RSGB Bulletin

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Vol. 31 No. 7 JANUARY, 1956 Price 2/6 Monthly

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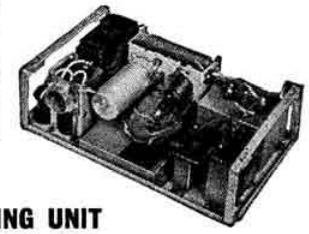

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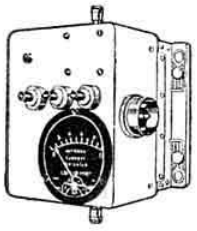

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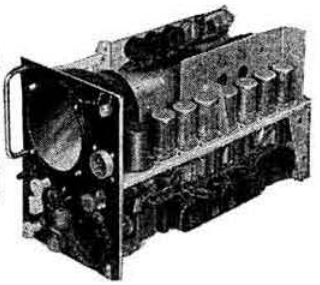

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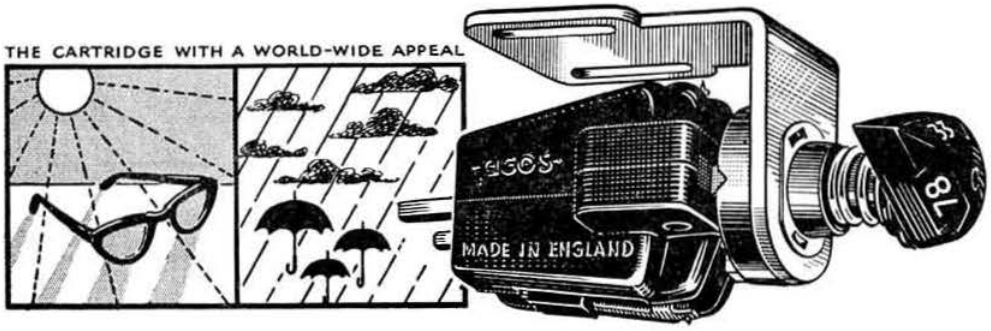

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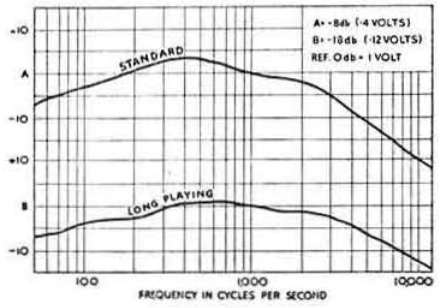

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Current Comment

B.B.C. Crystal Palace

A B.B.C. statement was published in the November issue of the R.S.G.B. BULLETIN to the effect that when the Crystal Palace transmitter takes over the London TV Service from Alexandra Palace, the standard of transmission will no longer be double sideband but will be vestigal sideband (lower sideband) and will conform to the standards used by all the other B.B.C. transmitters in the country. Crystal Palace is expected to commence transmission at the end of this month or in the early part of next. The change has been made for standardisation reasons alone. It does not release any ether space, since the upper sideband is sandwiched between Channels 1 and 2, nor is the transmitter made more efficient, since both sidebands are generated, one being removed by a vestigal sideband filter inserted between the output of the transmitter and the feeder.

As is usual in the process of standardisation, someone is unlucky, the unfortunates in this case being those viewers having receivers designed for upper sideband, who will receive an appreciably inferior picture. Such receivers comprise all t.r.f. types, many superheterodynes made before about 1950 and many of home construction to designs published in the trade press. On these receivers the definition will be such that the 1 Mc/s bars in Test Card "C" will be visible and possibly the 1.5 Mc/s bars, but little, if anything, above this frequency; the general effect being that of poor c.r.t. focus. It is estimated that at least 100,000 such receivers are in current use; quite possibly the true figure is several times greater.

Receivers were originally designed for Alexandra Palace transmission before the war to accommodate double sideband, and this practice was continued for a brief period after the war, but it was found that the design could be simplified and, therefore, cheapened if upper sideband only was employed. This was because by employing a narrower bandwidth more gain per stage was obtainable and also there was considerably less difficulty with interference from sound on picture.

When further B.B.C. stations were being planned it was evident that there was insufficient frequency space in Band I to accommodate all the proposed transmitters if double sideband was employed; hence the use of vestigal sideband (lower sideband) was adopted for all further stations, the first being Sutton Coldfield. From the time this station opened most receivers manufactured had to be suitable for lower sideband although some firms continued to make upper sideband receivers for sale in the London area only. In the course of time this practice ceased and nowadays only lower sideband types are made. Home constructors, however, resident in the London area were unaffected by the considerations applying to the trade and it is known that new upper sideband types were in fact made during 1955.

