craigowl Hill, Dundee. It was agreed that the figure quoted was too high for the Society and the Ministry would therefore be asked to make a substantial reduction. (The rental has now been agreed at £10 p.a.—EDITOR).

N.F.D. Scoring System

The Council considered a statistical report on N.F.D. scoring prepared by Mr Goldsbrough. It was decided to pass the report on to the H.F. Contests Committee.

"Communication Receivers"

Approval was given for the printing of a revised edition of *Communication Receivers.*

London Lecture Meeting

It was agreed to hold one lecture meeting at the Institution of Electrical Engineers during the 1964-65 season. (The meeting was held on November 27, 1964.—EDITOR).

It was decided to give further consideration to the holding of similar meetings outside the London area.

Preparations for the Region I IARU Conference, 1966

In view of the importance of co-operation between member-societies of the International Amateur Radio Union, and to ensure the most effective role of the RSGB, the Council agreed to set up a working group to prepare for the meeting of Region I societies to be held in 1966.

Newspaper Articles

Adverse publicity in some editions of two national newspapers regarding interference to model aircraft was considered. It was decided that a meeting between members of the Society's Technical Committee and representatives of the Society of Model Aeronautical Engineers Ltd. should be arranged to discuss the problem of interference to radio-controlled models.

Overseas Groups

Following a request from a member in Bahrain, the Council agreed that the formation of RSGB Groups overseas should be encouraged in countries where there is no national society for radio amateurs.

Lerwick Experimental Station

The purchase of an additional three element 10m beam aerial for use at GB3LER was authorized. The aerial is required in connection with propagation experiments being conducted with DL1UM and DL1XJ of the Deutsche Bundespost.

(Continued on page 808)

CONTEST NEWS

— RESULTS — REPORTS — RULES —

First 70 Mc/s Contest (Open) 1965

This contest is the first of four in the 1965 calendar. Later events will be another open contest in May, a portable contest in June and a c.w. contest in December.

There are two sections, and it is the intention of the Contests Committee that section *A* will be for single operators at their home stations, while a separate section *B* will be for clubs and portable teams (which have dominated the 70 Mc/s contests in recent years). It is not in the spirit of the contest for an established multi-operator station or club to nominate only one operator and compete in section *A*.

CONTESTS DIARY

December 5-6	- RSGB 21/28 Mc/s Telephony/ Receiving Contests (see page 472, July, 1964).
December 5-6	- OK C.W. DX Contest.
December 13	- 70 Mc/s C.W. Contest (see page 539, August, 1964).
January 23-24	- Affiliated Societies' Contest (see page 539, August, 1964).
January 30-31	- First 144 Mc/s Contest (C.W.) (see page 740, November, 1964).
January 30-31	- CQ WW 160m Contest.
January 30-31	- REF (C.W.).

1965

February 6-7	— QCWA Party.
February 13-14	— ARRL DX Contest (Phone).
February 14	— First 70 Mc/s Contest (Open)
February 20-21	— BERU Contest (see page 678, October, 1964).
February 20-21	— YL/OM (Phone) Contest.
February 27-28	— ARRL DX Contest (C.W.).
February 27-28	— REF (Phone).
March 6-7	— Second 144 Mc/s Contest (Open) and Listeners' V.H.F. Contest (see page 741, November, 1964).
March 6-7	— YL/OM (C.W.) Contest.
March 13-14	— ARRL International DX Competition (Phone).
March 20-21	— First 1·8 Mc/s Contest (see page 741, November, 1964).
March 20-21	— International S.S.B.'ers.
March 27-28	— ARRL International DX Competition (C.W.).
April 4	— Low Power Contest.
April 10-11	— CQ WW S.S.B. Contest.
April 25	— D/F Qualifying Event.
May 1-2	— Third 144 Mc/s Contest (Portable).
May 8-9	— USSR DX (C.W.) Contest.
May 9	— D/F Qualifying Event.
May 23	— D/F Qualifying Event.
May 29-30	— First 432 Mc/s Contest.
June 12-13	— National Field Day.
June 27	— D/F Qualifying Event.
July 3-4	— Fourth 144 Mc/s Contest (Portable).
July 17-18	— 1296 Mc/s Tests.
July 18	— D/F Qualifying Event.
September 4-5	— Region 1 IARU Contest.
September 4-5	— V.H.F. National Field Day.
September 12	— D/F National Final.
September 19	— Low Power Field Day.
September 25-26	— 21/28 Mc/s Telephony/Receiving Contest.
October 9-10	— Raynet Rally.
October 16-17	— 7 Mc/s DX Contest (Phone).
October 24-25	— CQ World Wide Contest (Phone).
October 30-31	— Second 432 Mc/s Contest.
November 6-7	— 7 Mc/s DX Contest (C.W.).
November 20-21	— Second 1·8 Mc/s Contest.
November 28-29	— CQ World Wide Contest (C.W.).
December 4-5	— Fourth 70 Mc/s Contest (C.W.).

1. **When:** 10.00 GMT to 20.00 GMT on Sunday, February 14, 1965.
2. The General Rules of RSGB Contests as published in the January, 1965 issue of the RSGB BULLETIN will apply except as superseded by the rules of this contest.
3. **Eligible entrants:** All fully paid up members of the RSGB resident in Europe. Multiple operator entries will be accepted in section *B* provided only one call-sign is used.
4. **Sections:** *A*, Single operator fixed stations. *B*, Other stations.
5. **Contacts** may be made on any mode permitted in the Amateur (Sound) Licence A, except A2 (m.c.w.).
6. **Scoring** will be on the basis of one point per mile.
7. **Contest Exchanges:** RST or RS reports followed by the contact number and location (e.g., RST 559007 Luton). This location must be identifiable on the 10 mile to one inch Ordnance Survey Map. It is the responsibility of the receiving operator to obtain the information he requires to calculate distances correctly.
8. **Logs:** (a) Must be tabulated in columns headed (in this order): " Date/ Time (GMT)," " Call-sign of station contacted," " My report on his signal and serial number sent," " His report on my signal and serial number received," " Location of station contacted as received," " Call-sign of operator" (multi-operator entries), " Points claimed."

(b) The cover sheet must be made out in accordance with RSGB Contests Rule 4 and the declaration signed. Operators of multi-operator stations must be listed and the NGR full six-figure reference recorded. Stations outside the area covered by the National Grid should show latitude and longitude.

(c) Entries must be postmarked not later than Monday, March 1, 1965.

9. **Awards:** at the discretion of Council a certificate of merit will be awarded to the winner in each section and to each runner-up.

Society Affairs **(Continued from page 807)**

Reports of the Committees

The Mobile Committee met on August 13 and dealt with arrangements for the Woburn Abbey Rally.

The Exhibition Committee met on August 14, 1964, to continue the work of preparation for the RSGB International Radio Communications Exhibition.

At a meeting on August 21, 1964, the Technical Committee dealt with matters relating to Society publications, recommendations regarding awards and trophies and the London Lecture programme.

The V.H.F. Contests Committee met on August 27 to consider reports on the 70 Mc/s Contest, the First 420 Mc/s Contest, and the checking of the entries for the 1250 Mc/s Tests and the Second 144 Mc/s Portable Contest. Rules for the 144 Mc/s C.W. Contest 1965 were approved for publication.

* * *

The Council was in session for 4½ hours.

* * *

A special meeting of the Council was held on September 9, 1964, and was attended by Messrs G. M. C. Stone, H. A. Bartlett, J. C. Graham, R. C. Hills, E. G. Ingram, R. H. James, L. E. Newnham, F. K. Parker, R. F. Stevens, J. W. Swinnerton, E. W. Yeomanson (Members of Council), John A. Rouse (General Manager and Secretary) and P. C. M. Smee (Minuting Secretary).

Apologies for absence were submitted on behalf of Messrs N. Caws, J. C. Foster, L. N. Goldsbrough, A. O. Milne, A. D. Patterson and Louis Varney.

New Headquarters

The meeting had been called to discuss the possible purchase of a building in Westminster, London, for use as the Society's Headquarters. A report by a firm of surveyors and a letter from the L.C.C. Architects Dept. were considered, together with an estimate of the probable annual cost of the property based on a mortgage of £40,000.

Methods of paying for the property, including the possibility of floating a property company as a subsidiary company, were discussed.

After careful consideration, the Council authorized the President to bid up to £40,000 for the property. (As reported in *Current Comment* in the October issue of the BULLETIN the Society's bid was unsuccessful.—EDITOR).

* * *

The Council was in session for nearly two hours.

Letters to the Editor

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents. Letters for inclusion in this feature should be concise and preferably not more than 200 words in length.

The Exhibition

DEAR SIR,—I should like to record what must be the thoughts of very many visitors to this year's RSGB Radio Communications Exhibition, namely, thanks to Len Newnham, G6NZ, and his helpers for the painstaking work that must have gone into producing the excellent humorous models depicting the various aspects of the Society's work. What a breath of warm involvement they seemed to radiate in what can easily become, in our type of activity, a slick, chrome and polished technocrat atmosphere.

Also a word of thanks to Phil Thorogood should be recorded for all his help again.

Finally, the time and enthusiasm of all workers, stand helpers and others, is prominent as a service to the Society for which we are all, I'm sure, very grateful.

Yours sincerely,
KEN SMITH, G3JIX

Walthamstow, London, E.17.

Four Metre Standard Calling Frequency

DEAR SIR,—On behalf of the active 4m members of the Worthing & District Radio Club I would like to " voice " our feelings on the current net frequency question.

May I just start with a little history; way back in the dim and distant past of 1962, G3GVM acquired two B44s, one of which he lent to me and both of which were installed in our respective vehicles. G3GVM had two crystals ground for the transmitters but in error these were ground for 70·26 Mc/s instead of 70·3 Mc/s. This was the origin of the 70·26 Mc/s net. By using this frequency, together with G3JHM, also of this club, and a suitable amount of persuasive propaganda on our part, very nearly all the mobile stations who have come on since April 1962 have used 70·26 Mc/s. At this time we were just about the only mobiles on the band and I can well remember London area stations saying that I was the first mobile they had ever heard on 4m.

Anyway, enough of the past, but the above does, I think, serve to illustrate the fact that we feel we have an axe to grind, albeit only a small chopper, in the present controversy.

Our feelings at the present, from discussion with our 4m members on this subject, are as follows:

1. 70·26 Mc/s should become a National Mobile and Calling frequency. In this way mobile stations would not need to tune, and could be sure of hearing any stations CQing on the band.

