RSGB

JANUARY, 1960

BULLETIN

2/6 Monthly

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOL. 35, NO. 7

GENEVA CONFERENCE REPORT

Smaller Size...

is an Eimac Ceramic Tube Extra

High power capability in a compact package has been made available to the radio amateur by Eimac ceramic tubes. For example, the stacked ceramic 4CX1000A shown above—conservatively rated at one thousand watts plate dissipation—is less than 5 inches high and 3½ inches in diameter. Compare it with the conventional glass tetrode of the same plate dissipation shown beside it.

Eimac's stacked-ceramic design now encompasses ⅓ of the Eimac vacuum power tube line. Advantages include: resistance to damage by impact, vibration, or high temperature. In addition, the ability of ceramic tubes to withstand rigorous high temperature processing techniques leads to high tube reliability, uniformity, and longevity.

For your next transmitter, choose a ceramic tube by Eimac. It's the answer for the amateur who desires a modern rig with the optimum in present-day electron tubes.

Cable: Eimac San Carlos

EITEL-McCULLOUGH, INC.
SAN CARLOS · CALIFORNIA
***Eimac First* with ceramic tubes that can take it**

Eimac®

Volume 35 No. 7
January 1960

R.S.G.B. BULLETIN

CONTENTS

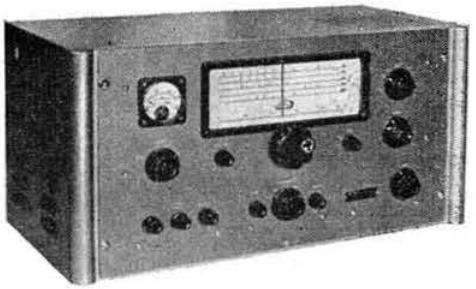
EDITOR:
John Clarricoats, O.B.E., G6CL

DEPUTY EDITOR:
John A. Rouse, G2AHL

EDITORIAL OFFICE:
R.S.G.B. Headquarters, New Ruskin House, Little Russell Street, London, W.C.1
Telephone: HOLborn 7373

ADVERTISEMENT MANAGER:
Horace Freeman, The National Publicity Co. Ltd., 20-21 Red Lion Court, Fleet Street, London, E.C.4
Telephone: FLEet Street 0473-6

The R.S.G.B. Bulletin is published on or about the 15th of each month as its official Journal by the Radio Society of Great Britain and issued free to members. Closing date for copy is the 22nd of the month preceding publication.



★ **K.W. "VANGUARD," complete 50 watt Transmitter.**
★ **K.W. "VALIANT," complete Transmitter with V.F.O.—add your own power supplies mobile or fixed. Now available in C.W. only version.**
★ **K.W. "VICTOR," complete 120 watt Transmitter**
★ **K.W. "VICEROY," SSB Transmitter.**
★ **K.W. 76 Mobile Receiver—double conversion.**
★ **K.W. GELOSO Converter.**

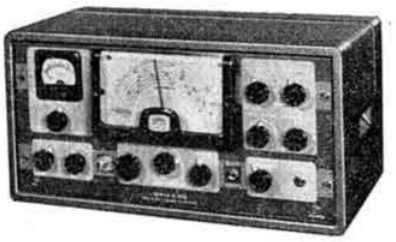
The "K.W. Match" SWR indicator (3-30 Mc/s). Complete in metal case, including calibrated meter. **Price: £6/15/0.**
40 watt Transistor Power Supply. 12 volt input, 300 volt 140 mA output, 87 per cent efficiency. **Price: £11/15/0.**
K.W. Pi Coil with Ceramic Switch, complete unit, **£2.** State whether required for single or parallel 807s, 6146, etc.

Reduced Prices! MOSLEY 3-band Vertical, **£7/10/0;** Beam TA33JR, **£24/15/0;** TA32JR, **£17/10/0;** POWERMASTER, 10m **£13;** 15m **£13/12/6.**

Triple Quad Beam (GM3BQA) 10, 15, 20m.; **Geloso Microphones,** etc.
6146 Valves 35/-. GEC TT21 35/-.
Send S.A.E. for details: Easy terms available on most of the above items.

K.W. ELECTRONICS LIMITED

£17/8/0 Deposit and 18 monthly payments of £4/5/9
G209-R excellent value and performance



GELOSO G209-R RECEIVER for Sideboard, A.M. and C.W. Includes 14 valves and 4 crystals. Nicely bandspread all bands, 10-80m; also 160m if required. Excellent signal/noise figures. Built-in Calibrator. *Latest Model.* **Price 83 gns.**

IMPORTS from U.S.A.
We can obtain most of the latest equipment from U.S.A. at best possible prices. (Our Shipping arrangments save you money in freight charges and Customs duty.)
NATIONAL NC303 RECEIVERS, £198.
HALLICRAFTERS EQUIPMENT: SX100, SX101, SX110, etc.
LET US HAVE YOUR ENQUIRIES!
All equipment checked by our Engineers against makers' specification. A complete service for the Radio Amateur which cannot be equalled in this country.
BEST H.P. TERMS.—E.g., SX110, £16 deposit and 12 monthly payments £5/10/7, or 18 monthly payments £3/16/2. CASH PRICE: £78.

WE ARE LARGEST U.K. STOCKISTS OF GELOSO EQUIPMENT FOR THE RADIO AMATEUR

Vanguard Works, 1 Heath Street, Dartford, Kent.
Tel.: Dartford 5574

LONDON'S LEADING STOCKISTS OF
EQUIPMENT • ACCESSORIES • MATERIALS
GOODS SENT TO ALL PARTS OF THE WORLD

STEEL METER CASES

	Each
4 × 4 × 4 in. Sloping Front ...	9 5
5 × 5 × 8 in. " " ...	14 11
6 × 6 × 12 in. " " ...	24 9
4 × 4 × 2½ in. Rectangular ...	6 8
6 × 4 × 3 in. " ...	8 10
8 × 6 × 3 in. " ...	11 0
10 × 6 × 2½ in. " ...	13 3
10 × 7 × 7 in. with Alum. Panel ...	£1 4 9
12 × 7 × 7 in. " " " ...	£1 11 5
14 × 7 × 7 in. " " " ...	£1 15 9
14 × 9 × 8 in. " " " ...	£2 5 8
16 × 9 × 8 in. " " " ...	£2 9 6
16 × 11 × 8 in. " " " ...	£2 16 8
19 × 11 × 10 in. " " " ...	£3 3 10

ALSO FULL RANGE OF CHASSIS
Chassis and Case List Free on Request.

PNEUMATIC LID STAY
with pressure adjuster
Heavy duty. **10/-** complete

ROTARY WAFER SWITCHES
A.B. Metal and N.S.F. Made to order. Price List free on request.

66 Page Catalogue Listing over 800 Items of our extensive stocks. 1/- plus P. & P. 6d.

SPECIAL OFFERS

1. Mains Transformer, 550-0-550 v., 150 mA, 6 v. 3 a., 4 v. 3 a., 110 v. Primary	£1 0 0
2. Mains Transformer (Potted), 350-310-0-310-350 v. 220 mA, 6·7 v. 5 a., 6·3 v. 3 a., 6·3 v. 1 a., 5 v. 3 a., 6 v. 3 a., 6·3 v. 1 a., 230 v. Primary. Size 7⅛" high × 5¼" × 4½". P. & P. 7/6.	£2 10 0
3. Mains Transformer, Weyrad Drop through, Shrouded. 250-0-250 v. 100 mA, 6·3 v. 3½ a. Tapped Primary 200-240 v.	18 9
4. Choke 10H 250 mA Potted "C" Core	£1 5 0
5. " 20H 50mA Potted ...	15 0
6. " 16H 120 mA Potted "C" Core	£1 0 0
7. " 5H 100 mA Potted ...	5 6
8. " 5H 300 mA " ...	12 6
9. Rectifier 300 v., 300 mA ...	13 6

SIMPLEX TIME SWITCH
200/250 v. 20 amp. Fitted with Smiths Electric clock. Price 69/6 P. & P. 3/3.

Immediate dispatch of goods available from stock. Carriage charged extra at cost.

"ALFA" TEST METER OFFER

6/12/60/300/1,200 v. A.C., ditto D.C., 0-20k, 0-2 megohm, 300 microA, 30mA, 300 mA — 20 to +23dB, +20 to +37 dB. Accuracy ±3% D.C. ±4% A.C. Multi-range, 5½in. x 3⅝in. x 1⅝in. Large clear dial. Leads. **£5/19/6.** (P. & P. 2/-).

The Connoisseur's Tape Equipment
MASTERLINK TAPE UNIT M2A
AND COLLARO "STUDIO" DECK
Build your own Hi-Fidelity Tape Equipment using our tape pre-amp. and the new Collaro deck.
Inc. Price £44 Carr. extra. Complete with instructions. The M2A is complete with external power pack and is also suitable for use with Wearite & Brenell decks, C.C.I.R. characteristic. Price 27 gns. plus P. & P. Leaflet on request.

TELE-RADIO (1943) LTD.
189 EDGWARE ROAD, LONDON, W.2
● Few mins. from Marble Arch ● Open all day Sat. ● *Phone: PAD 4455/6.*

Radio Society of Great Britain

(Incorporated 1926)

PATRON:

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

COUNCIL 1960

President:

W. R. METCALFE, G3DQ

Immediate Past President:

R. L. SMITH-ROSE, C.B.E., D.Sc., Ph.D., F.C.G.I., M.I.E.E.

Penultimate Past President:

L. E. NEWNHAM, B.Sc., G6NZ

Executive Vice-President:

OFFICE VACANT

Honorary Treasurer:

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

Ordinary Elected Members:

H. A. BARTLETT, G5QA
R. C. HILLS B.Sc. (Eng)., G3HRH
C. H. L. EDWARDS, A.M.I.E.E., G8TL
J. D. KAY, G3AAE
G. M. C. STONE, G3FZL
K. E. S. ELLIS, G5KW
A. O. MILNE, G2MI

Zonal Representatives:

E. G. INGRAM, GM6IZ
P. H. WADE, G2BPJ
F. K. PARKER, G3FUR
A. C. WILLIAMS, GW5VX
F. A. RUSSELL, G3BHS
E. W. YEOMANSON, G3IIR

General Secretary and Editor:

JOHN CLARRICOATS, O.B.E., G6CL

Deputy Editor:

JOHN A. ROUSE, G2AHL

Assistant Secretary:

MAY GADSDEN

REGIONAL REPRESENTATIVES

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

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

Region 3.—West Midlands. W. A. Higgins (G8GF), 28 Kingsley Road, Kingswinford, nr. Brierley Hill, Staffs.

Region 4.—East Midland. F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby.

Region 5.—Eastern. T. A. T. Davies (G2ALL), Meadow Side, Comberton, Cambridge.

Region 6.—South Central. L. W. Lewis (G8ML), 117 Fairview Road, Cheltenham, Gloucestershire.

Region 7.—London. F. G. Lambeth (G2AIW), 21 Bridge Way, Whitton, Twickenham, Middlesex.

Region 8.—South Eastern. Office Vacant.

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, Glam.

Region 11.—North Wales. F. G. Southworth (GW2CCU), Samlesbury, Bagilt Road, Holywell, Flintshire.

Region 12.—East Scotland. A. G. Anderson (GM3BCL), "Helford," Pitfodels, Aberdeen.

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 (G131WD), 54 Kingsway Park, Cherryvalley, Belfast.

Region 16.—East Anglia. H. H. Lowe (G2HPF), "Akabo," Main Road, Boreham, Chelmsford, Essex.

Region 17.—Southern. M. P. Nicholson (G2MN), 80 South Leigh Road, Warblington, Havant, Hants.

The annual subscription rates to the R.S.G.B. are as follows: Home Corporate Members—30/-; Overseas Corporate Members—28/- ($4 U.S. or Canadian); Associate Members under 21 years of age—15/-. Application forms may be obtained from Headquarters on request.

Current Comment

discusses topics of the day

Good Tidings

THOSE who were able to listen to the R.S.G.B. News Bulletin broadcast from GB2RS on the Sunday between Christmas and the New Year were among the first in the world to hear the good news that the Geneva Radio Conference had decided to retain all existing amateur bands. Highlights of the Conference referred to in the News Bulletin were:

- Top Band had been held against strenuous opposition from certain European countries.
- Amateurs in Czechoslovakia, Denmark, the Federal Republic of Germany and Finland would eventually be allowed to use Top Band in addition to the amateurs of those countries (including, of course, the United Kingdom) who are currently privileged to use that band.
- Proposals to reduce the width of the 3·5 Mc/s band had been dropped as had proposals by certain European Common Market countries to use the band 29-29·7 Mc/s for their Fixed as well as their Amateur Service.
- The only significant loss amateurs in Europe will suffer is the ultimate withdrawal of the 50 kc/s between 7100 and 7150 kc/s which is now shared with Broadcasting.
- The current 14, 21 and 144 Mc/s bands will remain exclusive amateur allocations on a world-wide basis.
- In most European countries the present 420-450 Mc/s band will, ultimately, be reduced to 430-440 Mc/s but in the United Kingdom amateurs will continue to use 420-450 Mc/s on a shared basis with Radiolocation.
- The current 1215, 2300, 5650 and 10,000 Mc/s bands will remain amateur allocations but will be shared with the Radiolocation Service.
- In the United Kingdom amateurs will be allowed to use the band 3400-3475 Mc/s, as well as an entirely new band, 1000 Mc/s—yes, 1000 Mc/s—wide between 21,000 and 22,000 Mc/s.

* * * *

Status quo having been achieved, the cynics, of which there are many, may ask, "Why was it necessary for the R.S.G.B., the A.R.R.L., the W.I.A. and the I.A.R.U. to spend large sums of money in sending representatives to Geneva?" The simple answer is that if the Amateur Radio movement had *not* been fully represented at the Conference by experienced amateurs, many of the privileges we now enjoy might well have been lost for ever.

It was fortuitous, for example, that when frequencies between 1605 and 2000 kc/s were being critically examined by Working Group 4B the two I.A.R.U. observers in attendance at the Conference at the time were both R.S.G.B. officials. Their experience and knowledge of Top Band conditions enabled them to refute, *on the spot*, certain statements made by one European delegation. If those statements had not been refuted *immediately* it is probable that the delegation concerned would have brought pressure to bear on other delegations, the result of which could have led to the deletion of the Footnote in the Frequency Allocation Table which authorizes the United Kingdom, and certain other administrations in Region I, to allocate up to 200 kc/s between 1715 and 2000 kc/s to the Amateur Service.

After Working Group 4D had agreed that the present 420-450 Mc/s band should ultimately be reduced to 430-440 Mc/s it was the R.S.G.B. representative attached to the U.K. delegation who suggested that the amateur allocation in the United Kingdom should become 420-450 Mc/s.

Prior to the Conference the Australian Government had proposed a reduction of 100 kc/s in the width of the 14 Mc/s amateur band. The fact that the proposal was withdrawn during the Conference was due in no small measure to work done behind the scenes by the W.I.A. representative attached to the Australian delegation.

The withdrawal of the proposal put forward by certain European Common Market countries to allocate the band 29-29·7 Mc/s to their Fixed as well as to their Amateur Service came about as the result of the efforts of the A.R.R.L. representatives attached to the United States delegation.

The decision to allow United Kingdom amateurs to use the band 3400-3475 Mc/s came about after an informal discussion between a member of the I.A.R.U. team of observers and members of the United Kingdom delegation.

* * * *

The enthusiasm with which official delegates of the United Kingdom, the United States, New Zealand, Canada, South Africa and many other countries referred to the value and importance of the Amateur Radio movement provided one of the most pleasant features of the Conference. For those who were charged with the responsibility

of safeguarding the interests of the Amateur Radio movement, it was heartening to know that the Chairman of the whole Conference (Mr. Charles Acton) and one of his two Vice-Chairmen (Mr. Juan Autelli) are active radio amateurs.

Throughout the Conference the Leader (Captain C. F. Booth, C.B.E.) and members of the United Kingdom Government delegation rendered most valuable assistance to the I.A.R.U. team of observers, whilst the Society's own representative on the delegation (Mr. L. E. Newnham, B.Sc., G6NZ) received much encouragement from his colleagues.

* * * *

Notwithstanding the very satisfactory state of affairs reflected in the above remarks and in the report of the Conference published in this issue, a number of Conference features will call for the utmost vigilance in the months that lie ahead. Consider, for example, the power wielded, through the medium of the ballot box, by the new and developing nations, of which at least 30 can be named. Those 30 nations, many of which are still in the very earliest stages of an independent existence, are anxious to achieve equality, or near equality, in the field of radio communications with the more senior Member nations in the International Telecommunication Union.

Before the Conference commenced it was obvious to all who could read the signs that India and a number of other developing nations were anxious to extend their high frequency broadcasting services in the region of 7 Mc/s even if it meant wholesale reductions in the allocations to other services. That the Amateur Service lost only 50 kc/s between 7100 and 7150 kc/s is something of a miracle bearing in mind the efforts that were made to turn over the whole of the present amateur allocation to the Broadcasting Service. The fact that those efforts did not succeed was due in large measure to the uncompromising attitude of the United States delegation who stubbornly resisted every attempt to reduce the width of the 300 kc/s band which is currently allocated to the Amateur Service in Region II (North and South America). However, it would require a brave man to forecast what is likely to happen to the 7 Mc/s amateur band at the next Radio Conference. What *is* known is that the Geneva Conference decided to set up a Panel of Technical Experts to examine the whole of the frequency requirements between 4 and 27·5 Mc/s. It is early days to say what the Panel is likely to achieve but it is certain that the demands of the new and developing countries, especially in the field of h.f. broadcasting, will come under critical survey.

* * * *

The Geneva Conference has shown clearly that the Amateur Radio movement is held in high esteem by the vast majority of the nations of the world. Certain countries are, however, still very much in the dark about the importance of Amateur Radio whilst others who should know better are inclined to regard the movement with suspicion.

A strong I.A.R.U. Member Society in every country is the only effective way of overcoming ignorance and combating suspicion of Amateur Radio. Food for thought—nearly 90 nations were represented at the Geneva Radio Conference; National Amateur Radio Societies exist in less than 60 of them! —J.C.

Top Band Users—Avoid these Frequencies

READERS who use Top Band should take very great care to avoid causing interference to ships and shore stations.

For the information of amateurs using the band the following is a list of frequencies in use by the Maritime Service:

Frequency	*Name of Station or Service*
1806 kc/s	Lynby
1813 kc/s	Blavand
1827 kc/s	Wick and Folkestone
1834 kc/s	Niton
1834 kc/s	Thyboroen
1841 kc/s	Cullercoats and Land's End
1848 kc/s	North Foreland and Oban
1855 kc/s	Ilfracombe, Stonehaven and Newhaven
1856 kc/s	Stonehaven
1869 kc/s	Humber
1883 kc/s	Portpatrick
1911 kc/s	Land's End, Niton and Seaforth
1925 kc/s	Land's End, Niton and Seaforth
1950 kc/s	Loran
1953 kc/s	British Ships
1960 kc/s	French Ships
1974 kc/s	Dutch Ships
1981 kc/s	British Ships
1988 kc/s	Danish Ships to Skagen Radio
1995 kc/s	Danish Ships to Roenne Radio
1998 kc/s	Dutch Ships

The following frequencies should also be avoided: 1857, 1890, 1930 and 1940 kc/s.

Watch Your Calling Procedure

IN a recent interference investigation the Post Office was put to considerable unnecessary trouble because the amateur concerned did not properly transmit the call-signs allotted to his own and to the called stations. The prefix " G " and the numeral were almost invariably omitted. When the letters " EE " occurred in the call-sign of the called station they were referred to as " double E." In consequence the interference was reported as being caused by a station in contact with a station containing the letter " W " in its call-sign.

The Postmaster-General takes a serious view of any breach of licence conditions, of which the foregoing is an example. The Post Office has, therefore, requested the Society to draw the attention of members to the provisions of Clauses 9 and 5 of the Amateur (Sound) and Amateur (Sound Mobile) Licences respectively and to the warning contained in Note (h) of the main licence.

More Intruders Cleared from an Exclusive Amateur Band

LAST September the Organizer of the R.S.G.B. Intruder Watch reported to Headquarters that interference was being caused to amateur stations working in the 7 Mc/s exclusive amateur band. The stations in question were suspected to be American-operated.

As the result of Post Office monitoring, the stations, which signed " Solicit 5 " and " Solicit 6," were located and action taken by the U.S. Forces to clear them out of the amateur band.

Another station signing " Outlook Able " was heard by the Intruder Watch on 7039 kc/s but was not heard by the Post Office monitors on any amateur frequency.

Geneva Radio Conference*

Status Quo maintained on all bands except 7 Mc/s
50 kc/s lost to Broadcasting between 7100 and 7150 kc/s

By JOHN CLARRICOATS, O.B.E. (G6CL)†

THERE is an old saying " Never trust Dame Rumour." For the past five months certain misguided radio amateurs, with a kink for the sensational, have been spreading or repeating rumours about reductions in this or that amateur allocation. How red will be their faces when they learn that the Geneva Radio Conference decided to retain every current amateur band! The only real loss has been 50 kc/s between 7100 and 7150 kc/s to Broadcasting in Regions I and III. *Any* cut in amateur frequencies is to be deplored but bearing in mind that the band 7100-7150 kc/s has, for the past 10 years, been shared with Broadcasting, the loss of 50 kc/s cannot be regarded, in the light of all the facts, as being as disastrous as at one time seemed likely.

Looking back over the events that took place in Geneva during the four months that elapsed between the opening of the Conference on August 17, 1959, until the closure on December 21, 1959, it is proper to record that on every suitable occasion Government delegates spoke in high praise of Amateur Radio and of the work done by amateurs, especially during times of emergency. Contributions made by amateurs during the I.G.Y. and in the development of the very-high and ultra-high frequencies were also referred to on a number of occasions.

The fact that the Chairman of the Conference (Mr. Charles Acton, of Canada) and one of his two Vice-Chairmen (Mr. Juan Autelli of Argentina) are active amateurs meant that right at the top were men who had practical knowledge of Amateur Radio. Altogether nearly 100 licensed radio amateurs were present at the Conference, many of them in key positions in their respective delegations.

With one outstanding exception (Sweden) the top-line European countries were friendly towards the amateur movement. Three or four delegations from countries in which Amateur Radio is not encouraged and in which there is no I.A.R.U. Member-Society, were opposed to certain proposals affecting amateurs, but it is very difficult to understand why Sweden appeared to be so anti-amateur, because S.S.A. has for many years worked closely with the Swedish licensing authorities. On the whole the U.S.S.R. and other countries in the Soviet bloc were in favour of maintaining status quo on all amateur bands except, perhaps, 7 Mc/s.

At no time prior to, or during, the Conference did it seem that any serious attack would be made on the main DX bands (14, 21 and 28 Mc/s) but there were signs that Top Band (1·8 Mc/s) and 7 Mc/s would present problems. The pre-Conference position in respect to the 3·5 Mc/s band was made a little confusing because there was a U.S.S.R. proposal in the " yellow book " to reduce the width of the band by one half but as will be seen later on that danger soon disappeared.

It is now proposed to consider each band in turn and to comment briefly on the final position.

Top Band (1·8 Mc/s)

In so far as the Amateur Service is concerned Top Band is *not* a shared allocation in Region I, but the Atlantic City Radio Regulations authorize the United Kingdom and seven other administrations in Region I* to assign up to 200 kc/s between 1715 and 2000 kc/s to the Amateur Service provided the mean power of any amateur station does not exceed 10 watts and no harmful interference is caused to the authorized services of other countries. In Region I the band 1605-2000 kc/s is allocated to the Fixed and Mobile (other than Aeronautical Mobile) Services, and it therefore came as no surprise to find at Geneva that certain countries, particularly Sweden, were opposed to the idea of amateurs being allowed to continue to use frequencies in that band. Fear was expressed that amateur transmissions might cause interference to vital marine services. Denmark too was initially concerned on the same score but later in the Conference the Danish delegation decided to associate them-

* This report has been sent to all I.A.R.U. member societies in Region I.

† *Leader of the I.A.R.U. team of observers at the Geneva Radio Conference, General Secretary, R.S.G.B.*

* Austria, Ireland, the Netherlands, Switzerland (in Europe), Northern Rhodesia, Southern Rhodesia, the Union of South Africa (in Africa).

GENEVA RADIO CONFERENCE 1959

Frequencies allocated to the Amateur Service

Frequency band in Mc/s	Primary allocation	Secondary allocation	Area to which amateur allocation applies
1·715 — 2	Fixed Mobile		Region I.—Austria, Czechoslovakia, Denmark, Finland, Ireland, Netherlands, F.R. of Germany, Rhodesia and Nyasaland, United Kingdom, Switzerland, Union of South Africa and Territory of S.W. Africa (200 kc/s maximum to Amateur Service. Mean power not to exceed 10 watts).
1·8 — 2	Amateur Fixed Mobile Radionavigation		Regions II and III
3·5 — 3·8	Amateur Fixed Mobile		Region I
3·5 — 3·9	Amateur Fixed Mobile		Region III.—Australia 3·5–3·7 Mc/s; India 3·89–3·9 Mc/s
3·5 — 4			Region II
7 — 7·1	Amateur		All Regions
7·1 — 7·3	Amateur		Region II
14 — 14·35	Amateur		All Regions
21 — 21·45	Amateur		All Regions
26·96 — 27·23	Industrial, Scientific and Medical	Amateur	Region II, Region III.—Australia and New Zealand only *
28 — 29·7	Amateur		All Regions
50 — 54	Broadcasting		Region I.—Rhodesia and Nyasaland, Belgian Congo and Ruandi, Union of South Africa and Territory of S.W. Africa
50 — 54	Amateur		Regions II and III
144 — 146	Amateur		All Regions
146 — 148	Amateur		Regions II and III

* Not an amateur allocation, but amateurs in Region II (North and South America) and in Australia and New Zealand may use the frequency 27,120 kc/s ± 0·6 per cent, which is designated for industrial, scientific and medical purposes.

selves with the United Kingdom and the other countries who were anxious to allow amateurs to continue to use frequencies in that band.

At one period of the Conference it seemed that Sweden might be able to enlist sufficient support from other European countries for a proposal to delete the Atlantic City footnote (No. 145) but following some intensive behind-the-scenes activity by members of the I.A.R.U. team of observers the position was retrieved, with the result that, instead of losing the authority of the footnote, *no less than another five countries* in Region I asked to be associated with the eight countries who are referred to in the Atlantic City regulations. It now means that in Austria, Czechoslovakia, Denmark, Finland, Ireland, the Netherlands, the Federal Republic of Germany, Rhodesia and Nyasaland, the United Kingdom, Switzerland, the Union of South Africa and the Territory of South West Africa (all in Region I), administrations may assign up to 200 kc/s to their Amateur Service within the band 1715-2000 kc/s. Originally Greece and Yugoslavia had asked to be included in the new footnote but as the result of pressure from Italy (who expressed concern that amateurs might interfere with their maritime services in the Mediterranean area) they agreed to withdraw.

In order to meet objections raised by Sweden and a few other administrations the Conference agreed that, *when allocating particular frequency bands within the range 1715-2000 kc/s to their Amateur Service, administrations shall, after prior consultation with neighbouring countries, take such steps as may be necessary to prevent harmful interference from their Amateur Service to the Fixed and Mobile Services of other countries.* As at present the mean power of any amateur station shall not exceed 10 watts.

It is of interest to record that members of the I.A.R.U. team of observers present at the Conference were able to refute certain statements made by the Swedish delegation, which if they had been allowed to go unchallenged might have

GENEVA RADIO CONFERENCE 1959
Frequencies allocated to the Amateur Service

Frequency band in Mc/s	Primary allocation	Secondary allocation	Area to which amateur allocation applies
220 — 225	Amateur Radiolocation		Region I.—Rhodesia and Nyasaland
			Region II
420 — 450	Radiolocation	Amateur	Regions II and III
			Region I.—United Kingdom, 420–450 Mc/s to Amateur Service on secondary basis
430 — 440	Amateur Radiolocation		All Regions
1215 — 1300	Radiolocation	Amateur	All Regions
			Region I.—F.R. of Germany, 1250–1300 Mc/s to Amateur Service
2300 — 2450	Fixed	Amateur Mobile Radiolocation	Region I
2300 — 2450	Radiolocation	Amateur Fixed Mobile	Regions II and III
3300 — 3500	Radiolocation	Amateur	Regions II and III
			Region I.—Austria, Israel, Netherlands, F.R. of Germany, and the United Kingdom, 3400–3475 Mc/s to Amateur Service on secondary basis
5650 — 5850	Radiolocation	Amateur	All Regions
			Region I.—F.R. of Germany, 5650–5775 Mc/s to Amateur Service
5850 — 5925	Radiolocation	Amateur	Region II
10,000 — 10,500	Radiolocation	Amateur	All Regions
			Region I.—In F.R. of Germany and in Switzerland, 10250–10500 Mc/s to Amateur Service
21,000 — 22,000	Amateur		All Regions

Region I comprises Europe, Africa and parts of Asia. Region II comprises North and South America. Region III comprises Australia, and parts of Asia not in Region I.

led other delegations to believe that radio amateurs were causing considerable interference to shipping in the North Sea and Baltic. Official statements and editorial comments published in the R.S.G.B. BULLETIN were submitted in support of the case for " status quo."

The position in Regions II and III remains unchanged except that in Region II (the Americas) the Loran System of Air Navigation has priority over the Amateur, Fixed and Mobile Services. These services may use any frequency in the band 1800-2000 kc/s provided they do not cause harmful interference to Loran.

3·5 Mc/s

Prior to the Conference the U.S.S.R. had tabled a proposal to reduce the width of the present band (3500-3800 kc/s) by one half. It came as a relief to the amateur representatives when the U.S.S.R. spokesman announced in Sub-Committee 4B (studying 10 kc/s to 4 Mc/s) that his Government did not intend to follow up that proposal. Thus in Region I the band 3500-3800 kc/s will continue to be shared by the Amateur, Fixed and Mobile (except Aeronautical Mobile) Services. In Australia the band 3500-3700 kc/s will be allocated exclusively to the Amateur Service, whilst India will allocate only 10 kc/s (between 3890 and 3900 kc/s) to amateurs. In Region II the Amateur, Fixed and Mobile Services will continue to share the band 3500-4000 kc/s. In Region III (except in Australia and India) the band 3500-3900 kc/s will continue to be shared by the Amateur, Fixed and Mobile Services.

7 Mc/s

For the past ten years amateurs in Region I have enjoyed

an " exclusive " allocation between 7000-7100 kc/s and have shared 7100-7150 kc/s with Broadcasting. It became apparent almost from the start of the Conference that a group of new and developing nations, to a grand total of about 30, had been casting envious eyes on the whole of the amateur allocation around 7 Mc/s. Their contention was that in order to provide an adequate national as well as an international high frequency broadcasting service, frequencies in the 7 Mc/s range must be made available to those nations that have recently achieved independence or have made rapid development. The delegate of Pakistan on one occasion stated quite bluntly that his Government would continue to operate broadcasting stations " off band " (i.e., between 7000 and 7100 kc/s) unless the Conference agreed to allocate more frequencies to h.f. broadcasting. A somewhat bitter argument developed in Committee 4, with India leading an attack on the whole of the 7 Mc/s amateur allocation, and the United States, backed up by many other delegations, standing firm against any change whatsoever. Finally, after a series of rather acrimonious discussions it was decided that the Amateur Service should operate exclusively between 7000 and 7300 kc/s in Region II (North and South America) and that in the rest of the world the band 7100-7300 kc/s should be allocated to Broadcasting. In South Africa and the Territory of South West Africa, however, the band 7100 to 7150 kc/s is to be allocated alternatively to the Amateur Service.

Following the decisions recorded above, a resolution was adopted which states that inter-regional amateur contacts should be only in the band 7000-7100 kc/s and that administrations should make every effort to ensure that the Broadcasting Service in the band 7100 to 7300 kc/s in Regions I and III does not cause interference to the Amateur Service in Region II. It was further resolved that the Broadcasting Service should be prohibited from the band 7000-7100 kc/s and that broadcasting stations operating on frequencies in this band should cease such operation. The United States delegation made a bold bid to introduce into the resolution a paragraph to the effect that the new arrangements would not operate until the International Frequency Registration Board (I.F.R.B.) had notified all Members of the Union that the band 7000-7100 kc/s was completely clear of broadcasting stations. The proposal after being hotly debated in Committee 4 was defeated, after a roll-call vote, by three votes (25 to 22) with six abstentions. It is important to record that the vote of the most recently accepted " new " Member nation ranked equal to the vote of any one of the more senior Member nations.

During the Conference it was repeatedly urged that steps should be taken at an early date to carry out a comprehensive review of all frequency allocations and requirements between 4 Mc/s and 27·5 Mc/s. After much discussion in Committee 4 and later in Plenary Meetings, it was agreed to set up a Panel of Technical Experts to undertake this work. The terms of reference state, *inter alia*, that the Panel will determine those categories of use of the high frequency radio spectrum which could be satisfied by means other than the use of radio frequencies between 4 and 27·5 Mc/s and analyse the implications of utilizing the " other means " from technical and practical aspects giving particular attention to the economic consequence. The deliberations of this Panel of Experts will be watched with interest by amateurs who use the 7, 14 and 21 Mc/s bands.