It may be possible to re-align some of the older design receivers for the lower sideband. However, such re-alignment will in most cases result in the sound rejection on the picture being inadequate, so that additional or more efficient sound traps will have to be fitted. In general it can be taken that the response at 41.5 Mc/s should be at least −40db and preferably −50db below the response in the picture pass-band to avoid sound break-through. It is a long and laborious process attempting to re-align a TV receiver even if a signal generator is available, because the adjustment of sound traps has unexpected and sometimes unpredictable effects, both inside and outside the pass-band. In this issue of the BULLETIN will be found an article on a simple wobbulator, which members involved in receiver re-alignment will find invaluable because it enables the effects of one adjustment on others to be seen at a glance, at the same time being related to the frequency calibration pips.

The Technical Committee were expecting some reaction from members to the B.B.C. statement but it may well be that the implication had not sunk in. However, if there is sufficient demand among the London membership an article dealing with the problem will be published in a future issue of the BULLETIN.—D. N. C.

Home Constructed Receivers

THE trend away from the home-built communications receiver began two or three years before the war when factory-built receivers, mainly of American origin, began to become available in this country, offering new standards of performance and ease of operation. The trend continued during the post-war years, assisted by the availability of war surplus receivers at low prices. In consequence many amateurs have felt that there was no future for home-constructed receivers: they could not be made so well or so cheaply as the commercial variety.

The important articles by Mr. Odell (October and November issues) should serve to dispose of some of these illusions. His "Britannia" design will undoubtedly be widely copied, but it may do something else besides, and that is to encourage a rethinking of the whole subject of home-constructed receivers.

Nowadays, it is no longer easier to build a transmitter than a receiver. A host of contemporary problems needs to be taken into account, of which TVI proofing is undoubtedly the toughest. Because a transmitter of modern design is frequently as difficult as a high performance communications receiver to make at home, many amateurs have been turning to the commercially built version. The "buy-it-ready-made" pendulum has swung from receivers to transmitters in no uncertain terms!

Even so, there are thousands who, come what may, will prefer to "roll their own." Mr. Odell's articles will undoubtedly prove to them that where receivers are concerned, the job is not so difficult after all.—J.H.

Almost the Ultimate

MOST operators must have pondered at some time or another on what is the ultimate in DX working. In terms of physical distance the longest span that can be covered within terrestrial confines is clearly the antipodes to one's own location. But in terms of ultimate achievement it is patently much more creditable to cover this distance on, say, the 3.5 Mc/s band than on the higher frequency bands where world wide communication is the accepted thing. To perform the feat on the 1.8 Mc/s band against the formidable difficulties of power restriction and high noise level is, surely, almost the ultimate in DX communication.

All the more credit, therefore, goes to "Dud" Charman (G6CJ) and Harold Merriman (G6GM) for having not only achieved the feat in 1954 but for repeating it in 1955.

Their success in working New Zealand on the 1.8 Mc/s band sprang from careful advance planning and prediction of the exact moment when, all too rarely, the 12,000 mile path would be open.

A great deal of DX working is rather like herring spawning—very chancy, or to vary the piscatorial analogy somewhat, it has much in common with angling in offering all sorts of surprises in the way of catches! But the Britain-Antipodes path has always called for the deliberate approach in order to span it on difficult bands, from Goyder in 1924 on 90 metres to Charman and Merriman thirty years later on 160 metres—but with a tithe of the power.

Even the Transatlantic crossing is a difficult one to make on Top Band. While "Top Band Transatlantics" were pioneered as long ago as 1930 by the then Contact Bureau of the R.S.G.B., no less credit is earned by the patient and skilful operators who manage to make the crossing today.

If "U.K. to N.Z." on 1.8 Mc/s is "almost the ultimate", what then is the complete and unqualified ultimate? Doing it on 2 metres? Maybe; yet assuredly, if this milestone is reached, doing it on 70 centimetres will loom up as the next challenge! The prospect seems remote at the present stage of technique, and so far as the v.h.f.s are concerned, communication across the Atlantic nearer the bounds of possibility. Indeed, the prospect of spanning the Atlantic on v.h.f. seems less fanciful than it did, following the disclosures that attempts are being made professionally to do so by means of signals reflected from artificially created ionospheres. Who will be the first *amateurs* to achieve this feat? —J.H.