2. Mobiles should be permitted to use this National Calling frequency unless they have an alternative channel (i.e. 70·32 Mc/s) which they can use. Fixed stations, however, should, upon making contact with another fixed station, immediately QSY to another frequency agreed between the two stations.

3. The Raynet frequency should also be 70·26 Mc/s. This is a frequency which almost all stations already are operative on and we in this club feel that if the people who suggest yet another different frequency from the National Calling and reserve channels are willing to buy us all crystals then we shall be pleased to use the frequencies concerned. We don't know who agreed with the GPO that 70·375 Mc/s should be used for Raynet, but one thing is for sure, he wasn't an active 4m amateur. We also feel that at least in this locality nothing could be more certain to kill RAEN stone dead than to arbitrarily allocate this frequency.

The National Calling frequency is the obvious frequency to use, not one on which no one is operational.

Yours faithfully,
R. J. TARR, G3PUR,
Assistant Secretary,
Worthing & District Amateur Radio Club

Worthing, Sussex.

(Under the terms of the Amateur (Sound) Licence A, RAEN operation is permitted only on 70·375 Mc/s ±25 kc/s. Use of this frequency for emergency purposes was only obtained after strong representations had been made to the licensing authorities who wished to exclude RAEN operation from the 4m band.—EDITOR.)

DEAR SIR,—I should like to endorse the suggestion by Mr Kendal, GM3GDU, for the use of a specific calling frequency to establish contact to and from mobile stations.

I think, however, that a 100 kc/s channel system such as Mr Kendal suggests would involve most operators in quite an expense unless they are equipped to grind their crystals to precise frequencies. Since this would be sufficient to discourage many people from adopting his idea, I should like to suggest that stations wanting to make contact with mobiles retain their normal operating frequencies but also have available crystals for one alternative channel to be used exclusively for calling purposes. After establishing contact on this channel they would QSY to their usual frequency.

A suitable calling channel would be 70·2 Mc/s, since this frequency could be obtained in any transmitter using a multiplication factor of 9 or 12 simply by inserting a crystal for 5850 kc/s or 7800 kc/s, which are obtainable suplus in FT243 style for around five shillings each.

The frequency of 70·2 Mc/s would not necessitate a change of normal working frequency for very many operators, particularly if they had chosen their frequencies before the band extension, and it would also be well clear of the RAEN channel on 70·375 Mc/s. In areas where operation on 70·2 Mc/s is not permitted another calling channel would, of course, have to be chosen.

I should appreciate the views of mobileers and anyone else on this subject.

Yours sincerely,
D. C. CHAPMAN, G3NGK/M

Gillingham, Kent.

Gain of Aerial Systems

DEAR SIR,—May I be allowed to comment on the caption to the photograph of the OH1NL " moonbounce " aerial on page 665 of the October issue.

I have no wish to criticize the excellent and successful work done by OH1NL, but I can find no technical justification for the claim that the aerial shown exhibits a *gain of 21db*. Apart from the usual error of omission of the reference aerial, the figure quoted is optimistic by all standards.

The computed free-space gain over a half-wave dipole of a uniform $\frac{\lambda}{2}$ spaced matrix of half-wave dipoles, $0{\cdot}2\lambda$ before a perfect plane reflector, is 16·52db. Allowing for a slight increase in horizontal spacing, and deducting losses due to radiation from the phasing lines, and phasing errors themselves, the net gain of the curtain is unlikely to exceed 17db. As this aerial is arranged to radiate at elevated angles for moonbounce, there is no question of a ground reflection contribution and the conditions are effectively those of free-space, giving a final answer of 17db relative to a half-wave dipole, which is some 4db short of the claimed figure.

Yours faithfully,
R. C. HILLS, G3HRH
RSGB V.H.F. Manager

Indoor Aerials

DEAR SIR,—From time to time brief mention has been made in the BULLETIN of picture-rail aerials, but I have yet to see a comprehensive treatise on the subject of indoor aerials. Perhaps I never will: the publication of negative results is always a difficult matter. My own observations over the last three years, following trials conducted in a particularly dirty and unfloored loft, are:

(i) parasitic radiators at 14 Mc/s or less have no effect at all on the directivity or impedance:
(ii) QSO's will be rattled off at the rate of one every twelve hours, but will rarely produce less than S8 reports.

My most successful aerial has been an X-shaped one on 14 Mc/s. This consists of four folded quarter-wave sections fed across opposite pairs of junctions: this is much more successful than feeding two folded dipoles in and out of phase, as the out-of-phase position has a disastrous effect on the impedance. Switching the feed to this system appears to alter the directivity about 30°, instead of the expected 90°. Presumably the r.f. has considerable difficulty in finding gaps in the large quantities of slate and zinc scattered around.

I now await further details of the hula hoop (? stacked): has anyone any other ideas?

Yours faithfully,
JOHN B. ROSCOE, GM4QK

Strathaven, Lanarkshire.

CLUBROOM

A Monthly Survey of Group and Club Activities

Acton, Brentford and Chiswick RC. At the meeting on December 8, members will have an opportunity to get acquainted with several commercially built transceivers during a demonstration arranged by Ad Auriema Ltd. This will take place at the club's headquarters at 66 High Road, Chiswick, beginning at 8 p.m. An invitation is extended to non-members who may wish to attend. Honorary Secretary: W. S. Dyer, G3GEN, 188 Gunnersbury Avenue, Acton, London, W.3.

Barnsley and District ARS. Mr W. Lee, G6LZ, gave a detailed talk on "Basic Single Sideband" at the meeting on October 9. The Annual Pie Supper followed on October 30, when an "unorthodox" quiz was conducted by G4JJ, the Secretary. Break-in keying will be the subject of a lecture by P. Carbutt, G2AFV, on December 11. Honorary Secretary: J. A. Ward, G4JJ, 44 North Gate, Barnsley, Yorks.

Basingstoke ARC. Club meetings are held regularly at 7 p.m. on the second Saturday in each month at the Immanuel Hall, Wote Street, Basingstoke. The December meeting will be devoted to a discussion on the RSGB International Radio Communications Exhibition, and there will also be an auction of surplus components. Visitors are always welcome at the meetings. Honorary Secretary: P. Jackson, G3ADV, 11 Oaklands Way, Basingstoke.

The inaugural meeting of the **Bedford and District ARC** was held on October 29, and was supported by 20 members and the Regional Representative, G5BQ. It was decided to hold fortnightly meetings at Harpur School, Horne Lane, Bedford, on the second Tuesday and fourth Thursday in each month. Officers were duly elected, the Chairman being Tony Paynter, G3NEU, the Honorary Secretary, John Clarke, G3OWQ, and the Honorary Treasurer, Derek Cox, G3KHZ. We are told that an attractive programme is being prepared by the committee and we imagine that the efforts will not be wasted, if the initial support is representative of the interest that members will show in the club in the future.

We have been asked by the **Belfast and District Group** to publicize an RAE Course which is being run at the Belfast College of Technology, with classes on Monday and Tuesday evenings at 7.30 p.m.

City of Belfast YMCA RC. At the recent AGM, the following officers were elected. President, J. Forsythe; Chairman, R. J. Boal, GI3AXI; Vice-Chairman, S. C. Bunting; Honorary Secretary, C. J. Rourke, GI3IVJ; Assistant Honorary Secretary, R. McKinty; Honorary Treasurer, T. J. Moss, BRS20775. There are more younger members on the committee this year, with three under 18, and two more under 25; the fact that they were returned unopposed is a tribute to their enthusiasm and services to the club. Perhaps this may be an encouragement to the younger members of other clubs who may feel shy of seeking opportunities to serve. The Winter lecture meeting got under way with a lecture on RTTY by Bill Kane, GI3GQB.

Mrs Gee Western, G3NQD, with Paul Laxton, G3SVG, officially opening the rebuilt Plymouth Radio Club station, G3PRC, on October 13. The equipment, from left to right, is a Class D Wavemeter, a CR100, a KW Gelosos converter, and a KW Vanguard transmitter.

Bradford RS. Recent meetings have included the Mullard Film Show which was held at the Queens Hall, Bradford, a junk sale, and a visit to Ultrasonics Ltd., Otley. The next meeting on December 15 will be a Ladies' Night, when members' coloured slides will be shown, while on January 5 there will be an informal meeting with members of the Spen Valley ARS and Leeds RS. All meetings are held at 7.30 p.m., at Cambridge House, 66 Little Horton Lane, Bradford 5.

The **City and County of Bristol Group** have just had the date of the 1965 Longleat Mobile Rally confirmed by the Marquess of Bath. It will take place on Sunday, June 27.

Burnham-on-Sea ARC. The season has begun with the prospect of a fairly full programme. It has got off to a good start with a couple of talks by Joe Wynne, G3NUK, on "Fifty Years of Fun with Morse," part two of which was related at the November meeting. The club is also looking forward to a talk promised by Ken Randell, G3RFH, ex-VP8HF, on his trip to the South Sandwich Islands. Members meet on Tuesday evenings and Sunday mornings at their clubroom at The Hall, Berrow Road, Burnham. Honorary Secretary: D. W. Birt, G3GIW, 99 Stoddens Road, Burnham-on-Sea, Somerset.

Cambridge and District ARC. A most interesting talk on his work as Air Traffic Control Officer at Gatwick Airport was given by John Graham, G3TR, on October 9. Another event which proved particularly popular was a "Take Your Pick" quiz, organized by Mike Dighton, G3TEJ, and Fred Taylor, G3RPF. There have so far been two claims for the fairly new "Worked all Cambridge" certificates which is awarded for contacts with twelve Cambridge stations on one band.

Chester and District ARC. Technical film shows have been very popular with most clubs recently, and Chester is not to be left out. A show has been arranged for December 8, while there will be a Christmas surprise night on December 15: sounds intriguing. A general discussion will take place on December 22, and a Net Night on December 29 will conclude the month's activities.

Civil Service RS. A lecture on the construction of tape and tape recorders on October 6 proved to be very interesting, and those present gleaned much useful information and advice. At the meeting on November 17 (these are held at the Science Museum, South Kensington, London) Fred Judd, G2BCX, was due to give a lecture on his transistor transmitter.

Conway Valley ARC. RAE discussions are a regular feature of each meeting, and are held half an hour before the main meeting which begins at 8 p.m. on the second and fourth Thursdays in each month at the Cross Keys, Madoc Street, Llandudno. The club's annual dinner is being held at Alfredo's Restaurant, Conway, on December 12; details may be had from the Honorary Secretary, Brian Clark, GW3HGL, 103 Tan-y-Bryn Road, Colwyn Bay.