14 Mc/s

Status quo has been maintained for the Amateur Service on a world-wide basis for the band 14-14·35 Mc/s. Originally Australia had proposed that the band should be reduced by 100 kc/s to 14-14·25 Mc/s but thanks to yeoman work behind the scenes by John Moyle, VK2JU (who represented the Wireless Institute of Australia on the Australian Delegation) the proposal was withdrawn in the Sub-Committee stage.

In Region I the existing footnote which permits the U.S.S.R. to operate stations in the Fixed Service between 14·25 Mc/s and 14·35 Mc/s was retained.

21 Mc/s

Status quo has been maintained for the Amateur Service on a world-wide basis for the band 21-21·45 Mc/s.

28 Mc/s

Prior to the opening of the Conference several European Common Market countries had given notice of their intention to propose that stations in their respective Fixed Services should be permitted to operate between 29 and 29·7 Mc/s. The I.A.R.U. team of observers made strenuous efforts to persuade the delegations concerned to withdraw the proposal but not until a late stage in the Conference was it dropped. When this happened it meant that status quo had been maintained for the Amateur Service on a world-wide basis for the band 28-29·7 Mc/s.

50 Mc/s

Because of Television Broadcasting requirements around 50 Mc/s no proposals were made by European countries in Region I to allow amateur operation at this part of the spectrum. However, in the African part of the Region, Rhodesia and Nyasaland, the Belgian Congo, the Union of South Africa and the Territory of South West Africa amateur operation will be permitted between 50 and 54 Mc/s. Amateurs in Regions II and III will continue to use this band on an exclusive basis.

144 Mc/s

Status quo has been maintained for the Amateur Service on a world-wide basis for the band 144-146 Mc/s. In Regions II and III amateurs will continue to use the band 146-148 Mc/s on an exclusive basis, except that as from July 1, 1963, Australian amateurs will use 148-150 Mc/s instead of 144-148 Mc/s.

220 Mc/s

The band 220-225 Mc/s will continue to be allocated to the Amateur Service in Region II but its use will be shared with the Radiolocation Service. The band will also be available to amateurs in Rhodesia and Nyasaland but to no other country in Regions I and III. The band has never been allocated generally to the Amateur Service in these two Regions.

430 Mc/s

When this band was first discussed in Committee 4D several European countries, notably Sweden and Switzerland, objected to the proposal that the present world-wide allocation of 30 Mc/s between 420-450 Mc/s to the Amateur and Aeronautical Radionavigation Services, should be allowed to continue. After much discussion it seemed probable that a Swiss proposal to reduce the band to 432-438 Mc/s (thereby providing harmonic relationship with the 144-146 Mc/s band), would be accepted but at a later stage, it was agreed that the band should extend from 430-440 Mc/s in Region I with the Radiolocation Service sharing the allocation. In the United Kingdom, however, the band 420-450 Mc/s will be allocated to the Radiolocation Service on a primary basis and to the Amateur Service on a secondary basis. In Regions II and III the band 420-450 Mc/s will be allocated to the Radiolocation Service and the Amateur Service, the latter service on a secondary basis. Radio altimeters may be temporarily employed additionally in the band 420-460 Mc/s until they are moved to a band allocated to the Aeronautical Radionavigation Service or until they are no longer necessary.

1215 Mc/s

Status quo has been maintained for the Amateur Service on a world-wide basis for the band 1215-1300 Mc/s except that in future the band will be shared with the Radiolocation Service, which will have priority over the Amateur Service.

In the Federal Republic of Germany the band 1250-1300 Mc/s will be allocated to the Amateur Service on an exclusive basis.

2300 Mc/s

Status quo has been maintained for the Amateur Service on a world-wide basis for the band 2300-2450 Mc/s except that in future the band will be shared with the Fixed, Mobile and Radiolocation Services. In Region I the Fixed Service is to be the primary service. The Radiolocation Service is to be the primary service in Regions II and III. In the Federal Republic of Germany the band 2300-2350 Mc/s will be allocated to the Amateur Service; the Amateur Service will be excluded from the band 2350-2450 Mc/s.

3300 Mc/s

In Regions II and III the band 3300-3500 Mc/s will be allocated to the Radiolocation and Amateur Services with the former as the primary service.

In Region I the band 3400-3475 Mc/s will, as the result of discussions between members of the I.A.R.U. team of observers and representatives of the United Kingdom delegation, be allocated on a secondary basis to the Amateur Service in the United Kingdom. Austria, the Federal Republic of Germany, Israel and the Netherlands subsequently agreed to permit amateurs to use that band.

Frequencies around 3400 Mc/s have not previously been available to amateurs in Region I.

5650 Mc/s

Status quo has been maintained for the Amateur Service on a world-wide basis for the band 5650-5850 Mc/s except that in future the band will be shared with the Radiolocation Service, the latter service having priority. In Region II the band 5850-5925 Mc/s will be shared by the Radiolocation and Amateur Services, with the former service having priority.

In the Federal Republic of Germany the band 5650-5775 Mc/s will be allocated to the Amateur Service and the band 5775-5850 Mc/s to the Fixed Service.

10,000 Mc/s

Status quo has been maintained for the Amateur Service on a world-wide basis for the band 10,000-10,500 Mc/s except that in future the band will be shared with the Radiolocation Service, the latter service having priority. However, in the Federal Republic of Germany and in Switzerland only the band 10,250 to 10,500 Mc/s will be allocated to the Amateur Service.

21 Gc/s

The band 21-22 Gc/s (21,000-22,000 Mc/s) has been assigned to the Amateur Service on a world-wide basis.

Frequencies in this band have not hitherto been available to amateurs.

Frequency Allocation Table

A table showing the major allocations to the Amateur Service appears on pages 298 and 299 of this issue. It has not been possible to include all the footnote information but this can be deduced from the foregoing survey of the Geneva Radio Conference decisions.

Radio Regulations

The Atlantic City Convention definitions of "Amateur Service" and "Amateur Station" have been maintained without any alteration. A proposal by the Argentine to amend the definition of "Amateur Service" came before the Conference but as the result of discussions between a member of the I.A.R.U. team of observers and a representative of the Argentine delegation it was withdrawn. The proposal was to define the Amateur Service as an "activity" rather than as a "service."

Atlantic City Article 42, which deals with Amateur Stations, has been left unchanged except that in future administrations may, if they so wish, waive the Morse Code requirement for those who intend to operate exclusively on frequencies above 144 Mc/s. The present limit is 1000 Mc/s, although it is known that certain administrations, including the United Kingdom, have worked to a lower figure. The Australian administration asked for the figure to be reduced to 50 Mc/s but after discussion at a Plenary meeting the compromise figure of 144 Mc/s was accepted in place of 250 Mc/s which figure had been adopted earlier in Committee 4. Article 42 now becomes Article 41.

The Q Code has been very extensively modified and extended. Of interest to amateurs is the decision to qualify degrees of Interference (QRM) and Static (QRN) by adding a numeral (1 to 5). For example, QRM 1 will indicate that there is no interference whilst QRM 5 will indicate that interference is extremely bad.

The QRK abbreviation has also been amended to qualify degrees of Intelligibility from QRK 1 (Bad) to QRK 5 (Excellent).

Further details of the amendments and additions to the existing Q Code will be reported upon later.

The I.A.R.U. Team

The I.A.R.U. team of observers consisted of the following:

John Clarricoats, O.B.E., G6CL,
General Secretary, Radio Society of Great Britain (Leader); Secretary, Region I Executive Committee.

Per-Anders Kinnman, SM5ZD,
Vice-Chairman, Region I Executive Committee; Past President, S.S.A. (Sweden).

Otfried Luhrs, DL1KV,
Member Region I Executive Committee.

Win Dalmijn, PA0DD,
Past Member, Region I Executive Committee.

Arthur O. Milne, G2MI,
Past President, R.S.G.B.; Past Secretary, Region I Executive Committee.

Harry Laett, HB9GA (Chairman of the Region I Executive Committee) was also present at the Conference for short periods as a member of the Swiss delegation.

I.A.R.U. observers were in attendance for approximately 12 weeks between the opening of the Conference on August 17, 1959, and the closing of the Conference on December 21, 1959.

The members of the I.A.R.U. team record their appreciation of the many kindnesses shown to them collectively and individually by Government delegates and officials of the I.T.U. Secretariat.

Conclusion

It has not been possible in this Report to deal fully with all aspects of the Geneva Radio Conference as they affect the Amateur Service but sufficient has been written to show that the Amateur Radio movement is held in high esteem in almost every part of the world. The few exceptions are those countries who for one reason or another have not yet fully appreciated the value of Amateur Radio.

Geneva Radio Conference Effective Date

The Geneva Conference Radio Regulations are due to come into force on May 1, 1961. Radio amateurs must, however, wait until they are officially notified by their licensing authorities before acting upon any of the new Regulations.

Sophisticated Sideband

A Pipedream of the Amateur Bands of the Future

By C. W. CRAGG, A.M.I.E.E. (G2HDU)*

NO ONE nowadays is likely to dispute the advantages of s.s.b. but something is never obtained for nothing, and in this case the disadvantages are mainly on the receiving side. The tuning of a receiver to an s.s.b. signal must be much more precise than for ordinary a.m.; consequently to search a band for s.s.b. signals takes considerably longer than a similar band of a.m. signals.

Most text books say that all the intelligence of a normal a.m. transmission is contained in the sidebands and that the carrier does not convey any information. This is not absolutely true. In fact, the carrier conveys a very important piece of information: it indicates the frequency on which the

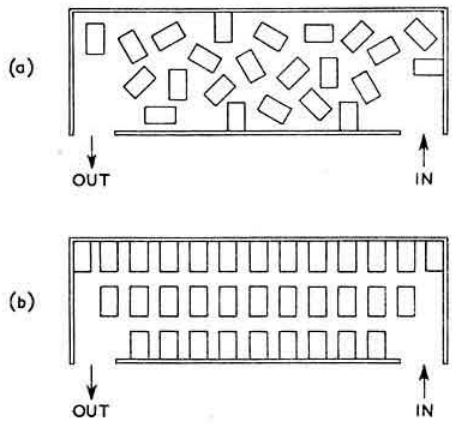


Fig. 1 (a). Joe Clott's Car Park. Drive right in and park where you like! (b). Willie Wise's Car Park. Please keep to the white lines!

sidebands are based. Without it, the operator is groping in the dark, trying to find the key frequency which makes the signal intelligible. More often than not, just as it is found the transmitting operator ceases to speak, and then neither carrier nor sideband is available on which to tune, until he starts to speak again. In addition there is the interference problem—trying to tune in an s.s.b. signal which is being interfered with by another s.s.b. transmission can be even more frustrating. By failing to transmit at least some pilot carrier, s.s.b. operators are cheating us of the vital piece of information which would make reception of their signals easy.

The way the bands are occupied at present makes a pilot carrier objectionable, due to heterodyne interference, but with the plan to be outlined much of this interference would be reduced, if not eliminated completely. Another disadvantage in tuning s.s.b. signals at the present time is the queer "Donald Duck" noises which make it almost unbearable for others in the room; it must be remembered XYL objections usually carry some considerable force.

The author believes that the following suggestions would help to combat QRM by a more sensible use of frequencies, would carry s.s.b. working one stage further, and enable s.s.b. signals to be tuned in even more quickly than a.m. signals are tuned by present methods of working.

* 292½ Hatherley Road, Cheltenham, Glos.

If you owned a car park and wanted to pack in as many vehicles as possible (without piling them on top of one another) what would you do? Would you let them drive in and park anywhere, as in Fig. 1(*a*)? Or would you draw a set of white lines and have them sit nicely side by side as in Fig. 1(*b*)? At the present time we are using our frequency allocations as economically as the attendant in Fig. 1(*a*). We just drive into the band and park anywhere, because there are no lines to guide us. It is time we used a little common sense and drew ourselves a set, and achieved something like Fig. 1(*b*).

As mentioned previously, an s.s.b. signal without carrier lacks the vital piece of information for easy tuning: if, however, it were previously known, this piece of information would not need to be sent over the air. The author's suggestion therefore is that the telephony portions of each amateur band be *voluntarily* divided into a number of known channels, each just wide enough to take a sideband (2·5 kc/s channel width is suggested). This kills two birds with one stone: it permits the close spacing of signals without overlap and it ensures that we already know the carrier frequencies, which need not therefore be transmitted.

The Ultimate Band-plan

Let us consider the QRM aspect first. Fig. 2(*a*) shows a small section of an amateur band. Three signals A, B and C are on arbitrary frequencies, and do not cause one another any trouble, but this does not last very long. Operator D decides to settle between A and B but the spacing between A and B is insufficient, so that D causes interference to both signals, and moreover suffers interference in return.

What happens if we "channelize" the band? Fig. 2(*b*) shows this new condition. B and C have moved on to their correct channels and leave room between A and B for D. Although no more frequency space is available, it is used fully, and everybody reaps the benefit. This type of working is not limited to s.s.b. but can be used for a.m. also, but each a.m. signal will occupy two channels instead of one.

Having filled our piece of band with four signals, what if another should arrive? With the present system he will QRM at least two signals (unless he happens to come up zero beat with one by coincidence), but with the channelled system he will only interfere with one other signal. Again a *reduction in the number of spoiled QSOs* has been achieved.

From the operating point of view Amateur Radio can

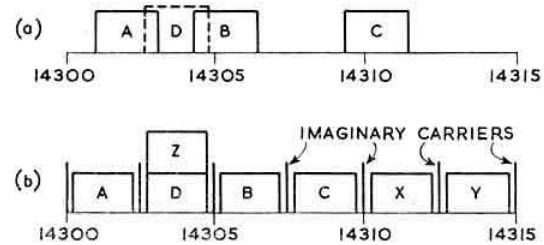


Fig. 2 (a). With arbitrary channel spacing signals frequently overlap while gaps are left elsewhere in the band. A, B, D all suffer QRM. (b). Proper channelling, showing the carrier frequencies (not necessarily transmitted). The interfering signal "Z" now only QRMs one and not two other signals.

only gain by the adoption of this system of channelling. The broadcasting stations did it years ago. Why has Amateur Radio lagged? The bands have already been voluntarily divided into c.w. and telephony sections; why not go a step further. The system might well be called c.s.b. (channelled sideband) or c.a.m. (channelled a.m.). All amateurs, in their own interests should sign a pledge to operate only on multiples of 2·5 kc/s throughout our frequency bands if they want to reduce QRM.

Technical Requirements

There are two technical requirements to achieve the channelling of the bands: (i) bandwidth of the signal radiated, and (ii) frequent stability, or accuracy of position of the channels within the band.

The bandwidth requirement is fairly easily disposed of; in fact many amateur transmitters and receivers already comply with this requirement. A small spacing between channels is necessary to allow for transmitter frequency tolerances, and because it is not yet possible to design i.f. filters with perfectly vertical skirt response. Assuming a channel spacing of 2·5 kc/s as mentioned previously, it would seem reasonable to transmit audio frequencies between 300 c/s and 2200 c/s. This gives a 600 c/s separation between channels. The i.f. bandwidth of the receiver should be 1·9 kc/s, and the skirts should be well down (say 30-40db) at a bandwidth of 2·5 kc/s, and about 60db down at 3·1 kc/s. The transmitter audio response should be reasonably flat from 300-2200 c/s, well down at 2·5 kc/s, and falling fairly steeply below 300 c/s. These requirements are not too difficult to meet in present day amateur practice.

The positioning of the channels (the " white lines ") is a rather tougher proposition, but as an initial step, with our present v.f.o.s, if we all agreed to use only carrier frequencies as nearly as possible on the 2·5 kc/s channels (i.e. within, say, half a kilocycle), the author believes a good deal of QRM would be alleviated. We should try to operate as nearly as possible on 14,300, 14,302·5, 14,305, 14,307·5 kc/s, etc., and not between these frequencies (and similarly on the other bands).

However, this would only be a starting point, and would not help much with the s.s.b. tuning problem. The present suggestion goes rather further. The tuning accuracy with which the carrier must be injected to an s.s.b. signal is within about 30 c/s for intelligible communications quality. If, therefore, the transmitter carrier frequencies could be guaranteed to be on the channel frequencies within this degree of accuracy, the normal receiver tuning control could be dispensed with, and a switched tuning arrangement adopted. Each channel would then be on tune right away, without any fiddling around to find the correct frequency to re-insert. In fact the receiver could be stepped to each channel in turn by automatic means, and arranged to stop when an occupied channel is found. A fine trimmer control could be provided for the purist who wants his tuning exact but it need only have a range of some 30 c/s.

Can this order of frequency control be achieved on the bands up to 30 Mc/s, without too much trouble? The author believes it can, and if it is achieved the main argument against radiating a pilot carrier on s.s.b. is removed, since adjacent carriers would fall well down the receiver response curve. The pilot carrier would then give something to tune receivers on. However, it is proposed to proceed on the assumption of no radiated carrier.

If the frequency tolerance is divided between the transmitting and receiving end, this gives plus and minus 15 c/s, or about one part per million on 14 Mc/s, and one part in two million on 28 Mc/s.

Some Suggestions for Equipment Design

The first thing to be done is to find some standard of frequency (its actual frequency is of secondary importance), and then derive the required channel frequencies from it. Finding the standard will be easy for those who can always rely on receiving a good signal from WWV or MSF (5 parts in 10^9), or Droitwich on 200 kc/s (5 parts in 10^8).

If a frequency standard cannot be borrowed in this way, we must make our own, and check it periodically against the primary standard. In other words, a short-term stability over a period of a few hours only is required. A stable crystal oscillator, with regulated power supply, and probably with an oven will be necessary. It would not be too difficult for the amateur to build his own oven, having bought a suitable crystal for the job. These crystals are not as expensive as might be thought, and a list of some current production crystals suitable for this purpose is given at the end of this article. One of these needs no oven at all (though an oven would undoubtedly increase its stability), and others have quick heating ovens which are up to temperature and stable within about 30 minutes. If this is not considered satisfactory, it may be necessary to run the oscillator continuously, in which case a transistor oscillator would be very helpful in the matter of power consumption. There is available to most amateurs a constant temperature region where the transistor oscillator may be left to run *ad infinitum*, and it costs nothing but a little sweat. I refer to a hole in the ground about three feet deep, where there is very little change in temperature from summer to winter. In *Tele-Tech & Electronic Industries*, the American magazine, for March 1953, a transistor crystal oscillator operating on 100 kc/s was described. With a stability of three parts in a thousand million per day, it operated for five years continuously from a single mercury cell. Its output was four-fifths of a volt.

Having obtained a standard of frequency, how can the actual frequencies required for our amateur receivers and transmitters be derived? Several well-known processes are available; frequency multiplication, frequency division, frequency addition or subtraction by mixing, and frequently locking. In all these processes the thing to be guarded against is the generation of spurious frequencies, which must be adequately filtered out.

An s.s.b. design by G3CVO which only used one crystal, is particularly suitable for c.s.b. (R.S.G.B. BULLETIN January 1959, p. 349) and is shown in Fig. 3. A crystal between 4300 and 4700 kc/s is specified, and the fundamental, third and fifth harmonics are used (a push-pull multiplier here will help to keep down even harmonics). Standard crystals are available in this range.

This brings us to the v.f.o. which must be rather different from the normal type. For c.s.b. the oscillator must be locked to the standard at intervals of 2·5 kc/s. There are several ways this might be done, and there is scope for

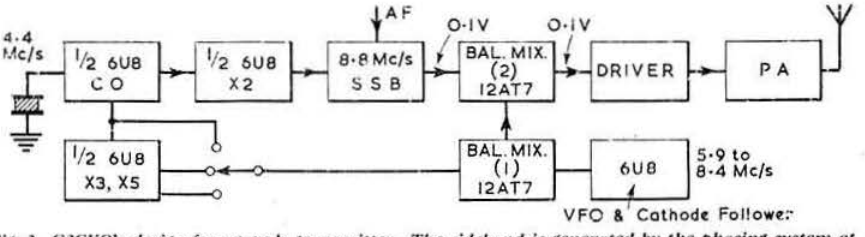


Fig. 3. G3CVO's design for an s.s.b. transmitter. The sideband is generated by the phasing system at 8·8 Mc/s.

Table I

Frequency combinations for the exciter illustrated in Fig. 3.

V.F.O. tunes	Beats with crystal harmonic	To give at output of Mix I	Which beats with 8·8 Mc/s s.s.b. to give	Relative sideband
6·1–6·4 Mc/s	4·4 Mc/s × 1	10·5–10·8 Mc/s	1·7– 2·0 Mc/s	Upper
7·9–8·4	4·4 × 1	12·3–12·8	3·5– 4·0	Upper
6·2–5·9	22·0 × 5	15·8–16·1	7·0– 7·3	Lower
8·0–7·7	13·2 × 3	5·2– 5·5	14 –14·3	Lower
7·8–8·2	22·0 × 5	29·8–30·2	21 –21·4	Upper
6·0–8·0	13·2 × 3	19·2–21·2	28 –30	Upper

Note that in all cases the mixer input and output frequencies are well separated.

amateur ingenuity in developing a simple but effective system. Whichever way may be chosen it is almost certain that a 2·5 kc/s output must be obtained from a standard. Fig. 4 shows a four-stage divider, starting with a 4·4 Mc/s crystal. The dividers may be normal locked oscillators, or regenerative types; the latter are to be preferred, since if the drive fails they give no output, whereas the locked oscillators will continue to give output on the wrong frequency. The 2·5 kc/s signal is now fed to a harmonic amplifier to produce a string of harmonics, all locked to the 4·4 Mc/s standard.

Unfortunately these harmonics cannot be used directly,

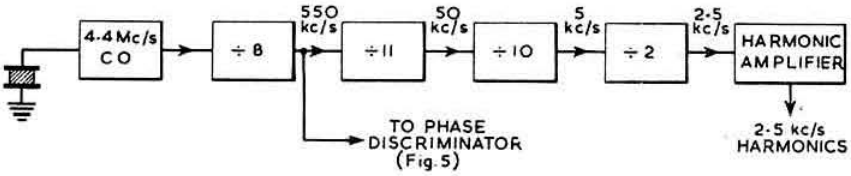


Fig. 4. Derivation of a group of 2·5 kc/s harmonics from a 4·4 Mc/s crystal oscillator.

due to the difficulty of separating adjacent ones in the frequency range needed for the v.f.o. One possible method is to use a phase-lock system as shown in Fig. 5. The train of harmonics is fed to a mixer, as also is the v.f.o. As the v.f.o. is tuned across its range it will beat with the different harmonics in turn to produce 550 kc/s output to the selective amplifier. This amplifier is well down in response at 2·5 kc/s off tune so as to reject adjacent beats and its output is fed to a phase discriminator (as used for f.m. detection). A 550 kc/s signal is also fed to the discriminator, whose output will vary in magnitude with the relative phases of the two inputs. This output is used to control

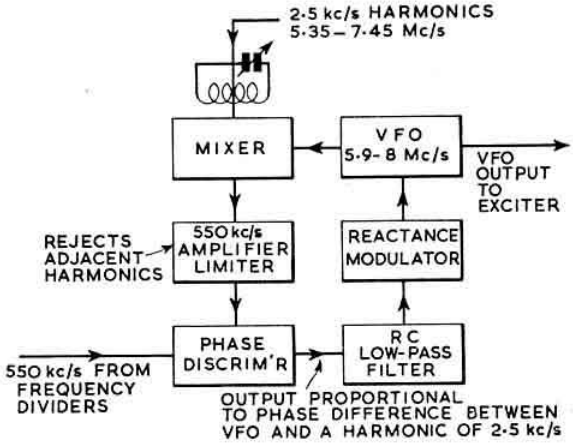


Fig. 5. A system for locking the v.f.o. to harmonics of 2·5 kc/s.

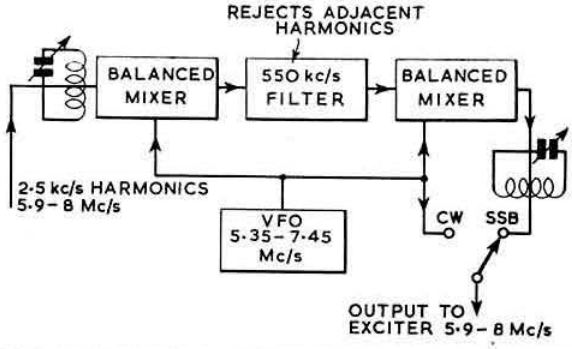


Fig. 6. Method of selecting 2·5 kc/s harmonics in the range 5·9-8 Mc/s.

a valve or junction diode type of reactance device and so control the v.f.o. that it maintains a constant phase difference with the 550 kc/s input. The v.f.o. is thus locked in frequency to the master standard. As it is tuned across its range it will step from one 2·5 kc/s channel to the next. A simple switch can disconnect the control if necessary, to work in the c.w. portion of the band. A similar arrangement could be used for the receiver v.f.o., or the same oscillator might be made to do double duty in both receiver and transmitter.

An alternative method of achieving the same result is shown in Fig. 6. The v.f.o. is merely used to beat the required harmonic down to approximately 550 kc/s, so that it may be passed through a sharp bandpass filter to reject all the other harmonics either side of it. The same v.f.o. then beats the 550 kc/s back to its original frequency for passing to the exciter. It can be seen that if the v.f.o. should drift slightly, or be set slightly off the correct frequency, there will be no change in output frequency, since the drift is first subtracted, and then added back again. It is only necessary to ensure that the drift does not go so far as to cause the 550 kc/s signal to move outside the passband of the filter. For c.w. working the v.f.o. output can be taken direct as shown.

This method is rather simpler than Fig. 5, and the only valves used are in the v.f.o., since the balanced modulators may be crystal diodes.

Summary

As amateurs we are not using the bands to anything like their fullest capacity. More efficient usage could be achieved by adopting a system of closely spaced channels instead of a haphazard distribution of signals within the bands as now.

Close control of channel frequencies would permit the use of pilot carriers in s.s.b., without heterodyne interference, since the carrier of an adjacent channel would fall 300 c/s outside the passband of the receiver. This would much simplify tuning of s.s.b. signals as the carrier gives something to tune to, even when there is no modulation.

A suggested system of very close frequency control is shown as an example of the sort of technique to be applied, but no doubt some simplification could be achieved in time as the usual amateur zeal is applied to the problem. The stepped tuning of a receiver would simplify s.s.b. reception.

It is realized that it must be some time before such a system

(*Continued on page 307*).

Technical Topics

By Pat Hawker
(G3VA)

Modern Super-Regens – Log Periodic Aerials – Sound-N-Sight – Bridge-T Filters – Low Level Clamp Modulation – D.C. Relays on A.C.

FASHIONS in circuits as well as clothes tend to run in cycles. If you keep an old design on the shack shelf long enough, who knows but what you may be able to jump on the band-waggon next time it becomes popular. Back in the thirties most of us dabbled with super-regenerative receivers and transceivers on (or somewhere near) 5m, but in the more serious forties, this interesting circuit was written off as all but useless. Yet here, with the sixties upon us, one detects some signs of a revival. Dressed up with new valves and transistors, the old-timer has started to be seen around again in the most respectable places.

The great advantage of the super-regen detector (one of the many brain-children of Major Armstrong) is the enormous gain that can be achieved in a single stage. Even in the thirties it used to be easy enough to receive American 28 Mc/s phone stations at good loudspeaker strength on a two-valve battery receiver. Disadvantages are, of course, the high interstation noise, poor selectivity, difficulty of receiving c.w., and the emission over considerable distances of a broad rough signal. The interstation noise is not—as commonly believed—the quench noise but is actually valve and circuit noise indicative of the high sensitivity. Radiation problems can be overcome by the use of a r.f. or frequency conversion stage ahead of the super-regen detector; with a transistor the power involved is small enough to dispense in many instances with these precautions. It is worth remembering that the super-regen detector will receive broadcast-type f.m. signals.

An interesting application of an advanced type of super-regen receiver is to be found in a 2m transceiver described in *CQ* (October, 1959). This has a 6AK5 r.f. stage followed by a double-triode mixer/oscillator. The oscillator is fed from a voltage-regulated source and covers 126-130 Mc/s. The mixer feeds into a fixed tuned 6C4 super-regen detector working on approximately 18 Mc/s. No ganged tuning, no i.f. alignment.

A simpler super-regen circuit turns up in the Heath CB-1 " Citizens Band " 27 Mc/s transceiver kit, reviewed in *Electronics World* (November 1959). This circuit, see Fig. 1, uses a 6AN8 triode pentode with the pentode section as an r.f. stage and the triode section as a super-regen. detector.

Fig. 2 shows the first stage of a 50 Mc/s combined transistor-valve " walkie-talkie " described by W6TNS in *Electronics World*, July, 1959. This is the old-style circuit brought up to date by the use of a SB103 surface barrier transistor (British equivalent is Semiconductors Ltd. SB346). The complete receiver includes two transistor a.f. stages using conventional junction transistors.

The super-regen circuit is not for the v.h.f. DX man—but there is plenty of room on the 70, 144 and 420 Mc/s bands for more " local " activity nets and portable and mobile operation using simple rigs.

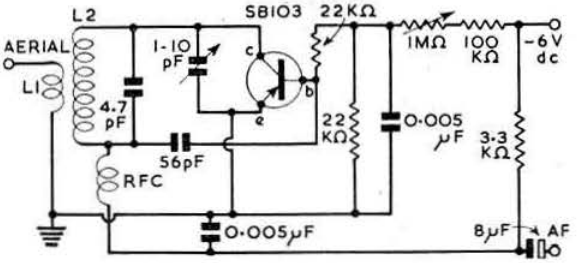


Fig. 2. Transistor super-regenerative detector forming part of W6TNS's 50 Mc/s walkie talkie. British electrical equivalent of the SB103 is the SB346.

Broadband Aerials

When we think of a multi-band aerial we normally think of one that resonates on a number of harmonically related bands. There is another approach to this problem: this is to devise an aerial which will operate over a continuous very wide band of frequencies. A good rhombic is one example; another is the " discone "—one practical design (*Radio Handbook*) covers 13-58 Mc/s with a standing wave ratio on 52 ohm feeder remaining below 1·5 throughout this range. Now a new name to conjure with is the " log periodic " aerial. In an article introducing this new family of aerials to the amateur, W1FVY (*QST*, November, 1959) explains how ten-to-one bandwidths can be obtained on one aerial (e.g. 14-144 Mc/s or 28-280 Mc/s) and gives some practical design data for fixed arrays, requiring two 30 ft., and one 15 ft., masts and without any major constructional problems. Although the main virtue of this type of aerial is its broadband feature, the design discussed provides a modest but useful 6db gain.

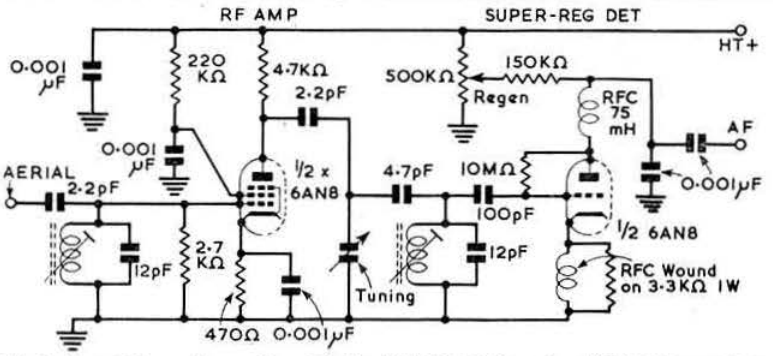


Fig. 1. Part of the receiver section of the Heathkit CB-1 Citizens Band (27 Mc/s) transceiver kit.

Sound-N-Sight

Learning Morse still remains one of the chief hurdles for every would-be amateur. Anything which can cut down the early grind is likely to be welcomed by many. A new teaching course designed to assist the rapid assimilation of the code has recently been marketed in the United States by the Rider publishing organization under the name " Sound-N-Sight," based on the principle of " reinforced learning." An independent appraisal of this system appears in the October, 1959 *Signal* (journal of the American Armed Forces Communications and Electronics Association).

The student first hears (on records) the correct Morse sounds which he writes down as dots and dashes. Three seconds later the instructor tells him what the sound pattern was in "dits and dahs." Next he learns to identify visually a letter with each signal pattern by means of identification cards. Thirdly he learns to write down the signal patterns in both dots and dashes and as a letter. After each letter the instructor gives the correct answer. Once these three steps have been mastered the student begins to receive normally at 3 w.p.m. and increases speed at 1 w.p.m. daily. It is estimated in this report that an average class should reach 13 w.p.m. in some 37 hours of instruction compared with an average speed of little more than 6 w.p.m. likely to be attained by conventional methods in the same period. Most of us, however, will probably be glad that we should never again need to put these claims to a practical test.