Presidential Address

MR. R. H. Hammans (G2IG) will deliver his Presidential Address at a meeting of the Society to be held at the Institution of Electrical Engineers on Friday, January 27, 1956. Buffet tea will be served from 5.30 p.m. and the meeting will commence at 6.30 p.m.

During the meeting scrutineers will be appointed to scrutinize the Ballot for four Elected Members to serve on the Council.

Television Society

PROFESSOR J. D. McGee, O.B.E., M.Sc., Ph.D., A.M.I.E.E., of Imperial College, London, will deliver the Fleming Memorial Lecture to a meeting of the Television Society on January 19, 1956. He has chosen as his subject "Television in the Service of Science." Admission will be by ticket only, which may be obtained from the Hon. Secretary, 164 Shaftesbury Avenue, London, W.C.2. The lecture will be given in the Royal Institution, Albemarle Street, London, W.1.

British Institution of Radio Engineers

AT a meeting of the Brit.I.R.E. in the Lecture Theatre of the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1, on January 25, at 6.30 p.m., there will be a symposium on "Electronic Methods of Pictorial Reproduction" including papers on Facsimile Communication, Electronic Stencils, and Electronic Engraving. Visitors will be admitted by ticket only.

British Interplanetary Society

LECTURES, organized by the British Interplanetary Society, will be held in the York Hall of Caxton Hall, Caxton Street, London, S.W.1, at 6 p.m. on February 4 ("Portable Breathing Apparatus," by T. D. Bourdillon, who was a member of the 1953 Mount Everest Expedition), March 3 ("Combustion Chambers for Rocket Engines," by Professor A. D. Baxter, M.Eng., M.I.Mech.E., F.R.Ae.S., F.Inst.P.), and April 7 ("Power Supplies and Telemetry for Instrument-carrying Artificial Satellites," by J. Foley, B.Sc., F.R.Ae.S., G.I.Mech.E., E. White and R. Wilkins).

Electrical Engineers' Exhibition, 1956

CAPTAIN the Rt. Hon. Peter Thorneycroft, P.C., M.P., President of the Board of Trade, is to open the Fifth Electrical Engineers' Exhibition at Earls Court on March 20 next. The General Manager of the Exhibition is Phil Thorogood (G4KD).

The R.S.G.B. Amateur Radio Exhibition, 1955

A Stand-by-Stand Review

THE first impression of the Ninth Annual R.S.G.B. Amateur Radio Exhibition at the Royal Hotel, London, last November was of "the mixture as before." And so far as the all-pervading atmosphere of Ham Spirit is concerned it was right. But even a casual look round the bright and attractive stands exploded the suggestion that there, too, the mixture was "as before."

On Headquarters' stand, the first really new amateur communications receiver for some years—"The Britannia"—made its bow and was carefully studied by many members who were impressed by its simple and logical layout and neat appearance. Many must have gone away feeling that here, at last, was a first-class design which could be built at home without difficulty. Other items which attracted attention were G2IG's r.f. bridge for measuring separately resistive and reactive components of aerial impedance up to 30 Mc/s, an f.m. tuner unit built by G3ECA and G6MB's Antennamatch.

Opposite Headquarters' stand was the R.A.F. stand, a bamboo reconstruction of a typical R.A.F. sergeant's quarters in Malaya with a workshop adjoining. Undoubtedly this was the most picturesque stand in the whole Exhibition. A "try your skill" Morse exhibit proved most popular while the prototype of a new Amateur Radio transmitter in kit form for use by R.A.F. personnel throughout the world was shown by the R.A.F. Amateur Radio Society, members of which manned the stand.

Freedom from TVI and the considerable effective gain of the system were emphasized on the Single Sideband stand on which the centre-piece was GI3ZX's neat 3.7 Mc/s filter rig using an 829B housed in an S640-type cabinet. An s.s.b. receiver with a 3 section half lattice filter was shown by G3FHL and a three band mixer amplifier by G3CU. G3ILI exhibited a pulsed two-tone oscillator for aligning linear amplifiers and G2MF a homebuilt version of the American Multiphase 10B exciter.