The **Clifton ARS** has been recently improving its workshop facilities. Two meetings were recently taken up with a junk sale, and a talk on s.s.b. was given to members by Brian Watling, G3RNL. Winner of the 1964 D/F Shield was SWL Frank Bettis, who was also leading in the receiving section of the DX Ladder; well done. Honorary Secretary: J. Rose, G3OJE, 63 Broomfield Road, Beckenham, Kent.

Crawley ARC managed a good score in V.H.F. NFD despite a generator failure at 2.30 a.m. Plans have been made to hold the 1965 annual dinner on March 19, when it is hoped that there will be good turn-out of members and friends to celebrate another successful year. Honorary Secretary: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley, Sussex.

At the third AGM of the **Dudley ARC**, the following members were elected as officers: Chairman, A. Goode, G2DTQ; Honorary Secretary, R. Fisher, 63 Swan Crescent, Langley, Oldbury, Birmingham; Honorary Treasurer, S. Plumtree, G3OSP;

Programme Secretary, J. Boardsmore, G3SLO; News-sheet Editor, G. Bunting. Meetings are held fortnightly at the Art Gallery, Dudley, at 8 p.m.

At an **East London Group** meeting recently, Mr. John Erskine gave a talk on transistorized circuitry in oscilloscopes. A detailed study of the various circuits showed that difficulties had been encountered, and, although these were not insurmountable, they did call for the use of transistors priced well above the average amateur's pocket. This most interesting talk was followed by a more general discussion on transistors.

East Worcestershire ARG. A transmitting station with the call-sign GB3RSG was put into operation during the Jamboree-on-the-Air on October 17 and 18. Four new call-signs have recently been gained by members. Honorary Secretary: M. J. Nicholas, G3TOI, 12 Crabtree Close, Lodge Park, Redditch, Worcs.

Members in the area around Eccles are asked to note that the **Eccles and District RC** has had to vacate its clubroom. A venue is being sought, and it is also hoped to be able to make temporary arrangements. Further details will be announced as soon as possible.

Ex-G Club. A reminder to everyone that certificates are issued by the club for working a specified number of member stations, or for hearing a number of members operating. The best time to accomplish this is on Sundays at 19.00 GMT on 14·346 Mc/s (phone) or at 21.00 on Saturdays on 14·065 Mc/s during the nets. Full details of the club and the awards may be obtained by sending an s.a.e. to H. J. Basterfield, G4MJ, 1 Manor Abbey Road, Quinton, Birmingham 32.

Flintshire RS. On September 29, Eric Foulkes, ex-GW5FU, gave a most entertaining talk on radio in the early days. The junk sale held on September 27 proved a great attraction. Details of future meetings may be obtained from the Honorary Secretary, Alan Antley, " Fairholme," Fairfield Avenue, Rhyl.

Holywell Grammar School RS is a recently formed society with over 30 schoolboy members, many of whom are keen SWLs. A programme of meetings is being arranged, and any help in this respect would be very welcome. The Honorary Secretary, Peter Parry, c/o Holywell Grammar School, would also like to hear from anyone who would be prepared to offer equipment to the society.

Another fairly new club is the **Haverhill ARC**, which at present has 21 members, but is constantly on the look-out for more. An enrolment drive is going on at the moment, in fact, and anyone interested is invited to look in at one (or more, of course) of the meetings which are held at 41a High Street, Haverhill, Suffolk, on Mondays at 7.30 p.m. RAE classes are also conducted on Wednesdays at 7.30 p.m. at Haverhill Secondary Modern School, Eastern Avenue, Haverhill. The club project is a Top Band and 80m transmitter, although at the moment members are busy redecorating the shack.

Leicester RS. The AGM was held on October 5, and the following officers were elected: Chairman, H. A. Gray, G3LTT; Honorary Secretary, N. Harrison-Grassby; Assistant Honorary Secretary, J. R. Dowson; Honorary Treasurer, M. Harrison, G3LIR. A new club receiver, an Eddystone 680X, has been purchased. Forthcoming arrangements include a visit to the Leicester University Engineering Block, and a lecture by G3CCA on parametric amplifiers.

Liverpool and District ARS. A varied programme of forthcoming events has been forwarded, and the events listed are: December 8, a visit to the Chester Club, assembling at 19.00 GMT; on December 15, G3NEM will give a talk on transistor d.c.-to-d.c. converters; no meeting on December 22, instead there will be a " nosh-up at the local pub! " December 29 will be an Open Night; a junk sale on January 5, and G3LPX will be talking on 3cm DX on January 12. The annual Liverpool Top Band Contest will be taking place on January 10 between 14.00 and 17.00 GMT, and the Liverpool Hamfest will follow in March: more details will be given later. Many thanks for the good wishes G3PDC—we at HQ wish you and all club members a merry time at Christmas, and a successful new year with your activities. Honorary Secretary: H. James, G3MCN, 448 East Prescot Road, Liverpool 14.

Loughton and District RS. During the period November 14 to 21, the society was due to participate in a large scale experimental closed circuit television presentation on behalf of the Television Viewers Council. Professionally produced programmes of features of local interest in which many groups representing education, domestic and social, dramatics and the arts, etc. will be relayed to selected panels at Loughton Hall; the object being to decide whether such a service would be of value to the community. Much of the equipment would be supplied by members of the BATC, and would be operated under the direction of Jim Brett, G3MJZ/T. Other organizations also volunteered equipment and staff for the event, which is one of the few, if not the first, on such a scale in the country. Meetings of the Loughton Radio Society, at which visitors are always welcome, are held on alternate Fridays at 7.30 p.m. at Loughton Hall, Rectory Lane, Loughton, Essex. Honorary Secretary: A. W. Sheppard, 11 Barfields, Loughton, Essex.

Mid-Warwickshire ARS. A demonstration of Heathkit test gear was given to members on October 19 by Mr Castleford, the local service agent. The most comprehensive array of meters, signal generators etc., brought many envious whispers. The descriptions and uses of the various items of equipment, together with practical exercises in video and audio circuit checking and adjustment impressed the audience, particularly because of the efficiency of the instruments and the expertise of the operator. It is hoped that in the New Year a further demonstration by the same organization will be given: this time on receivers and transmitters.

Northern Heights ARS. The tape recorded lecture on " Top Band DXing " by W1BB brought a crowd of 60 to the meeting—this was without any doubt a record attendance. The following week the tape was played again for the benefit of members of the Spen Valley Radio Club who paid a visit, and at the end of the month a party went by coach to the Radio Communications Exhibition. The annual dinner will be on December 9; on December 23 there will be a ragchew evening, and on January 6 A. W. Walmsley, G3ADQ, will give a talk on " S.S.B. Trends." Honorary Secretary: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.

Peterborough and District ARS. The AGM was held recently in Peterborough Technical College, when the following officers were elected: Committee Members, L. Critchley, G3EEL, D. Sylvester, G3RED, B. Vaughan, G3TGO, J. Grierson, G3TSO, S. Warner and W. Yeomans; Honorary Secretary, D. Byrne, G3KPO, Jersey House, Eye, Peterborough; Honorary Treasurer, A. Walker, G3RDZ. A suggestion to raise the annual subscription did not find a seconder! It was instead agreed to organize a jumble sale to raise funds, as well as a mobile rally near Peterborough next summer.

Plymouth Radio Club. The most important recent event was the opening of the new club station G3PRC on October 13. The first contact after the opening was with G3HHV on 160m, and soon afterwards Ws were being worked on 14 Mc/s c.w. as a pastime. A recent talk about RAEN by G3OJI aroused considerable interest amongst members, and it is quite probable that this might well be instrumental in the resuscitation of the old Plymouth RAEN group. Meetings are held every Tuesday evening at 7.30 p.m. at The Clubroom, Virginia House, Palace Street, St. Andrew's Cross, Plymouth. Honorary Secretary: R. Hooper, G3SCW, 2 Chestnut Road, Peverell, Plymouth.

Reading ARC. The December meeting has been brought forward one week, and will be held on December 19. The judging of the constructional contests and a junk sale will be fitted in that evening. The annual dinner will be held on January 9 at " The White Hart " Hotel, St. Mary's Butts, Reading, and tickets for this, price 15s., may be obtained from the Honorary Secretary, R. G. Nash, G3EJA, " Peacehaven," 9 Holybrook Road, Reading, or from any other officer of the club. It is hoped that all members will attend the AGM on January 30 at 7.30 p.m. at the Palmer Hall, West Street, Reading.

The Reigate Amateur Transmitting Society chose Eastbourne for the V.H.F. NFD station, in view of the clear take-off in all directions. Seventeen members camped for the weekend, and although for some it was their first taste of being under canvas, and the weather was somewhat inclement, none were deterred from a repeat in the future. At the next meeting on December 19, the Annual Constructional Contest for the G8KW and XYL trophies will be taking place. This will start at 7.30 p.m. at the George and Dragon, Redhill.

The President and committee of the **Royal Naval ARS** wish all their members throughout the world seasonal greetings and a happy New Year.

Shefford and District ARC (Bedfordshire). This club is very fortunate in having its headquarters in the new Town Recreation Centre, situated in Hitchin Road and adjacent to Digswell House, the former home of the club. Members are very pleased with the facilities available in the new building, where meetings are held on Thursdays at 7.30 p.m.

The **Slade Radio Society** will be having its annual fun and games evening on December 11, and this will include the annual cricket match between the President's and Secretary's teams. OMs, XYLs, YLs and Jnr OPs are welcome to take part and make the most of the evening, for there will be no meeting on December 25. Honorary Secretary: D. T. Wilson, 177 Dower Road, Four Oaks, Sutton Coldfield, Warks.

South Birmingham RS. An air of satisfaction surrounded the latest notice from this society, for enclosed was the annual balance sheet which showed a net gain of just over £40 during 1964: satisfactory indeed! J. Rowley, G3TQO was appointed Honorary Secretary at the AGM on October 15, and his address is 195 Castle Lane, Solihull. Future events include a junk and surplus sale on December 17, and a demonstration of members' equipment on January 21. Meetings are held at 8 p.m. at the Friends Institute, Balsall Heath.