Bridge-T Filters

Although the normal Q-Multiplier can provide a sharp rejection notch tunable through the i.f. passband of a receiver (see, for example, G2BVN's article in the August 1959 BULLETIN) a modified arrangement used in a number of receivers (including the famous Collins 75A4) is based on the bridge-T filter.

Currently, the bridge-T filter is also widely found in television receivers as a means of providing a sound rejection

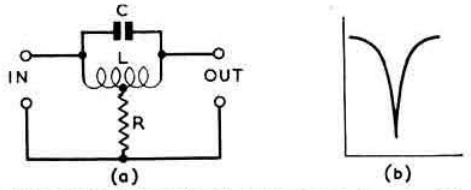


Fig. 3. Basic bridge-T filter circuit and response characteristics. The notch attenuation will be maximum when R is equal to one-quarter of the resonant impedance of LC.

notch on the vision channel. Fig. 3 (a) gives the basic bridge-T filter and Fig. 3 (b) its associated response characteristics. Fig. 4 shows how the filter is incorporated in the 75A4 with the filter effect increased by Q-multiplication. It enables a deep, sharp notch to be placed anywhere within the passband to eliminate heterodynes or other interference. Compared with the phasing notch of a conventional crystal filter, it is claimed that the T-filter causes less distortion of the i.f. response curve, thus helping to maintain good intelligibility of telephony signals.

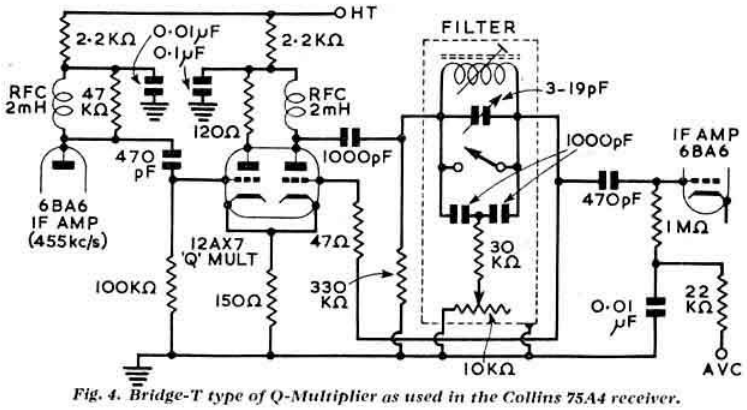


Fig. 4. Bridge-T type of Q-Multiplier as used in the Collins 75A4 receiver.

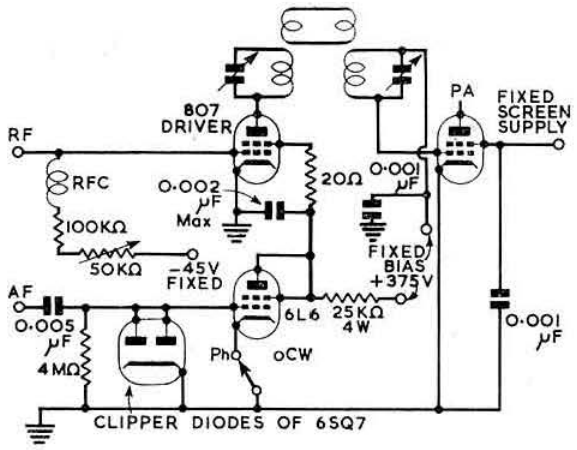


Fig. 5. W2BCV's low level clamp modulator. Key section of a kilowatt p.e.p. transmitter which uses two 4X125A valves in the p.a.

Low Level Clamp Modulation

The widespread interest aroused by G3BPM's article on "Series Gate Modulation" (BULLETIN, May, 1959) proves that there is still a demand for simple a.m. systems requiring little a.f. power. In *Electronics World*, May 1959, W2BCV shows how a single 6L6 can fully modulate a kilowatt of peak envelope power. His system is to use an adaption of the original 1950-model clamp modulator but to apply this to the *driver* stage. This would suggest that the power amplifier would have to be operated, as in s.s.b. practice, as a class B linear with its relatively low efficiency. W2BCV states that in this design, the bias potentials applied to the p.a. are those for class C c.w. operation. This is possible because the system operates as a form of efficiency modulation with the grid operating point of the p.a. being constantly changed by the modulated driver. The p.a. is normally adjusted so that the standing carrier power is about 25 per cent of the peak modulated value. Fig. 5 provides the essentials of the system, although for full adjustment procedure it would be advisable to refer to the original article.

In Brief

G4ZU writes on "The Coaxial Minibeam" in *CQ*, November, 1959, giving information on the use of a coaxial resonator with bi-nodal coupling to provide co-ax feed for his beam. . . . Information on one of the most promising valve developments in recent years—the MgO cold cathode (heaterless) valve appears in an article in *Proc.I.R.E.* (October, 1959) entitled "The magnesium oxide cold cathode and its applications in vacuum tubes." Present types are not self starting and have a tungsten filament used temporarily to start emission. A 900 mW a.f. amplifier with a cold cathode pentode-type valve in the final stage has been demonstrated. Another promising development is the R.C.A. "Nuvistors," tiny thimble-sized valves with metal or ceramic shells intended for use in communications receivers and television turrets as a means of beating transistor competition. . . . Miniaturization has reached the stage where component densities can reach 500,000 to 700,000 parts per cubic foot. . . . A two-part article on the design of transistorized d.c. to d.c. converters with complete procedures for design, with typical worked examples and

tabulated data appear in *Electronic Design* Part I (September 16, 1959); Part 2 (September 30, 1959). . . . K4ZGM describes (*CQ*, November, 1959) the construction of a signal generator covering 45-120 kc/s to facilitate alignment of the low i.f. stages of double-conversion receivers. . . . In the same issue, W4GJR advises users of vertical radiators to get busy fitting ground screens and long ground radials.

D.C. Relays on A.C.

A problem when operating or testing mobile equipment with a.c. supplies is that presented by any d.c. relays in the equipment. W5CWP provides (*CQ*, November, 1959) a simple solution in the form of a low voltage silicon diode

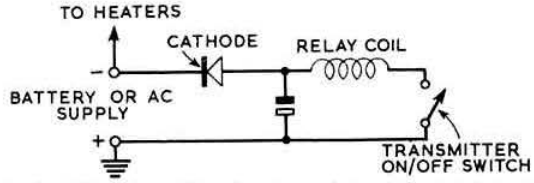


Fig. 6. W5CWP's modification for mobile equipment to permit operation from a.c. supplies. The diode can be left permanently in circuit. The d.c. potential will, to some extent, be governed by the value of the electrolytic smoothing capacitor (100-500 μF, 25 V wkg.).

rectifier (suitable inexpensive American types being Sarkes Tarzian 20K, Texas Instruments 1N2069, General Electric 1N536) and a 100-500 μF 25 volt electrolytic. Because of the very low forward resistance of the silicon rectifier, an a.c. source will provide on load a d.c. voltage of about the same value or slightly higher, allowing the relays to operate at their correct rating. A circuit suitable for positive earth systems is shown in Fig. 6.

Amateur Radio as a Hobby

ON Wednesday, February 3, 1960, Mrs. Sylvia Margolis, XYL of G3NMR, is to give a talk on Amateur Radio as a hobby in the B.B.C.'s *Woman's Hour* programme on the Home Service.

GB2RS SCHEDULE

R.S.G.B. News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	10 a.m.	London
	12 noon	Yorkshire
145·55 Mc/s	11.15 a.m.	Beaming south-east from Leeds
	11.30 a.m.	Beaming south-west from Leeds
	11.45 a.m.	Beaming north from Leeds
145·3—145·4 Mc/s	12 noon	Beaming north from London area
	12.15 p.m.	Beaming west from London area

British Interplanetary Society

THE following lecture programme has been arranged by the British Interplanetary Society:

February 2, 7 p.m., " The Use of Reinforced Plastics in Rockets," by A. Wilson, A.P.I. (Bristol Aerojet Ltd.), Lancaster Room, Caxton Hall, London, S.W.1.

February 23, 7 p.m., " Some Problems Encountered in the Design of Large Rocket Test Beds," by R. H. B. Forster and L. Breen, Royal Society of Arts, John Adam Street, London, W.C.2.

March 5, 2.30 p.m., A symposium entitled " The Exploration of the Moon," Lancaster Room, Caxton Hall, London, S.W.1.

April 7, 7 p.m., " Lunar Missions and Vehicle Design," by J. Allen, F.B.I.S. (A. V. Roe Ltd.), Tudor Room, Caxton Hall, London, S.W.1.

Tickets for the meetings on February 23 and March 5, 1960, may be obtained from the Secretary, The British Interplanetary Society, 12 Bessbrough Gardens, London, S.W.1. Tickets are not required for the meetings on February 2 and April 7, 1960.

Sophisticated Sideband (continued from page 304)

would become widespread, but the author feels it merits serious consideration as the numbers of amateurs increases. At the very least, it should prove a fruitful topic for discussion.

Bibliography

" Design for an S.S.B. Driver," M. Barlow (G3CVO), R.S.G.B. BULLETIN, January 1959, page 349.

" Precision Transistor Oscillator," *Tele-Tech & Electronic Industries*, March 1953, page 93.

" Locked L/C Oscillators," *Marconi Instrumentation*, September 1955.

" Phase Locked Oscillators," *Proceedings of the I.R.E.*, June 1959.

Appendix

The following crystals and units are at present available:

(i) Cathodeon Crystals Ltd., Linton, Cambs., make an oven type B2 to operate on 6 or 12 volts, and crystals in the range 5-15 Mc/s type 2MF which together are capable of an accuracy of one part per million over several days. The oven temperature is maintained within 0·1° C. and has a booster heater to enable it to reach operating temperature after 25 minutes. Price of the crystal is 52/6 and of the oven £17/10/-.

(ii) Salford Electrical Instruments Ltd., Times Mill, Heywood, Lancashire, make a transistor 100 kc/s crystal oscillator type QC949, which operates on 6 volts at just under 1 mA. Frequency tolerance is approximately two parts per million per degree C., and with 10 per cent change in supply voltage the frequency change is less than five parts per million. The price is not known.

(iii) Standard Telephones & Cables Ltd., Quartz Crystal Division, Temple Fields, Harlow, Essex, make a 5 Mc/s standard crystal type 4423/AT/5, which has a temperature coefficient (when held at 75° C.) of one part in ten million. An oven type 57 LWU 610 ensures that the crystal is within one part in ten million of its working frequency, within 30 minutes. Prices of these units are not known.

(iv) The automatic Telephone & Electric Co. Ltd., 8 Arundel Street, London, W.C.2, make a compensated crystal with a thermistor mounted in the same bulb. These units are remarkable in that they require no oven, and may be obtained in the range 4-20 Mc/s. A stability of one part per million can be achieved over a 40° temperature range (Centigrade) and the unit is ready for operation within a minute or two from cold. Using an EF91 oscillator the frequency change with variation of h.t. voltage is about 0·045 part per million per volt, and with l.t. 0·171 part per million per volt. These units would appear to be ideally suited to amateur work. The crystal and thermistor cost about £3 and the complete oscillator with EF91 is £15.

A Grid Dip Oscillator for 70-160 Mc/s

By G. R. JESSOP (G6JP)*

ANYONE who has built a number of converters or transmitters for the 2m or 70cm bands will know that the alignment to the correct frequency can be a tedious job if a grid dip oscillator is not available. Unless the unit is a copy of some published design, it is surprising how far off frequency the various tuned circuits can be. Substitution of similar valves which are not plug-in replacements can easily make considerable difference especially where circuits with little or no tuning capacity are employed.

A recent experience in this direction has prompted the present article. While building yet another 2m converter the writer's judgment of the coil sizes was well " off beam " but by use of the g.d.o. was soon corrected. A second reason is the relatively frequently heard statement, " I really ought to make a new converter but I haven't a suitable g.d.o. to get the circuits right! "

The instrument to be described has been in use for the past

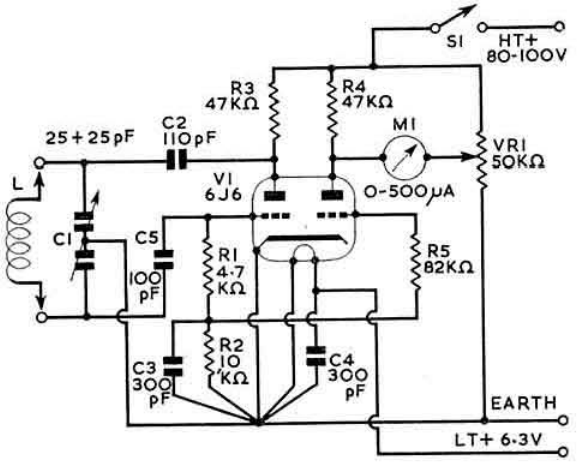


Fig. 1. Circuit diagram of the g.d.o. for 70-160 Mc/s. As explained in the text, the range can be expanded with additional coils to cover 23 to 220 Mc/s.

five years or so and has proved invaluable on many occasions. The calibration accuracy is usually sufficient to put the circuit in the band. Construction is relatively simple and should present no particular problems. Certainly the time involved will be amply repaid by subsequent ease of adjustment of tuned circuits within the range covered.

Circuit

The circuit (Fig. 1) is quite conventional and perfectly straight-forward. A double triode is used, one section operating as the oscillator and the other as a d.c. amplifier. It should be noted, incidently, that the meter reading rises at resonance and to that extent the description grid dip is inaccurate! There is some variation in the meter reading from range to range and it is necessary to set the meter reading to a suitable value, say 100 μA. The reading tends to vary over each range but in the original there are no spurious resonances.

The power supply is contained in a separate unit and fed

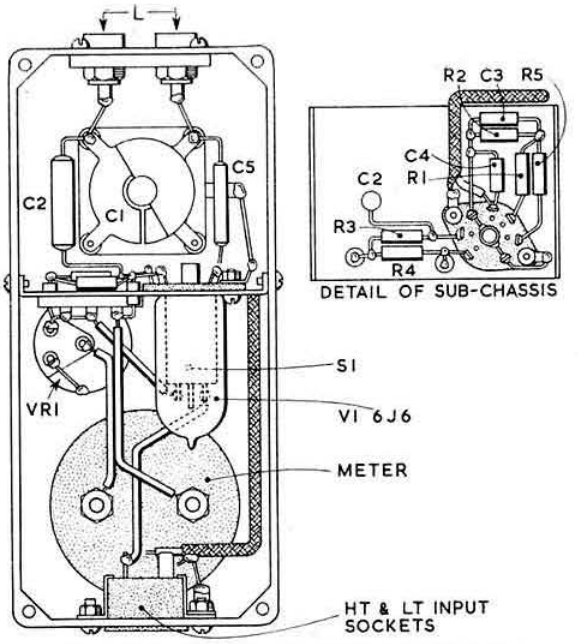


Fig. 2. Component arrangement inside the diecast box.

to the oscillator by a 6 ft. length of three-core cable, an arrangement which has been found more convenient than building in the power unit. As a result the operating head is small and light and easily used.

Construction

The whole unit is built into a cast alloy box (obtained from war surplus) measuring 6 in. × 2¾ in. × 2 in. deep, but

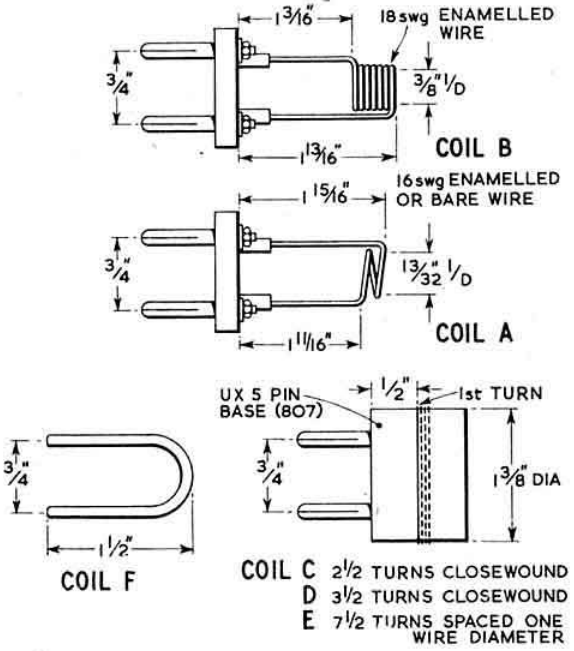


Fig. 3. Construction of the coils.

* 32, North View, Eastcote, Pinner, Middx.

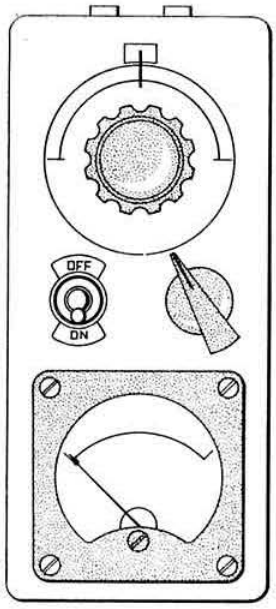


Fig. 4. Front panel layout of the g.d.o.

a specially fabricated box of similar dimensions would be equally suitable. The component layout is shown in Fig. 2 and the general appearance of the front panel in Fig. 4.

The tuned circuit is based on an Eddystone split stator capacitor Cat. No. 583. It should be noted that the coupling capacitors to the valve (C2 and C5) are connected to the same terminals as the sockets for the plug-in coil. If this is not done some spurious resonances may result. The stator connection of C1 is returned directly to the valve socket for the same reason.

A direct drive dial (Eddystone 844) is used with the tuning capacitor and it is necessary to tune slowly across the band. A low ratio slow motion drive would be an advantage but at the time of building no suitable type was available.

The power supply to the oscillator is connected by a miniature 4-pin Jones plug for convenience of storage without loose leads.

Details of the various coils are given in Fig. 3. With care in duplicating the mechanical and electrical details it should be possible to obtain a similar frequency ranges with the various coils.

Frequency Ranges

The primary frequency ranges are 60-104 Mc/s and 108-164 Mc/s but with other coils it is possible to cover from 23 to 220 Mc/s satisfactorily. Calibration curves for these coils are given in Fig. 5.

Coils to cover lower frequencies could be made but the tuning capacitor is rather too small to give reasonable frequency ranges. Those covered are sufficient for both the input frequencies and the first intermediate frequencies and the fundamental local oscillator stages in v.h.f. converters.

Calibration is most readily carried out by comparison with another g.d.o. If it is not possible to borrow one, the job may be done with signals of known frequency or on the higher frequencies by use of Lecher lines or a v.h.f. receiver such as the S.27.

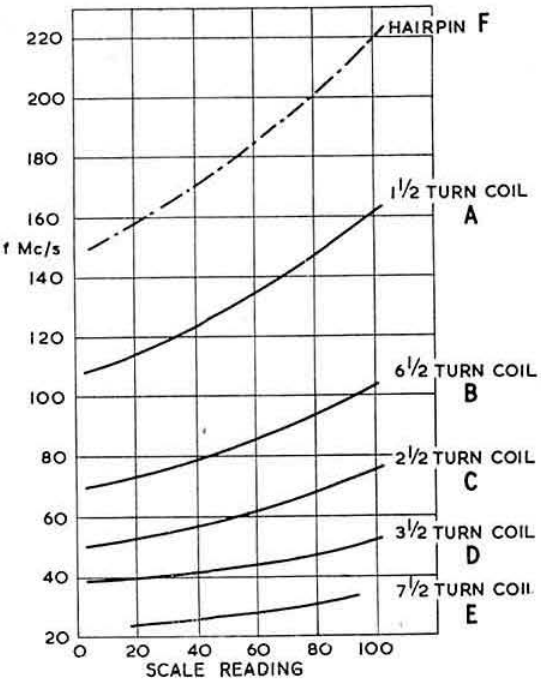


Fig. 5. Approximate calibration curves for the coils shown in Fig 3.

A.R.R.L. International DX Contest

AMATEURS all over the world are cordially invited to take part in the 26th A.R.R.L. International DX Contest to be held during four weekends in February and March this year. The phone section will take place during the weekends of February 6 to 7 and March 5 to 6, and the telegraphy section during the weekends of February 20 to 21 and March 19 to 20. In all cases, the starting time is 00.01 G.M.T. on the first date and the finishing time 24.00 G.M.T. on the second date.

As in the past, certificate awards are offered to the top single-operator phone and c.w. scorers in each country. A special category recognizes multiple-operator stations in those countries from which three or more valid multiple-operator entries are received.

There is only one change in the rules from last year. Alaska (KL7) and Hawaii (KH6), because they are now states of the U.S.A., may be worked by amateurs outside North America, with other W and VE stations. The full rules appear in *QST* for January 1960.

Log sheets are available on application from the A.R.R.L. Communications Dept., 38 La Salle Road, West Hartford 7, Conn., U.S.A.

Affiliated Societies' Contest 1960

THE rules governing the Affiliated Societies' Contest to be held on February 6 and 7, 1960 were sent to all affiliated societies and clubs in the United Kingdom early in January. The contest will take place between 18.00 and 23.00 G.M.T. on both February 6 and 7.

London Meeting
Friday, January 22, 1960

"Radio Aspects of the I.G.Y."
by Dr. R. L. Smith-Rose, C.B.E.
(Immediate Past President)

followed by

"Amateur Radio Participation in the I.G.Y."
by G. M. C. Stone, G3FZL
(R.S.G.B. I.G.Y. Co-ordinator)

at the

Institution of Electrical Engineers
Savoy Place, Victoria Embankment

Buffet Tea 6 p.m. **Lectures 6.30 p.m.**

The MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By J. DOUGLAS KAY (G3AAE)*

THE year 1960 opens with a burst of DXpeditionary activity from the Tokelau Islands, Nicobar Islands, Galapagos Islands and the promise of further activity from French Togoland and various Pacific islands, while 1959 went out in a blaze of glory enhanced by emanations from Nepal, Basutoland, Christmas Island and San Andreas Island. However, no one who is active on the h.f. bands will be in any doubt about the decline of the sunspot cycle, for propagation conditions have been markedly poorer this winter than during the past three years.

One very gratifying fact that emerges from the annual table of DXCC holders is that an increasing number of British stations are near the top of the tree. The following are listed as having more than 200 countries confirmed: G3AAM, G2PL, G4CP, G6ZO, GM3EST, G6RH, G3HLS, G3DO, G3YF, G5VT, G3FKM, G3AAE, G3FNN, G8KP, G6YQ, G4ZU, G3BKF, G8KS, G5RV, G2MI, G8IG, G6XL, G6BS, G3FXB, while G2PL, G5VT, G3HLS, G3FNN, G3DO and G4ZU have passed this landmark on 'phone. **ZL2GX** is joint world leader with **W6AM** at 296 confirmed, while **G3AAM** is only four behind with 292. No doubt there are quite a few more British operators who would be included in the list if they decided to submit all their confirmations.

News from Overseas

Antarctica. From E. W. (Ossie) Osborn **ZS6CR** comes news that a South African weather team has left for Queen Maud Land, and that **ZS6ZY** is a member of the team. He has taken a rig with him, and expects to be operating as **ZS6ZY/Antarctica** will be active from about January 15. Operation will be on 14180 kc/s and on a frequency in the 21 Mc/s band. Operating time will be from about 1500 G.M.T. daily. Antarctica is certainly a great attraction and, although it only counts as one country it has seen operation by stations signing ZS, ZL5, VK0, CE9, LU, VP8, KC4, 8J1, OR4, LA/G, UA1 and FB8.

Malpelo Island. **W9EVI** writes to say that between January 15 and 20, W3PZW, W4KVX, W9EVI and several HK amateurs will be operating from Malpelo Island, which is 310 miles west of Buenaventura, Colombia and about 400 miles south of the Panama Canal. Simultaneous operation by three stations is planned using c.w., a.m. and s.s.b. on all the h.f. bands. The call-signs to be used and QSL information are not yet available, but will be announced over GB2RS as soon as known.

French Togoland. Angus Murray-Stone **ZD2AMS** has now received official permission from the French authorities to operate from Togoland. He will be active from February 6 to 26 using mainly 14, 21 and 28 Mc/s a.m. and c.w. but with the possibility of some 7 Mc/s activity also. Although the exact call-sign to be used is not yet definitely known it will probably be **FD8AMS**. Angus will be accompanied by his XYL who has agreed to handle the QSL chores, and cards should be sent to P.O. Box 524, Jos, Nigeria. I.R.C.s are requested where a direct reply is required.

Tannu Tuva. During the past 12 months there have been so many hazy rumours about Tannu Tuva that it is nice to hear something concrete for once. **G6ZO** has received QSL confirmation of a Tannu Tuva contact with **UO0OM** who was active from there between June 25 and July 10, 1959, while **B.R.S.20317** heard **UA0KYA** giving the serial number 44923 during the *CQ* Contest, though whether he is permanently there or went for the period of the contest is not known. Anyway, if you still lack Zone 23 and cannot find JT1AB it might be a good idea to keep an ear open for UA0KYA.

Sierra Leone. Ted Owen **ZD1EO** outlines the present position in Sierra Leone. Ted is the ZD1 QSL Manager, and continues to handle cards for **ZD1FG** who has now gone QRT and left the country. **ZD1GM** has moved to Nigeria, and cards for him should be sent via the ZD2 bureau. **ZD1AW** continues active, while 9G1CP has recently arrived in Sierra Leone and will soon be signing **ZD1RO.**

South Dakota. During the c.w. section of the A.R.R.L. DX Contest the Sioux City High School Radio Club will operate from South Dakota signing **W0LNI/0**. The dates involved are February 19-21 and March 18-20.

Reciprocity

A most interesting angle on the reciprocal licensing problem is brought to light by Harry Bourne, who was **G2KB** pre-war and **GM2AH** until 1956. Harry was off the air for three years when he moved to the U.S.A. but has now been granted the call **VE3CXW** by the Canadian authorities. There are reciprocal arrangements between VE and W, so Harry can now operate using the call

DXotic Showcase

Call-sign	kc/s		G.M.T.	
VE2AZT	1,800	c.w.	06.50	Canada
KL7CDF	7,006	c.w.	05.16	Alaska
TI2CAH	7,020	c.w.	04.30	Costa Rica
HK7MM	7,003	c.w.	02.00	Colombia
OR4RW	7,010	c.w.	21.55	Antarctica
JA6AGJ	7,031	c.w.	20.09	Japan
KC6TM	14,020	c.w.	08.30	Caroline Is.
KX6BQ	14,035	c.w.	07.30	Marshall Is.
HL9KT	14,015	c.w.	07.45	Korea
VU2ANI	14,043	c.w.	15.30	Nicobar Is.
ZD9AK	14,080	c.w.	18.15	Gough Is.
JZ0DA	14,020	c.w.	07.30	Neth. New Guinea
9N1GW	14,317	s.s.b.	15.00	Nepal
VQ8BBB	14,052	c.w.	16.45	Cargados Is.
EA0AB	14.088	c.w.	00.50	Span. Guinea
ZS7M	14,060	c.w.	17.00	Swaziland
ZS6IF/ZS8	14,008	c.w.	16.44	Basutoland
UA0KYA	14,006	c.w.	11.00	Tannu Tuva
FU8AA	21,070	c.w.	09.30	New Hebrides
JT1AB	21,080	c.w.	10.20	Mongolia
KC6PE	21,210	a.m.	10.15	Caroline Is.
KC6GJ	21,210	a.m.	10.20	Caroline Is.
ZS8I	28,300	a.m.	17.00	Basutoland
VP2DY	28,260	a.m.	17.00	Dominica
YA1AO	28,100	a.m.	11.30	Afghanistan
HK0AI	28,320	a.m.	16.55	San Andreas Is.
FE8AH	28,090	c.w.	12.30	French Cameroons

* *40 Fryston Avenue, Coulsdon, Surrey.*

THE YOUNGER GENERATION
No. 1

G3NRZ of Mill Hill, London, N.W.7, has been licensed for only 3 months but already has this fine station in operation. The equipment, from left to right, includes a CR100 receiver with a preselector on top (both tuned to 4·6 Mc/s), a Geloso five band converter, a 150 watt transmitter covering 3·5 to 28 Mc/s surmounted by a Z match aerial tuning unit and an oscilloscope on which stands a crystal calibrator. Other equipment includes s.w.r. and harmonic indicators, a Labgear low pass filter and a beam rotator and indicator for the home-built three band G4ZU aerial. The transmitter comprises a Geloso v.f.o., 807 driver stage and 813 p.a., modulated by 807s in zero bias class B. power supplies for the p.a. and modulator are underneath the desk.

VE3CXW/W4! Activity is at present confined to 14 Mc/s c.w. with a power of 60 watts, and contacts with G stations are especially welcomed.

Personalities

The many friends of Lou Littlefield **ex-W1MCW** will be interested to know that she is now operating from Florida with the call **K4HEF**. Activity is at present mainly on 14 Mc/s 'phone using a kilowatt to a Gonset 3 element tribander on a 53 ft. tower.

Edmundo Quinones **HL7LX** has moved back to Bogota, and will shortly be signing **HK3LX** again on 14, 21 and 28 Mc/s 'phone.

G2MI has numerous QSL cards for **VS9AP** now home in England but has mislaid his QTH. If this catches his eye, will he please send some s.a.e. to the Bureau.

John Packer **ZD8JP** is now home once more and on the air as **G3NRD**. He expects to remain in England until March.

Arthur Wilberforce **G2IY**, well known as **DL2IY**, will shortly be back on the h.f. bands again from Walton-on-the-Naze, Essex.

Pete Brisbar **G3JHZ** now signs **MP4BCR** from Bahrein and **MP4BCR/MM** from the *Motor Vessel Sonic*. Pete is only one confirmation short for the BERTA, and queries the validity of VK9AT, VP8HH, VP6EE, VQ9CY and VP2GW who have not verified contacts with him. VP2GW is quite genuine Peter—G3AAE has his card.

28 Mc/s.

The welcome appearance of **HK0AI** of rare San Andreas Island has been the most noteworthy occurrence on this band: he appears to favour Sunday afternoons.

A welcome to Neville Cheadle **G3NUG** (Mill Hill) who received his licence a month ago and has since been active on 'phone using 25 watts to a tri-band cubical quad. Neville lists LU2FCD (16.35, '300), CX3AA (19.16, '280), RN1KAB (10.20, '310), RN1AT (12.38, '290) and aforementioned HK0AI (16.10, '180).

G3BHW (Margate) used 'phone for CR9AK (10.38, '230), FB8CM (15.25, '450), RD6ADR (13.50, '400), RH8AAD (14.05, '650), RO5AGA (13.55, '320), YA1AO (11.30, '100) and YN1AW (14.11, '475) while on c.w. he raised UA0SK who is in Zone 19 (10.35, '010). **G6UT** (Little Hallingbury) worked ZS8I (17.00, '300) and VE0NA/MM (15.50, '400) on a.m. while **G6ZO** keyed with FE8AH (12.30, '090), CR5AR (14.15, '060) and VK9XK (12.00, '020). **G8KS** (Farnborough) got a new country when he worked HK0AI (16.55, '320).

Jack Brazzill **G3WP** (Chelmsford) reports for the first time for many years. Jack at present uses 10 metres exclusively with a 150 watt transmitter and a half wave dipole only 10 ft. above ground and results show 105 countries worked. On November 15 he worked a station signing VU4A (10.50, '100) who claimed to be located in the Laccadive Islands and gave his QSL QTH as P.O. Box 102, Bombay. His note was a chirpy T6 and he drifted. Has anyone any ideas or information?

G3NWT (Sandiacre), who was B.R.S.22344 until December 10, used 'phone to contact CX8BM, LU1CB, OQ5RS, ZE5JG, FQ8AT and sundry ZS stations. His transmitter is an Elizabethan and aerial a ten metre quad at 40 ft., which was in use when he was listening only.

B.R.S.2292 (Hounslow) logged 'phone from RA9CAR (10.12), VP9DM (16.11), VP9FR (17.47), XE3CW (17.52), ZD3E (11.35) and 9G1BA (15.50), while **B.R.S.20317** (Bromley) switched on his b.f.o. to record YA1AO (09.24,

QTH Corner

HC8JU. Box 2951, Quito, Ecuador.
HK3LX. Edmundo Quinones, Carrera 27, 70-89 Bogota.
HK7MM. Box 172, Bucaramanga, Colombia.
HK0AI. via W9WHM.
LC0X. via Norwegian Radio Relay League.
PZ1AX. Box 1842, Paramaribo, Surinam.
VE6AAE/SU. 56 Canadian Signal Squadron, U.N.E.F. Base, P.O. Beirut, Lebanon.
VP2DY. P.O. Box 63, Roseau, Dominica, B.W.I.
VP2KJ. via W8MXS.
VE3CXW/W4. 452 Valley Road, Fall Church, Va., U.S.A.
YN1AW. Box 2113, Managua, Nicaragua.
ZS3D. Box 1205, Windhoek, S.W.A.
ZS7L. Box 8, Hlatikulu, Swaziland.

* * *

R.S.G.B. QSL Bureau. G2MI, Bromley, Kent.