G3BCM's miniature transmitter-receiver covering 1.8 to 28 Mc/s which won him the Amateur Radio Constructors' Award for 1955, presented by Phil Thorogood (G4KD), took pride of place on the Test Gear and Miscellaneous Equipment stand. The complete unit measures 16in. high by 12in. wide by 7in. deep and weighs only 12¼ lb. The receiver section is a 7 valve superhet with plug-in coils comprising r.f., mixer, regenerative i.f. amplifier, second i.f., second detector, a.f. output and b.f.o. A silicon diode is used as the i.f. detector for the "S" meter. A QV04-7 giving 10-12 watts output on all bands is used in the p.a. of the three-stage transmitter. The oscillator can be used with either a crystal or a Tesla m.o. circuit and is followed by a tuned buffer. All stages in the transmitter operate on the output frequency. Provision is made for break-in working on c.w., m.c.w. or phone.

Other interesting items on this stand were G3IIR's home-built tape recorder (which was used to record the opening of the Exhibition by Vice-Admiral Dorling), Sven Weber's miniature transistor receiver, G3AAZ's 150 watt bandswitched transmitter (to be described in a forthcoming BULLETIN article), a 21 Mc/s crystal controlled converter for the HRO (G2RX), G3BK's "Countryman" mobile transmitter-receiver (described in the December BULLETIN), a mobile transmitter for use on a small yacht (G3BPM) and a 7 Mc/s transceiver (G3KGH/VK5QV).

Excellent pictures were again a feature of the Amateur Television stand, the main exhibit being G2DUS/T's miniature TV station which included a 16 mm. telecine scanner, monoscope unit, bar generator and camera. An example of the simple equipment possible for initial experiments was provided by a flying spot scanner (M. H. Cox) and a number of easily built converters for receiving 70 cm Amateur TV signals on commercial receivers designed for the B.B.C. or I.T.A.

The V.H.F./U.H.F. stand took on a new look this year with the advent, in some quantity, of crystal controlled equipment for 1250 Mc/s. The stand was dominated by a fine paraboloid for 1250 Mc/s complete with motorized tuning gear and automatic direction indication exhibited by G5DT who also had on show a 2C39A power tripler for the same band.

A view of the attractive R.A.F. stand showing a typical sergeant's quarters in Malaya. The amateur station is to the right of the picture.
(Photo by courtesy of the Air Ministry)

Other 24 cm gear included a DET24 power tripler (G3HBW), a crystal controlled local oscillator (G3EOH), a 1250 Mc/s p.a. stage (Harrow Radio Society) and a lamp load (G3HBW).

Equipment for 70 cm included a 150 watt p.a. using a 4X150A (G2BVW), modified G3BKQ-type converters (G2DDD, G3EOH and G3KEQ), an all-6J6 transmitter (G8SK), a mobile transmitter-receiver (G2DD), a television sound transmitter using a QQV03/20 p.a. and a vision transmitter using QQV06/40 p.a. (G2WJ).

Portable and mobile equipment was prominent amongst the 2m exhibits and included G6AG's mobile transmitter-receiver (which was used as a fixed station from the stand with a two stacked slot beam on the roof of the hotel), as well as G3XC's and G2ATK's equipment. Portable gear included a 10 watt transmitter by G3EOH.

Equipment for the 144 Mc/s band included a 50 watt transmitter (G5BD), a miniature converter, tunable i.f. and transmitter (G6XM) and a crystal controlled converter (B.R.S.12638).

Test equipment included the "Poor Man's Signal Generator for 420 Mc/s" (G3FP) and a 70 cm wavemeter with transistor amplifier (G3HT). G5CD showed a cavity oscillator for 350-450 Mc/s. G2FKZ and G3FZL demonstrated 70 cm impedance matching using two stub tuners and a slotted co-axial line to check the standing wave ratio. They also demonstrated the matching of a 12 element stacked array constructed by G3FZL.

Exhibition Stations

In addition to the usual Exhibition station on Top Band and 3.5 Mc/s a popular innovation this year was the operation of a 144 Mc/s station from the V.H.F./U.H.F. stand. For most of the time the h.f. station used the call-sign GB3RS but this call-sign was used on 144 Mc/s for about an hour each day. Both stations proved a great success and were worked by many members all over the country. Equipment for the h.f. station was loaned by Clem Jardine (G5DJ) and Eric Yeomanson (G3IIR) and for the v.h.f. station by C. J. McClelland (G6AG).