South Dorset RS. As the talk on " Outer Space " had to be cancelled, Michael Box, G3RZG, gave a lecture on " Line Communication " at the November meeting. A visit to the Weymouth Pavilion Theatre to view the modern lighting and sound equipment had also been arranged for November. There will be another outing during December, this time to Messrs Sidney S. Bird at Poole. Honorary Secretary: C. E. Biggs, G2TZ, 54 Prince of Wales Road, Dorchester, Dorset.

Southgate, Finchley and District Group's AGM will be held on December 10, and two days later the Barnet Christmas Party will be held at Oakmere House, High Street, Potters Bar, at 7.30 p.m. Dancing, spot prizes, free refreshments and a bar will be provided. Tickets for the party, which was a resounding success last year, are available from B. Boothby, G3RPN, 34 Ecclesbourne Gardens, Palmers Green, London, N.13. Honorary Secretary: R. Wilkinson, 33 Amberley Road, Palmers Green, London, N.13.

Stockport RS. The next meeting, on December 16, will be the AGM. At the following meeting on January 13, members will hear from Bill Banks, G2ARX, about some of his recollections of pre-1939 Amateur Radio. Honorary Secretary: S. J. Scarbrough, G3MBQ, 95 Cavendish Road, Hazel Grove, Stockport, Cheshire.

The Surrey Radio Contact Club will meet next on December 8, when J. F. Pawling, of Mullard Applications Laboratory, will give a lecture on modern electronic components.

Swindon and District ARC. " Quiet Hiss and then world's their oyster " headed a large article in a Swindon newspaper. We completely agree with members of the Swindon Club when we say that it is one of the best and least sensational pieces of writing about Amateur Radio that has been seen in print for many years. If only the national dailies would follow suit. The reporter concerned has, incidentally, since been enrolled as a member of the club! A large Christmas sale has been planned for December 9, and there will be a social evening sometime in January. Meetings are now held every fortnight at the Deers Leap Hotel, Penhill, Swindon, where the landlord, Mr Edwards has been kind enough to make a room available for the club.

Torbay ARS. At the recent monthly meeting, a welcome was extended to visitors G3RUV and G3RUX from the Exeter club, and also to G3BBF, a club member now home from serving with the RAF in Malaysia. A film show was given by Mr F. Hawkin.

University College of North Wales ARS. John Lawrence, GW3JGA/T, gave his Presidential address on October 22, and spoke on the subject of amateur television. A number of demonstrations were given, and were watched by over 100 members and friends. The UCNW Science Festival is on between November 30 and December 4, when the society will be operating GB2SFW. Amateur television will also be transmitted during the open day on December 2. Slow Morse classes are held every Wednesday and meetings on Thursdays fortnightly. Further details may be obtained from the Honorary Secretary, c/o Department of Electronic Engineering, Dean Street, Bangor.

Uxbridge RS. Members obviously had an interesting time during the Jamboree-on-the-Air, when they operated a station on behalf of the 6th Uxbridge (St. Andrews) Scout Group. Eight scouts and the scoutmaster were present, and it is expected that there may be some converts amongst them. G3NDU gave an interesting talk on s.s.b. on November 2, and afterwards had quite a large number of questions fired at him. The December programme includes a " Bangers and Mash " supper at which Geoff Stone, G3FZL, President of RSGB, has promised to appear and " earn his banger " by giving a short talk. The other December meeting will probably include a lecture on test gear by G3JXC. The new Honorary Secretary is F. J. P. Offord, 43 Grays Road, RAF Uxbridge, Middlesex, and the venue for meetings, which has also changed, is the Railway Arms, Vine Street, Uxbridge.

Welwyn Garden City. The annual Open Meeting for neighbouring clubs and groups on November 12 enjoyed a showing of the award winning movie about National Field Day made by Keith Clarke, G3KRC. It is in full colour and complete with KRC-composed soundtrack, music as well as commentary. It earned a deserved ovation from the sixty members, visitors and ladies who were present. Later in the evening the new Decca film on the making of a gramophone record " Handle with Care " was also screened.

The **Wickford RC** meets every Friday evening at 7.30 p.m. in Beauchamp School, Hill Avenue, Southend Road, Wickford.

Wimbledon and District RS. The AGM will be on December 11, and on January 8, G6QN and G3EPU will give a practical demonstration of aligning a superhet receiver. Meetings are always on the second Friday in each month at the Community Centre, 28 St. George's Road, Wimbledon, S.W.19. Honorary Secretary: E. N. Hurle, G3RZN, 156 Monkleigh Road, Morden, Surrey.

Wirral ARS. At the AGM on October 7, the following officers were elected: Chairman, G. L. Flint, G3IIH; Honorary Secretary, A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral, Cheshire; Honorary Treasurer, A. J. Keiller, G3KXR; Newsletter Editor, W. R. Evans. A film show of the club's outdoor activities was enjoyed by members on October 21, and a surplus sale was conducted by G2AMV on November 4.

Worthing and District ARC. Pete Robinson, G3KFH/T, gave a talk on simple test equipment and printed circuit boards on November 9, and this was very well received. The next meeting will be on December 11, when a film show will take up most of the evening. The local " lads " will give a lecture on 4m equipment on January 11. Visitors and prospective members will be very welcome to take part in the meetings.

RAEN Registration

All RAEN members are reminded that membership registration for 1965 is now due, and membership cards must be sent to the Honorary Registrations Secretary, F. C. P. Flanner, G3AVE, 40 Parkhouse Drive, Birmingham 23, before *December 31, 1964*. A stamped, addressed envelope for the return of the card must also be included.

County Controllers and Independent Area Controllers may if they wish collect their members' cards and forward them in bulk.

LONDON MEMBERS' LUNCHEON CLUB

Arrangements for the Christmas meeting are being made with the Horse Shoe Hotel, Tottenham Court Road, W.1, London, for Friday, December 11 at 6.30 for 7 p.m.

This year due to popular demand, the meeting will be held in the evening and will take the form of a Dinner-Dance.

Tickets, price 25/- each may be obtained from the Honorary Secretary G. A. Leicester, G3IKC, 153 Park Road, Chiswick, London, W.4.

Early application is advised.

The luncheon arranged for the third Friday in December will not now take place.

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the first of the month preceding publication. A.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out the copy, preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.

REGION 1

Ainsdale (ARS).—December 9 (" Station Layout and Control "), December 23 (no meeting), January 6 (AGM), 8 p.m., 77 Clifton Road, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B & FARS).—December 7 (" Some Problems of Space Travel " tape recording), December 14 (demonstration of home-built oscilloscope by D. Taylor, G3OPT), December 21 (" Constructors' Competition—Display of home-built apparatus—Prize distribution "), December 28 (" Questions and Answers "), January 4 (Open Night), 8 p.m., Pontins Holiday Camp, Squires Gate.
Bury (BRS).—December 8 (AGM), 8 p.m., Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, except December 1 and January 5, 8 p.m., YMCA.
Eccles (E & DAC).—No meetings at present owing to loss of clubroom.
Liverpool (L & DARS).—Tuesdays, 8 p.m., Conservative Association Rooms, Church Road, Wavertree.
Macclesfield.—December 8, 22, The George Hotel, Jordongate.
Manchester (M & DARS).—Wednesdays, 7.30 p.m., 203 Droylsden Road, Newton Heath, Manchester 10.
Manchester (SMRC).—Fridays, 7.45 p.m., Rackhouse Community Centre, Daine Avenue, Northenden.
Morecambe.—December 2, January 6, 125 Regent Road.
Preston.—December 8, 22 (all meetings start with a Morse practice at 7.30 p.m.), St. Paul's School, Pole Street.
Southport (SRS).—Wednesdays, 8.30 p.m., Sea Cadets Camp, The Esplanade.
Stockport.—December 2, 16, 30, The Blossoms Hotel, Buxton Road, Stockport.
Wirral.—December 2, 16, 7.45 p.m., Harding House, Park Road West, Claughton, Birkenhead.

REGION 2

Barnsley.—December 11 (" Break-in Keying," by P. Carbutt, G2AFV), King George Hotel, Peel Street.
Bradford.—December 15 (Ladies' Night, with Colour Slides), 7.30 p.m., 66 Little Horton Lane.
Catterick.—Tuesdays and Thursdays, 7.30 p.m., Club Room, Vimy Road.
Halifax.—December 29 (Discussion on Members' Receivers), 7.30 p.m., Bee Hive & Cross Keys, King Cross Street.
Northern Heights.—December 9 (Annual Dinner), December 23 (Ragchew), 7.30 p.m., Sportsman Inn, Ogden.
Scarborough.—Thursdays, 7.30 p.m., rear of 3 Trinity Road.
Spen Valley.—December 10 (Film Show), 7.30 p.m., Heckmondwike Grammar School.

REGION 3

Birmingham (MARS).—December 15 (Christmas Party and Equipment Sale), 7.30 p.m.,"Midland Institute, Paradise Street, Birmingham.
(South).—December 17 (Christmas Junk Sale), 7.30 p.m., Friends Meeting Hall, Moseley Road.
Cannock Chase (CCARS).—December 3 (" A Modern Approach to V.H.F. Working," lecture and demonstration by T. P. Douglas, G3BA), December 17 (Committee Meeting, Morse Group and Constructional Group), January 7 (" The KW2000," lecture and demonstration by E. A. Matthews, G3FZW), 8 p.m., The George Inn, Walsall Road, Cannock.
Coventry (CARS).—Mondays, 8 p.m., Westfield House, Radford Road, Coventry.
Redditch (EWARG).—December 10 (Film " Ham Hop Holiday," by G3HZG), 7.30 p.m., Old Peoples' Centre, Park Road, Redditch.
Slade Radio Society.—December 11 (Annual Fun and Games Evening), Church House, High Street, Erdington, Birmingham 23.
Stourbridge (STARS).—January 12 (" Transistorised Equipment," by E. L. Gardiner, G6GR), 7.45 p.m., Foley College, Stourbridge.
Stratford-upon-Avon (ARS).—December 11 (RAE Lecture), December 18 (House Warming of New Club Room), c/o Mason's Arms, Sanctus Road, Stratford-upon-Avon.
Wolverhampton (ARS).—Mondays, 8 p.m., Neachells Cottage, Stockwell Road, Tettenhall.