W9NN of Des Plaines, Illinois, operates principally on 7 Mc/s c.w. and has 154 countries confirmed on the band. His equipment includes a Collins 75A1 receiver, 32V1 transmitter and a Viking Thunderbolt. The aerials are a 7 Mc/s dipole and a multiband vertical.

'015), ET2US (09.30, '030), 7G1A (09.35, '052), UL7HB (12.17, '100), and XW8AC (11.00, '225) on 'phone.

A.1902 (Reading) reports RH8AAD (07.27, '460), HH2Z (13.18, '520), CR6DO (14.51, '400), ZD2CKH (14.32), RN1AT (14.42), RO5BDG (15.02, '582), 9G1BU (09.23, '140) and VU2BK (13.56). **A.1965** (Penzance) heard VP3MC (11.44), CR7EO (16.20), VE6AAE/SU (15.13) and VE2AIG/SU (14.14).

21 Mc/s.

Although not outstanding because of the sudden appearance of any individual rarity, fifteen metres continues to propagate nicely to all six continents almost every day.

G3BHW (Margate) found JT1AB (10.20, '080) and YA1AO on c.w. and FB8CD Comoros (16.00, '210), KC6PE (10.15, '210), KC6GJ (10.20, '210) and VS9AZA (16.52, '195) on a.m. **G3NUG** talked to ON4TX/MM, the third Belgian Antarctic expedition vessel off the coast of South Africa (19.05, '290), VP8DW (20.00, '280), HH2NV (17.05, '300) and ZD2AMS of future FD8 fame (17.05, '300).

G6ZO who uses c.w. exclusively worked FK8AW (11.00, '040), BV1USB (12.55, '065), YA1AO (11.30, '100), FU8AA (09.30, '070), VP8EP (08.45, '090), VK9XK (11.00, '015), W5EZB/KG6 (11.45, '140), WG6AIV (11.45, '140), ST2AR (11.30, '020), and ZD3S (14.30, '040).

G8KS reports a.m. from XW8AL (12.30, '230), 9M2FX (12.35, '180), KR6NCB (09.40, '303), VR2DF (08.55, '204), UA0LO Zone 19 (08.40. '195), FU8AC (08.50, '150), FB8CD (17.30, '170) and FB8CO (17.30, '180).

GM3ITN (Clydebank) used c.w. for JZ0HA (15.45, '075) and a.m. for FB8CO (20.00, '200), HV1CN (18.20), VP8BN (20.45), W7AHW/KG6 (13.50), DU1SA (15.20), KR6DZ (13.20), ZS3D (18.00), VK9RO Papua (11.30), ZS7L (17.00) and CR7AG (19.00).

A welcome report comes from **G2DCG** (Margate) who uses a Panda Cub feeding into a home-made G4ZU beam. On c.w. he worked UJ8AG (11.48, '040), W7IVU/KP4 (12.25, '040), W5EZB/KG6 (09.42, '070) and VS6BJ (14.18, '050).

B.R.S.20317 reports a.m. signals from UL7FA (10.55, '220), FB8CD and FB8GP (17.00-17.45, '175) and from ZD1AW (14.00, '075), ZD2IHP (16.55, '025), VK9XK (10.00, '020), VS9OM (10.05, '030), W5EZB/KG6 (11.58' '004), and HC1JW (18.43, '012) on c.w. **A.1902** found VP6JK (19.56), HH2NV (20.13), PZ1AA (20.26), ZP5CF (21.07), and KZ5CT (21.56) on 'phone, while **A.1965** reports VQ2PM (18.22), KZ5JW (21.10) and KP4AAQ (20.10).

14 Mc/s.

The appearance of **9N1GW** on the top end of the band has certainly caused quite a stir during the early afternoons recently. His first British contact was with **G3FPQ** who worked him on December 12. Since then a great many others have been able to put a tick against the Nepal entry on the country list.

G6ZO submits another excellent c.w. log including JZ0DA (07.30, '020), VR2DA (08.00, '080), FB8XX (17.30, '040), ZS3AH (19.00, '065), LC0X (09.30, '050), VK0CC (09.30, '005), FB8YY (08.15, '340), FR7ZD (18.30, '020), FG7XC (22.00, '050), 8J1AA (18.00, '055), MP4MAB (14.15, '085), FB8CK (18.00, '055), YA1AO (17.45, '100), VK0TF (18.15, '085), VK0RH (16.45, '010), ZD9AK (18.15, '080), ZS7M (18.15, '055), HL9KT (07.45, '015), FM7WP (22.30, '025), VP8A1 (22.45, '025), VU2XG (18.30, '085), LA1VC/G (19.45, '075), VP8DM (20.00, '090), KX6BQ (07.30, '035), KG6CY (08.00, '045), VP8BK (20.00, '010), UA1KAE Antarctica (18.00, '080), VK9XK (08.00, '085), OR4RW (18.00, '020), YS1O (13.15, '005), ZD1AW (18.00, '050), CE9AH Antarctica (21.00, '025), UPOL8 (08.15, '025), OQ0CZ (18.15, '015), KC6TM (08.30, '020), ZS6IF/8 (18.00, '010), and LU7ZL Antarctica (19.15, '010).

G3YF concentrated on 14 c.w. this month and unearthed FB8XX (17.00, '020), FB8ZZ (16.50, '040), FB8CE (16.55, '045), VS9AZ (16.20, '080), VQ8BBB (16.45, '052), VS9OC (19.45, '076), EA0AB (00.50, '088), VP2LO (00.30, '020), ET2VB (17.00, '078), XZ2TH (17.15, '010), FR7ZD (17.45, '050), VS9MB (19.00, '020), OQ0CZ (19.30, '025), FG7XC (19.45, '025), ZS7M (17.00, '060), F9UC/FC (16.30, '064), ZS6IF/8 (16.44, '008), VS9OM (15.15, '050) and all the Asiatic Russian prefixes whose signals seem to peak around 15.00. G3YF also worked 9N1GW (a.m. to s.s.b.).

Another to strike lucky with Nepal was **G8KS** who hooked him at 15.30 on 14,317 kc/s, helped considerably by

Tom Moss, W4HYW, is the A.R.R.L. W4-K4 QSL Manager but still finds time to do a little operating and is number one in the Award Hunters' Club. Equipment in this picture includes a 500 watt c.w./a.m./s.s.b. transmitter usually operated on 28 Mc/s. The receivers are a National HRO50T1 and Hallicrafters S40A with R.M.E. DB22A preselector and selectoject. The c.w. rig, not shown in this picture, has separate finals for each band from 1·8 to 144 Mc/s. An RTTY position is in process of completion. W4HYW is one of the few U.S. operators to have obtained the Empire DX Certificate.

the new Collins "S" line equipment that now graces his shack. Other sideband contacts were with CR9AH (16.00, '308), MP4QAO (16.00, '309), and SV0WB Rhodes (07.00, '310). Incidentally, SV0WB is shortly returning to the U.S.A. while MP4QAO will also be leaving Qatar in the near future.

Another c.w. devotee is **G3BHW** who found FG7XC (20.28, '065), MP4TAF (16.36, '098), VP2LO (21.17, '030), VP4TR (19.45, '025), VS9OC (19.50, '085) and 4S7EC (19.25, '010). **GM3ITN** also on c.w. reports HH2AR (00.30), 8J1AA (18.30, '050), VP8BK (19.00, '030), VP8EL (19.30, '030) and XZ2TH (16.30, '030) with MP4TAF (19.00, '150) on a.m.

B.R.S.20317 logged KG6AIG (15.47, '088), 4S7EC (16.00, '025), FB8XX (18.40, '040), LU1ZS Antarctica (21.00, '026), UA0KYA Zone 23 (11.00, '008), VK9XK (11.17, '009), LA3SG/P Jan Mayen (12.42, '010), UM8KAA (13.05, '018), KX6CO (15.43, '015), VP4WD (23.00, '050), CP3CD (23.08, '010), EA0AB (01.00, '080), and UI8KAA (11.55, '045) while on s.s.b. he heard the extremely popular 9N1GW (14.30-15.00, '314).

A.1902 records 'phone from ET2US (17.00, '350), SM8AY/MM (18.55, '108), VS9OC (19.27, '167), OD5CN (21.39, '150), and PY2CK (21.56, '305) with OQ5IE (19.36, '280), CR6BW (19.37, '280) and SU1MS (21.19, '318) on s.s.b.

7 Mc/s.

With the three higher frequency bands fading out completely from around 22.00 G.M.T., the only place for DX communications late at night has been forty metres. Your scribe put up a dipole for the band just before Christmas and was surprised to find that the first five contacts were with stations in five different continents.

Even so reports of DX worked are almost non-existent this month. **G3BHW** worked UA9VB (00.10, '040) and UO5KAA (00.30, '030) while **G3KSH** reports KG1AQ (22.20) and LU2KN (22.55). **G3AAE** worked 4X4DR (20.06, '035), VE6AAE/SU (23.58 '030), PY7VBR (20.23 '020) and K3BUU/KP4 (00.12, '038), while **GM3ITN** found a good one in OR4RW Antarctica (21.55, '010).

Just to illustrate what there is around **B.R.S.20317** located VQ4HT (19.15, '038), JA6AGJ (20.09, '031),

Keith Taylor, G3NNW, who is 17 years of age, operates from his home in Heywood, Lancashire, with the gear shown in this picture. The entire Top Band rig cost only £7. From left to right, the equipment includes an R208 used for DX listening and a BC455 Command receiver used for Top Band (on top of which are the loudspeaker and a clock). The transmitter comprises a v.f.o. for 80 and 160m in the lower rack with the p.a. in the upper one. On top of the transmitter is the aerial current meter and an absorption wavemeter. Other items are a station control unit containing the send/receive switch and indicating lights and a 100/10 kc/s crystal controlled frequency meter. A 10 watt stabilized power supply for the transmitter and various other supplies are located under the table. A 110 ft. end-fed wire aerial is used for Top Band and a 20m dipole with the R208

Charles Olley (G3AIZ) of Ilford, Essex, operates from a 6 × 4 ft. "hole in the wall" shack, and has EDXC and WAS for phone operation and 202 countries confirmed for DXCC. The power input is 45 watts to a G5RV type transmitter. The receiver is an HRO and the aerial a home built G4ZU Minibeam at 30 ft.

4X4KL (21.22, '005), VQ4GQ (21.30, '023), VS9OM (20.15, '005), UD6AM (19.20, '034), UL7DF (20.12, '034), UL7IG (20.27, '032), HK7MM (02.00, '003), VP9BO (02.55, '004), ST2AR (03.00, '008), CX2TF (01.20, '001), ZS2HI (03.30, '012), YV4CI (04.10, '020), KP4ARR (04.14, '025), TI2CAH (04.30, '020), KL7CDF (05.16, '006), EL4A (05.35, '003) and LA5AD/P (20.52, '015). Insomnia! **B.R.S.2292** logged OR4RW (21.50), UL7IG (21.40), K4JXL/KL7 (06.45) OD5LX (20.13), TF3AB (20.42) and numerous VE and W districts.

3.5 and 1.8 Mc/s.

Reports on these bands are very few and far between this month. Greater support for this section of the column would be appreciated.

G2CYV reports that **W1JAE** is anxious to work a European on 80m, and will listen between 3600 and 3800 kc/s from 09.00 to 11.00 G.M.T., on Saturdays for calls and will transmit on 3800-3810 kc/s (phone). **VE1IE** is also looking for 80m contacts.

B.R.S.20317 logged VE1ZZ (21.50, 3501), W8AK (23.30, '503), W4LFD (23.50, '501), UN1AE (19.30, '500), IT1TAI (03.49, '501) and UA9CM (23.26, '503).

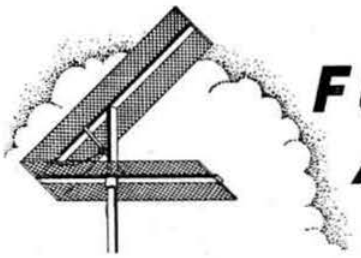
G3FPQ worked VE2AZT on Top Band on December 6 at 06.50 G.M.T., so the band has been open for trans-Atlantic DX.

Late Quickies

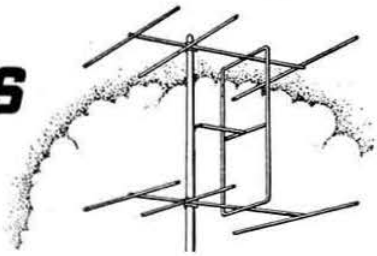
VU2ANI is very active from the Nicobar Islands and has been worked by many G stations on both 14 and 28 Mc/s. In the mornings 28 Mc/s is best and 14 Mc/s in the afternoons. **VP2DY** has appeared on 10m. Operating around 28,260 kc/s on a.m. he can often be found around 16.30-17.30 G.M.T. **ZM7DA** was worked by GM3EST on January 7, on 14,040 kc/s. Signals started to peak at 05.30 reaching RST589 at 05.45 and fading out at 06.10 G.M.T. This was obviously one for the early birds.

Jack Lambert **VP4WD** went QRT on January 12 after a most enjoyable 3½ months operating the B2 from Tobago. Despite handicaps presented by a poor location, local interference, high temperatures, high humidity and restricted operating time, Jack managed contacts with nearly 500 stations in 36 countries, all on 7 and 14 Mc/s c.w.

Well that brings us to the end of another month on the DX bands. The next *M.O.T.A.* will contain the first table of Commonwealth Competition participants: do join in the fun and give it your support. Cheerio for now, and keep up the good work.



FOUR METRES AND DOWN



G3HBW works OE1WJ by Meteor Scatter Propagation – December Auroral Opening

By F. G. LAMBETH (G2AIW)*

DURING the early hours of January 4, 1960, G3HBW and OE1WJ made contact on 144 Mc/s by means of meteor scatter propagation during the Quadrantid shower. Although OE1WJ copied all the contact details during the first half-hour, it took another half-hour for the information to be successfully passed the other way. Both stations copied both call-signs, the reports and the final R. Keying speeds of 24-28 w.p.m. were used, as it is of course necessary to pass the maximum amount of information during each "burst." Altogether the QSO lasted from 01.00 to 02.10 G.M.T. G3HBW's signals were reported to be S44 while OE1WJ's were S26. The contact—the fifth European meteor scatter QSO—followed an abortive attempt the previous night.

G3HBW used his high power transmitter running 750 watts to a pair of 4-125As and a 28-element array (gain 15-16db) comprising four 7-element Yagis on a 40 ft. mast. OE1WJ's transmitter was running 180 watts input to a 3C24 feeding a 4-over-4 aerial. The receivers at both stations were capable of extremely high frequency-stability.

Transatlantic Tests

G2RY (Bridport, Dorset) would be pleased to take part in the proposed 2m transatlantic tests, both in helping to erect the station and in watch-keeping. G2RY mentions the claims of the North Devon and Cornwall coasts for such a station on the grounds of travelling costs. Help from the electronics industry should be confined to the loan of equipment that amateurs could normally buy and use, with power not exceeding 1 kW. Aerials also should be of a type usable at a country QTH, otherwise any success would not really be a truly amateur achievement. Other comments and a lot more support are wanted. Forward with your ideas, please!

Notes and News

Apart from the December aurora and a few spasmodic spurts, there have been no unusual openings on the v.h.f. bands. On this subject, it seems pertinent to reproduce the following comment from the excellent *News Letter* of the Enfield and District Group, which observes, *inter alia*, "Nowadays v.h.f. frightens everybody to death and they complain about the lack of activity on the bands. Whose fault is it? *Yours* and *mine*, in other words, *ours*." There is a great deal of truth in this, as is evidenced by the fact that regular skeds are usually successful, even in the worst conditions. (In this connection, see G5UM's letter elsewhere in this issue.—EDITOR.)

Perhaps the general dreary outlook of winter in these Islands has a lot to do with it—if the shack is not heated, some safe and simple heater may be installed, when, who knows, the conditions may miraculously improve! In any case there would be a little more activity. It has always been the writer's opinion that in many cases "conditions" are dependent upon activity. After all, you must be operating before you can work anyone!

Another subject on which some news is required is the extent to which transistor experimentation is taking place in this country. We all know of, or have seen, the results of the splendid work F3SK has been doing, but hitherto no information has come in of our efforts to meet this friendly challenge.

North Western V.H.F. Group

A very welcome addition to v.h.f. clubs is the North Western V.H.F. Group. This has been made possible by the generosity of Mr. Ray Townley who has placed a most excellent and comfortable club room and workshop at Central Car Hire, 164 London Road, Manchester, at the disposal of the organizers. There is ample parking space in the rear and the club room is fully equipped and is available at all times. Meetings are being held each Tuesday evening from 8 p.m. onwards, and all licensed v.h.f. operators and other enthusiasts are encouraged to join in the proceedings. It is eventually intended to apply for a club licence for operation on v.h.f./u.h.f. Those interested are asked to communicate with J. G. Barnes (G3AOS), 5 Prospect Drive, Hale Barns, Cheshire, who is acting Honorary Secretary (Telephone Ringway 2415).

G2HCJ (Warrington) who sent in the above note, says that most of his recent time has been spent on the construction of a 4X150A p.a. using an ex-Government unit with lines tuning approximately 100 to 250 Mc/s. It is beginning to work, but more drive is required. Due to blower noise it will be run unattended in the attic, hence blower failure, bias failure, and excess screen current protection is built in. Some thought has been given to the measurement of air flow. The simplest way seems to be to fit a nozzle consisting

LONDON U.H.F. GROUP ANNUAL DINNER

Bedford Corner Hotel, Bayley Street, Tottenham Court Road

Saturday, February 13, 1960, at 7 p.m.

All v.h.f. and u.h.f. enthusiasts welcome.

Tickets, price 12/6 each, may be obtained from P.A. Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

* *V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex.*

of a 2 B.A. bolt with a hole drilled through it in the high pressure enclosure at a point out of direct air flow. To test, fit a length of transparent plastic tube to the nozzle and immerse the other end in a glass of water. The air will flow down the tube, and for full ratings of the 4X150A it should hold ¾ in. of water.

Mobile Activity

G2HCJ often travels around the country on business and frequently calls CQ during the day, but apart from one memorable Monday morning when there were four contacts one after the other, there is very seldom a reply except from G3IWJ who leaves a receiver on G2HCJ's frequency when convenient. G2HCJ wonders whether there is a possibility of a calling frequency being agreed on which could be used and monitored for such occasional calls during the day.

G2HCJ's activity is mainly limited to mobile contacts with G3IWJ at about 5.30 p.m. two weeks out of three and at 7 p.m. every other day. The QTH is badly screened to the south, but the Barrow-in-Furness stations (G3IKV, G3EFC and G3ILX) are like locals. G3IKV and G3IWJ are both working on 4X150A finals and hope to be on with them soon; G3MED is already using one.

There is a move in Merseyside to persuade Top Band operators to move to 2m by demonstrating the QRM-free contacts which are normal on v.h.f. G3MED is taking part, and is also trying out a new 2m p.a. using " Micro-pup " p.p. triodes. Has anyone succeeded in using a larger c.r.t. than a 1CP1 as a trapezium type modulation monitor on 2?

The writer wishes to thank all those who kindly sent him Christmas and New Year wishes, which are heartily reciprocated, with the additional hope that 1960 may be an outstanding year for v.h.f./u.h.f. operation.

Two Metre News

The first report on the aurora of December 5 which came in was from **OZ7BR** (Lyngby) who is thanked for such excellent service. From 15.00 G.M.T. until 16.21 many SMs, LAs, DLs and PAs were heard, with OH1NL contacted (55A). Congratulations on what appears to be the first OZ/OH on 2m. QSOs were also had with SM6ANR (58A), DL6QS (57A) and SM3AKW (57A). GM2FHH (57A) and GM3HLH/A (56A) were heard. No Gs were logged but many unreadable A3 signals were noted. This aurora appears to have been more intense in Denmark than it was in Scotland.

G4LX (Newcastle upon Tyne) reports the aurora as lasting from 15.00 to 20.00 G.M.T. During the period GM2FHH, GM2FXN, GM3HLH/A, GM4HR, ON4ZH, GI5AJ and G2HCG were heard. GI3GXP was worked. Although the GM stations were calling DL and PA, none of these was heard by G4LX.

G3HAZ (Northfield, Birmingham 21) found conditions on November 22 very good to the s.e., with G3LTF, G3HBW, G3GNR, G5MA and G3BLP good signals. This condition still obtained on the 23rd with the addition of the French stations F3LP and F9NW. Good signals from G3FZL, G3DVV, G2FM, G3KMT, G3BLP, G5LK, G6OX, G4AU and G4RB were also heard. Things were then pretty quiet until December 5 when G3HAZ missed nearly all the aurora, hearing GI5AJ calling G3NNG at the tail end. However, G2CIW worked GM2FHH and heard GI3GXP and GI5AJ.

DL3FM (Muelheim-Ruhr-Ickten) sends the following aurora report for December 5: " OH1NL was heard by DL3IZ and was worked by an SM6. DL3FM worked GM2FXN, GM2FHH and GM3HLH/A; no Scandinavian signals were heard. GM2FHH was worked as far south as Heidelberg (DL3NI, DL9GU, DL1LS) although the last mentioned missed his report. DL3NI was even able to call GI3GXP, but the contact was spoiled by QRM."

GM2FHH (Aberdeen) also reports on the aurora during which he worked many DLs, Gs, LAs, ONs, PA and SM. Among the stations heard was an unidentified OH, presumably OH1NL. The opening lasted from 15.00 to 19.00 G.M.T. and signal strengths were very good. There was a visual aurora with a very strong corona on December 3 but no signals were heard on 2m.

GM3GUI (Friockheim, Angus) sends a welcome report on the aurora of December 5. Stations heard between 19.15 and the fade out were GI3GXP (58A), G3JWQ, G3LRP, G2XV (?) and ON4FG, all 57A, and DL3FM (56A). All were on c.w. with the characteristic note. The bearing from GM3GUI was 030° and rather sharp, i.e., plus or minus 7°. The converter comprises a A1714 inductively neutralized r.f. amplifier into the usual ECC82 into an SX28 at 24/26 Mc/s. The aerial is a 6-over-6 slot beam 30 ft. high. The transmitter is a modified SCR522 which feeds an 829B, although this unfortunately was out of commission during the aurora. Although other Scottish stations were on during the period (evidenced by the fact that other stations were heard calling them) the only GM heard was GM3HLH/A and this by direct beam bearing: no auroral influence was noted.

A.1491 (Palmers Green) says the most notable happening was a minor opening on November 23. Two new stations heard were F9NW and G4AP (Wiltshire). During this opening, G2ANS, G3EJO, G3MED, G2FNW, G3MLP and F3LP were also heard. Conditions had been quite good on the 22nd with G5YV and G3LHA outstanding. G3MNQ was heard on sked (November 19) under adverse conditions on a dead band! G3GNJ (Rustington) was heard for the first time on November 8 and G5NN (Charlwood, Surrey) on the 7th. G3EUU is now in North Kent (and a better location) whilst G3NWG is a new one at Earlsfield, South London. G3EJO, who was a personal QSO at the R.S.G.B. Radio Hobbies Exhibition, shares with G3LHA the credit of being the most consistent from the Midlands.

B.R.S.21476 (Penarth) is building a new c.c. converter, using 417A first r.f. followed by a 6J4 (cascode combination), half 6J6 mixer and a c.c. injection chain using 6J6s with oscillator injection at 120 Mc/s. A 6666·6 kc/s crystal not being available, a 6650 kc/s (FT243) type was etched to a final 6666·6 kc/s by immersion in a solution of ammonium di-hydrogen fluoride. This method is far less laborious than grinding, with no risk to the crystal!

G2JF (nr. Ashford, Kent) found activity at a low ebb, but did nevertheless manage to work GM3HLH/A via aurora and to hear GM2FHH by the same means on December 5. Both stations were peaking S7. Indications that aurora was performing were first observed on Channel 1 (B.B.C.-TV).

G2XV (Cambridge) says the only thing to report is that he caught the tail end of the aurora on December 5 when GM2FHH (Aberdeen) was heard at 59+ calling a DL3. GI5AJ was then worked 55A both ways—by the time this QSO was finished (8 p.m.) the aurora had gone, and nothing more was heard or worked. G2XV hopes to provide this column with some " startling " news items in 1960.

G3LTF (Danbury, Essex) found November 22 quite good in most directions, with Yorkshire and Lancashire stations fairly numerous. The skeds with GW3MFY and G3ILX faded out a few times during the recent intense depressions, but even so, on most nights it has been possible to exchange RST and weather reports! On December 7 with a deep depression (barometer lowest since last winter) G3ILX was RST 56/19, but for a few days either side of this the signals were in the region of 229. G3LTF missed the aurora on December 5 but made up for it by hearing OE1WJ by meteor reflection on December 14 during the OE sked with G3HBW. The most exciting burst was one

of about six seconds with " R, R, R " etc. (S2/3.) also many pings, all between 20.10 and 23.30 with breaks for skeds. A total of three bursts was heard.

G5DW (Ashcott) has been busy with bench work and only had time for the G2NY sked and the usual weekend rag chew with the locals. Otherwise, most of the QSOs were personal ones at the Radio Hobbies Exhibition. On the London trip, G5DW bought a surplus crystal marked " Navy Type CRV40062B TBS Trans. Channel Freq. 72·1 Mc/s crystal freq. 18·025 Mc/s." This was considered admirable for the new portable gear. The only snag was that the chassis was fitted for FT243 $\frac{1}{2}$ in. spacing, whereas these crystals are really large, $2\frac{1}{4}$ in. $\times$ $1\frac{1}{2}$ in. $\times$ $\frac{3}{4}$ in. with fat banana pins at $\frac{7}{8}$ in. spacing. After " carving up " the chassis and fitting the crystal, it was found it would not work. On opening it up, G5DW found to his intense chagrin that it contained an FT243 type crystal plugged into the base! Loose fitting here, incidentally, was the trouble. Nevertheless, these crystals are a very good buy at 7/6 each!

GW3MFY (Bridgend) confirms that the sked with G3LTF is going strong with just one or two " misses " recently, always when the barometer is low. Two new " faces " on 2m in Cardiff are GW8NP and GW5AB. G3DLU is at Weston-super-Mare with a small portable rig running about three watts, whilst G3HXJ (Southampton) has been heard a few times on phone, working locals. On December 13 G3HBW was heard calling the Continent on c.w., presumably meteor scatter. GW3MFY ends by hoping that the January c.w. contest will be well supported. So do we all!

G3MED says the new North Western V.H.F. Group has about 20 people attending already with a lot more interested. Activity at home has been mainly concerned with a new p.a. using VT90 triodes (only 1/- each). It is working well, giving approximately the same r.f. output as the 4X150A. It will now run 600 watts p.e.p. on s.s.b. compared with about 250 watts p.e.p. with the 4X150A. The s.s.b. signal seems about two S points stronger than with the A3 transmitter. (Not bad when considering the relative costs.) Since the Radio Hobbies Exhibition G3MED has had a sked with G3JHM (Worthing). G3JHM hears G3MED most evenings, but it is not yet so successful the other way.

G5MR (Hythe, Kent) has had gale damage, and further incessant gales and winds have prevented re-erection of normal beams, but a temporary 2m aerial has helped to maintain contact with F8GH and the locals. We hope the main aerials will soon be up again.

G5QA (Exeter) found conditions poor on the whole, but all the same, stations were worked in Yeovil, Bridgewater, Bristol, Surrey, Derby, Coventry and Cheltenham. The sked with GW3ATM is being maintained, and records of weather and barometric conditions are being kept. During tests with carefully adjusted gain controls, signals between the two stations have never varied by more than one S point.

Seventy Centimetre News

G3HAZ says he had a good QSO with G3KQJ/T (434·7) on December 15. G3BA is back again, using an h.t.-less DET24 tripler driven from a QQV03/10. G6XA is getting ready in Leamington Spa.

Twenty-four Centimetres

The first contact on this band between Germany and Switzerland took place between DJ3ENA and HB9RG (41 miles) on December 8.

Six Metres

B.R.S.21476 (Penarth) says the highest m.u.f. lately has only been 45 Mc/s. On December 6 G3EHY was heard on " 10 " calling CQ crossband, listening on 6, but no signals were heard by B.R.S.21476. **G3EHY** (Banwell) sends some notes of the 6m position, and would himself like to know what other stations have to report.

During the peak of the sunspot cycle the m.u.f. rose sufficiently to provide good paths for communication on 50 Mc/s and slightly higher across the Atlantic. During the autumn/winter of 1957 this lasted from the beginning of October to the first few days of February 1958. During the corresponding period the following year the period extended even further—until February 20, 1959—which appears to be an all-time record. We are now on the declining side of the peak, and observations at Banwell during October showed no rising of the m.u.f. above even 40 Mc/s could be detected or confirmed. It is, however, reported from the United States that there were occasions during October when the powerful B.B.C. TV signals on Channels 1 and 2 were detectable at times. November proved to be little better than October, but on the average the m.u.f. appeared to rise to the upper 30s and was probably workable in patches up to 40 Mc/s. On November 25/26 American police signals in bursts could be read at S7/9 just above 40 Mc/s and from that date similar signals have been observable almost daily, peaking up around 15.00/16.00

(Continued on page 318)

BRITISH ISLES TWO METRE BAND PLAN

Zone	Mc/s	Area
1	144.0 -144.1	Cornwall, Devonshire, Somerset.
2	144.1 -144.25	Berkshire, Dorset, Hampshire, Wiltshire, Channel Islands.
3	144.25-144.5	Brecknockshire, Cardiganshire, Carmarthenshire, Glamorgan, Gloucestershire, Herefordshire, Monmouthshire, Pembrokeshire, Radnorshire, Worcestershire.
4	144.5 -144.7	Kent, Surrey and Sussex.
5	144.7 -145.1	Bedfordshire, Buckinghamshire, Essex, Hertfordshire, London, Middlesex.
6	145.1 -145.3	Cambridgeshire, Huntingdonshire, Leicestershire, Norfolk, Northamptonshire, Oxfordshire, Rutland, Suffolk, Warwickshire.
7	145.3 -145.5	Anglesey, Caernarvonshire, Cheshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Shropshire, Staffordshire.
8	145.5 -145.8	Derbyshire, Lancashire, Lincolnshire, Nottinghamshire, Yorkshire.
9	145.8 -146	All Scotland, Northern Ireland, Isle of Man, Cumberland, Co. Durham, Northumberland, Westmorland.

V.H.F. QSY

Members who wish to acquire or dispose of crystals in connection with the revision of the British Isles Two Metre Zone Plan announced in March 1959 are invited to send details to "V.H.F. QSY," R.S.G.B. *Bulletin*.

Crystals Offered

By G3FRV, 9 Hawkins Road, Tilgate, Crawley, Sussex. 8044 kc/s.

Crystals Required

By G3FRV, as above. Any crystal in the range 8028 to 8038 kc/s.

Single Sideband

By G. R. B. THORNLEY (G2DAF)*

MANY readers have been kind enough to write expressing appreciation of the articles describing the G2DAF S.S.B. Transmitter, particularly the first part dealing with design considerations. There have also been a number of queries and although all letters have been answered personally it may be of help to other potential constructors to mention these points in the BULLETIN.

Unfortunately, in the circuit diagram the dotted lines indicating a dust core were omitted from the carrier oscillator transformer IFT1. This is of course trimmed to resonance by the core in the usual way. The 100 pF capacitor shown across the primary is the correct value for the type of transformer used; this also applies to the 75 pF capacitor across the primary of IFT5. A different type of transformer might require some other value.

It is necessary to use series tuning of the primary of IFT2 to present a low impedance load to the diode modulators, but the *effective* capacity of the two capacitors in series must be the required amount to enable the winding to be adjusted by the dust core to resonance. If correction is necessary the 100 pF capacitor should be altered in value.

Rather surprisingly, the use of two half-watt resistors in series or in parallel has occasioned some query. This is solely to obtain the required value with a one watt rating and saves having to duplicate an extensive resistor stock which is very necessary when a lot of experimental work is in progress.

All the crystals used in the transmitter are available from surplus sources and this was kept very much in mind during the initial development. The final frequencies used for the carrier and in the filter were obtained by edge grinding available FT241 crystals. The 1613·25 kc/s sideband oscillator crystal is a stock 10X type, but the 2538 kc/s crystal (or whatever value is required) is a 10X type of 2430 kc/s ground to final frequency. This also applies to the 9 Mc/s final conversion crystal which is an FT243 type of 8650 kc/s, also ground to frequency. The rest of the conversion crystals are available either as FT243 or 10X types on the frequencies required.

One correspondent has asked if it is possible to use two 6146 output valves in parallel and get the same output as the Hallicrafters HT32. This should be perfectly satisfactory and for normal class AB1 or AB2 operation the existing EF80 should give adequate grid drive. It will, however, in theory be necessary to alter the pi output network values for the new loading. A pair of TT21 valves would also make a useful p.a. stage.

The chassis depth of 16 in. was necessary to accommodate the large size i.f. transformers used in the original exciter, but it should be possible to use a 13 in. chassis with physically smaller i.f. transformers.

In the transformers IFT6 and IFT7 the diameter of the former is $\frac{7}{16}$ in. with $\frac{3}{8}$ in. diameter dust cores with screwed rod adjustment. The 0·01 μF by-pass capacitors used throughout are Hunts Mouldseal type W99, 400 volts working.

Communication Receivers

The casual mention of the author's receiver in the October BULLETIN has sparked off a deal of interest and letters and on-the-air reports asking for "more details please." It certainly appears that there is a considerable revival of interest in receiver technicalities and construction.

This is much too big a subject to handle in the *Single Sideband* feature, but perhaps something can be done about it in the near future.

* *5 Janice Drive, Fulwood, Preston, Lancashire.*

AR88 Switch Assembly

Ceramic switches suitable for band switching in receivers and transmitters are difficult to obtain as new items. A very good buy—at present available on the surplus market at a fraction of normal cost—is the AR88 switch assembly. This is the eight bank switch unit used in the receiver and is supplied with the cross screens, the top plate, the selector mechanism and extension shaft as a complete unit.

The six wavebands are selected by a 360° rotation of the

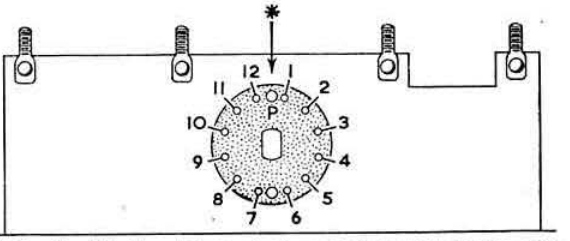


Fig. 1. Identification of the contact numbering system in the AR88 switch assembly looking at the switch banks from the panel end. Before dismantling the assembly, the selector switch should be turned to the band 1 position (fully anti-clockwise) and each ceramic bank marked in pencil or ink on the top edge as shown by the arrow with the letter "P" to indicate the side facing the panel.

selector knob and each bank is actually two switches with the second half acting as a shorting plate, except for the aerial input switch which controls the input from balanced feeders. Additionally the rotor is not a complete ring (as it would be in normal practice) and it is therefore necessary to use multiple poles. This was necessary in the AR88 because a four gang tuning capacitor with the stator plates in each section in two unequal banks is used. The sections are selected, depending on the range and the bandspread required for the range, either singly or in parallel.

The two banks controlling the anodes of the first and

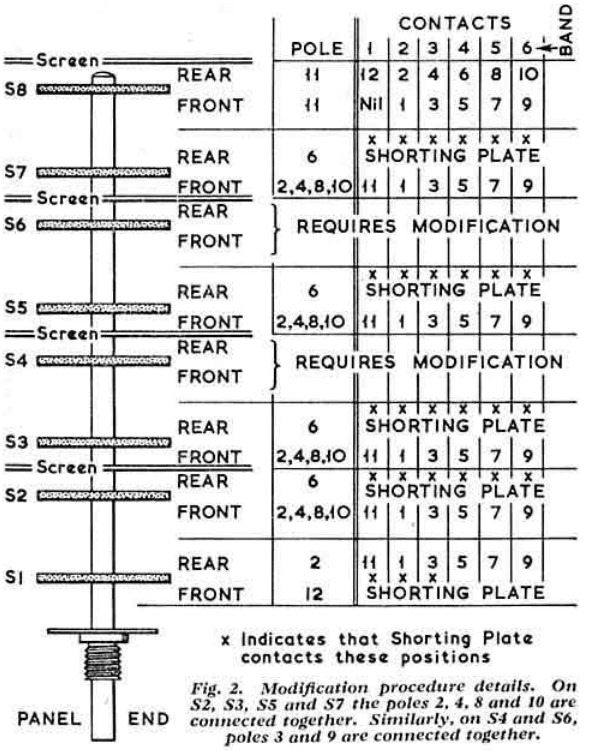


Fig. 2. Modification procedure details. On S2, S3, S5 and S7 the poles 2, 4, 8 and 10 are connected together. Similarly, on S4 and S6, poles 3 and 9 are connected together.

second r.f. stages are further complicated because series fed primary windings are used on bands, 1, 2 and 3 while on the higher frequencies (bands 4, 5 and 6), the anodes are capacitively coupled to the following grids. The primary windings of the band 3 coils are retained in circuit to function as r.f. chokes and provide a path for the h.t. These two banks cannot be used as normal wave change switches without modification.

Very complicated indeed, and to many amateurs lacking

Fig. 3. Modification of banks S4 and S6. First drill out the rivets and remove contacts 1, 2, 10 and 11, so freeing the three long and two short contacts. The two short contacts should then be fitted to positions 2 and 10 with 8 B.A. nuts and bolts. The switching sequence after modification is as shown.

past experience and without the AR88 circuit diagram, a puzzle not possible to solve. This is a great pity. The assembly is beautifully made and it can be stripped and rebuilt as required and could become an essential part of any all-band transmitter or receiver.

All the necessary information is shown in Figs. 1, 2 and 3.

Correspondence

VK2CS is thanked for an Aerogramme sent on a long journey to give G2DAF some most interesting information on half-lattice filter alignment and in particular the direct coupled c.r.o. with slow speed time base and wobbulator designed and constructed by VK2AC. It is always interesting and refreshing to hear of something different and original. (Details, please.—EDITOR.)

How would you like an all-band s.s.b. transmitter covering 1·8 to 30 Mc/s, with crystal controlled carrier and crystal controlled final conversion but using *one* crystal only? G3MPO and G3MTT have designed and constructed just such a rig and it is in use on the air now! More details next month.

Finally, notes, news and technical information for inclusion in the February BULLETIN should reach the writer not later than January 18.

Four Metres and Down

(continued from page 316)

G.M.T. November 30 was a good day. The Radio Paging Service (Boston, Mass.) on 43·5 Mc/s began to come through at RS59. An aircraft signal (phone) was heard on 47 Mc/s. On December 1 U.S.A. police, paging systems and P.O. signals from many transatlantic areas were coming through steadily for long periods around 40 Mc/s. The Boston station on 43·5 Mc/s was again S9 and very solid. This continued until December 5 and then improved further. On December 6 at about 15.00 G.M.T. after the paging stations had been S9 for over an hour, there was a short break through of either police or P.O. signals from U.S.A. on 49 Mc/s. Immediate calls were made by G3EHY on 28 Mc/s informing the Ws of the rise of m.u.f. and asking for crossband calls on 50 Mc/s, but nothing was heard. Since that date, the highest frequencies observed to be breaking through have been around 43·50/44·50 Mc/s which are now almost daily occurrences.

From *QSO* (New Jersey, U.S.A.) comes the following news:

ZS3G was worked by K2LTW on November 8. On the same day K2RRG worked HC1FS, HC1JW and HC1EX. On November 18 W3LCC (Maryland) worked KA6AJF on phone and K6EPX on c.w. K2RRG worked W6JRR, K6GOX and W6BJI. On November 17 K7ALF (Phoenix, Arizona) was heard by K2RRG (New Jersey). On November 19 CO2RR and CO2GX were heard at tremendous strength by K4PEV.

144 Mc/s C.W. Contest

Don't forget that the 144 Mc/s C.W. Contest has been arranged for January 31. The rules were published in the December 1959 BULLETIN and convenient log sheets are available on request from Headquarters.

Worked and Heard on V.H.F.

Two Metres

A.1491 (Palmers Green). Up to December 17.
Heard: F3LP, 9NW, G2ANS, 2DDD, 2FNW, 3BA, 3DVK, 3EJO, 3FAN, 3GNV, 3JWQ, 3KMP, 3LHA, 3LOK, 3MED, 3MLP, 3MNQ, 4AP, 5YV.

GM2FHH (Aberdeen) December 5.
Worked: DJ4NGA, DL3FM, 3HI, 3VJ, 9GU, DM3ZFI/P, G2CIW, 2XV, 3JAM, LA4RD, 9T, ON4FG, 4ZH, PA0FB, SM6ANR. *Heard:* DL6QS, GI3GXP, 5AJ, OZ7BR.

GM3GUI (Friockheim) December 5.
Heard: DL3FM, G2XV?, G3JWQ, 3LRP, GI3GXP, ON4FG.

GW3MFY (Bridgend) Since November 22. *Worked:* G3BDQ, 3CGE, 3DLU, 3FWW, 3GNR, 3LTF, GW5AB, 8NP, 8SU.

Japanese Mechanical Filters

MECHANICAL filters are finding increasing application in transmitting and receiving applications, particularly those connected with single sideband, and a new range of filters manufactured by the Kokusai Electric Co. Ltd. of Tokyo will create wide interest.

These filters are centred round frequencies of 455 kc/s and 100 kc/s with bandwidths of between 1 kc/s and 35 kc/s at 6db attenuation. The unit type MF-455-15 seems to be ideally suited for use in communication receivers, and has a bandwidth of 3 kc/s and the shape shown in Fig. 1.

The base size of the filters is 2 in. by 1 in. and the height 3 in. The units contain terminating resistances and with high impedence input and output are suitable for use in valve circuits. The approximate cost of these units is £14 but unfortunately it is doubtful if they will be available in this country.

A specification sheet for the range is held by the Technical Development Sub-Committee at R.S.G.B. Headquarters and, if required, photostat copies of the essential data can be supplied at cost.

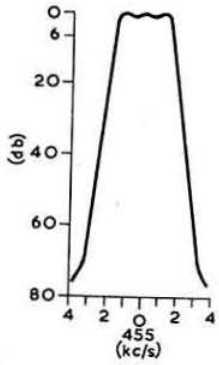


Fig. 1. Response curve of the type MF455-15 mechanical filter.

"A Keyed Franklin Master Oscillator"

ON page 263 in the December 1959 issue of the BULLETIN, the diagrams shown against Figs. 2 and 3 of the above article were inadvertently transposed. Fig. 2 should read Fig. 3 and vice versa. In the "Frequency" column in Table II on page 264, 3·5 Mc/s should appear against "250 pF mica and 20 pF ceramic" in the "Capacitors" column and against "0·00027 μF" in the "C Total" column.

Taylor Instruments at the R.S.G.B. International Radio Hobbies Exhibition 1959

THE winner of the type 68A Signal Generator offered by Taylor Instruments Ltd. in connection with the R.S.G.B. International Radio Hobbies Exhibition 1959, was Mr. R. Purdom of Croft Cottage, Berrow, Burnham-on-Sea, Somerset.

Society News

The President

DUE to illness Mr. W. R. Metcalfe (G3DQ) will not be able to deliver his Presidential Address at the meeting of the Society to be held at the Institution of Electrical Engineers on Friday, January 22, 1960.

Dr. R. L. Smith-Rose, C.B.E. (Immediate Past President) will lecture to the membership that evening on Radio Aspects of the I.G.Y. Following the lecture Mr. G. M. C. Stone (G3FZL) will speak on the work done by radio amateurs during the I.G.Y.

Buffet tea will be served from 6 p.m. and the meeting will commence at 6.30 p.m.

Executive Vice-President

MR. S. L. HILL (G8KS), who was elected Executive Vice-President with effect from January 1, 1960, has resigned from that office due to business commitments.

The procedure for electing or appointing a new Executive Vice-President will be discussed by the Council when it meets on January 21, 1960.

Annual General Meeting

DUE to pressure on space in this issue the Minutes of the Annual General Meeting held on December 11, 1959 have, with the approval of the Chairman of the meeting (Dr. R. L. Smith-Rose, C.B.E.), been held over until the February issue.

NOMINATIONS FOR THE MULLARD AWARD FOR 1959 INVITED

THE terms and conditions governing the Mullard Award, are as follows:

(1) *The Award is offered annually by Mullard Limited during the pleasure of the Directors of that Company.*

(2) *The Award will take the form of a gift in kind (preferably electronic or electrical apparatus and/or books) to the value of £25, and a plaque.*

(3) *The Award will be made to the member of the Radio Society of Great Britain resident in the United Kingdom who (in the opinion of a Committee consisting of three representatives of Mullard Limited and three representatives of the Council of the Radio Society of Great Britain) has, through the medium of Amateur Radio during the preceding calendar year, rendered outstanding personal service to the community by his own endeavour or by his own example of fortitude and courage.*

(4) *The presentation of the Award will take place during the month of April each year on a date and at a place to be decided by the Committee.*

(5) *In January of each year, the Radio Society of Great Britain shall, through its Official Journal, invite nominations for the Award. Each such nomination shall be supported by at least three Corporate Members of the Society and shall be accompanied by a brief factual account of the personal service rendered by the nominee.*

In accordance with Rule 5, the Council invites nominations for consideration for the Mullard Award for 1959. Such nominations should be sent in writing to the General Secretary at R.S.G.B. Headquarters to arrive not later than February 14, 1960.

Presentation of Trophies

AT the conclusion of the informal discussion which followed the Annual General Meeting on December 11, 1959, the President (Dr. R. L. Smith-Rose, C.B.E.) presented the following trophies and awards:

Special Trophies and Awards

Courtenay Price	Mr. H. F. Smith (G2DD).
Calcutta Key	Mr. F. G. Lambeth (G2AIW).
Founder's	Mr. C. E. Newton (G2FKZ).
Ostermeyer	Mr. P. J. H. Matthews (G3BPM) and Mr. H. T. Rogers (G3NHR).
Bevan Swift Memorial Premium	Mr. R. C. Hills (G3HRH) and Mr. P. M. Elton (G3GOZ).
Norman Keith Adams Prize	Mr. C. F. Hubbard (G5OX).

Contest Trophies

Whitworth	Mr. D. A. G. Edwards (G3DO).
Metcalfe	Mr. R. B. I. Rutherford (A.1495).
European V.H.F.	Mr. N. H. Hales (G2DTO/P).
Mitchell-Milling	Mr. N. H. R. Munday (G5MA).
N.F.D. Shield and Replica	Gravesend Radio Society.
N.F.D. Replicas	Stourbridge, Chelmsford, Gravesend, Wirral, Stamford, Croydon.

Miniatures were presented to Messrs. R. C. Taylor, GW2HCJ (Winner of the Second 144 Mc/s Field Day) and G. A. Jeapes, G2XV (Winner of the 420 Mc/s Contest).

Trophies awarded to members who were not present at the Annual General Meeting were despatched from Headquarters early in the New Year. Miniatures of the B.E.R.U. Senior and Junior trophies were sent to Messrs. J. T. Hepburn (VE7KX) and J. C. van Wyk (ZS6R) winners of the High and Low Power sections respectively. The actual trophies are held at Headquarters.

Receipts

RECEIPTS for subscriptions paid by cheque, bankers' order or postal order are not now issued unless specially requested. Receipts are drawn, however, and kept on file at Headquarters for six months.

Silent Keys

REV. FR. RALPH CONESA, S.J. (VU2SX)

It is with deep regret that we record the death on November 20, 1959, of Rev. Fr. Ralph Conesa, S.J., Ph.D., M.A. (VU2SX), principal of St. Xavier's Technical Institute. As Honorary Secretary of the Amateur Radio Society of India (Western Zone), he was its guiding spirit.

By his death, Amateur Radio in India has suffered a severe loss. Though his voice will no longer be heard on the air, his memory will always be cherished by those who had the good fortune to know him. VU2MD.

LESLIE DUMBLE (G3FCQ)

It is with great regret that we record the death of Mr. Leslie Dumble (G3FCQ). His connections with radio began as a seagoing operator many years before he took out an amateur licence and many will remember his distinctive "fist" on the air. For some time Leslie had been well known on the 2m band, radiating a very potent signal from his excellent site at Crowborough, Sussex.

Mr. Dumble was a member of the R.S.G.B. and of the West Kent Amateur Radio Society and at the time of his death was in Government service after an earlier connection with the motor trade.

Our sympathies are extended to Mrs. Dumble and family in their sad loss. W. H. A.

R.A.E.N. Notes and News

By E. ARNOLD MATTHEWS (G3FZW)*

AT times in high places there crops up a question of vital importance to all amateurs—"What use is Amateur Radio?" One imagines that it occurs fairly often when frequency allocations are under scrutiny, and it is not always easy to give a satisfactory reply since many facets of the hobby are of indirect rather than direct value to the community at large. Yet in many countries amateurs are banded together ready to give direct aid to their fellow countrymen should disaster strike, and it is very encouraging to learn via Mr. L. E. Newnham (G6NZ) that the activities of amateur emergency communications networks were considered in some detail during the Geneva Radio Conference.

Large-scale emergencies caused by weather are commonplace in some parts of the globe and governments in such areas have recognized amateur aid to the extent of giving financial or other assistance to networks.

In the U.K. the weather is bad, but the climate is good. Fortunately we rarely experience weather which causes widespread serious threat to property and life. But disasters do occur and we are ready to give aid as and when required. By their preparedness to help others in time of need members of R.A.E.N. also help Amateur Radio.

R.A.E.N. Signboards

Amateur Radio Signal Point posters, 15 in. × 10 in., printed in two colours on glossy paper are now obtainable from R.S.G.B. Headquarters, price 1/9 plus postage. It is intended that these posters should be pasted on to a suitable board and varnished all over to form an effective and reasonably weatherproof sign board for the identification of R.A.E.N. stations at portable, mobile or fixed sites, in hospitals and user services' headquarters, etc. Holes should be drilled through the board so that it can be nailed, screwed or tied to its mounting.

Another Group Wanted

Cumberland Branch B.R.C.S. has recently asked for details of groups in the county, informing us that the services of Amateur Radio will be of much value there. Unfortunately we have no group in the county and we shall welcome any efforts to form one and to recruit members capable of providing portable or mobile stations in addition to fixed stations. B.R.C.S. already have considered the detail of possible tasks. Will amateurs interested please contact the Hon. Secretary, R.A.E.N. Committee.

Appointments

W. C. Holley (G5TN), " Waverley," Worlibury Hill Road, Weston-super-Mare, Somerset, and G. S. C. Udall (G2HCD), " Field View," Albert Street, Blandford Forum, Dorset, have been appointed County Controllers, D. A. Pilley (G3HLW), 116 Belle Vue Road, Southbourne, Bournemouth, Hants., has been appointed Area Controller.

Resignations

W. Marlow (G2FT) has resigned from the office of A.C., Mablethorpe.

Relinquishments

Messrs. E. W. Yeomanson (G3IIR), R. C. Hills (G3HRH) and D. C. French (G3HSE) have relinquished their appointments as Controllers, London Group, consequent upon the redistribution of members in the area. Mr. Yeomanson will continue as Controller, B.R.C.S. H.Q. Station.

* *1 Shortbutts Lane, Lichfield, Staffs.*

Nomenclature

Frequency and Wavelength Bands used for Radio Communications

THE Geneva Radio Conference 1959 decided that the radio spectrum shall be divided into nine frequency bands which will be designated by progressive whole numbers in accordance with the following table. Frequencies will be expressed in kilocycles per second (kc/s) up to and including 3000 kc/s, in Megacycles per second (Mc/s) thereafter up to and including 3000 Mc/s and in Gigacycles (Gc/s) thereafter up to and including 3000 Gc/s. However, where adherence to these provisions is likely to introduce serious difficulties reasonable departures are permissible.

Band No.	Frequency Range (Lower Limit Exclusive, Upper Limit Inclusive)	Corresponding Metric Sub-Division (waves)	Abbreviation for adjectival band designation
4	3 to 30 kc/s	Myriametric	VLF
5	30 to 300 kc/s	Kilometric	LF
6	300 to 3000 kc/s	Hectometric	MF
7	3 to 30 Mc/s	Decametric	HF
8	30 to 300 Mc/s	Metric	VHF
9	300 to 3000 Mc/s	Decimetric	UHF
10	3 to 30 Gc/s	Centimetric	SHF
11	30 to 300 Gc/s	Millimetric	EHF
12	300 to 3,000 Gc/s	Decimillimetric	—

CONTESTS DIARY

January 16-17 B.E.R.U. Contest
B.E.R.U. Receiving Contest
(see page 226, November, 1959)

January 31 144 Mc/s C.W. Contest
(see page 276, December 1959)

February 6-7 Affiliated Societies' Contest

February 6-7 A.R.R.L. DX Contest
(Phone Section)

February 20-21 A.R.R.L. DX Contest
(C.W. Section)

February 27-28 First 1·8 Mc/s Contest

March 5-6 - 144 Mc/s Open Contest*
March 5-6 - A.R.R.L. DX Contest (Phone Section)
March 19-20 - A.R.R.L. DX Contest (C.W. Section)
March 26-27 - 1250 Mc/s Tests
April 9-10 - Low Power Contest
April 24 - D/F Qualifying Event
May 8 - First 144 Mc/s Field Day*
May 15 - D/F Qualifying Event
May 22 - 420 Mc/s Contest
May 29 - D/F Qualifying Event
June 11-12 - National Field Day
(see page 276, December 1959)
June 19 - 70 Mc/s Contest
July 3 - Second 144 Mc/s Field Day*
July 10 - D/F Qualifying Event
September 3-4 - European V.H.F. Contest
September 3-4 - National 144, 420 and 1250 Mc/s Contests*
September 4 - D/F National Final
September 25 - Low Power Field Day
October 2 - R.A.E.N. Rally
November 6 - Second 1·8 Mc/s Contest
November 19-20 - R.S.G.B. Telephony Contest
R.S.G.B. Telephony Receiving Contest

* To coincide with Region 1 I.A.R.U. v.h.f. contest dates.

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.

Exhibitions

DEAR SIR,—A most successful and enjoyable Show was the general verdict of the thousands of visitors who attended the R.S.G.B. Radio Hobbies Exhibition last November. Successful, because of the excellent organization by Mr. Phil Thorogood (G4KD); enjoyable, because so many old and new friends were able to get together and continue QSOs of the past. Yet without the continued enthusiasm and persistence of more or less the same few members, a Show of this nature would not be possible.

As early as January each year, contacts are made with the Radio Industry Council regarding the Society's Stand at the Earls Court Exhibition, and shortly afterwards the Exhibition Committee is called to decide the theme of the Society's participation in that Show, as well as the Hobbies Exhibition. Many times during the spring and summer the Committee meets to discuss details and plan appeals to members for the loan of equipment for display. Finally, when the time comes, the individual members of the Committee have to take off their coats to dress the Society's Stands and rig up the aerials. All this after a day at work, getting home often in the small hours of the morning. And at the end of it all those same members have to dismantle the Society's Stands and the aerials.

They don't want thanks but they do need assistance. It is for that reason that I am writing these few words, particularly to provincial members. A whole year lies ahead, during which time many members will no doubt be constructing new equipment. If you should be one of them, will you help the Society by loaning it for display? The London membership has, for many years, filled the breach when gear from the country has not been forthcoming, so we are looking to provincial members for early details. We are sufficiently ambitious to want to better the 1959 Exhibitions and we can only do this if members give of their best.

The question has been asked at some O.R.M.s, " Why not pass the Hobbies Exhibition around? " Nothing would please the Exhibition Committee better than to stand down for a year for a well deserved rest, but although various provincial cities have been invited to stage a National Exhibition, no region has yet accepted. To undertake such a task means finding a suitable venue and enlisting the services of a full-time Exhibition Manager who would require to receive good support from the trade and a Committee to organize and run the R.S.G.B. section of the Exhibition. Quite a sizeable and responsible project. By far the greater number of provincial members, however, express the view that they prefer the Hobbies Exhibition to be held in London because they look forward during the year to a journey to the Metropolis and all that the City of London can offer.

So here's to this year's Show—may it be bigger and better.

Yours faithfully,

C. H. L. EDWARDS (G8TL)

Theydon Bois, Essex. Chairman 1959 Exhibition Committee.

Mullard Award 1958

DEAR SIR,—I would be obliged if you could find space in the BULLETIN for me to express my sincere thanks to all concerned in the presentation to me of the Mullard Award for 1958.

I feel it a great honour to be the first recipient of the Award, and I am very pleased indeed to have such a fine transistor portable receiver, not to mention the beautifully inscribed Plaque. My thanks to Mullard Ltd.

The many friends, both radio and non-radio who helped to make the presentation ceremony such a success were all unanimous in saying how much they had enjoyed the afternoon and evening spent together. My thanks to the R.S.G.B.

It certainly was a day in my life that I shall always remember with great pleasure.

The added surprise of the presentation to my mother of a portable typewriter from radio amateur friends filled me with pride. She wishes to thank all those who were associated with the kind gesture. They can rest assured that it will be put to good use!

In conclusion I wish the best of luck to the 1959 Winner of the Mullard award, whoever he or she may be.

Yours faithfully,

PETER S. ODELL (Twinkletoes G3MUM).

Redcar, Yorkshire.

Conditions on Two Never Rock Bottom

DEAR SIR,—The tenor of the November v.h.f. notes made sad reading with its complaints of lack of occupancy and of conditions being " at rock bottom." Conditions on Two are *never* at rock bottom. There is no such state. Frequently they are above average and occasionally, influenced by aurora or hot weather, quite exceedingly so. But long distance propagation on Two should be accepted as a bonus, certainly not as the natural state of the band.

" Natural " use of two metres is for phone contacts over much the same distances as on 160m but with far more signal and far less noise than on that band.

Typical results achieved by an average operator from an average site in a built-up area are demonstrated by G3FRF of Clapham S.W. (and I have his permission to quote them). Using two metres for about a couple of hours each evening and never much later than 10.30 p.m. G3FRF has been notching something like 80 contacts a month all on phone and quite leisurely. This, if I may say so, is the proper way to use Two—and if this fact of life could be dinned into the heads of those operators who come on to the band only when conditions promise to be what they call good, occupancy would be much greater than it is.

Yours faithfully,

Knebworth, Herts. JACK HUM (G5UM).

"S" Meters

DEAR SIR,—I note with interest the description of W3BLC's " S " meter in the October BULLETIN. This is an improved version of a single triode circuit I have used for some years with good results, and should give an even better performance for zero-set stability. I would like to add a few remarks on the operation of this circuit, which I hope will be taken as constructive criticism.

It should be obvious that the a.v.c. to the meter should be undelayed, otherwise weak signals will not register—if suitable the d.c. component of the detector output may be used.

If the meter is used with the a.v.c. control off, it will read in a reasonably linear manner the input signal, with fixed r.f. and i.f. gain settings. Thus, whilst easy to calibrate in db, and more accurate for comparative checks, in this position the meter has a useful range of only 40db, i.e. between 1 per cent and 100 per cent of f.s.d., say to S7½, taking noise as S1, and one S point as 6db.

If the a.v.c. is on, the meter will not read linearly due to the limiting action of delayed a.v.c. The relationship will also depend on the settings of the r.f. and i.f. gains, i.e. reducing an S9 signal by 2db but an S5 by 10db! Thus a fixed setting of the h.f. and i.f. gains will be essential. This seems to be the mode used by W3BLC.

As an alternative to the method of calibration used by W3BLC, the use of a series of switched 6db attenuators in the (matched) input circuit to the receiver was suggested some time ago by ex-G3HPY.

I hope these remarks will assist in the application of this excellent S meter.

Yours faithfully,

Chelmsford, Essex. B. PRIESTLY, B.Sc. (G3JGO).

Regional and Club News

Aldershot and District Amateur Radio Society.—Meetings are held every Wednesday at the Signals Wing, No. 4 Training Regiment, Royal Engineers, Gibraltar Barracks, Aldershot, commencing at 7.30 p.m. with the exception of the second Wednesday in each month when the meeting is held at " The Cannon," Victoria Road, Aldershot. A technical instruction course at R.A.E. level has commenced and Morse instruction is available. Additional instructors are required and offers will be welcomed by the *Hon. Secretary:* A. M. Laidler, " Pondside," Sandy Lane, Churt, near Farnham, Surrey.

Barnsley and District Amateur Radio Club.—Recent events have included a display of members' equipment. The programme for 1960 has been drawn up and comprises films, slides and recorded lectures, as well as talks on receivers' transmitters, test equipment and aerials. The Annual Dinner is to be held on January 16 and a Pie Supper in October. *Hon. Secretary:* P. Carbutt, 19 Warner Road, Barnsley, Yorkshire.

Brighton and District Radio Club.—Visitors and prospective members are cordially invited to attend meetings at the Home Guard Club, British Legion, 76 Marine Parade, Brighton, details of which are given in *Forthcoming Events.* Further information may be obtained from the *Hon. Secretary:* H. R. Henley (G3IHR), 35 Wilmington Way, Brighton, 6.

Bristol Group.—About 45 members were present at the December meeting when D. V. Newport (G3CHW) gave a talk entitled " Current Trends in 144 Mc/s Equipment and Operation." In the local elections G3RQ was re-elected Hon. Secretary/Treasurer and G5UH Hon. Auditor for 1960. The following were elected to the Committee: C. R. Baldwin (B.R.S.18165), K. J. Creamer (B.R.S.10167), W. J. Dear (B.R.S.19985) and R. A. Prior (G3MTG). At the meeting on February 5 there will be a programme of films compiled by B.R.S.19985. The meeting will be open to ladies. The result of the contest versus Midland Amateur Radio Society on November 8 was a win for Bristol Group in both the Transmitting and Receiving sections; the " return " encounter is now awaited with interest. Local members who have not yet received a copy of the 1960 programme are invited to get in touch with the *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

Cornish Radio and Television Club.—At the December meeting two cups were presented to the club: the G2FHB Memorial Cup and the John Bray Cup, both for award in connection with home-built equipment. G3NVJ gave a talk on the electricity supply system in Cornwall. G2AYQ took part in the *Short Wave Magazine* Club Contest on behalf of the club. *Hon. Secretary:* G. Hubber (G3NVJ), 9 Cardrew Terrace, Redruth, Cornwall.

Crawley Amateur Radio Club.—The club was due to visit Horsham Telephone Exchange on January 7, and arrangements are in hand for the 1960 National Field Day. Meetings will be held at " The Brewery Shades " on January 28 and February 25. Visitors and prospective members will be welcomed. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley, Sussex. (Crawley 3359.)

Crystal Palace and District Radio Club.—Recent events have included a lecture by Cliff Leal (G3ISX) entitled " A Painless Approach to Aerials." The next meeting is on January 26 while the A.G.M. has been arranged for February 13. Further information may be obtained from the *Hon. Secretary*, G. M. C. Stone (G3FZL), 10 Liphook Crescent, London, S.E.23.

AMATEUR RADIO MOBILE SOCIETY MEETING

ST. BRIDE FOUNDATION INSTITUTE, BRIDE LANE, LONDON, E.C.4.

SATURDAY, JANUARY 30, 1960

3 p.m.—Informal Discussion; 3.45 p.m.—Business Meeting; 4.45 p.m.—Lecture; 5.30 p.m.—Tea; 7 p.m.—Film Show.

Talk-in Station—G3NMS on Top Band

Admission 1/- or 3/6 including tea.

Details from George Storey (G3HTC), 10 Avon Road, Sunbury-on-Thames, Middlesex.

Members of the Blackburn Amateur Radio Club operated their Club station G3NTJ during the CQ World Wide DX Contest. Holding the microphone is Jim Whittle (G3EKP) with short wave listener Geoff Altham on his left. The log-keeper, right, is Adrian Mosby.
(Photo by Blackburn Times)

Dunfermline.—At the recent A.G.M. members said goodbye to the Group's president, David Leah (GM3FGH) who has moved to Bath. The new president is Andy Lawrence (GM3IQL). At the January meeting Alec Mercer (GM3EGU) is due to give a talk on D/F work. A visit to the South of Scotland Electricity Board's new power station at Kincarden-on-Forth has been arranged for February. Prospective members are always welcome and are invited to contact the *Hon. Secretary:* A. H. Kightley (GM3MZZ), 28 Castlandhill Road, Rosyth, Fife.

Halifax and District Amateur Radio Society.—Recent activities have included a lecture on Radio Astronomy by Mr. Doihty and a talk on TVI/BCI by H. Swift (G3ADG). The Annual Dinner was due to be held on January 8. The next meeting is on January 19 at the Sportsman Inn, Ogden. *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Reading Amateur Radio Club.—There was an excellent attendance at the December meeting when G3LLK demonstrated and talked about his home built amateur bands receiver, transmitter and oscilloscope. At the meeting at the Palmer Hall, West Street, Reading, on January 30 at 7 p.m. there will be a discussion on N.F.D. followed by a junk sale. Morse instruction is given before meetings commence. *Hon. Secretary:* R. J. Nash (G3EJA), " Peacehaven," 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society.—Tickets for the Annual Dinner, to be held at Laker's Hotel, Redhill, on February 6, are now available price 15s. each. On February 20, G2DVD and G3HCU are to give a talk entitled " Amateur Radio and Polio." At the December meeting, R. Wade gave a much appreciated talk on " The Application of Transistors to Amature Radio." Members were due to visit B.B.C.'s Tatsfield Station on January 9. The A.G.M. is arranged for January 16 at The Tower, commencing at 7.30 p.m. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill, Surrey.

South Manchester Radio Club.—The Region 1 Representative, Mr. Basil O'Brien (G2AMV), will be one of the guests at the club's Hot Pot Supper to be held at Fallowfield Bowling and Lawn Tennis Club Ltd., 81 Wellington Road, Fallowfield, Manchester 14, on January 29. This year's Joint Rally with Stockport Radio Society will be held on August 28.