REGION 4

Burton-on-Trent (B-o-TARS).—December 9 (Film Show), December 23 (Christmas Prize Draw), 7.30 p.m., Club Rooms, Stapenhill Institute, Burton-on-Trent.
Derby (D & DARS).—December 2 (Surplus Sale), December 9 (Constructor Contest for Founder Members' Trophy), December 13 (G5YY Trophy Contest), December 16 (Open Night—Committee), December 23 (Christmas Party), December 30 (The Year in Retrospect—Members' Slides), 7.30 p.m., Room 4, 119 Green Lane, Derby.
Heanor (H & DARS).—December 1 (Film Show), December 8 (Open Evening), December 15 (D & DARS Films shown by T. Darn, G3FGY), 7.30 p.m., Room 5, Heanor Technical College, Ilkeston Road, Heanor, Derbyshire.
Leicester (LRS).—Mondays, 7.30 p.m., Sundays, 10.30 a.m., Club Room, Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (ARC).—First Wednesday in each month, 7.30 p.m., Lincoln Technical College, Cathedral Street, Lincoln.
Loughborough (ARC).—December 4 (Film Show by G3FYV), December 11 (Tape Lecture by Mullard Ltd), December 18 (Christmas Sale), 7.30 p.m., Club Room, Beach Yard, Ward's End, Loughborough.
Mansfield (MRS).—Fridays, 7.30 p.m., ATC Headquarters, Sutton Road, Mansfield.
Melton Mowbray (ARS).—December 31 (" The use of Test Gear," by L. Fisher, G4MK, and D. Fisher), 7.30 p.m., St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.
Nottingham (ARCN).—Tuesdays and Thursdays, Room 3, Sherwood Community Centre, Woodthorpe House, Sherwood, Nottingham.
Northampton (NSWC).—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
Worksop (NNARS).—Tuesdays (RAE Classes), Thursdays (Lectures), 7.30 p.m., Club Rooms, 13 Gateford Road, Worksop, Notts.

REGION 5

Bedford (B & DARC).—Second Tuesday and fourth Thursday in each month (except December 24), Harpur Secondary Modern School, Horne Lane, Bedford.
Cambridge (C & DARC).—December 4, December 11 (Junior Evening), December 18 (Sausage Supper—bring own cutlery), Club Headquarters, Corporation Yard, Victoria Road, Cambridge.
Cambridge University (CUWS).—Tuesdays during Term, 8.15 p.m., Psychology Department, Downing Site.
Haverhill (H & DARC).—Mondays, 7.30 p.m., Secondary Modern School, Haverhill, Suffolk.
Luton (L & DARS).—December 8 (Annual Dinner), December 15 (AGM), December 22, 29 (no meetings), 8 p.m., ATC Headquarters, Crescent Road, Luton, Beds.
March (M & DRAS).—Tuesdays, 7.30 p.m., rear of Police Headquarters, High Street, March, Cambs.
Royston (R & DARC).—Wednesdays, 8 p.m., Manor House Social Club, Melbourn Street, Royston, Herts.
Shefford (S & DARS).—Thursdays, 7.45 p.m., Town Recreational Centre, Hitchin Road, Shefford, Beds.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street, Cheltenham.
Gloucester.—Thursdays, 7.30 p.m., " The Cedars," 85 Hucclecote Road, Gloucester.
Oxford (O & DARS).—Second and fourth Wednesdays in each month, 7.30 p.m., Cherwell Hotel, Water Eaton Road, N. Oxford.

REGION 7

Acton, Brentford & Chiswick (ABCRC).—December 8 (Transceiver Demonstration), 7.30 p.m., AEU Club, 66 High Road, Chiswick.
Ashford, Middlesex (EARS).—December 23, 7.30 p.m., Ashford Grammar School.
Bexleyheath (NKRS).—December 10, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Barnet (BRC).—December 22, 8 p.m., Red Lion Hotel, Barnet.
Chingford (Group).—December 11. Details from the Hon. Secretary, Loughton 2397.
(SRC).—Fridays, except first in month, 8 p.m., Friday Hill House, Simmons Lane.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the White Hall Hotel, Bloomsbury Square, London, W.C.1
at 12.30 p.m. on Friday, January 18, 1965
Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

Croydon (SRCC).—December 8 (" Modern Electronic Components," by C. Parling, of Mullard Application Laboratories), 7.30 p.m., Blacksmiths Arms, South End, Croydon.
Dorking (D & DARS).—December 8 (Informal), 8 p.m., Wheatsheaf, Dorking. December 15 (Christmas Dinner).
East Ham.—Tuesdays fortnightly, 7.30 p.m., 12 Leigh Road, East Ham.
East London District.—December 13 (AGM and Jumble Sale), 2.30 p.m., Lambourne Room, Ilford Town Hall.
East Molesey (TVARTS).—December 2, Carnarvon Castle Hotel, Hampton Court.
Edgware & Hendon (EARDS).—December 14 (" 70 Mc/s Equipment," by D. Lisney, G3MNO), 8 p.m., John Keble Hall, Church Close, Deans Lane, Edgware.
Enfield.—December 17, 7.30 p.m., George Spicer School, Southbury Road, Enfield.
Gravesend (GRS).—December 16, 7.30 p.m., RAFA Club, 17 Overcliffe, Gravesend.
Guildford (G & DRS).—December 11 (" Operation of Practical Equipment from 1900 to 1922," by Maurice Child), 8 p.m., Guildford Model Engineering Society Hall, Stoke Park.
Harlow (DRS).—Tuesdays, 7 p.m., rear of 11 High Street (G. E. Read, G3ERN).
Harrow (RSH).—Fridays, 8 p.m., Roxeth Manor County School, Eastcote Lane, Harrow.
Holloway (GRS).—Mondays and Wednesdays (RAE and Morse, 7 p.m.), Fridays (Club, 7.30 p.m.), Montem School, London, N.7.
Hounslow (HADRAS).—December 14, 28, The Canteen, Mogden Main Drainage Dept., Mogden Works, Isleworth.

LOOKING AHEAD

December 18.—RSGB Annual General Meeting.
May 30, 1965.—RNARS Mobile Rally at RN Signal School, HMS Mercury.
June 27.—Longleat Mobile Rally.
July 10-11—Oxford and District ARS—10th Anniversary Mobile Rally.
October 2.—N.W. V.H.F. Convention.

Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford.
Kingston.—December 10, 8 p.m., YMCA, Eden Street, Kingston. Fridays, (Weekly Morse Classes), 2 Sunray Avenue, Tolworth.
Leyton & Walthamstow.—December 22, 7.30 p.m., Leyton Senior Institute, Essex Road, London, E.10.
Loughton.—December 11, 7.30 p.m., Loughton Hall (near Debden Station).
Mitcham (M & DRS).—December 11, 7 p.m., "The Cannons," Madeira Road, Mitcham.
New Cross (CARS).—Wednesdays and Fridays, 8 p.m., 225 New Cross Road, London, S.E.14.
Norwood & South London (CP & DRS).—December 19, CD Training Centre, Catford, London, S.E.6.
Paddington (P & DARS).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, London, W.2.
Purley (P & DRC).—December 18, 8 p.m., Railwaymen's Hall (side entrance), Whytcliffe Road, Purley.
Reigate (RATS).—December 19 (Constructional Contest), George and Dragon, Cromwell Road, Redhill.
Romford (R & DRS).—Tuesdays, 8.15 p.m., RAFTA House, 18 Carlton Road, Romford.
Scout ARS.—December 17, 7.15 p.m., Baden Powell House, Queens Gate, South Kensington.
Science Museum (CSRS).—December 15 (Christmas Informal Meeting, visitors welcome), January 5 ("Transistor Applications," talk and demonstration by D. Christian), 6.30 p.m., Science Museum, South Kensington.
Sidcup (CVRS).—December 3, 7.30 p.m., Congregational Church Hall, Court Road, Eltham.
Slough (SARS).—First Wednesday in each month, 8 p.m., United Services Club, Wellington Street, Slough.
Southgate & District.—December 10 (AGM), December 12 (Barnet Christmas Party), 7.30 p.m., Atlasta Lodge, Tottenhall Road, Palmers Green, London, N.13.
St. Albans (Verulam ARC).—December 16, 8 p.m., Hedley Road.
Sutton & Cheam (SCRS).—December 16, 8 p.m., The Harrow Inn, High Street, Cheam.
Uxbridge.—December 7 (Bangers and Mash Supper (Stag only). Book in advance), December 21, 8 p.m., Railway Arms, Vine Street.
Welwyn Garden City.—December 10 ("The 23cm Amateur Band," by Arnold Mynett, G3HBW), 8 p.m., Vineyard Community Centre, Digswell Road, Welwyn Garden City.
Wimbledon (W & DRS).—December 11, 8 p.m., Community Centre, St. Georges Road, Wimbledon, London, S.W.19.

REGION 8

Crawley (CARC).—December 9 (Informal, for details contact G3FRV), December 23 (AGM), 8 p.m., Trinity Congregational Church, Ifield.
Tunbridge Wells (WKARS).—December 11 (Exchange and Mart Junk Sale), December 18 (Christmas Party), 7.30 p.m., Culverden House, Culverden Park Road, Tunbridge Wells.
Worthing (W & DARC).—December 14 (Radio Film Evening), 7.45 p.m., Adult Education Centre, Union Place, Worthing.

REGION 9

Bath.—December 18, 7.30 p.m., Room 248, Fourth Floor, Main Building, Bath Technical College.
Bristol.—December 11 (AGM), 7.15 p.m., Small Physics Theatre, Royal Fort, Bristol University, Woodland Road, Bristol, 8.
Burnham-on-Sea (B-o-SARS).—Second Tuesday in each month, 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.
Camborne (CR & TC).—First Thursday in each month, Staff Recreation Hall, SWEB Headquarters, Pool, near Camborne.
Exeter.—First Tuesday in each month, 7.30 p.m., George and Dragon Inn, Blackboy Road, Exeter.
Plymouth (PRC).—Tuesdays, 7.30 p.m., Virginia House, Bretonside, Plymouth.
South Dorset (SDRS).—First Friday in each month, 7.30 p.m., Labour Rooms, West Walks, Dorchester.
Torquay (TARS).—Last Saturday in each month, Club HQ, Belgrave Road, Torquay.
Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road.
Yeovil (YARC).—Wednesdays, 7.30 p.m. Park Lodge, The Park, Yeovil.

REGION 10

Cardiff.—December 14 (Informal Christmas Gathering), 7.30 p.m., TA Centre, Park Street, Cardiff.