South Yorkshire Amateur Radio Society.—The inaugural meeting of this new society was held on December 17, 1959, with an attendance of about 30 shortwave listeners and licensed amateurs. The following officers were provisionally elected: *Chairman*—J. Barnard (G8BA), *Hon. Secretary*—W. Farrar (G3ESP), 2a Highbury Avenue, Bessacarr, Doncaster (Tel.: Doncaster 56082), *Hon. Treasurer*—A. Field. Meetings will be held on the second and fourth Thursdays of each month, commencing on January 14, at the Stag Inn, Dockin Hill Road, Doncaster, at 7.30 p.m. All interested persons are invited to attend.

Spen Valley Amateur Radio Society.—The Annual Dinner is to be held at the Kingsway Café, Dewsbury, on January 23, commencing at 6.30 p.m. The guest speaker will be Mr. W. Easton, Assistant Area Engineer, G.P.O., Leeds. The date of the Northern Mobile Rally at Harewood House has been provisionally fixed for May 22, while a visit to Ringway Airport,

Manchester, is being arranged for May 29. *Hon. Secretary:* Norman Pride, 100 Raikes Lane, Birstall, near Leeds.

Tees-side Amateur Radio Club.—There was a record attendance of 62 at the club's Annual Dinner on December 12. Those present included G2FO, G3IV, G3YK, G4WJ, G5YP and G6ZT, all pre-war licensees, and G3NWU who had received his licence only a few days prior to the event. G3LXG/A acted as talk-in station on Top Band for visiting mobiles while G3AWL demonstrated a transistorized electronic key and G3KBD the LG300 transmitter. Details of future meetings are given in *Forthcoming Events* and further details may be obtained from the *Hon. Secretary:* Allan L. Taylor (G3JMO), 12 Endsleigh Drive, Acklam, Middlesbrough.

Torbay Amateur Radio Society.—At the December meeting a large gathering listened to a talk on Amateur Radio experiences by Frank Robb (GI6TK). A welcome visitor was Frank Johnstone (G3IDC, ex-VS1FJ). Information regarding future activities may be obtained from the *Hon. Secretary:* George Western (G3LFL), 118 Salisbury Avenue, Barton, Torquay.

Wirral Amateur Radio Society.—At the meeting on January 22 there will be demonstration and lecture on the TR1986 for 2m. A welcome visitor at a recent junk sale was VE7GQ. The society now has its own call-sign, G3NWR. *Hon. Secretary:* A. Seed (G3FOO), 31 Withert Avenue, Bebington, Wirral, Cheshire.

Representation

THE following are additions to the list of Town or Area Representatives published in the December 1959 issue.

Region	Town or Area	Name, Call-sign (or B.R.S.) and Address
1	**Lancashire East**	
	Bury and Rossendale	JOHN E. HODGKINS (G3EJF), 24 Beryl Avenue, Tottington, Bury.
	Lancashire West	
	Liverpool	A. D. H. LOONEY (G3L1U), 149 Page Moss Lane, Liverpool 14.
2	**Yorkshire East**	
	Scarborough ..	P. B. BRISCOMBE (G8KU), "Roseacre," Irton, near Scarborough.
	County Durham	
	Hartlepools Area ..	A. R. DONALD (G3TO), 77 Granville Avenue, West Hartlepool.

Corrections to December List

Region 6—Buckinghamshire

The address of Mr. P. Carment (G5WW), Representative for **High Wycombe** should read: "The Dovecote," Hunts Hill, Naphill.

Region 8—Kent

The representative for the **Thanet Area** is R. Bastow (B.R.S.6170), 31 Canterbury Road East, Ramsgate, and not J. P. Barnes.

Affiliated Society Representatives

THE following are additions to the list published in the December 1959 issue.

LIVERPOOL & DISTRICT AMATEUR RADIO SOCIETY: A. D. H. Looney (G3L1U), 149 Page Moss Lane, Liverpool 14.

STOCKPORT RADIO SOCIETY: W. P. Green (B.R.S.4567), 23 Buttermere Road, Ashton-under-Lyne, Lancs.

THANET RADIO SOCIETY (G3DOE): J. P. Barnes (G3BKT), 18 Grange Road, Ramsgate, Kent.

KW Electronics Competition

FROM a very large number of entries for the competition at the R.S.G.B. Radio Exhibition 1959 for a name for the new KW Electronics single sideband transmitter, the title "KW Viceroy" has been selected. The prize offered is shared by G2ADC, G3BPM, G3CCN, G3HRE, G3ISX, G3LMX, G3MAO, G3MJS, G3MVS, G3NEA and Mrs. D. F. Owen (XYL of G3MCA), all of whom suggested the winning name.

Enquiries Regarding Bulletin Articles

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

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives. T.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 copy in the style used below.

DATES FOR YOUR DIARY

January 22.—London Lecture Meeting at I.E.E.
January 30. — Amateur Radio Mobile Society London Meeting.
February 13.—London U.H.F. Group Annual Dinner.
March 11.—London Lecture Meeting at the I.E.E.
April 24.—North Midlands Mobile Rally.
May 1.—Amateur Radio Mobile Society Rally.
May 15.—Harwell Mobile Rally and Hamfest.
May 22.—Northern Mobile Rally at Harewood House, near Harrogate (Provisional).
June 15-18.—Region 1 I.A.R.U. Conference, Folkestone.
June 26.—Longleat Mobile Rally.
July 24.—Amateur Radio Mobile Society Rally.
August 14.—Derby Mobile Rally.
August 28.—South Manchester Radio Club and Stockport Radio Society Joint Rally.
September 15-18.—R.S.G.B. National Convention, Cambridge.
September 20. — Lincoln Hamfest and Mobile Rally.

REGION 1

Ainsdale.—Wednesdays, 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., The Corporation Park Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Squires Gate Holiday Camp.
Bury (B.R.S.).—February 9, George Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Crosby (C.A.R.S.).—Tuesdays, 8.30 p.m., "Colonsay," Crosby Road South, Waterloo.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield (M. & D.R.S.).—January 26, February 9, 23, "The Bruce Arms," Crompton Road.
Manchester (M. & D.R.S.).—February 8, 7.30 p.m., The Wellington Hotel, Nicholas Croft, High Street, off Market Street.
Manchester (S.M.R.C.).—Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Fallowfield. January 29, Hot Pot Supper at Fallowfield Bowling & Lawn Tennis Club, 81 Wellington Road, Fallowfield, Manchester 14.
Preston (P.A.R.S.).—Wednesdays, 7.30 p.m., 145 Hammond Street.
Southport.—Thursdays, 8 p.m., The Esplanade, Southport.
Stockport (S.R.S.).—January 20, February 3, 17, The Blossoms Hotel, Buxton Road.
Wirrall (W.A.R.S.).—January 22, February 5, 19, 7.45 p.m., 4 Hamilton Square, Birkenhead.

REGION 2

Barnsley (B. & D.A.R.C.).—January 16 (Annual Dinner), January 22 (Lecture on Radio Fundamentals), 7.30 p.m., King George Hotel, Peel Street, Barnsley.
Bradford (B.A.R.S.).—January 26 (Display of Members' Gear); February 9 ("Inexpensive Sound Fidelity," D. M. Pratt, G3KEP); February 23 (Junk Sale); 7.30 p.m., Cambridge House, 66 Little Horton Lane, Bradford 5.
Cleckheaton (S.V.A.R.S.).—January 20 ("Tape Recorders," Philips Electrical Ltd.); February 3 (Talk by A. E. Falkus, B.Sc.); February 17 (Film Show); 7.30 p.m., George Hotel, Cleckheaton. January 23, 6.30 p.m., Kingsway Café, Dewsbury (Annual Dinner. Guest Speaker: W. Easton, Assistant Area Manager, G.P.O., Leeds.)
Leeds (L.A.R.S.).— January 20 ("Tape Recorders," Philips Electrical Ltd.); 7.30 p.m., George Hotel, Cleckheaton; January 27 (Film Show), Psychology Dept.; February 3 (Ragchew), February 10 ("Simple Items of Test Gear," E. Sollitt and W. Riple), Swarthmore Education Centre, 4 Woodhouse Square, Leeds 3. February 17, Visit to Mains Radio Gramophones Ltd.
Middlesbrough (T-S. A.R.C.). — January 22, February 5, 19, 8 p.m., Settlement House, 132 Newport Road, Middlesbrough.
Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street, Scarborough.

REGION 3

Birmingham (Slade).—January 15, 7.45 p.m., The Church House, High Street, Erdington.
Birmingham (South).—January 21 ("Stereo," by G3LNS); February 18 (Film Show); 7.30 p.m., Friends Meeting House, Moseley. January 24 Mobile Rally (weather permitting), 10 a.m., Lickey Hills Car Park. Check at 09.30 G.M.T. on 1875 kc/s.
Coventry.—January 22, 7.30 p.m., Vine Street Schools.
Stourbridge.—January 5 ("Electronics in Industry" by G3HVX), 8 p.m., Brotherhood Hall; January 22 (Informal), "White Horse," Amblecote.
Wolverhampton.—January 25 (Station Visits); February 1 (R.A.E. Class); February 8 (Ragchew); February 15 (R.A.E. Class); 8 p.m., Nechells Cottage, Stockwell Road, Tettenhall.

REGION 4

Derby (D. & D.A.R.S.).—January 20 (Open Evening); January 27 (Quiz); February 3 (A.G.M.); 7.30 p.m., Room No. 4, 119 Green Lane, Derby.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
High Wycombe.—January 27, 7.30 p.m., G3DQC, 218 Totteridge Road, High Wycombe (Ragchew).

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 12.30 p.m. on Fridays, February 19 and March 18, 1960.

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

REGION 7

Acton, Brentford and Chiswick.—January 19 (A.G.M.); February 16 ("Amateur TV" by G3MEO/T), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Bexleyheath (N.K.R.S.).—January 28 (Junk Sale); February 11, ("Design and Construction of Multiband TVI Proof Transmitters" by W. J. Green, G3FBA), 8 p.m., Congregational Hall, Bexleyheath, Kent (near the Clock Tower).
Croydon (S.R.C.C.).—February 9, 7.30 p.m., "Blacksmith's Arms," South End, Croydon.
Dorking (D. & D.R.S.).—Second and fourth Tuesdays in each month, 8 p.m., Star and Garter Hotel, Dorking.
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, London, W.5.
East Molesey (T.V.A.R T.S.).—February 3, Carnarvon Castle Hotel, Hampton Court.
Enfield and District.—January 28 ("The Control System at G5DJ," by Clem Jardine), 7.30 p.m., George Spicer School, Southbury Road, Enfield.
Harlow and District.—Thursdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays, 7 p.m., R.A.E. and Morse; Fridays (Club); January 22 ("K.W. Products" by R. Shears, G8KW); 7 p.m., Montem School, Hornsey Road, N.7.
Kingston.—Lectures alternate Thursdays, Theory and Morse classes weekly; January 28, Joint meeting with Mullard Ltd., 7.45 p.m., Y.M.C.A. Eden Street, Kingston.
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., 225 New Cross Road London S.E.13.
Romford (R. & D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Slough.—February 1 ("Going Mobile" by H. C. Spencer, G6NA), 8 p.m., "Stag Hotel," Wexham Street, Wexham.
South Kensington (C S.R.S.). — January 19 (Informal); February 2 ("Propagation and Aerials," J. Douglas Kay, G3AAE); February 16 (Informal); Science Museum, South Kensington.
Welwyn Garden City.—February 11 (Transistor Symposium organized by T. A. McMullin, Murphy Radio Ltd.), 8 p.m., I.C.I. Restaurant, Blackfan Road, Welwyn Garden City.

REGION 8

Brighton (B. & D.R.C.).—January 20 (Film Show), January 27 (Informal), February 3 ("A Transistorized El-bug" by H. R. Henly, G3IHR), February 10 (Informal), February 17 (Film Show), Home Guard Club, British Legion, 76 Marine Parade, Brighton.

REGION 9

Bristol.—January 15 ("Atoms and the Amateur" Part II by D. H. Collins, B.R.S.19638, and G. E. Thompson, B.R.S.20190); February 5 (Film Show, arranged by W. J. Dear, B.R.S.19985); 7.15 p.m., Carwardines Restaurant, Baldwin Street, Bristol 1.
Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—February 8 (Fim Show), 7.30 p.m., The British Volunteer, The Hayes, Cardiff.
Penarth.—January 25 (Junk Sale), 7.30 p.m., Y.M.C.A., Penarth.

REGION 12

Aberdeen.—Aberdeen Members' Luncheon Club. February 2, Royal Atheneum Restaurant, 12.45 p.m. (Phone GM3HTL at Aberdeen 34928 for reservations). **(A.A.R.S.).**—January 22 ("S.S.B. versus A.M."); January 29 ("Etched and Printed Circuit Techniques"); February 5 ("GM3BSQ Activity Night"); February 12 ("Frequency Standards and Measurements"); February 19 ("Test Gear in the Shack of GM3ICS"); 7.30 p.m., 6 Blenheim Lane, Aberdeen.

REGION 13

Edinburgh (L.R.S.).—January 28 ("70cm Equipment and Operation," GM3DDE); February 11 ("Tape Recording as a Pastime"); 7.30 p.m., Y.M.C.A., 14 St. Andrew Street, Edinburgh 2.

REGION 17

Newbury (N. & D.A.R.S.).—January 22 ("A Limey Looks at Uncle Sam," by Ken Willis, G8VR, illustrated with colour slides); February 26 ("The Application of Transistors in Electronic Devices," by K. Beauchamp); 7.30 p.m., Elliotts of Newbury Canteen, West Street, Newbury.

Can You Help?

● Stuart Bridgman (VK2AHO, ex-G3BAA, ex-SU1SB), 11 Hunter Street, Mona Vale, New South Wales, Australia, who requires the circuit diagrams and/or service manual for the Wireless Set No. 33, Sender ZA10730 and Power Supply ZA10730 and Power Supply ZA17029? Airmail postage will be refunded.

● Albert Parker (G3KH), 133 Station Road, Cropston, Leicester, who requires circuit information and calibration charts for the Wavemeter W.1646 with Indicator Unit Type 230?

● Norman Pride, Hon. Secretary, Spen Valley Amateur Radio Society, 100 Raikes Lane, Birstall, near Leeds, who requires information on the Indicator Unit Type 292, Ref. 10 QR/6466? The Indicator is part of the Monitor Type 59.

Council Proceedings

AUGUST 1959 MEETING

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1 on Monday, August 10, 1959, at 6 p.m.

Present: The President (Dr. R. L. Smith-Rose in the Chair), Messrs. H. A. Bartlett, N. Caws, C. H. L. Edwards, K. E. S. Ellis, D. A. Findlay, W. J. Green, J. H. Hum, E. G. Ingram, J. D. Kay, W. R. Metcalfe, A. O. Milne, L. E. Newnham, W. A. Scarr, A. C. Williams, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary) and John A. Rouse (Deputy Editor).

Apologies: An apology for absence was submitted on behalf of Mr. P. H. Wade.

Absent: Mr. H. W. Mitchell.

* * *

Membership

Resolved (i) to elect 30 Corporate Members and six Associates; (ii) to grant Corporate Membership to seven Associates who have applied for transfer.

National Convention 1960

After considering a report from the General Secretary and correspondence from the Region 5 Representative (Mr. T. A. T. Davies) it was

Resolved to agree in principle to a proposal that a National Convention be held in Cambridge during the period Thursday, September 15 to Saturday, September 17, 1960.

Council Nominations, Regional Representatives, Society Trophies

Consideration was given to these matters. (The outcome of various decisions taken at the meeting was reported upon in the August 1959 issue of the Society's Journal.—EDITOR.)

Headquarters

Resolved to defer until the November 1959 meeting of the Council a suggestion that the Council should set up an *ad hoc* Committee to look into the question of establishing a new Headquarters.

Reports of Committees

Consideration was given to reports of meetings of the Publications, V.H.F., TVI/BCI and Exhibition Committees and of the Technical Development Sub-Committee.

Resolved to receive the Reports and to accept the various Recommendations contained therein.

The Recommendations dealt, *inter alia*, with decisions (i) to increase the size of certain issues of the BULLETIN, the publication of certain information (e.g. *New Members, Council Proceedings*) quarterly instead of monthly; (ii) regarding insurance in connection with the Society's V.H.F. Beacon Station at Wrotham Hill, (iii) regarding the purchase of fold-flat countering for use at Radio Exhibitions; (iv) regarding Exhibition expenses.

It was reported that a letter had been sent to all Society representatives asking for assistance in connection with the technical development programme.

Articles of Association

The Honorary Treasurer reported that he had drafted for consideration by the Finance and Staff Committee, draft articles dealing with (i) the continued absence without explanation of members of the Council; (ii) the investments of the Society.

Mr. Hugh McConnell

The Council

Resolved to place on record an expression of their deep regret on learning of the death of Mr. Hugh McConnell (an ex-member of the Council).

The meeting terminated at 9.45 p.m.

SEPTEMBER 1959 MEETING

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, September 28, 1959, at 6 p.m.

Present: The Executive Vice-President (Mr. W. R. Metcalfe in the Chair), Messrs. H. A. Bartlett, N. Caws, C. H. L. Edwards, K. E. S. Ellis, D. A. Findlay, W. J. Green, J. H. Hum, E. G. Ingram, J. D. Kay, A. O. Milne, L. E. Newnham, W. A. Scarr, P. H. Wade, A. C. Williams, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary) and John A. Rouse (Deputy Editor).

Apologies: Apologies for absence were submitted on behalf of the President (Dr. R. L. Smith-Rose).

Absent: Mr. H. W. Mitchell.

* * *

National Convention 1960

It was reported that the Cambridge Group had now met and had agreed to organize a National Convention in that city during the period September 15-17 (or 18), 1960.

(The Honorary Treasurer and General Secretary plan to meet the Convention Committee at an early date to discuss financial and other arrangements.)

Russian QSL Cards

It was reported that as the result of a letter sent to the Russian QSL Bureau, cards from the U.S.S.R. were now being addressed to the R.S.G.B. QSL Bureau.

Cash Account

Resolved to receive and adopt the Cash Account for August 1959 as prepared by the General Secretary.

Annual Accounts

The Honorary Treasurer (Mr. N. Caws) submitted the audited annual accounts for the year to June 30, 1959.

Resolved that the audited accounts be approved for printing and subsequent presentation to the members at the Annual General Meeting on December 11, 1959.

Annual Report

The General Secretary submitted a draft Annual Report of the Council for the year to June 30, 1959.

Resolved that the Annual Report be approved for printing and subsequent presentation to the membership at the Annual General Meeting on December 11, 1959.

Membership

Resolved (i) to elect 148 Corporate Members and 65 Associates; (ii) to grant Corporate Membership to 10 Associates who had applied for transfer; (iii) to grant Life Membership to Mr. P. O. Hooker, G3KSP, of Bare, Morecambe, Lancs.

It was reported that 55 visitors to the Society's stand at the Earls Court Radio Show had applied for membership.

Applications for Affiliation

Resolved to grant affiliation to the following Societies and Clubs: Conway Valley Amateur Radio Club; R.A.F. Stanbridge Amateur Radio Society; R.A.F. Pergamos Amateur Radio Club; and the Wanstead and Woodford Radio Society.

Mullard Award 1958

Mr. Metcalfe reported verbally on the arrangements made for the presentation of the Mullard Award for 1958 to Mr. Peter Odell (G3MUM) of Redcar. The presentation was made by the Mayor of Redcar in the presence of about 100 local radio amateurs and their ladies.

Redcar Meeting

It was reported that an informal meeting of members had followed the Mullard Award presentation and that during the meeting suggestions were put forward regarding local representation and the holding of an O.R.M. in that part of Region 2. Mr. Metcalfe agreed to discuss these matters with the Region 2 Representative.

Arising from a suggestion made at the Redcar meeting it was agreed that it would not be a practical proposition at the present time to hold the R.S.G.B. Radio Hobbies Exhibition at the same time as the National Radio and Television Show, Earls Court.

Geneva Radio Conference

Mr. Newnham and the General Secretary reported on the work done during the first three weeks of the Geneva Radio Conference.

Mr. Newnham tabled the various documents (numbering more than 300) that had so far been issued by the Conference Secretariat. He also informed the Council that he would be free to return to Geneva for a further short period towards the end of October (Mr. Newnham, who is a member of the U.K. delegation, had been invited by the leader of the delegation, Captain C. F. Booth, to return to Geneva if his private arrangements permitted.—J. C.).

Resolved to authorize Mr. Newnham to incur a further expenditure of up to £100 in connection with his attendance at the Geneva Radio Conference.

R.S.G.B. News Bulletins

Mr. Metcalfe informed the Council that due to pressure of other duties he would no longer be able to read R.S.G.B. News Bulletins.

Resolved to place on record the thanks of the Council to Mr. Metcalfe for his past services to the Society in connection with the reading of R.S.G.B. News Bulletins.

Radio Teletype

Resolved to advise the G.P.O. that the Society will raise no objection to the use by amateurs of the system known as Radio Teletype provided it is not used in the band 1800-2000 kc/s. (The Society had previously been informed that the G.P.O. would be prepared to allow individual amateurs, upon application, to use Radio Teletype subject to a review of the arrangements after 12 months.)

Facsimile

Resolved to advise the G.P.O. that the Society will raise no objections to the use by amateurs of the system of transmission known as Facsimile in the bands 420 Mc/s and higher.

R.S.G.B. Bulletin Costs

The Secretary reported that Loxley Bros. Ltd. had submitted a revised estimate for printing the Society's Journal. Using the May 1959 issue as a basis for comparison, the net increase would amount to approximately £720 per year for 12 48-page issues. (In a covering letter Loxley Bros. Ltd. had explained that the settlement of the recent dispute in the printing industry had led to increased charges for work done after August 6, 1959.)

It was agreed to request the Publications Committee to consider the financial implications of the revised estimate insofar as it concerns the proposals recently put forward by that Committee to increase certain issues of the BULLETIN to 64 pages.

Mr. W. J. Green

Mr. Green informed his colleagues that as he would be moving from Zone D on October 2, 1959, he would no longer be qualified to serve as a member of the Council after that date.

Mr. Green intimated that he much regretted having to withdraw from the Council before the end of the period for which he had been elected.

The Chairman, on behalf of the Council, thanked Mr. Green for his past services to the Society as a Zonal Representative.

Reports of Committees

Minutes of Meetings of the Technical Development Sub-Committee, the Handbook, Exhibition, Contests, R.A.E.N. and TVI/BCI Committees were submitted as Reports.

Resolved to receive the Reports and to accept the recommendations contained therein.

The Recommendations dealt, *inter alia*, with the award of prizes in connection with the R.S.G.B. Radio Hobbies Exhibition, N.F.D. Contest Results 1959, 420 Mc/s Contest 1959, 70 Mc/s Contest 1959, Programme of Events for 1960 and the purchase of printed paper signs for use in connection with R.A.E.N.

It was agreed to bring to the notice of the Publications Committee a suggestion put forward by the Exhibition Committee that the Society should publish a list of CV valve numbers and their commercial equivalent type numbers.

The meeting terminated at 10.50 p.m.

OCTOBER 1959 MEETING

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, October 19, 1959, at 6 p.m.

Present: The President (Dr. R. L. Smith-Rose, in the Chair), Messrs. H. A. Bartlett, N. Caws, C. H. L. Edwards, K. E. S. Ellis, D. A. Findlay, J. H. Hum, E. G. Ingram, J. D. Kay, W. R. Metcalfe, A. O. Milne, L. E. Newnham, W. A. Scarr, P. H. Wade, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary) and John A. Rouse (Deputy Editor).

Apologies: An apology for absence was submitted on behalf of Mr. A. C. Williams, who was indisposed.

Absent: Mr. H. W. Mitchell.

* * *

Audited Accounts

The Honorary Treasurer submitted for signing by the appropriate officers printed copies of the audited accounts for the year ended June 30, 1959.

Membership

Resolved (i) to elect 65 Corporate Members and 25 Associates; (ii) to grant Corporate membership to two Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to the Guildford and District Radio Society and the Radio Club of Uganda.

R.S.G.B. News Bulletin Service

Resolved to set up an *ad hoc* Committee consisting of the Zonal Representatives and Mr. Kay to examine the present arrangements for the R.S.G.B. News Bulletin Service and to request the Committee to submit a report to the Council based on providing the maximum coverage with the minimum number of stations.

N.F.D. Scoring

The Chairman of the Contests Committee (Mr. Findlay) reported upon the difficulties experienced by stations in remote areas who claim that they are unable to compete on even terms with stations in more central or crowded areas. He stated that the possibility of introducing a multiplier for stations in remote areas would be considered by the Contests Committee.

Geneva Radio Conference

The General Secretary and Mr. Milne reported on the recent work of the Geneva Radio Conference.

Mr. Newnham informed the Council that he would be returning to Geneva, as a member of the U.K. delegation, on October 24 and that he planned to remain until November 4. It was suggested that it might prove helpful to Mr. Newnham if another member of the Council could attend the Conference for a short while.

Resolved to authorize Mr. Kay to attend the Geneva Radio Conference for one week and to reimburse him for his out-of-pocket expenses.

Raffle Prizes

Arising from the publication in the September issue of the Society's Journal of a circular letter dealing with raffles organized in connection with Society functions a Letter to the Editor was submitted from a member in which he expressed the opinion that it is a " ridiculous imposition " to require members who win prizes in raffles to write a personal letter of thanks to the company or firm responsible for supplying the gift.

Resolved to publish the letter.

Reports of Committees

The Minutes of Meetings of the Technical Development Sub-Committee and the Exhibition Committee were submitted as Reports.

The Reports contained no recommendations.

TVI/BCI Literature

Resolved to authorize the printing of 1,000 copies of the TVI/BCI articles published in the August 1959 issue of the Society's Journal for distribution to members who appeal to the TVI/BCI Committee for help in cases of alleged interference.

Two Metre Beacon

It was reported that J-Beam Aerials Ltd. had donated to the Society a special five-element array for the Wrotham 2m beacon station.

The Secretary was instructed to write to thank J-Beam Ltd. for their generosity.

Council Ballot Scrutineers

It was reported that no response was received at the Ordinary Meeting of the Society held on October 16, 1959 to a request for Council Ballot scrutineers.

It was agreed that in the circumstances the Secretary should endeavour to enlist the services of sufficient members to assist in the counting of the Ballot.

The meeting terminated at 9.15 p.m.

NOVEMBER 1959 MEETING

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, November 23, 1959, at 6 p.m.

Present: Mr. L. E. Newnham (Immediate Past President in the Chair), Messrs. N. Caws, C. H. L. Edwards, K. E. S. Ellis, D. A. Findlay, J. H. Hum, E. G. Ingram, J. D. Kay, A. O. Milne, W. A. Scarr, P. H. Wade, A. C. Williams, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary) and John A. Rouse (Deputy Editor).

Apologies for Absence. Apologies were submitted on behalf of the President (Dr. R. L. Smith-Rose) and Messrs. H. A. Bartlett and W. R. Metcalfe (who was indisposed).

Absent: Mr. H. W. Mitchell.

* * *

Geneva Radio Conference

(a) It was reported that Mr. J. D. Kay had attended the Conference for one week in November.

(b) The Secretary and Mr. Newnham reported on recent happenings at the Conference. The former submitted for information Report No. 4 of the I.A.R.U. team of observers.

Membership

Resolved (i) to elect 98 Corporate Members and 22 Associates; (ii) to grant Life Membership to Mr. J. R. Toothill, B.R.S.20543; (iii) to grant Corporate Membership to seven Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to the Boscombe Down R.A.F. Amateur Radio Society and the Halifax and District Amateur Radio Society.

Historic Radio Equipment

It was reported that Mr. Maurice Child had expressed a wish to donate about one dozen pieces of historic radio equipment to the Society.

Resolved to inform Mr. Child that the Council accepts with thanks his kind offer.

(A member of the Council is storing most of the equipment in his home until such time as the Society is able to provide accommodation for it to be displayed.—J. C.).

National Convention—Cambridge 1960

Resolved to inform Mr. T. A. T. Davies (Region 5 Representative) that the Council will assume responsibility for the financial aspects of the Convention, subject to the Honorary Treasurer and General Secretary being satisfied with the various proposals put forward by the Convention Committee.

Headquarters

Resolved to recommend the 1960 Council to set up a Commission of experienced members, who need not all be members of the Council, to discuss and report upon the future housing of the Society.

Raffle Prizes

It was agreed that the Secretary should draft, for consideration by the 1960 Council, a revised circular letter dealing with raffle prizes. The revision would take note of the following specific points:

(a) There shall be no charge for tickets relating to the draw for raffle prizes.

(b) The organiser of the raffle shall accept responsibility for acknowledging and thanking donors of prizes.

(c) Winners shall not be required to write to donors of prizes.

Cardiff O.R.M.

The Region 10 Representative (Mr. C. H. Parsons) reported that a profit of £3 11s. 10d. had accrued from the Cardiff O.R.M.

It was agreed to suggest to Mr. Parsons that the profit should be credited to the Region 10 fund.

Hampshire County Civil Defence

A letter was submitted from the Head of the Hampshire County Civil Defence (Major-General W. O. Bowen) in which he asked to be supplied with the names and addresses of members in Hampshire, so that an approach could be made to them to join the Radio Section of the County's C.D. organisation.

The Secretary was instructed to send a copy of the 1960 *Call Book* to Major-General Bowen and to inform him that the Society is not able to supply him with a list of members resident in Hampshire.

Wirral Amateur Radio Society

The Secretary was authorised to accept an invitation to attend the annual dinner of the Wirral Amateur Radio Society on February 26, 1960.

It was agreed to defer until the January 1960 meeting the question of appointing a Council member to attend the dinner.

Scottish O.R.M.s

It was agreed to circulate, on rota to all members of Council, a copy of a report on the O.R.M.'s held in Glasgow and Ayr during September 1959.

Overseas Group

Consideration was given to a suggestion put forward by a member resident in South Africa that the Society should sponsor the formation of an Overseas Group.

Resolved to inform the member in question that the Council feels that in the light of past experience it would be unwise to adopt his suggestion.

(Members of long standing will recall that prior to the war the R.S.G.B. sponsored an organisation known as the British Empire Radio Union. For a variety of reasons it was decided after the war not to revive the B.E.R.U.—J. C.)

Dr. E. S. G. K. Vance

It was reported that Dr. E. S. G. K. Vance had resigned from the office of Region 4 Representative.

The Secretary was instructed to write a suitable letter to Dr. Vance thanking him for his past services to the Society.

Reports of Committees

The Minutes of Meetings of the TVI/BCI, Exhibition and Contests Committees, were submitted as Reports.

Resolved to receive the Reports and to accept the Recommendations of the Contests Committee contained therein. (The Recommendations dealt with various Contest matters.) The other Reports contained no Recommendations.

The Minutes of a Meeting of the Technical Development Sub-Committee were submitted for information.

Propaganda

A letter was tabled from an R.S.G.B. member living in Belgium. The envelope bore an imprint of the R.S.G.B. emblem whilst the contents of the envelope contained anti-Catholic and anti-vivisection propaganda.

The Secretary was instructed to write to the member concerned pointing out that the R.S.G.B. emblem must not be used on envelopes containing propaganda.

The meeting terminated at 10 p.m.

New Members

THE following have been elected to membership.