REGION 11

Bangor (UCNWARS).—Meetings fortnightly. Details from the Honorary Secretary, c/o the Department of Electronic Engineering, University College of North Wales, Dean Street, Bangor.
Llandudno (CVARC).—December 10 (Discussion on RAE Manual, Chapter 2, "Interference"; RSGB Tape "V.H.F. Propagation," by Ed Tilton, W1HQD), 7.30 p.m., Cross Keys, Madoc Street, Llandudno. December 12 (Annual Dinner), Alfredos Restaurant, Conway. Details from the Honorary Secretary, B. Clarke, GW3HGL.
Prestatyn (FRS).—Details from the Honorary Secretary, A. Antley, "Fairholme," Fairfield Avenue, Rhyl.

REGION 14

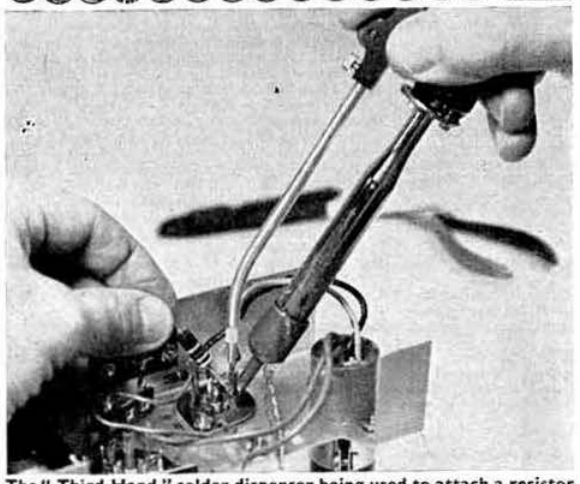
Glasgow.—First and third Wednesdays in each month, Christian Institute, 70 Bothwell Street, Glasgow, C.2.

REGION 16

Basildon (BDARS).—December 9 ("V.H.F./U.H.F. Working," by P. K. Blair, G3LTF), December 23 (Social Evening at the "Van Gogh"). Details from G3IJB.
Chelmsford (CARS).—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Great Yarmouth (GYRC).—Fridays, 7.30 p.m., the Manager's Office, the Old Power Station, South Quay, Swanston's Road, Great Yarmouth. Details from G3HPR.
Southend (SDARS).—December 4 (talk by G3KXQ), December 18 (2m "On the Air," conducted by G3NPF), the Executives' Canteen, E. K. Cole Ltd., Priory Crescent, Southend-on-Sea.

REGION 17

Portsmouth (PDRS).—Wednesdays, 7.30 p.m., Twyford Avenue Community Centre.
Southampton.—December 12 ("Integrated Circuits," talk and demonstrations by D. Perkins of Texas Instruments Ltd.), 7 p.m., Engineering Lecture Theatre, Lanchester Building, Southampton University.



The "Third Hand" solder dispenser being used to attach a resistor to a valveholder tag. The soldering iron shown is an American model, but no trouble should be found in using the "Third Hand" with British types.

"Third Hand" Solder Dispenser. The accompanying photograph shows a device developed for easing the problem of requiring an unlimited supply of hands while soldering. The attachment can be fitted to most types of soldering-iron, and models are available to accept both 18 and 22 s.w.g. solder. The solder is fed through the tube by means of a knurled wheel, and, when the attachment is correctly adjusted, is projected ⅜ in. beyond the soldering-iron bit. It is manufactured by Invention Development & Engineering Associates Inc., of Sante Fe, New Mexico, but is available in this country through Alpha Metals, Inc., (UK) Ltd., 75 New Bond Street, London, W.1. It costs £3.

Writing to Headquarters?

When writing to Headquarters please use separate sheets of paper for:

- Changes of Address (return a wrapper from the *Bulletin* if possible)
- Orders for Publications
- Queries
- *Bulletin* Items

When paying your subscription please return the reminder card sent to you by Headquarters or quote the date on which your subscription falls due.

Whenever you write to Headquarters please write your name in block letters and quote your call-sign, BRS or A number.

4U1ITU CALLING

INTERNATIONAL AMATEUR RADIO CLUB *Geneva*

SPECIAL OFFER

IF YOU JOIN BEFORE DECEMBER 31, 1964

IARC Membership costs YOU $ 5.00 and brings YOU:

- Membership Certificate
- Copies of 1964 and 1965 issues * of IARC-Magazine "4 U 1 I T U CALLING"
- Club lapel pin

and gives you

- Identification with the world's ONLY international Amateur Radio Club.

AN ANNUAL MAGAZINE
OF WORLD-WIDE AMATEUR RADIO

To the Secretary, International Amateur Radio Club
Geneva 20, Switzerland.

☐ I apply for IARC membership. I enclose check/bank draft for $ 5.00 (or equivalent).

☐ I want a copy of the 1964 issue of the International Amateur Radio Club magazine "4 U 1 I T U CALLING" (I enclose $ 1.00 or equivalent).

☐ I want a copy of the inaugural 1963 issue of "4 U 1 I T U CALLING" (I enclose $ 0.50 or equivalent).

(Name) _____

(Address) _____

* Due to continued demand we have had a repeat printing of the inaugural 1963 issue of "4 U 1 I T U CALLING". This is now available to collectors at the special price of $ 0.50 (or equivalent).
Separate copies of the current 1964 Edition are available at $ 1.00 (or equivalent) (142 pages of international ham features; international personalities speak to you; news and activities and HAM-TECH-AID).

Gifts for the Radio Amateur and Shortwave Listener

RSGB PUBLICATIONS

AMATEUR RADIO HANDBOOK. Covers the whole field of Amateur Radio transmission and reception from fundamentals to station operation. Practical designs for home-constructed h.f. and v.h.f. equipment are important features. Profusely illustrated with nearly 700 line diagrams and more than 100 half-tones. 544 pages bound in maroon buckram linson. **Price 36s. 6d. post paid.**

RADIO DATA REFERENCE BOOK. Data for the radio designer, engineer and amateur presented in the form of curves, tables and charts. 136 pages bound in blue buckram linson. **Price 14s. post paid.**

AMATEUR RADIO CIRCUITS BOOK. A wide selection of circuits for use in transmitters, receivers and ancillary equipment. 96 pages specially bound to lie flat. **Price 8s. 6d. post paid.**

RADIO AMATEURS' EXAMINATION MANUAL. Covers the syllabus of the City and Guilds of London Institute examination. Chapters on licence requirements and conditions, interference, receivers, circuits, calculations, semiconductors, aerials and propagation. Essential reading for those wishing to obtain the Amateur (Sound) Licence. More than 50 line diagrams. 60 pages. **Price 5s. 6d. post paid.**

RSGB AMATEUR RADIO CALL BOOK, 1965. The latest edition of this best-selling annual directory of Amateur Radio stations in the United Kingdom and the Republic of Ireland records more than 3,000 changes since the 1964 edition was published. 96 pages. **Price 5s. 6d. post paid.**

A GUIDE TO AMATEUR RADIO. Provides the newcomer to Amateur Radio with basic information on receivers, transmitters, and aerials. Explains how to obtain an amateur transmitting licence. Well illustrated, 80 pages. Tenth Edition. **Price 4s. post paid.**

THE MORSE CODE FOR RADIO AMATEURS. A carefully graded selection of exercises designed to make learning the Morse code as simple as possible. 24 pages. **Price 1s. 9d. post paid.**

COMMUNICATIONS RECEIVERS, Second Edition. A reprint of the RSGB BULLETIN articles by G. R. B. Thornley on the design of communications receivers. The G2DAF high performance receiver is described in detail. This second edition also contains information on the G2DAF H.F. Bands Converter and the use of a mechanical filter. 36 pages. **Price 3s. post paid.**

S.S.B. EQUIPMENT. A reprint of the articles in the RSGB BULLETIN describing the G2DAF S.S.B. Transmitter Mk2, with a condensed description of the G2DAF Linear Amplifier. 24 pages. **Price 3s. post paid.**

SERVICE VALVE EQUIVALENTS. Lists the commercial equivalents of all CV numbered valves, cathode ray tubes and semiconductors useful to the radio amateur and home constructor. Equivalents of British Army, Royal Navy, Royal Air Force and US Signal Corps valves are also given. Pocket size. 48 pages. **Price 3s. 6d. post paid.**

BRITISH ISLES TWO METRE BAND PLAN MAP. A reprint on stiff card of the map published in the February, 1963, issue of the RSGB BULLETIN. Details are also given of the 70cm Zones. **Price 6d. post paid.**

OTHER BRITISH PUBLICATIONS

RADIO AMATEUR OPERATOR'S HANDBOOK. Contains a list of Amateur Prefixes with provision for heard/worked record, W.A.S. chart, Zones record, Counties Heard or Worked record, Call Areas, Directional bearings, Standard Frequency transmissions, etc. Published by Data Publications Ltd. 48 pages. **Price 5s. post paid.**

WEBB'S RADIO LOG BOOK. Inexpensive paper-backed log book conforming with GPO requirements. **Price 7s. 3d. post paid.**

MANUAL OF TRANSISTOR CIRCUITS. Intended to help those interested in radio and electronics to realize the possibilities of the transistor. In addition, it is an excellent reference source of semiconductor circuits. Published by Mullard Ltd. 308 pages. **Price 13s. 6d. post paid.**

TRANSISTOR RADIOS, CIRCUITRY AND SERVICING. Deals with the principles of transistors, printed wiring, receiver circuits and the servicing of transistor radios, with a brief review of the test equipment necessary. Published by Mullard Ltd. 72 pages. **Price 5s. 9d. post paid.**

RADIO VALVE DATA. Characteristics of 4,800 valves, transistors, rectifiers and cathode ray tubes. Base connections are included. Seventh edition compiled by the staff of *Wireless World*. 156 pages. **Price 8s. 3d. post paid.**

GUIDE TO BROADCASTING STATIONS. Gives details of broadcasting stations throughout the world. Published by Iliffe Ltd. **Price 5s. 6d. post paid.**

SHORT WAVE RECEIVERS FOR THE BEGINNER. Describes 1 and 2 valve battery receivers, 2 and 3 valve mains operated short wave receivers, with notes on soldering and an introduction to the short waves. Published by Data Publications Ltd. 72 pages. **Price 6s. 6d. post paid.**

AMERICAN PUBLICATIONS

ARRL RADIO AMATEUR'S HANDBOOK, 1964. One of the best-known textbooks for the amateur written from the American point of view. Now in its 41st edition. 592 pages plus 34 pages of valve tables, 14 page index and 80 page advertising section. **Price 37s. 6d. post paid.**

UNDERSTANDING AMATEUR RADIO. A new ARRL publication containing down-to-earth information on circuit design, construction of receivers, transmitters, aerials and accessories, testing and adjustment. Sixteen easily understood chapters. 313 pages plus six page index. **Price 18s. post paid.**

RTTY HANDBOOK. A new edition of the well-known *CQ* publication by Byron Kretzman, W2JTP. A valuable textbook for both the beginning and experienced RTTY'er. 191 pages. **Price 30s. post paid.**

CQ NEW SIDEBAND HANDBOOK. The fundamentals of single and double sideband suppressed carrier transmission with many practical designs. Details of a number of commercial equipments are given. 232 pages. **Price 24s. 6d. post paid.**

SINGLE SIDEBAND FOR THE RADIO AMATEUR. Outstanding articles from *QST* on all aspects of s.s.b. transmission and reception. 224 pages. **Price 18s. 6d. post paid.**

MOBILE MANUAL FOR RADIO AMATEURS. A selection of articles from *QST* on mobile operation—transmission, reception, aerials, noise suppression, power supplies. 282 pages. **Price 23s. 6d. post paid.**

CQ MOBILE HANDBOOK. By Bill Orr, W6SAI. Chapters devoted to car ignition systems, power supplies, receivers, transmitters, aerials, s.s.b. equipment, noise problems and test equipment. 240 pages. **Price 23s. 6d. post paid.**

ARRL ANTENNA BOOK. Probably the best-known textbook on aerial systems for the amateur station. 320 pages. **Price 18s. 6d. post paid.**

CQ ANTHOLOGY 1952-1959. More than 75 articles published in *CQ* during the years 1952-1959. 256 pages. **Price 23s. post paid.** A few copies of *CQ Anthology 1945-1952* are still available, **price 16s. post paid.**

HINTS AND KINKS, Volume 6. A further selection of helpful ideas from *QST*'s long-running feature. 128 pages. **Price 10s. 6d. post paid.**

SURPLUS SCHEMATICS. Circuit diagrams for more than 90 popular American surplus equipments. A useful addition to any club library. A *CQ* publication. 111 pages. **Price 19s. 6d. post paid.**

TELEVISION INTERFERENCE—Its Causes and Cures. By Phil Rand, W1DBM. The second edition of this well-known American guide to the cure of interference. Well illustrated with diagrams, photos, charts and tables. 56 pages. **Price 14s. 6d. post paid.**

CQ ANTENNA ROUNDUP. A collection of the best articles on aerials published in *CQ* over a period of 12 years. A Cowan publication. 160 pages. **Price 23s. 6d. post paid.**

RADIO HANDBOOK. Covers most aspects of amateur communication and contains a comprehensive introduction to radio mathematics, also introductory chapters on hi-fi and computers. Published by Editors and Engineers. 794 pages of text. Hard cover. 16th edition. **Price 77s. 6d. post paid.**

TRANSISTOR RADIO HANDBOOK. A wide range of transistor circuits for amateur and commercial communication equipment, with practical construction projects and a section covering simplified circuit theory. Published by Editors and Engineers. 178 pages. **Price 41s. 6d. post paid.**

SHOP AND SHACK SHORTCUTS. A collection of hundreds of hints, kinks, shortcuts and useful information for the amateur who wishes to save time and improve the efficiency of his equipment. Published by *CQ*. 244 pages. **Price 29s. post paid.**

A COURSE IN RADIO FUNDAMENTALS. A step-by-step course in the principles required for a basic understanding of amateur radio. Intended to be used in conjunction with the *ARRL Radio Amateur's Handbook*. 103 pages. **Price 10s. 6d. post paid.**

HOW TO BECOME A RADIO AMATEUR. Information on learning Morse, getting on the air, the fundamentals of radio, a two valve receiver and a simple one valve transmitter. An ARRL publication. 148 pages. **Price 5s. post paid.**

AMERICAN MAGAZINE SUBSCRIPTIONS

QST. Journal of the American Radio Relay League. Devoted entirely to Amateur Radio. Monthly, direct from USA. **Price 43s. 6d. p.a.**

CQ, the Radio Amateur's Journal. Covers the whole field of Amateur Radio. Monthly, direct from USA. **Price 44s. p.a.**

73 Magazine. Almost exclusively technical and constructional articles. Monthly, direct from USA. **Price 28s. 6d. p.a**

RSGB PUBLICATIONS (Dept. B), 28 LITTLE RUSSELL STREET, LONDON, W.C.1

CLASSIFIED ADVERTISEMENTS

OFFICIAL APPOINTMENTS

RADIO TECHNICIAN

A number of suitably qualified candidates will be required for training, leading to permanent and pensionable employment. (Normally at Cheltenham but with opportunities for service abroad or appointment to other U.K. stations.)

Applicants must be 19 or over and be familiar with the use of Test Gear and have had Radio/Electronic workshop experience. They must offer at least "O" level GCE passes in English language, Maths and/or Physics, or hold the City and Guilds Telecommunications Technician Intermediate Certificate or equivalent technical qualifications.

Pay according to age, e.g. at 19 £722, at 25 £929 (highest pay on entry) rising by four increments to £1,067.

Prospects of promotion to grades in salary range £997-£1,634.

Annual Leave allowance of 3 weeks 3 days, rising to 4 weeks 2 days.

Normal Civil Service sick leave regulations apply.

Apply:

Recruitment Officer (RT/43)
Government Communication Headquarters
Oakley
Priors Road
Cheltenham

MINISTRY OF AVIATION

RADIO TECHNICIANS

Vacancies for RADIO TECHNICIANS aged 19 or over at airports and radio stations throughout the United Kingdom, maintaining radio communications and electronic navigational aids. A good basic knowledge of the theory and practice of radio and/or electronics is required. The possession of recognised technical qualifications would be an advantage. Training given on equipment in use. National rates of pay, age 19, £722 rising to £1,067 (max.). Starting pay at age 25 and over, £929. Paid sick leave. Facilities to study for higher qualifications. Good prospects of permanent pensionable posts and promotion to Telecommunications Technical Officer. For further details apply to:—

Ministry of Aviation
Est. 5(a)1
Room 754
The Adelphi
John Adam Street
London, W.C.2

SITUATIONS VACANT

ELECTRONIC TEST ENGINEERS

Due to a rapidly expanding programme, Engineers fully experienced in tape recorders and transistors are required for production testing and trouble shooting, with £900/£1,000 p.a. for top grade men. Apply Robophone Ltd., Beulah Works, Beulah Road, Thornton Heath, Surrey. LIV 2278/9.

SITUATIONS VACANT (contd.)

1. **A PROJECT LEADER** is required for engineering communications equipment to batch production standards. Resourcefulness and ability to get things done quickly are more important than theoretical qualifications although sound practical experience in building H.F. equipment is essential.

2. **A VERSATILE ENGINEER** is required for servicing a variety of electronic products. Reasonable familiarity with circuits used in communications engineering is necessary.

Please send details of past experience, and state for which post you wish to apply to Labgear Limited, Cromwell Road, Cambridge. Tel. Cambridge 47301.

A. T. & E. (BRIDGNORTH) LTD.

TELECOMMUNICATIONS INSTALLATION AND COMMISSIONING ENGINEER

To be based on the Works at Bridgnorth but to undertake several tours abroad each year.
Experience of UHF/VHF Radio Link equipment essential as a basis to the training which will be given at the Works.
Apply for full details to:—

Personnel Officer,
A. T. & E. (Bridgnorth) Ltd.,
Bridgnorth, Shropshire.

TEST GEAR DEVELOPMENT ENGINEER

Required by E.M.I. Ltd., for the development of specialised test equipment for use on mass production testing. Applicants should be able to carry out the above function with the minimum of supervision and have a general knowledge of modern pulse techniques and component testing. Please write or telephone Hayes 2701, quoting ref: T.G/2 to:

Personnel Department,
E.M.I. Limited,
Springfield Road Works,
Hayes,
Middlesex.

ELECTRONIC DESIGN ENGINEERS

Vacancies exist for Senior and Assistant Electronic Engineers for the design and development of equipment ranging over the audio and radio field, in a newly formed group design and development unit. Good prospects and working conditions. Letters of application, which should be addressed to Scientific & Technical Developments Ltd., Melbourne Road, Wallington, Surrey, will be treated in confidence.

SITUATIONS VACANT (contd.)

SITUATIONS VACANT (contd.)

FIDELITY RADIO LTD.

Require experienced personnel for inspection and testing of tape recorders and transistor radios. Suitable unskilled personnel would be trained. Experienced trouble-shooters and fault-finders also required. Good rates of pay and production bonus. Canteen facilities. Telephone for immediate appointment Mr. J. Israel. PARK 0131.

LABGEAR LTD. have vacancies for Test Engineers and Fault Diagnosticians for S.S.B. Transmitting and Receiving equipment. Applicants should preferably have had some practical experience with transistor circuits. Excellent pay and prospects with first-class working conditions. Applications, which will be treated confidentially, should give full details of past experience.—LABGEAR LIMITED, CROMWELL ROAD, CAMBRIDGE.

PERSONAL

QSL CARDS. G.P.O. approved log books, cheapest, best prompt delivery. Samples.—Atkinson Bros., Printers, Looe, Cornwall.

PATENTS and TRADE MARKS. Booklet on request. Kings Patent Agency Ltd. (B. T. King, G5TA, Mem. RSGB, Reg. Pat. Agent).—146A Queen Victoria Street, London, E.C.4. (Phone: City 6161.) 60 years' refs.

CQ DE G3RIA. Stan the friendly ham offers end of the year greetings to all. Listen for London's big signal SSB or CW. (HI).

SERVICES OFFERED

GO ONE BETTER. Have your cabinets, panels, etc., stove-enamelled and lettered to your own or original specification. —For by-return quotations, contact: The Universal Productions (Enamellers) Ltd., 22 Aston Road North, Birmingham 6. Tel.: Aston Cross 2987.

CASES, chassis, panels. ANYTHING in metal; send your drawings, for quote. Stove enamelled, hammertone, or plain, in any colour.—Moss Watson, 40 Mount Pleasant Street, Oldham, Lancs. (Main 9400).

WANTED

WANTED for cash. Good SSB Receiver and Transmitter, would purchase complete station if reasonable. Box No. C.7150, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

WANTED.—All types of communications receivers, test equipment, tape recorders, amplifiers, etc. Prompt cash payment.—Details to R. T. & I. Electronics Ltd., Ashville Old Hall, Ashville Road, London E.11 (LEYton 4986).