SEPTEMBER, 1959

Corporate Members, Home (Licensed)

G2OS †J. W. Ostens, 27 Seafield View, Tynemouth, Northumberland.
G2APN †R. A. Perryman, Hillside, Whitehill, Bordon, Hants.
G2BBZ †C. Levy, 174 Holders Hill Road, Mill Hill, London, N.W.9.
G2CPM †W. B. Mansell, 25 Selsdon Avenue, Woodley, Reading, Berks.
G2DFH †H. Griffiths, 12 Hillside Road, Saltash, Cornwall.
G3GZ †A. Houchin, 90 Shaggy Calf Lane, Slough, Bucks.
G3BJN †T. L. Johnson, 101 Beech Road, Harrogate, Yorks.
G3BNM †A. Whitelock, 8 Station Cottages, Alne, York.
G3GMR †C. Scothern, 3 Albert Street, Radcliffe, Lancs.
G3KKJ A. Shannon, 1 Orcades Green, Walney Island, Barrow-in-Furness, Lancs.
G3KZD A. A. Snell, Homeland, Hillhead, Colyton, Devon.
G3LNR A. E. Gwynne, 31 Caroline Street, Nottingham.
G3LRD B. R. Clements, 27 Stainforth Road, Newbury Park, Ilford, Essex.
G3LRO †J. H. Tinker, 68 Caulfield Road, East Ham, London, E.6.
G3MCS W. R. Hawthorne, 154 Botany Road, Margate, Kent.
G3MGF S. H. Heaven, 1 Sunnyside, Horsley, nr. Stroud, Glos.
G3MPW A. S. Walker, 100 Buckingham Avenue, Scunthorpe, Lincs.
G3NAZ F. J. Barkas, 14 Lickhill Road, Calne, Wilts.
G3NBH T. J. Binderman, 7 Floyd Road, Charlton, London, S.E.7.
G3NCM B. C. Moss, 34 Ringwood Road, Headington, Oxford.
G3NDW F. J. Moore, 3 Redlands Close, Solihull, Warwicks.
G3NIZ K. Lawless, 276 Vicarage Road, Longwood, Huddersfield, Yorks.
G3NKB D. J. Hodder, The Uplands, Newquay Road, Truro, Cornwall.
G3NMI R. Purdom, Croft Cottage, Berrow, Burnham on Sea, Som.
G3NMW T. L. Whateley, 34 Inverness Road, Northfield, Birmingham 31, Warwicks.
G3NMX *D. Wills, 35 Kingsfield Avenue, N. Harrow, Middx.
G3NNA *M. J. Codd, 20 Cromwell Road, Luton, Beds.
G3NNP M. L. Luff, Flat 3, 8 The Downs, Wimbledon, London, S.W.20.
G3NNV P. A. Swanson, 19 Dovecot Place, Liverpool 14, Lancs.
G3NNW *K. Taylor, 65 Manchester Street, Heywood, Lancs.
G3NNZ *B. W. East, 14 Barnard Avenue, Gt. Yarmouth, Norfolk.
G3NON R. W. Harris, 16 Cornwall Road, Handsworth, Birmingham 20.
G3NOT D. J. Tanner, 44 M.Q'rs., Middle Wallop Camp, nr. Stockbridge, Hants.
G3NPA *G. W. Anderson, 96 Nork Way, Banstead, Surrey.
G3NPD S. B. Young, 5 Northwick Park Road, Harrow, Middx.
G3NPE P. J. Wood, Tickenham Court House, Tickenham, Clevedon, Som.
G3NPF *A. C. Wadsworth, 2 Edith Road, Prittlewell, Southend-on-Sea, Essex.
G3NPL E. H. Matthews, 20 Stockwell Furlong, Haddenham, Bucks.
G3NPU †P. Hill, 12 Harding Avenue, Eastbourne, Sussex.
G3NPW J. Marsden, 42 Courtwick Road, Littlehampton, Sussex.
G3NQO V. T. Brown, 40 Lansdowne Drive, Dalston, London, E.8.
G3NQS E. Russell, 163 Fillebrook Road, Leytonstone, London, E.11.
G3NQW G. F. Welsh, 110 Alderney Road, Slade Green, Kent.
G3NRA D. Appleton, 22 Maldon Road, Goldhanger, nr. Maldon, Essex.
G3NRM M. R. Moore, 30 Abbey Crescent, Beauchief, Sheffield 7.
G3NRN *J. L. Schuler, 18 Chaucer Road, Wanstead, London, E.11.
G3NRW *A. I. H. Wade, 20 Upper Pines, Woodmansterne, Banstead, Surrey.
G6NK †R. J. Denny, 32 Waverley Road, Weybridge, Surrey.
G8OT †A. S. Tripp, 40 Brewers Hill Road, Dunstable, Beds.
GI3JGZ E. J. Wright, 3 Queen Street, Portadown, Co. Armargh, N. Ireland.
GM3ASM †S. E. Hincks, 26 Castlemilk Crescent, Croftfoot, Glasgow S.4, Scotland.
GM3FSV †C. O. Thomsen, Papdale House, Kirkwall, Orkney.
GM3KRO J. P. O'Donnell, 38 Forbes Road, Edinburgh, Scotland.
GM3DZG †J. A. Keating, 1 Mount Terrace, Lochans, Stranraer, Wigtownshire, Scotland.
GW3IWM †M. Holland, Greenfields, Burton, Rossett, nr. Wrexham, N. Wales.

Corporate Members, Overseas (Licensed)

DL1TA Dr. Karl-Heinz Birr, Braunschweig, Cellerstr. 101, Germany.
F2BT L. Delaplace, 1 K The Mansions, Earls Court Road, London, S.W.5.
I1QT C. Laviani, 20 Via Broletto, Milano, Italy.
K2ESZ J. A. Lambert, II, 89 Thayer Street, New York 40, N.Y., U.S.A.
K4IFW H. H. Russell, 951 Marietta Avenue, Norfolk 13, Virginia, U.S.A.
K4ZSI J. D. Tell, P.O. Box 152, Melbourne Beach, Florida, U.S.A.
SM6BDS C. L. Forsberg, Biskopsbogatan 59, Molndal, Sweden.

VE3CRA †O. A. Sandoz, c/o G3XC, "Pentire," Christmas Lane, Farnham Common, Bucks.
VK4EL †E. J. Lake, 17 Stanton Street, Belgian Gardens, Townsville, N. Queensland, Australia.
VP8AH R. M. Pitalusa, Gibraltar Station, Port San Salvador, Falkland Islands.
VQ2RR H. Ritchie, P.O. Box 589, Broken Hill, Northern Rhodesia.
W1UOP R. C. Paulson, P.O. Box 4, Needham 92, Mass., U.S.A.
W3LEZ †P. D. Boardman, 2644 Kirk Avenue, Broomall, Pa., U.S.A.
W5YAX O. N. Cronk, 38 Carolyn Drive, RFD 2, Ocean Springs, Miss., U.S.A.
W8IZF J. S. Kovac, 2/5 Ash, Port Clinton, Ohio, U.S.A.
W9VPE T. J. Rusco, 808 West Park Avenue, Joliet, Ill., U.S.A.
ZE8JV G. L. H. Evered, Turk Mine, P.O. Turk, Southern Rhodesia.
4X4ES S. Spector, Haifa, P.O. Box 163, Israel.
9G1DB P. L. Hamnett, c/o Cable & Wireless Ltd., Box 32, Accra, Ghana.

Corporate Members, Overseas (British Empire Receiving Stations)

1025 Dr. G. A. C. Keenan, c/o Medical Dept., Freetown, Sierra Leone.
1026 B. D. Pritchard, c/o Aeradio, International Airport, Nandi, Fiji.
1027 B. Crosbie, H.Q. Coy, 2 Para. Btn., Nicosia, Cyprus, B.F.P.O. 53.

Corporate Members, Home (British Receiving Stations)

22417 L. Holling, 22 Hillary Road, Wrose, Shipley, Yorks.
22418 D. G. Arigho, 81 Holland Park, London, W.11.
22419 R. L. J. Kissick, Brookside, Brookside Road, Freshwater, Isle of Wight.
22420 F. J. Thompson, 41 Boverton Drive, Brockworth, Gloucester.
22421 T. W. Turner, Bude, Liverpool Road, Hutton, nr. Preston, Lancs.
22422 G. A. Breed, The Oaks, Runwell Chase, Wickford, Essex.
22423 R. S. Unsworth, 10 Bidston Way, Blackbrook, St. Helens, Lancs.
22424 D. A. Golder, 92 Belmont Street, Oldham, Lancs.
22425 R. J. Hearn, 30 Hilton House, Honour Oak Estate, London, S.E.4.
22426 J. F. Walton, M.V. *Wavebank*, c/o Andrew Weir & Co. Ltd., 21 Bury Street, London, E.C.3.
22427 A. Harris, 19 Boyne Road, Hastings, Sussex.
22428 P. C. H. Spencer, 11 Staddon Crescent, Staddon Park, Plymstock, Plymouth.
22429 J. S. Orme, 13 Wirksworth Road, Duffield, Derby.
22430 G. V. Moss, 4 High Street, Greenhithe, Kent.
22431 L. T. Taylor, 42 Ecclesbourne Gardens, Palmers Green, London, N.13.
22432 J. H. Reynolds, Television House, Handsworth, Birmingham 19.
22433 G. W. Mallows, 14 Yukon Road, Balham, London, S.W.12.
22434 J. Wilson, 28 Pitfour Street, Dundee, Angus, Scotland.
22435 S. Fernie, 8 Upper Montagu Street, London, W.1.
22436 W. H. Morecock, 6 Hubbard Street, London, E.15.
22437 M. D. Bass, 42 Clevedon Road, London, S.E.20.
22438 J. A. T. Pritchard-Gordon, Shakespeare Hall, Rowington, Warwick.
22439 D. C. Maestier, 8 Recreation Ground Road, Newport, I.o.W.
22440 G. W. Burt, 61 Sherland Road, Twickenham, Middx.
22441 D. C. Davis, 132 Gordon Road, West Ealing, London, W.13.
22442 J. Foong, 73 Portland Road, Holland Park, London, W.11.
22443 N. Lord, 55 Lennox Road, Gravesend, Kent.
22444 O. P. Oputa, 29 Gibson Square, London, N.1.
22445 W. Parmenter, 41 David House, St. Leonards Road, Poplar, London, E.14.
22446 A. D. Smith, 23 Stuart Drive, Lanark, Scotland.
22447 C. R. Winson, 104 Grove Avenue, London, W.7.
22448 W. F. C. Sherry, 66 Hollybush Lane, Welwyn Garden City, Herts.
22449 A. S. Edwards, 67 Central Avenue, Church Stretton, Shropshire.
22450 C. W. Stratford, 18 Osney Way, Chalk, Gravesend, Kent.
22451 J. H. Buying, 26 Napsbury Avenue, London Colney, Herts.
22452 T. H. Atherton, Wayside, Swanlow Lane, Winsford, Cheshire.
22453 R. I. Jackson, No. 1 Guided Weapons Trials Squadron, R.A.F. Valley, Angelesey, North Wales.
22454 J. W. Roberts, 34 Preston Avenue, Alfreton, Derbys.
22455 C. Ward, 132 Barbieston Road, Auchinleck, Ayrshire, Scotland.
22456 J. V. Mee, 207 Grimshaw Lane, Middleton Junction, Manchester, Lancs.
22457 T. Vidler, 25 Kensington Avenue, Thornton Heath, Surrey.
22458 Dr. C. T. Cowan, A.R.I.C., 2 Cormongers, Cormongers Lane, Redhill, Surrey.
22459 R. H. Truman, Flat 2, 95 Trowbridge Road, Bradford-on-Avon, Wilts.
22460 L. F. G. Thomas, Koughton, Corntown Road, Ewenny, nr. Bridgend, Glam.
22461 A. Keenan, 3 Crown Place, Crieff, Perthshire, Scotland.
22462 J. Smith, 88 Richmond Park Avenue, Kimberworth, Rotherham, Yorks.
22463 D. Bailey, 39 Park Place, Parkinson Lane, Halifax, Yorks.
22464 D. E. J. Coles, 113 Berrow Road, Burnham-on-Sea, Som.
22465 E. Crouch, 2 Geneva Road, Kingston-on-Thames, Surrey.
22466 W. D. Fletcher, 5 St. Georges Terrace, Regents Park, London, N.W.1.
22467 P. I. Park, 50 High Street, Strichen, Aberdeenshire.
22468 F. W. Fagan, 38 Thane Villas, Holloway, London, N.7.
22469 J. H. O. Hawkins, "Etrona," The Common, Ramsdell, nr. Basingstoke, Hants.
22470 E. C. Weatherall, 16 Avebury Close, Clifton, Nottingham.
22471 D. J. Bowskill, 53 Park Road, Teddington, Middx.
22472 D. B. Pitt, 2a Mabel Grove, West Bridgford, Nottingham.
22473 A. T. Chamberlain, 51 Hunter Road, Southsea, Hants.
22474 F. D. M. Sloan, 39b Golders Way, Golders Green, London, N.W.11.
22475 B. G. Taylor, "St. Margarets," Irvine Crescent, Bathgate, West Lothian, Scotland.
22476 J. E. Hobin, 61a Cobbold Road, Felixstowe, Suffolk.
22477 P. B. Gaunt, 2 St. James Walk, Horsforth, nr. Leeds, Yorks.
22478 R. C. Shuck, Tregarrow, Lowe Lane, Wolverley, Kidderminster, Worcs.
22479 G. M. T. Large, 19 Belgrave Gardens, Southgate, London, N.14.
22480 J. R. R. Smith, 5 Holly Grove, Blaby, Leicester.
22481 M. Jones, Flat 3, Jesmond, East Parade, Llandudno, Caerns., N. Wales.
22482 R. V. Court, 48 West Cromwell Road, London, S.W.5
22483 D. L. Slight, 19 Denoon Terrace, Dundee, Angus.
22484 J. R. Ellison, 18 Tiverton Avenue, Weeping Cross, Stafford.
22485 H. D. Cooper, 22 Lyndhurst Road, Highams Park, London, E.4.
22486 B. A. Morrall, 50 Hollyhedge Lane, Walsall, Staffs.
22487 D. L. C. Meader, 4 The Oaks, Uxbridge Road, Hanworth, Middx.
22488 J. Forry, 56 Douglas Crescent, Viewpark, Liddingston, Lanarkshire, Scotland.
22489 L.R.O. G. J. Perry, C/J, 934411, 4H 32 Mess, H.M.S. *Centaur*, c/o G.P.O. London, E.C.1.
22490 C. C. Bevis, 60 Worthing Road, Horsham, Sussex.
22491 *M. H. Davis, 100 Northgate, Regents Park, London, N.W.8.
22492 *L. R. Fairbrother, 21 Rugby Road, Kingsbury, London, N.W.9.
970[illegible] †F. W. J. Neale, "Westholme," Hyde Lane, Marlborough, Wilts.
18213 †H. S. Westnott, 29 Dijon Street, Daubhill, Bolton, Lancs.
19319 †E. H. Jones, Tudno View, Benllech, Anglesey, N. Wales.
20365 †L. A. Sandy, 19 Hindsley Place, Forest Hill, London, S.E.23.

Associates

2020 C. G. Jenkins, 98 Theobald Street, Borehamwood, Herts.
2021 D. Logan, 95 Bath Road, Keynsham, near Bristol.
2022 A. Roberts, 86 Church Lane, Scunthorpe, Lincs.
2023 R. A. Hargreaves, Wych Cottage, Adlington, Nr. Macclesfield, Cheshire.
2024 R. Gilmore, 37 Leman Street, Derby.
2025 J. M. Potter, 34 Brookside Avenue, Eccleston, St. Helens, Lancs.
2026 J. W. G. Pethard, Dorset House, The Halve, Trowbridge, Wilts.
2027 M. J. Bonner, 90 Aveling Park Road, Walthamstow, London, E.17.
2028 J. A. Lush, 55 Edgecumbe Road, St. Austell, Cornwall.
2029 B. C. Davies, 4 Queens Road, Penarth, Glam., S. Wales.
2030 H. J. Matthews, 3 Queens Road, Egham, Surrey.
2031 A. R. Jones, 15 Coolgardie Avenue, Highams Park, London, E.4.
2032 A. J. Wakeling, Barking Vicarage, Barking, Essex.
2033 M. D. Cundell, Holmside, Long Walk, Chalfont St. Giles, Bucks.
2034 M. D. James, 36 Iver Lane, Iver, Bucks.
2035 B. P. Van Biene, 31 Camrose Avenue, Edgware, Middx.
2036 C. J. Smith, White Knowle, Shepley, nr. Huddersfield, Yorks.
2037 K. H. Gould, Woodcroft, Hughenden, High Wycombe, Bucks.
2038 P. A. Brown, 6 Ripon Street, Preston, Lancs.
2039 I. Jackson, 4 The Croft, Whittingham, Alnwick, Northumberland.
2040 C. Gadsden, 2 Savoy Buildings, West Street, Fareham, Hants.
2041 M. A. Hall, Redthorn House, Cleobury Mortimer, nr. Kidderminster, Worcs.
2042 I. D. Welling, 127 Clayhall Avenue, Ilford, Essex.
2043 J. P. Vine, 123 London Road, High Wycombe, Bucks.
2044 A. Hiiemae, 36 Barclay Road, London, S.W.6.
2045 J. R. Childs, 87 Manor Farm Drive, Chingford, London, E.4.
2046 L. M. Reed, 6 Rosebery Street, Taunton, Som.
2047 J. W. Doick, 3 Fieldhurst Close, Addlestone, Surrey.
2048 R. E. Jones, 34 Station Road, Epping, Essex.
2049 C. L. Jenkins, 43 Shirley Avenue, Southampton.
2050 R. J. Pryor, 6 Litchfield Avenue, Epsom Road, Morden, Surrey.
2051 J. W. Joyce-Townsend, 2 Limes Close, Ashford, Middx.
2052 D. J. Still, 198 Uxbridge Road, Feltham, Middx.
2053 D. Whittaker, Cherry Cottage, Goldcliffe, Newport, Mon.
2054 J. Vernon, 46 West Drayton Park Avenue, West Drayton, Middx.
2055 P. M. Lane, 86 Torrington Road, Ruislip Manor, Middx.
2056 G. J. Bedwell, 13 Little Plucketts Way, Buckhurst Hill, Essex.
2057 S. K. Overend, 4 Lark Hill, Worcester.
2058 M. J. Blewett, Cedram, Gatehouse Lane, Goddards Green, Hassocks, Sussex.
2059 B. S. Tibbs, 14 Meadway, Bush Hill Park, Enfield, Middx.
2060 B. Hawes, 19 West Street, Walton-on-the-Naze, Essex.
2061 H. D. C. Fearnley, 6 Chapelhouse Walk, Formby, Liverpool, Lancs.
2062 D. M. Willoughby, Bygot House, Dittons Road, Stone Cross, nr. Pevensey, Sussex.
2063 A. S. Davidson, Linton House, Thurlsthine Road, Cheltenham, Glos.

2064 A. Roll, 54 Oxford Road, Lowestoft, Suffolk.
2065 P. W. Waters, 6 Walden Way, Hornchurch, Essex.
2066 P. Beecroft, Revesby, Irton, Scarborough, Yorks.
2067 K. Hillman, 51 Cornfield Road, Springfield, Dudley, Worcs.
2068 I. F. Newey, 26 Market Street, Kingswinford, Staffs.
2069 P. J. R. Tolman, 88 Newport Road, Barnstaple, Devon.
2070 R. Catton, 81 Arnesby Avenue, Sale, Cheshire.
2071 C. S. W. Brunt, 7 Colindeep Lane, Sprowston, Norwich.
2072 E. R. Macpherson, 124 Carters Mead, Potters Street, Harlow, Essex.
2073 E. Ferbrache, Penpol, Saumarez Road, Castel, Guernsey, Channel Islands.
2074 A. M. Jubb, 1 Cumberland Avenue, Grimsby, Lincs.
2075 R. D. Nickols, 31 Shafter Road, Dagenham, Essex.
2076 J. L. Jones, 8 Rushall Place, Longbenton, Newcastle upon Tyne, 12.
2077 G. L. Price, 32 St. Stephens Avenue, Ashstead, Surrey.
2078 J. Thomas, 50 Bloomfield Road, Blackwood, Mon.
2079 J. D. Price, 67 Gordon Road, Blackwood, Mon.
2080 M. D. Rogerson, 5 Swanton Road, Erith, Kent.
2081 J. C. A. Rundall, 15 Allen House, Allen Street, London, W.8.
2082 V. D. Crowley, 51 Pease Street, Darlington, Co. Durham.
2083 A. Q. Todd, 1 Brighton Terrace, Bedminster, Bristol 3.
2084 P. D. Howell-Davies, 44 Craneswater Avenue, Southsea, Hants.
2085 B. L. Nuttall, 592 Eastern Avenue, Ilford, Essex.
2086 N. Collins, 4 Woodview Terrace, Bryncoch, near Neath, Glamorgan.

★ ★ ★

OCTOBER, 1959

Corporate Members, Home (Licensed)

G2FFK Dr. G. M. Holme, 90 Coleshill Road, Marston Green, Birmingham, Warwicks.
G3FX †H. Clegg, Bracken Bank, Glen Road, Eldwick, Bingley, Yorks.
G3AEF †D. J. Sole, 22 Halsall Lane, Formby, Lancs.
G3DFL †G. C. Hill, 18 Lightwoods Hill, Bearwood, Smethwick 41, Staffs.
G3ESB A. D. Hitchcock, 38 West Road, Spondon, Derby.
G3FQQ †J. Thornton, 18 Western Road, Billericay, Essex.
G3JBI H. W. Parnell, 41 Charlton Crescent, Barking, Essex.
G3KZM S. J. Bunce, 3 Johnson Road, Newport, I.o.W.
G3MVG J. N. Horton, The Cottage, Burland Road, Brentwood, Essex.
G3NAQ G. H. Grayer, 103 Vicarage Road, West Bromwich, Staffs.
G3NDE G. C. Driver, 57 Central Avenue, Farnworth, Bolton, Lancs.
G3NDG B. I. Fleming, The Cottage, Gill Lane, Yeadon, nr. Leeds, Yorks.
G3NHH R. T. Heywood, 383 Whitton Dene, Isleworth, Middx.
G3NMZ †*G. N. Bath, 182 Bishopscote Road, Luton, Beds.
G3NNT S. J. Pilkington, 23 Southport Road, Ormskirk, Lancs.
G3NQA S. W. Hall, 186 Tyburn Road, Erdington, Birmingham 24.
G3NQL R. C. J. Pope, 2 Rosebery St., Rowbarton, Taunton, Somerset.
G3NQV E. S. Collin, 549 North Road, Darlington, Co. Durham.
G3NRR L. J. Abbiss, 56 Ravenhurst Road, Braunstone, Leics.
G3NRU D. Brook-Foster, Alma, Grigg Lane, Headcorn, Ashford, Kent.
G3NRZ †C. A. Hogg, 20 Sunbury Avenue, Mill Hill, London, N.W.7.
G3NSS T. R. Spain, 147 Wolverhampton Road, Birmingham 32.
G3NTY †B. E. Gillingwater, 79 Lancaster Road, Great Yarmouth, Norfolk.
GM3NSQ J. M. Melvin, 34 Lochbrowan Crescent, New Cumnock, Ayrshire, Scotland.

Corporate Members, Overseas (Licensed)

W1IJL †C. M. Manitsas, 592 Springfield Street, Chicopee, Hampden, Mass., U.S.A.
W2ZX C. Dale Kentner, Kresson Road, Marlton, New Jersey, U.S.A.
W0QGI L. D. Harvey, RT.1, Knoxville, Iowa, U.S.A.
ZB1ALP A. L. Podesta, 37 Victoria Avenue, Sliema, Malta.
ZC4FR G. D. Griffiths, A.I.S., No. 113 M.U., R.A.F. Nicosia, Cyprus, B.F.P.O. 53.
ZD1AW T. A. Wilson, Lungi Airport, Freetown, Sierra Leone.
ZD1EO E. I. Owen, Sgt., 2 Force Workshop, S.L.E.M.E. Juba Barracks, Freetown, Sierra Leone.
ZD2HJG H. J. Groves, Decca Navigator Co. Ltd., P.O. Box 320, Calabar, Eastern Region, Nigeria.
ZD2RJO R. J. Osborne, Birnin Kebbi, Sokoto Province, N. Nigeria.
ZL4FR J. G. Howard, 44 Adderley Terrace, Ravensbourne, Dunedin, N.E.2, New Zealand.
ZS6MP C. Pearson, Box 11508, Johannesburg, South Africa.
5A3TA G. Yapapas, P.O. Box 666, Tripoli, Libya, N. Africa.

Corporate Members, Overseas (British Empire Receiving Stations

1028 J. Sciberras, 131 Palm Street, Pawla, Malta.
1029 M. J. P. J. Lagesse, Cere Street, Curepipe Road, Mauritius.
1030 R. E. A. Tabone, 35 St. John The Baptist Street, Sliema, Malta.
1031 D. L. Dayaraina, Electrical Engineer's Office, Gal-oya Development Board, Amparai, Ceylon.

Corporate Members, Overseas (Foreign Receiving Stations)

308 E. E. Berger, Pasaje San Luis 188, Dept. 305, Lince, Lima, Peru, South America.

Corporate Members, Home (British Receiving Stations)

22493 T. M. Proverbs, 59 High Street, Ketton, nr. Stamford, Lincs.
22494 J. Turner, 30 Snowden Avenue, Flixton, Manchester, Lancs.
22495 J. Dacoutros, 30 Ridgeway Road, Long Ashton, Bristol.
22496 R. H. Chamber, 33 Trinity Avenue, Mildenhall, Bury St. Edmunds. Suffolk.
22497 A. D. W. Smith, 108 Alexandra Road, Parkstone, Poole, Dorset.
22498 W. C. Phillips, 111 Ruskin Gardens, Kenton, Middx.
22499 L. W. Hastings, The Nower, Headley Park, Headley, Surrey.
22500 W. G. Hammond, 17 Priory Road, Hornsey, London, N.8.
22501 C. D. Osborn, 25 Toley Avenue, Wembley, Middx.
22502 G. G. Gemmill, 127 Rosehill Road, Burnley, Lancs.
22503 F. M. Maddison, 33 Brook Lane, Galleywood, Chelmsford, Essex.
22504 W. J. Watson, 8 Mayville Terrace, Lisburn, N. Ireland.
22505 R. A. Talbot, 31 Chapel Lane, Formby, nr. Liverpool, Lancs.
22506 G. H. Gardner, 141 London Road, Reading, Berks.
22507 C. H. Street, 25 Arlington Road, Southend-on-Sea, Essex.
22508 R. E. Smith, 1 Holly Cottages, Gossard Wood, Wheathampstead, St. Albans, Herts.
22509 Miss P. Gissop, 229 Graham Road, Sheffield 10, Yorks.
22510 G. T. Collins, 12 Blackwood Road, Streetly, Sutton Coldfield, Warwicks.
22511 R. J. Lock, 476 Becontree Avenue, Dagenham, Essex.
22512 K. S. Budge, 180 Eastwood Road, Boston, Lincs.
22513 A. J. Jershaw, 153 Nevendon Road, Wickford, Essex.
22514 D. B. Raine, 1a Oldfield Road, Sutton, Surrey.
22515 C. W. Pedler, 72 Rosebery Road, Smethwick 40, Staffs.

Associates

2087 M. Russoff, 30 Bunns Lane, Mill Hill, London, N.W.7.
2088 A. H. Gardner, 41 Hassocks Road, Streatham Vale, London, S.W.16.
2089 G. Williams, 4 Union Terrace, Union Road, Abergavenny, Mon.
2090 D. R. Hankinson, 162 Cateswell Road, Hall Green, Birmingham, 11.
2091 J. A. Lay, 21 Beaumont Buildings, St. John Street, Oxford.
2092 J. Etheridge, 50 Micawber Avenue, Hillingdon, Middx.
2093 G. C. Ewart, Buckingham House, Flat 19, 157 Cleveland Street, London, W.1.
2094 H. M. Gillings, 7 Attimore Close, Welwyn Garden City, Herts.
2095 P. C. G. Nolan, 24 Tooting Bec Gardens, Streatham, London, S.W.16.
2096 W. R. Seary, 22 Privett Road, Gosport, Hants.
2097 A. J. C. Park, 118 Fabian Crescent, Shirley, Solihull, Warwicks.
2098 D. Quigley, 142 Belle Vue Road, Cowes, I.o.W.
2099 S. Bexon, 19 Hornedale Avenue, Barrow-in-Furness, Lancs.
2100 R. B. Fidler, 38 Burchells Green Road, Kingswood, Bristol, 5.
2101 G. J. Marwood, The Corner House, Green Street, Sunbury-on-Thames, Middx.
2102 B. W. Harrison, 24 Barrow Point Avenue, Pinner, Middx.
2103 K. V. Horton, 322 Boldmere Road, Sutton Coldfield, Warwicks.
2104 T. R. Mills, Crab Hill, Sandy Point, St. Kitts, B. W. Indies.
2105 P. Handover, 16 Toley Avenue, Wembley, Middx.
2106 A. Griffiths, 50 Redlands Road, Solihull, Warwicks.
2107 M. J. Harding, 123 Cranborne Avenue, Tolworth, Surrey.
2108 H. J. Rippiner, 37 Woodclose Avenue, Coundon, Coventry, Warwicks.
2109 A. Beale, 17 River View, Enfield, Middx.
2110 C. J. Brockbank, 71 Parsonage Road, Heaton Moor, Stockport, Cheshire.
2111 L. S. Margolis, 95 Collinwood Gdns., Ilford, Essex.

★ ★ ★

NOVEMBER, 1959

Corporate Members, Home (Licensed)

G2DYO †J. Fulton, 39 Priests Lane, Brentwood, Essex.
G2FQW K. Jones, Flat 3, 50 Shelley Road, Worthing, Sussex.
G3QG †W. C. Green, 840 Dunstable Road, Luton, Beds.
G3VO †J. R. Brierley, 39 Glen View Road, Burnley, Lancs.
G3EWZ W. D. Wardle, 31 Greenbank Road, Hoole, Chester.
G3FBP †G. A. Perrins, 51 Cemetery Road, Heckmondwike, Yorks.
G3MPA T. A. Sheen, 16 Winchester Close, Amesbury, Wilts.
G3MQH †J. Richardson, 448 Manchester Road, Sudden, Rochdale, Lancs.
G3MVY J. Talbot, 271 Ross Road, Hereford.
G3NJC W. C. Cox, 41 St. Annes Road, Belle Vue Doncaster, Yorks.
G3NJZ R. W. Modral, 1 Lady Anne Road, Sherburn, Co. Durham.

G3NOO B. R. Jessop, Hamble House, Hamble, Hants.
G3NPI *G. C. Suggate, 50 York Hill, Loughton, Essex.
G3NQR A. G. Goddard, 808 Kenton Lane, Harrow Weald, Middx.
G3NQU A. W. Dick, 19 Warners Gardens, Southend-on-Sea, Essex.
G3NRI H. C. Hopkins, 61 Coldyhill Lane, Newby, Scarborough, Yorks.
G3NSN J. G. Waring, 25 Massie Street, Cheadle, Cheshire.
G3NTI *R. Blain, 1 Mill Bank, Ness, Neston, Wirral, Cheshire.
G3NTP A. Johnson, 16 Lonsdale Close, Hillingdon, Middx.
G3NTQ P. E. Barker, 80 Gainsboro Avenue, London, E.12.
G3NUA *J. Hogg, The Vicarage, New Seaham, Co. Durham.
G3NUL V. M. Johnston, 4 Eliot Place, Blackheath, London, S.E.3.
G3NVD S. I. Posen, 39 Ivor Court, Gloucester Place, London, N.W.1.
GI3NSP *J. C. Lennox, Sunnymead, Deans Bridge, Armagh, Northern Ireland.
GI6TK †F. A. Robb, 125 Downshire Road, Holywood, Co. Down, Northern Ireland.
GM3DDE †L. F. Benzies, 83 Hillview Road, Edinburgh, 12.
GM3ENJ †K. Street, No. 1 York Place, Dunfermline, Fife.
GM3NIP D. W. Smith, c/o Park, 18 Robertson Street, Greenock, Renfrewshire.
GM3NPM *A. D. MacDonald, Cronan Farm, Newmilns, Ayrshire.
GM3NTX R. Burt, 11 Saughton Mains Place, Edinburgh.
GW4MZ †Capt. A. Evans, 31 Rhuddlan Avenue, Llandudno, Caerns, North Wales.
GW3NUO P. M. Williams, 22 Druslyn Road West Cross, Swansea, Glam., South Wales.

Corporate Members, Overseas (Licensed)

DL2AA/GW3MTL R. J. Parsons, Box 125A, R.A.F. Butzweilerhof, B.F.P.O. 19.
F9RS C. Saniez, rue Marechal Lefebvre, Calais, Pas-de-Calais, France.
K2UQD R. W. Ringrose, 160 Edison Road, Haddonfield, New Jersey, U.S.A.
K5HSP J. C. Lord, 901 North Fourth, Sayre, Oklahoma, U.S.A.
K8KCO R. D. Minnick, 754 South Military Drive, Dearborn 7, Michigan, U.S.A.
OD5CI/W4JSS S. A. Magness, 130 Flagler Drive, Miami Springs, Florida, U.S.A.
OE1FF F. J. Friedl, Trauttmansdorffgasse 56, Vienna 13, Austria.
OE3ME Dr. Anton Meller, Krems a./d Donau, Goeglstrasse 11, Austria.
VE3CFI †L. Humphries, 41 Kildonan Drive, Scarborough, Ontario, Canada.
VE7BW J. Forsyth, 7407 Victoria Drive, Vancouver 16, B.C., Canada.
VK2SF V. Fitton, 34 Fawcett St., Mayfield, N.S.W., Australia.
VK3OH A. Holst, 10 Flintoft Avenue, Toorak, Melbourne, Australia.
VS5PM P. K. I. Mohamed, M.B.E., Brunei Town, Brunei, Borneo.
VQ2HT H. R. Tempest, P.O. Box 1018, Lusaka, Northern Rhodesia.
VS6EK L. S. Drakeford, 25 Chatham Road, 11th Floor (Front), Hong Kong.
W1RWU C. V. Madek, 6 Dawes Terrace, Boston 25, Mass., U.S.A.
W3DVB L. Tonik, 1204 Passmoe Street, Philadelphia, 11, Pa., U.S.A.
W3YPL C. E. Kranias, 104 Johns Avenue, Gettysburg, Pa., U.S.A.
W6MZT C. A. Woodhull, P.O. Box 1687, Redding, Calif., U.S.A.
W8OOR A. T. Lausten, 16148, Prairie Avenue, Detroit 21 Mich., U.S.A.
ZC4LG Capt. L. G. W. D. Nutting, 12th Royal Lancers, B.F.P.O. 53.
ZC4RK/G3MNN †T. G. Kelly, Cpl., Signals Section, G.R.S.S., R.A.F. Nicosia, B.F.P.O. 53.
ZS4D N. A. T. Palmer, P.O. Box 1205, Windhoek, South West Africa
ZS9G D. Baird, P.O. Kazungula, Bechuanaland Protectorate.