WANTED Commercial SSB/AM/CW Transceiver, with A.C./D.C. power supplies, e.g. Swan, Drake, Hallicrafters or other top make. Full details and price Box No. F.7161, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

MANUAL for R206 Rx. Details to G3RQJ, How Green Farm, Edenbridge, Kent. Phone: Four Elms 276.

WANTED, workable R1132 Receiver, in reasonably good condition. Will collect 100 miles radius Berwick if cheap.—E. Allen, 24 Tweed Street, Berwick on Tweed.

ANTENNA ROTATOR, CDR, etc. with control preferably to fit 2in mast. G3TAE, 10 Manor Road, Sundridge, Sevenoaks, Kent.

WANTED (contd.)

WANTED. Modern amateur band receiver. Good price paid. Box No. F.7164, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

BEG, borrow or buy—19 set manual. Wanted by budding young R.A.E. hopeful. Suitable deposit offered. Box No. F.7163, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

FOR SALE

HALLICRAFTER SX.101A SSB/AM/CW Receiver complete with handbook. Auto transformer, perfect condition. Sensible offers please. 805 (2) 813 (1), 10/- each plus postage. Box No. F.7160, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

PYE V.H.F. RADIOS—P.T.C. 116 " Reporters," £5 each; all less crystals and carriage extra. One Hudson A.M. 108 c/w extension control unit (current model)—as new condition, £50 plus carriage. G.E.C. F.M. V.H.F. equipment—two mobiles, fixed station, battery chargers, etc., £15 the lot. Pendry & Kennedy, 6 Coed Celyn Road, Derwen Fawr, Swansea.

EDDYSTONE 750. 0·45 to 32 megs. Double Superhet. Speaker and manual. Condition as new; performs to maker's specification. Offers. Phone Gipsy Hill 4068.

BARGAINS. HALF-PRICE AND LESS. K.W. Vanguard, 10-160 metres, latest circuit, recently aligned, £36 10s. B.M.C. stick microphone with stand, £2. B.C. 221 frequency meter, 125 kc/s-20 Mc/s, with calibration book, recently aligned and tested, £14 10s. Ekco car radio, CR 61, ideal mobile receiver, 8 valves with power pack, ·515-1·64 Mc/s, 3·3-7·4 Mc/s. Preset ranges: 9·3-10·1 Mc/s, 11·6-12·3 Mc/s, 15-15·6 Mc/s. Readily convertible to 160, 80, 40 and 20 metres, cost £56, sacrifice, £12. Car aerial, 7 ft. whip, complete, £2 10s. Labgear Triband Quad, eight bamboo poles, special castings with U-bolts, boom, masthead, clamp and insulators, £10 10s. J-Beam, 6 over 6 skeleton slot with mountings, £4. Cowgill motor for beam rotation—24v, £6. 4 Selsyns, 10/- each. Buyer collects or pays carriage. G3KWI, Dr. Bob Stewart, 109 Radbourne Street, Derby. Tel. 44553 after 8 p.m.

STABILIZED 300v, 500mA, 6·3 VAC 12A PSU, 10½in x 19in, grey hammer panel, part wired, suitable amateur TVTX, £4. 800v 70mA, 12·6v a.c. PSU, steel case, spare rectifiers, 30/-. Carriage extra. Data sheet for 10W, 160M all-transistor fixed/mobile AM/CW transmitter, 7/6. Germanium diodes 75mA 300v, 4/- per dozen.—G3SBA, 46 St. James Road, Harpenden, Herts. OLU27-4815.

BAMBOO POLES FOR CUBICAL QUAD ANTENNAS, ETC. ALL SIZES. S.A.E. BRINGS LIST.—WHINES & EDGELER, BAMBOO PEOPLE, GODMANSTON, DORCHESTER, DORSET.

ELECTRONIC BUG KEYS TRANSISTORISED. SEND FOR LISTS. ELECTRONIC DEVICES, WELLINGTON ROAD, CHELTENHAM.

METALWORK.—All types of cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks Ltd. (G4BI), Chapman Street, Loughborough.

EDDYSTONE Communications Receiver 840C with service booklet, excellent condition: £35.—Summers, 834 The White House, Albany Street, London, N.W.1. Phone: EUS 1200/834.

EDDYSTONE 680X Receiver. KW " Victor " Transmitter —over 100 countries with 120W A.M. during television hours in six months. Offers over £80 each, or exchange pair for SX115 Receiver or SR150 Transceiver.—G3CAZ, Springate, 10 Pipers Close, Burnham, Bucks. Burnham 1391.

SPARES for AR.88.D/LF. Send S.A.E. for list. Manuals for AR.88.D. HRO/MX/5T, 25/- each.—A. J. Reynolds, 139 Waller Road, New Cross, London, S.E.14. Tel: New Cross 1443 after 7.30 p.m.

FOR SALE (contd.)

SSB EXCITER, filter type, selectable sidebands, output 15v RMS at 3·5 to 4 Mc/s, £14. Parmeko transformer, 620 and 375v., 5v. twice, 65/-. RSGB BULLETINS, 1949-1959, 40/-. All carriage paid.—G3GVV, Farleigh, 65 Harlands Road, Haywards Heath, Sussex. Telephone 50961.

50-WATT transmitter (807 p.a.) and VFO 3·5-28 mc (Knight Kits, Allied Radio, Chicago) with manuals, in beautiful condition: £25. Prefer buyer to collect but would deliver 40 miles. Also Heathkit grid dip meter (110V a.c.), perfect: £7. Also electronic morse key (Cheltenham Electronic Devices) with monitor, perfect: £4.—Wiltshire, 2 Gainsborough Gardens, Weston, Bath.

HEATHKIT MOHICAN GC-1U receiver. New condition. Mains power unit: £20.—GM3LAV, 9 Wilfrid Terrace, Edinburgh 8.

FOUR-METRE ANTENNAS, 75Ω feed. 5 elements, 9·5 db gain, heavy duty, 82/-. 3 elements, 7 db gain, lightweight, 42/4d. 2 elements, 4·5 db gain, lightweight, 35/-. Prices include mast clamp and postage. S.A.E. lists of aerials and fittings.—Baker, 35 St. Mark's Road, Windsor, Berkshire.

R107 for sale. Receiver in mint condition, complete with all plugs, handbook, etc., and built-in "S" meter: £12 o.n.o. A.3214, 18a Botwell Lane, Hayes, Middlesex.

G.E.C. BRT400E 150 kc/s-32 Mc/s. Crystal calibrator. Overhauled, re-valved, perfect condition: £65. Buyer collects. Barry, 15 Fairlawn Court, London, W.4.

OFFERS: 80 *Practical Television*, 85 *Practical Wireless*, 88 *Radio Constructor*, 108 *Shortwave Magazines*, all up-to-date. ARRL Antenna handbook. Radio Designers Handbook, Langford Smith. Radio Engineering, Terman. Buyer arranges transport, Oxfordshire. Box No. F.7162, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

RADIO TELEPHONE equipment comprising the following Pye items: One fixed station PTC 723. Five mobile stations PTC 2002. Two mobile stations PTC 2202V. Offers invited. Apply to Ross Foods (Westwick) Ltd., Westwick, Norwich, Norfolk. Nor. 57Y.

D.S.T. 100, good working order: £11. BC312, excellent with power unit, etc.: £12. BC221, self-contained mains unit: £12. Box of many relays: £1. Several electric motors: £1 the lot. Many valves for sale. A. Melhuish, 31 Shepherds Bush Green, W.12. Mornings only.

RSGB BULLETINS, Volumes 27 to 39, i.e. July 1951 to December 1963. Also schematics for BC 454 and SCR 274. Tudor, 179 Shelford Road, Trumpington, Cambs.

MULLARD high speed valve tester; offers. Manuals: SX28A, £1. S504, 12/6d. BC342N-Dynomotor, 12/6d. Pullin 100 testmeter, Grundig TK1, need repairs, details S.A.E. **WANTED:** BC1147 receiver-78A coax relay. G3LHA, 112 Attoxhall Road, Coventry.

EDDYSTONE 840C communications receiver, mint condition: £39. Buyer collects. Croydon. ADD 3781.

LG.300 RF section only, nearest £28. Minimitter MR44/2 receiver in new condition, six months old, nearest £40 Minimitter, mobile or fixed TX 160, 80, 40, 25W control box and transistor power supply, nearest £20. Manuals available for all above.—G5KS, "Oaklands," 53 Knottsall Lane, Langley, Oldbury, Birmingham.

SPECIAL QUALITY versions of the following types of valves: ECC81, ECC82, ECC83, ECC91, all at 5/- each, post free. Also many ordinary types including: EF86, 6BR7, EL90 at 3/- each. S.a.e. for list.—G3RHF, 88 Village Way, Ashford, Middlesex.

TYPE 37 Transmitter, 20 to 80 Mc/s. TU5B. RF26. 700 and 500 volt transformers, etc., £15 the lot.—G4DR, 7 Padwell Lane, Bushby, Leicester. Thurnby 2644.

62 RSGB Bulletins, 1958-63, mint condition, indexes, £1, buyer collects.—130 Avenue Road, Acton, London, W.3.

FOR SALE (contd.)

INDEX TO ADVERTISERS

RSGB BULLETIN

INDEX TO VOLUME 40

(January 1964 to December 1964)

Key to Page References

JANUARY	...	...	...	...	1–64	MAY	...	...	...	...	273–344	SEPTEMBER	...	...	...	553–616
FEBRUARY	...	...	...	...	65–128	JUNE	...	...	...	...	345–408	OCTOBER	...	...	...	617–696
MARCH	...	...	...	...	129–208	JULY	...	...	...	...	409–488	NOVEMBER	...	...	...	697–760
APRIL	...	...	...	...	209–272	AUGUST	...	...	...	...	489–552	DECEMBER	...	...	...	761–832

TECHNICAL AND CONSTRUCTIONAL

Aerials and Propagation

Books and Commercial Products

General

* *Reviews* † *Information from manufacturer or distributor*

V.H.F. AND U.H.F.

REGULAR FEATURES

CONTESTS

EDITORIALS

LICENSING

MISCELLANEOUS ARTICLES AND REFERENCES

REGIONAL REPRESENTATION MEETINGS AND REPORTS

Italicized page numbers refer to "Letters to the Editor."

Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, New Ruskin House, Little Russell Street, London, W.C.1
by Loxley Brothers Limited, Letchworth, Hertfordshire