Corporate Members, Home (British Receiving Stations)

22516 G. Hartman, 349 Watford Way, London, N.W.4.
22517 I. M. Bartlett, 194 Purves Road, London, N.W.10.
22518 W. F. Williams, 58 Holmewood Gardens, London, S.W.2.
22519 J. Nethercott, 7 Lambrook Road, Fishponds, Bristol.
22520 T. A. B. Conway, 58 Lawford Lane, Bilton, Rugby, Warwicks.
22521 R. A. L. Walker, The Gables, Ladywood, Droitwich Spa, Worcs.
22522 A. C. Kennedy, 2 Mayfield Place, Eastbourne, Sussex.
22523 S. W. Law, BM/ZN4K, London, W.C.1.
22524 R. H. M. Whitaker, 57 Burlington Lane, London, W.4.
22525 W. B. Powell, 27 Norton Road, Stourbridge, Worcs.
22526 E. Haines, 61 School Street, Barrow-in-Furness, Lancs.
22527 B. N. Holt, 79 Grove Lane, Hale, Cheshire.
22528 D. E. Robinson, The Laurels, Melford Road, Sudbury, Suffolk.
22529 †H. Cole, 25 Causeway Road, Seaton, Workington, Cumberland.
22530 R. A. Simpson, 75 Stoke Road, Shelton, Stoke-on-Trent, Staffs.
22531 V. R. Campbell, 356 Windmill Road, Ealing, London, W.5.
22532 W. Bailey, 130 Melling Road, Aintree, Liverpool 9, Lancs.
22533 J. Miller, 15 Riverside, Antrim, N. Ireland.
22534 H. Muir, 41 Turnberry Road, Partickhill, Glasgow.
22535 E. J. Kelly, 62 Morningside Drive, Edinburgh 10, Scotland.
22536 P. R. Brown, 36 Staines Road, Ilford, Essex.
22537 F. Duley, 21 The Dene, Wembley, Middx.
22538 R. Thorley, 85 Lansdowne Road, Manchester 20, Lancs.
22539 A. G. Smyth, 77 Hill Street, Lurgan ,Co. Armagh, N. Ireland.
22540 T. G. Cartwright, Sunnymead, Chaple Lane, Leasingham, Sleaford, Lincs.
22541 V. M. Patel, 11 Lordship Park, London, N.16.
22542 J. Kendall, Caeharris House, Dowlais, Merthyr Tydfil, Glam., South Wales.
22543 R. J. Harris, 5 Yew Grove, Cricklewood, London, N.W.2.
22544 J. Sharp, 43 Priory Road, Glasgow W.3, Scotland.
22545 D. M. Ling, Royal Naval College, Greenwich, London, S.E.10.
22546 A. G. Breckenridge, c/o 65 Main Street, Prestwick, Ayrshire, Scotland.
22547 T. W. Willetts, 48 Lower Trinity Street, West Bromwich, Staffs.
22548 R. L. Shelley, 65 Maple Grove, York.
22549 D. Taylor, 31 Bates Lane, Helsby, Via Warrington, Lancs.
22550 D. A. S. Drybrough, 421 Walsgrave Road, Coventry, Warwicks.
22551 J. R. Wilson, 3 Ross Avenue, Albert Road, Levenshulme, Manchester 19, Lancs.
22552 C. E. Horsham, 45a Littlemore Road, Ilford, Essex.
22553 M. L. Aspinall, 19 Nicholes Road, Hounslow, Middx.
22554 A. Skelton, 106 Buckingham Avenue, Scunthorpe, Lincs.
22555 S. M. Gee, 15 Wheatley Avenue, Corby, Northants.
22556 R. Thomas, 91 Fraser Street, Bilston, Staffs.
22557 A. A. Sturman, 49 Milton Street, Kingsley, Northampton.
22558 J. B. Sutton, 434 St. Albans Road, Bulwell, Nottingham.
22559 R. D. Barrow, c/o 104 Waterloo Street, Oldham, Lancs.
22560 J. E. Parsons, 22 Paddockhurst Road, Gossops Green, Crawley, Sussex.
22561 I. J. McGeachy, 90 Doncaster Road, Wyke Regis, Weymouth, Dorset.
22562 G. H. Gilmour, 1 Burnside Terrace, Stranraer, Scotland.
22563 M. R. Hubbard, 15 Rosslyn Terrace, Edinburgh 6, Scotland.
22564 *J. W. Selwood, 89 Somerton Road, Newport, Mon.
22565 *M. T. Healey, 31 Highlands Avenue, Horsham, Sussex.
22566 *R. J. Richards, Glynogwr, Blackmill, nr. Bridgend, Glam.
22567 R. B. Hannan, 59 Denzil Avenue, Southampton, Hants.
22568 A. Melhuish, 31 Shepherds Bush Green, London, W.12.
751 †E. Weaver, Ashleigh, Rudgeway, nr. Bristol.
7323 †S. Clements, 52 Milbank Road, Dyke House Estate, West Hartlepool, Co. Durham.
18680 †G. W. Airey, 29 High Beeches, Chelsfield, Kent.
18905 †C. R. Wiggett, 91 Derbyshire Lane, Hucknall, Nottingham.

Corporate Members, Overseas (Britsh Empire Receiving Stations)

1032 J. E. K. Nkrumah, PRESCO, Box 421, Koforidua, Ghana.
1033 H. G. Beard, Lloyds Bank Ltd., Dacca, East Pakistan.
1034 E. W. Meyer, 172 King George Avenue, Mufulira, Northern Rhodesia.
1035 G. F. Brindle, Rm. 5, 2 Sqdn., 15 Sig. Regt., B.F.P.O. 53.
1036 C. A. Thomas, Communications (OM 153), P. D. (Oman) Ltd., Heima, P.O. Umm Said, S.E. Arabia.

Corporate Member, Overseas (Foreign Receiving Station)

309 R. A. Kemp, 200 Ridge Road, Richmond 29, Virginia, U.S.A.

Associates

2112 I. D. Mason, White Haven, Aldridge Road, Little Aston, nr. Sutton Coldfield, Warwicks.
2113 B. C. Hills, The Nutshell, 10 Waterford Common, Waterford, Hertford, Herts.
2114 P. D. Baker, 6 Wayside, East Sheen, London, S.W.14.
2115 T. J. Davies, 38 Elmway, Grays, Essex.
2116 L. K. Anderson, A Coy., A.A.S. Arborfield nr. Reading, Berks.
2117 G. M. Davies, 36 Westbourne Road, Penarth, Glam.
2118 G. M. Preece, 128 Owen Road, Wolverhampton, Staffs.
2119 F. J. Bellamy, 68 Mill Green Road, Welwyn Garden City, Herts.
2120 R. Blakeway, 68 Newhall Road, Rowley Regis, Staffs.
2121 B. S. Carter, 45 Furness Road, West Harrow, Middx.
2122 H. M. Davison, 15 Forest Way, Ashtead, Surrey.
2123 D. Staite, 7 Fosse Crescent, Princethorpe, nr. Rugby, Warwicks.
2124 I. Sykes, The Vicarage, Lostwithiel, Cornwall.
2125 J. K. Fidler, 68 Pine Gardens, Eastcote, Ruislip, Middx.
2126 T. B. Palmer-Benson, Moretons, Harrow-on-the-Hill, Harrow, Middx.
2127 E. F. Shield, Thornbrae, Alnmouth Road, Alnwick, Northumberland.
2128 R. M. Lawson, 23 Yew Tree Lane, Elmdon Heath, Solihull, Warwicks.
2129 J. G. Devine, 17 Elmfield Avenue, Birstall, Leicester.
2130 A. Eckersley, 56 Grange Road, Bury, Lancs.
2131 M. G. Foster, 5 Goring Road, Dagenham, Essex.
2132 T. J. F. Blyth, Lower Kerse, Thurlestone, nr. Kingsbridge, S. Devon.
2133 C. R. Howson, 9 Hanover Road, Norwich, Norfolk.
2134 C. Drew, 47 Fairview Road, Penn, Wolverhampton, Staffs.

★ ★ ★

DECEMBER, 1959

Corporate Members, Home (Licensed)

G2OF †W. G. D'Arcy, 29 Adelphi Crescent, Hayes, Middx.
G2BYI †A. E. Barnes, "Harrowby," Farcet, Peterborough, Northants.

G3NY †E. A. Topham, 43 Market Place, Thirsk, Yorks.
G3BGM F. D. Shirreff, Milton Abbey School, nr. Blandford, Dorset.
G3BTQ J. B. Staker, 1 The Paddock, Anlaby Park Road, North Hull, East Yorks.
G3BWY W. J. Crossan, 8 Pine Avenue, West Wickham, Kent.
G3CCD G. H. Cox, 89 Hartington Road, Chiswick, London, W.4.
G3CCN †H. Goodwill, c/o 5 Shawe Road, Flixton, Manchester.
G3CAE †R. E. C. Lord, 34 High Street, Camberley, Surrey.
G3CPN M. J. Stevens, 61 Brighton Road, Godalming, Surrey.
G3FYV †H. G. Gosling, 16 Salisbury Street, Loughborough, Leics.
G3GFU †W. H. Otley, 49 Ripon Road, Redcar, Yorks.
G3HPW A. Milner, 21 Brooklyn Way, West Drayton, Middx.
G3IOM †R. L. Chidzey, 33 Bruce Avenue, Worthing, Sussex.
G3JYM †R. J. Faloon, 38 Pinewood Green, Iver Heath, Bucks.
G3JPP E. H. Price, 7 Laurence Close, Shurdington, nr. Cheltenham, Glos.
G3LSP B. A. Pattison, 378 Lynmouth Avenue, Morden, Surrey.
G3MYS H. E. Bagguley, Oakdene, Priory Road, Mansfield Woodhouse, Notts.
G3MER Mrs. J. D. Davis, 24 Trinity Road, Gillingham, Kent.
G3MPQ G. Balfe, 235 Hanworth Road, Hampton, Middx.
G3MYL R. Longstaff, 91 Queensway, Buckland, Newton Abbot, Devon.
G3NHB D. E. Bowyer, 38 Downham Road, Ely, Cambs.
G3NIA C. C. Wright, 6 Hartford Road, Huntington, Hunts.
G3NIL G. C. W. Munden, 126 Stanley Green Road, Poole, Dorset.
G3NKC L. G. Tonkinson, 37 Ash Crescent, Kingshurst, Birmingham 34.
G3NMH H. E. Perkins, "Ty Newydd," Wood Lane, Louth, Lincs.
G3NRE J. E. Allen, 3/17 Woodbridge Road, Moseley, Birmingham 13.
G3NSA J. W. Hillyer, Burghley Park, Stamford, Lincs.
G3NTN A. M. O. Veale, 27A Primrose Gardens, London, N.W.3.
G3NUH M. F. Goodchild, Shorton Farm, Paignton, Devon.
G3NVA F. F. Dodson, 78 St. Bernards Road, Olton, Solihull, Warwicks.
G4IS †J. D. Reed, The Crescent Café, Alton, Stoke-on-Trent, Staffs.
G5NH †D. E. Pasfield, 34 Sheaf Street, Daventry, Northants.
G6JS A. A. Jones, 12 Comptons Lane, Horsham, Sussex.
GI3NUM J. McKinley, 15 Bachelors Walk, Lisburn, Co. Antrim, Northern Ireland.
GM3NKG A. Campbell, 5 Clyde Drive, Shotts, Scotland.
GM3KNX J. McGregor, 54 Albion Street, Coatbridge, Lanarkshire, Scotland.
GM3FFQ †W. Donaldson, 11 Broomhall Place, Edinburgh 12, Scotland.
GM3NQB W. N. Hardie, 10 Moat Crescent, Hawick, Roxburghshire, Scotland.
GW3ALV †A. J. Crookes, 13 Penygroes Road, Whitchurch, Cardiff, Glam., South Wales.
GW3LFC R. R. Copestake, 19 Glan-Pwll, Nevin, Pwllheli, North Wales.
GW3NNB R. J. Evans, "Rhianfa," Nevin, Pwllheli, Caerns, North Wales.
GW3NTO J. H. Galley, 43 Cornwall Road, Newport, Mon.

Corporate Members, Overseas (Licensed)

K2QTL J. Kane, 27 School Lane, Haddonfield, New Jersey, U.S.A.
K3CNL P. R. Pape, 3609 Frankford Avenue, Baltimore 14, Maryland, U.S.A.
MP4BCZ A. W. Everest, c/o Station Post Office, R.A.F. Bahrain, B.F.P.O. 63.
SM2BYW E. J. J. Jonsson, Kanalgatan 55/1, Skelleftea, Sweden.
VQ4HW †R. H. Munro, c/o Registrar General's Dept., Central Government Offices (West Wing), 11th Floor, Hong Kong.
W1ZSD L. J. Atwood, 3 Arlington St., Newburyport, Mass., U.S.A.
W5LAK J. H. Garrett, Robert H. Ray Geophysics, Inc., P.O. Box 638, Tripoli, Libya.
W9HOV W. H. Roberts, 7921 Woodlawn Avenue, Chicago 19, Ill., U.S.A.
W0FQY Carl E. Mosley, 8622 St. Charles Rock Road, St. Louis, Missouri, U.S.A.
W0PI H. G. Austin, Page Comm. Engineers, Kingston Wood, Kingston Blount, Oxon.
ZL1HJ A. N. H. Snow, 18 Wallace Street, Whangarei, New Zealand.
ZS6AJO E. N. Gilson, 19 Ivy Street, Sunnyside, Pretoria, South Africa.
9G1CQ A. J. D. Armet, c/o Mobil Oil Co. Ltd., P.O. Box 885, Accra, Ghana.

Corporate Members, Home (British Receiving Stations)

22569 H. G. Shaw, 31 Ravenswood Road, Heswall, Cheshire.
22570 A. J. Lawrence, S.R.N., 28 Ivyhouse Road, Dagenham, Essex.
22571 F. O. Hillman, 54B Batchwood Drive, St. Albans, Herts.
22572 P. E. G. Lewin, 24 Marine Approach, Canvey Island, Essex.
22573 R. F. Fisher, 4 Brettenham Road, Buxhall, Stowmarket, Suffolk.
22574 G. A. Orme, 4 Latchford Place, Chigwell, Essex.
22575 D. A. Bell, 27 Inwood Court, St. Pancras Way, London, N.W.1.
22576 W. Keylock, All Saints' Vicarage, 108 Herbert Road, Plumstead, London, S.E.18.
22577 H. May, 58 Rosslyn Hill, Hampstead, London, N.W.3.
22578 J. B. Armstrong, 15 Broadmead, Auriol Road, London, W.14.
22579 P. R. Cox, Crossways, Greenlands Road, Kemsing, Kent.
22580 J. B. Eddie, 9 Gladstone Avenue, Manor Park, London, E.12.
22581 E. E. Franklin, Restawhile, Station Road, Wootton, I.O.W.
22582 S. B. Shooter, Wyndham, Kings Avenue, Skegness, Lincs.
22583 E. W. Dyer, 69 Kirkland Avenue, Ilford, Essex.
22584 J. Irvine, Thorndale, The Leas, Chestfield, Whitstable, Kent.
22585 J. A. Mansell, 22 Kingfield Gardens, Kingfield, Woking, Surrey.
22586 R. Cutts, 335 Cranbrook Avenue, Hull, E. Yorks.
22587 J. B. Duffy, 92 Northwood Way, Northwood, Middx.
22588 Mrs. E. M. Edwards, 28 Morgan Crescent, Theydon Bois, Nr. Epping, Essex.
22589 T. F. Marsh, 4 Ferguson Avenue, Surbiton, Surrey.
22590 H. G. Farrah, 26 School Field, Glemsford, nr. Sudbury, Suffolk.
22591 J. Parnell, 417 High Road, Chilwell, Notts.
22592 F. Butler-Miles, Shrewley, Warwick.
22593 D. E. Hobbs, 5 Norfolk Road, Salisbury, Wilts.
22594 E. C. Taylor, The Old Vicarage, Chapel Street, Billericay, Essex.
22595 C. R. W. Burgess, 15 Old Mill Road, Plumstead, London, S.E.18.
22596 K. R. Belcher, Pine View, Savill Road, Lindfield, Sussex.
22597 A. G. Lucas, 28 Bradley Road, Upper Norwood, London, S.E.19.
22598 F. P. J. E. Coles, 45 Victor Road, Teddington, Middx.
22599 J. F. Marriott, 16 Queen Mary Avenue, Basingstoke, Hants.
22600 D. Gaskell, 233 Altway, Aintree, Liverpool 10, Lancs.
22601 A. C. Turner, 96 Cippenham Lane, Slough, Bucks.
22602 J. G. Wilcox, 4 Lena Street, Easton, Bristol 5.
22603 M. B. Wilson, Suncroft, South Wonston, nr. Sutton Scotney, Hants.
22604 D. A. G. Hunt, 375 Whitton Dene, Isleworth, Middx.
22605 D. F. Smyth, 67 Raeburn Road, Sidcup, Kent.
22606 W. C. Lindsey, Flat 5, 149 Queens Drive, London, N.4.
22607 F. R. Dawson, 1 Eastfield Road, Bridlington, Yorks.
22608 R. Hodson, 22 Kingston Avenue, Chelmsford, Essex.
22609 W. C. Brooks, 21 Yarwood Road, Chelmsford, Essex.
22610 A. A. McKenzie, Flat 3, 18 Belsize Grove, London, N.W.3.
22611 S. G. Collyer, 200 Bridgewater Road, Wembley, Middx.
22612 J. Terry, 16 James Street, Gillingham, Kent.
22613 A. P. Hibbitt, BM/APHI, London, W.C.1.
22614 M. J. Marin, 486 Watford Way, Mill Hill, London, N.W.7.
22615 D. G. Tilling, 27 Pewley Hill, Guildford, Surrey.
22616 P. B. Brodribb, Simcoe, Baddow Hall Avenue, Great Baddow, Chelmsford, Essex.
22617 B. C. Wright, 10 Mornington Avenue, Bromley, Kent.
22618 A. W. Redman, 46 Tukes Avenue, Bridgemary, Gosport, Hants.
22619 G. C. Boulton, 14 Waterloo Street, Leek, Staffs.
22620 J. T. Bodiam, Harrow County School for Boys, Gayton Road, Harrow, Middx.
22621 R. Glencross, 1 Goodier House, Fold Hyde, Ches.
22622 D. Wheeler, Little Meadow, Brickhouse Lane, Stoke Prior, Bromsgrove, Worcs.
22623 D. Carroll, 8 Ribble Bank, Penwortham, Preston, Lancs.
22624 W. B. Crook, 8 Thornpark Drive, Lea, nr. Preston, Lancs.
22625 W. Kitchen, 11 Sudbury Hill Close, Wembley, Middx.
22626 E. R. Meachen, School House, Swinford, Rugby, Warwicks.
22627 K. Stepney, 189 Windsor Road, Oldham, Lancs.
22628 J. McLeod, Rosedene, Tytler Street, Forres, Morayshire, Scotland.
22629 R. Howe, 162 Victoria Road, Wood Green, London, N.22.
22630 P. James, 218 Old Croft Lane, Shard End, Birmingham 34, Warwicks.
22631 C. Greenwood, 9 Barford Close, Hendon, London, N.W.4.
22632 T. W. C. Daffon, Station Road, South Cerney, nr. Cirencester, Glos.
22633 A. M. Chapman, 3 Walden Avenue, Chislehurst, Kent.
22634 A. R. East, 40 Orchard Road, Maldon, Essex.
22635 *M. T. Blenkinsopp, 17 Hillersdon Avenue, Barnes, London, S.W.13.
22636 *A. C. Butcher, 95 Norval Road, N. Wembley, Middx.

Associates

2135 M. A. Smith, 12 Bowring Park Road, Liverpool 14, Lancs.
2136 K. R. Dally, 30 Sherwood Avenue, Askern, nr. Doncaster, Yorks.
2137 A. C. Smith, 29 Greenhill Gardens, Edinburgh 10.
2138 A. E. Voysey, 77 Arran Road, Catford, London, S.E.6.
2139 I. G. Robson, 54 Leaver Gardens, Western Avenue, Greenford, Middx.
2140 P. Redshaw, 110 Queensway, West Wickham, Kent.
2141 G. M. R. Dare, 129 St. Albans Road, Derby.
2142 W. S. Holmes, 2 Tudor Lodge, Grand Avenue, London, N.10.
2143 G. J. Wyatt, 177 Barry Road, Barry, Glam.
2144 L. R. B. Phillips, 4 Camomile Avenue, Mitcham, Surrey.
2145 J. Baker, 8 Sylvan Avenue, Mill Hill, London, N.W.7.
2146 D. G. Carlill, 108 Dell Road, King's Norton, Birmingham 30.
2147 J. A. Strutt, Barnoon, Camden Way, Chislehurst, Kent.
2148 P. J. Moxon, 884 High Lane, Chell, Tunstall, Stoke-on-Trent, Staffs.
2149 C. J. French, Whistlewood, Wood Street, Ash Vale, nr. Aldershot, Hants.
2150 C. Turner, 2 Heather Close, Huntington, York.
2151 R. M. McKim, 76 Lanfine Road, Paisley, Renfrewshire, Scotland.
2152 M. R. Jones, 145 Westend Road, Bitterne, Southampton.

2153 C. J. Reeves, 10 Poplars Close, Ruislip, Middx.
2154 A. M. Hockey, Tannery House, Middle Leigh, Street, Som.
2155 M. Stott, Wellview, Percy Place, Ovingham, Prudhoe Station, Northumberland.
2156 D. J. N. Nabarro, 15 Hanover Gate Mansions, Park Road, London, N.W.1.
2157 F. R. Sanger, 89 Northiam, Woodside Park, London, N.12.
2158 C. R. Masters, 34 Lismore House, Linden Grove, London, S.E.15.
2159 G. A. Richardson, 35 Queen Street, St. Helier, Jersey, Channel Islands.
2160 J. D. Crowe, 65 Pyrles Lane, Loughton, Essex.
2161 V. A. Tomkins, 31 Trenwith Place, St. Ives, Cornwall.
2162 D. J. Coldwell, 24 Hogart Close, Newport, Mon.
2163 E. Wharton, 151 Spearing Road, High Wycombe, Bucks.
2164 P. B. Withey, 27 Glebe Gardens, New Malden, Surrey.
2165 A. R. C. Green, 3 Hill Drive, Pollards Hill North, Norbury, London, S.W.16.
2166 C. L. West, 22 Villiers Close, Surbiton, Surrey.
2167 D. R. Barclay, 67 Oakleigh Park Drive, Leigh-on-Sea, Essex.
2168 M. A. Burns, 50 Eastwick Road, Burwood Park, Walton-on-Thames, Surrey.
2169 R. A. Lescott, 2 Charnwood Drive, London, E.18.
2170 P. N. Moutell, 104 Selwyn Avenue, Highams Park, London, E.4.
2171 D. I. Richards, 430A North Circular Road, London, N.W.10.
2172 P. L. A. Burton, The Homestead, 18 Manor Way, Purley, Surrey.
2173 C. N. R. Barker, Section House, Police Station, Hyde Park, London, W.2.
2174 H. W. Almond, 265 Longley Lane, Gatley, Cheshire.
2175 M. C. Waggett, 43 Priests Lane, Brentwood, Essex.

*Denotes transfer to Corporate Grade.
†Denotes previously a Member.

Swift Action

DURING the December gales, Victor Stewart (A.1394) of 2 South Oxford Street, Edinburgh, an 18 year old member of the Lothians Radio Society, picked up distress signals on 2182 kc/s from the Dutch tug *The Cycloops* which was in difficulties off Torbay while towing three barges to West Africa, and calling Niton Radio without effect. He passed a telephone message to the Coastguard Station at Cockburnspath, Berwickshire, which later thanked him and informed him that the Torbay lifeboat had gone to the tug's assistance.

Slow Morse Practice Transmissions

G.M.T.	Call-sign	kc/s	Town
Sundays			
09.00	G3BHS	1810	Southampton
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3HZM	1860	Manchester
12.00	G3LP	1850	Cheltenham
12.00	GI5UR	1860	Belfast
15.00	G3LEQ	1900	Tunbridge Wells
20.00	G3MRA	1915	Southampton
20.30	G3HTA	1850	Exeter
21.00	G2FIX	1812	near Salisbury
Mondays			
18.30	G3NC	1825	Swindon
19.00	G3EJF	1820	Bury, Lancs.
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
20.00 †	G3EWE / G3IAF / G3NEU	1975	Woking
20.00	G3GZE	1840	Blackburn
20.00	G3MDH	1915	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3MXI	1910	Derby
20.00 †	G3LCK	1935	Barnet
21.00	G3LXP		
21.30 †	G3LGK / G3MXI	1980	Ilkeston, Derbys. / West Hallam, Derbys.
21.45	G3JKY	1900	Beckenham
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
20.00	G2FCI	1850	Exeter
20.00	G3IBI	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MEH	1980	Sutton, Surrey
21.00	G3EFA	1855	Southport
21.00	G3LSC / G3MKN / G3MXF	1875	Poole
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
Wednesdays			
19.00	G3EJF	1820	Bury, Lancs.
19.00 †	G3MCJ / G3FLK / G2FCI / G3HTA	1845	Exeter
19.00	G3LZC	1830	Heanor, Derby

G.M.T.	Call-sign	kc/s	Town
Wednesdays			
19.00	G8RQ	1850	Chesterfield
20.00	G3BHS	1915	Southampton
20.00	G3GZE	1840	Blackburn
20.00	G3INZ / G3KRR / G3LSK / G3MGH	1920	High Wycombe
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MXI	1910	Derby
21.00	G3BHS	1810	Southampton
21.00	G3AGX	1920	Hull
22.00			
22.00 †	G3LGK / G3MXI	1980	Ilkestone, Derbys. / West Hallam, Derbys.
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
20.00	G3NBV	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3GDZ	1910	Kingsbury, N.W.9
20.00 †	G3EWE / G3IAF / G3NEU	1975	Woking
21.00	G3BHS	1810	Southampton
21.30	G3HMY	1850	Exeter
Fridays			
18.30	G3DMN / G3FVP	1880	Ipswich
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	G3JLS	1915	Southampton
20.00	G3INZ / G3KRR / G3LSK / G3MGH	1920	High Wycombe
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.00	G3BHS	1810	Southampton
21.30 †	G3NPO / G3KSS	1900	Bradford
22.00 †	G3LGK / G3MXI	1980	Ilkestone, Derbys. / West Hallam, Derbys.
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
20.00	G3MCL	1915	Southampton

† *Alternately*

EXCHANGE AND MART SECTION

ADVERTISEMENT RATES. Members' Private Advertisements 3d. per word, minimum charge **5s. Trade Advertisements 9d. per word** minimum charge **12s.** All capitals **1s.** per word, minimum charge **18s.** Write clearly. No responsibility accepted for errors. Use of Box number **1s. 6d.** extra. Send copy and remittance to **National Publicity Co.Ltd., 20-21 Red Lion Court, Fleet Street, London, E.C.4, by 22nd** of month preceding date of issue.

DX100.—American Model Variec, £60. Collaro Twin Tape Deck, unused, £12. Buyer collects. 829B.'s, 10/-.—H. James, 448 East Prescot Road, Liverpool. (1066

FOR SALE.—Bulletins, vols. 31-34 inclusive, July 1955-June 1959. Offers to cover postage, collect free.—P. Woollett, How Green Farm, Edenbridge, Kent. (1069

FOR SALE.—Elizabethan Transmitter, £10, o.n.o. Also large solid oak desk, 3 drawers, 2 cupboards, 55 in. by 29 in. by 30 in. high, £10, o.n.o. Buyer collects.—G3ACC, 59 Upland Road, S.E.22. (1064

FOR SALE.—S640, good condition, £18; Panda Cub, as new, £35 or £45 the lot.—Lawrence, 97 Sheldon Road, Chippenham, Wilts. (1065

K. W. VANGUARD, 10-80, complete, £35. AR88LF with "S" meter, £45. Geloso Receiver G207DR, £50. All works overhauled.—K. W. Electronics Ltd., Dartford.

MINIMITTER converter, as new. HRO, all coils, power pack, speaker. Collins TCS Transmitter, Receiver, twin gen. power pack L.S., remote control Mod Crystal mike. Offers.—G8DT, 32 Homecroft Drive, Cheltenham. (1068

PATENTS and Trade Marks. Booklet on request. King's Patent Agency Ltd. (B. T. King, G5TA, Mem. R.S.G.B. Reg. Pat. Agent).—146A Queen Victoria Street, London, E.C.4. (Phone: City 6161.) 60 years' refs. (372

QSL cards, G.P.O. approved. Log books, cheapest, best, prompt delivery. Samples.—Atkinson Bros., Printers, Looe Cornwall. (206

SALE.—CR100 receiver, 0·06-30 Mc/s, good working order, £10.—E. Brumby, 21 Melbourne Place, North Berwick. (1062

SALE.—H.R.O. 9 coils bandspread, 4 band transmitter 50 watt power pack modulator. Buyer collects, £35.—Ball, 9 Saint Ann's Square, Heald Green, Cheadle, Cheshire. (1063

SELLING AR88 Receiver, resprayed, rechromed, excellent condition and working order, also hardly used Heathkit 0-12U 5 in. scope immaculate and perfect, both or separate or exchange for Tape Recorder or Stereo Tapedeck.—Box No. 1067, The National Publicity Co. Ltd., 20/21 Red Lion Court, Fleet Street, London, E.C.4. (1067

T.C.S. TRANSMITTER, as new, with Power Supplies 60 watt phone-c.w. 160-80-40, £15, CR100. Resprayed, all valves, condensers and most Resistors changed, £10. MCR1 Receiver with matched power supply and phones. Coil units complete. Circuit diagram, £4/10/-.—GM3NVQ, 42 Rose Street, Dunfermline, Fife. (1060

"TELECOMM" 40 watt Transistor d.c. converters, 12 volt in 300 volt out, size 3½ in. by 2½ in. by 7 in., a must for mobile operation, £11/15/-.—R.E.E. Telecommunications Ltd., Telecomm Works, Crewkerne, Somerset. (1061

TRANSFORMERS, all Pri. 200-250 volts. Sec. 1100-0-1100 volts 400 mA., £2. 300-0-300 volts 200 mA., 4 volts 1 amp. CT twice, 5 volts 2 amp., 6·3 volts 6 amp., 25/-. 7·5 volts 5 amp., 7/6. CR100 MT, 10/-. Thordarson 5 volts 3 amp. CT 2·5 volts 10 amp. CT, 15/-. Black Crackle Cabinets 19 in. by 10½ in. by 9 in., 17/6. 10¾ in. by 13 in. by 10 in., 15/-, 12 in. by 7 in. by 7 in., 12/6. Eddystone dials 4 in. dia. scaled 0-100 with knob, 2/-. Muirhead 100/1 slow motion 4½ in. scaled 0-180, 7/6, ditto 4 in., 5/-. National slow motion velvet vernier 4 in. scaled 0-100, 7/6. Pots. 17·5 k. HD, 2/6. Carriage extra.—G3ADK, 264 Stockingstone Road, Luton 4036. (1070

VALVES for sale.—All tested on Mullard Valve Tester, 6F12, 6D2, EF80, 10F1, 6F1, PY82, 20Li, 6V6, 6P25, 6F13, 6F14, 6F15, 20D1, ECC81, ECC82, 5/- each. Plus 1/- p. & p. on orders of less than six.—J. R. Calverley & Co. Ltd., 130 Water Street, Radcliffe, Lancs. (1022

WANTED.—1·6 Mc/s i.f. unit with crystal.—G6OT, 119 Wynchgate, London, N.14. (1059

WANTED for cash.—Good clean communication receivers and S.S.B. equipment. Please state price.—Short Wave (Hull) Radio, 30-32 Princes Avenue, Hull. (Telephone 18953.) (983

WANTED.—Marconi TF.329G circuit magnification meter (Q meter). Write stating price and condition to.—Wireless Telephone Co. Ltd., Hallamgate Works, Crookes Road, Sheffield, 10. (1044

YANKEE MOBILE. Palco Bantam Transmitter Top to Ten, Power Pack and Modulator, 60 watts. Transmitter 8in. x 4in. x 10in. deep. Has worked VP6 from U.K. Aerial with special perspex base. Yankee Elmac receiver, all bands, Top to ten, matching p.p. The lot, £60. American Navy Panadaptor, mains, two spare tubes, £30, packing and delivery £1/10/-. Geloso receiver, needs retrimming, new last year, £55.—Box No. 1073.

INDEX TO ADVERTISERS

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

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, W.C.1

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET W.C.1