Non-R.S.G.B. Stands

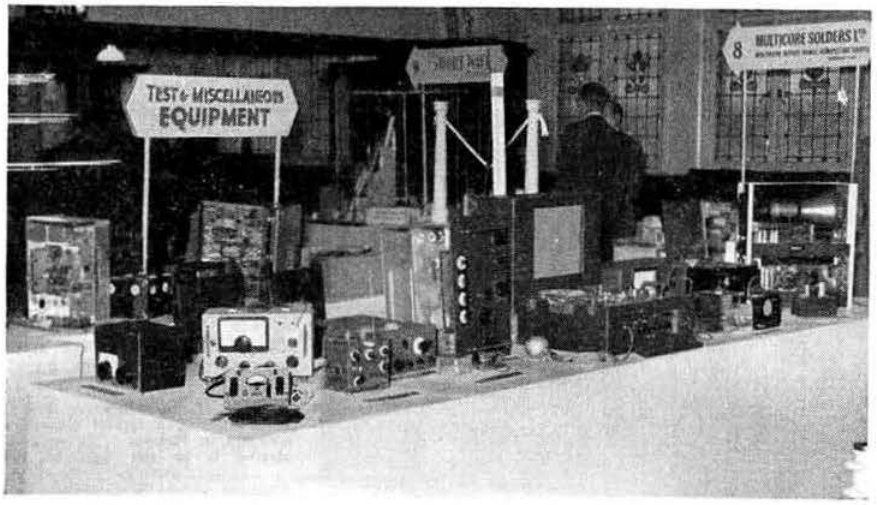
The Television Society—a new exhibitor—displayed books on television and pamphlets dealing with the work of the Society.

Another newcomer was PCA Radio, manufacturers of the well-known Hamobile 2m transmitter-receiver for car and home station use which is now also available in kit form, complete with easy to follow point-to-point schematic diagrams as well as circuits.

In addition to the popular Minimitter table top transmitter covering 3.5-28 Mc/s at full power, the Minimitter Company showed two new items—a tunable 144 Mc/s converter complete with internal power pack and a

GI3ZX's single sideband transmitter in an S640-type cabinet was the centre-piece of the Single Sideband stand.
(Photo by G3IIR)

144 Mc/s exciter-low power transmitter, the line-up of which is 6BX6 Clapp v.f.o. on 3 Mc/s, 6BX6 doubler or crystal oscillator, three 6BX6 multiplier stages, 5763 doubler and a QQV03-10 p.a. Apart from its use as a low power transmitter, the unit is intended to act as a driver for a higher power p.a. using either a QQV03/20A or QQV06/40A. Another interesting Minimitter item was an inexpensive low-pass filter which gives 80 db attenuation at frequencies above 36 Mc/s with negligible insertion loss.

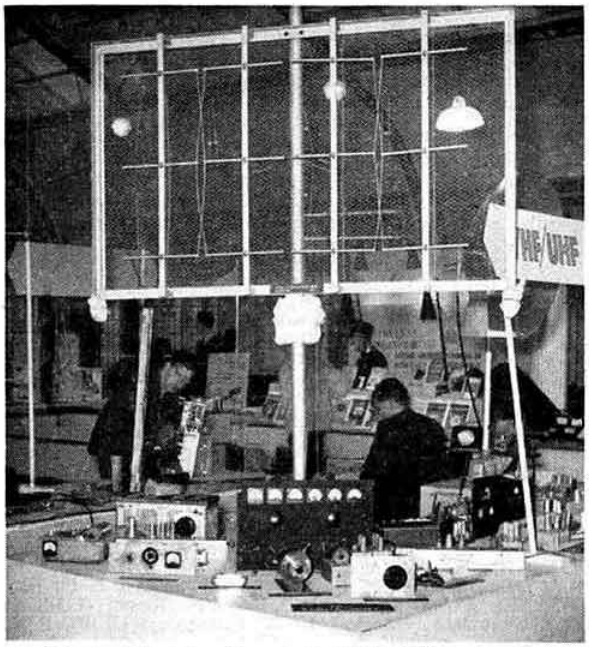


Panda Radio featured a model of their new Globemaster Minibeam for 14, 21 and 28 Mc/s designed by G4ZU. The beam requires no tuning when changing bands but gives 4.5 db gain at 14 Mc/s, 7.5 db at 21 and 9.5 db at 28. Other products displayed included the well-tried Panda PR120-V and Panda Cub table-top transmitters.

A production model of the LG.300 transmitter, shown last year as a prototype, was exhibited by Labgear with its new matching power sup-

Some of the excellent equipment shown on the Test and Miscellaneous Equipment stand. In the centre are G3AAZ's 150 watt band-switched transmitter and G3IIR'S tape recorder.
(Photo by G3IIR)

ply and modulator unit. The power supply provides 1000 volts at 180 mA, 300 volts at 200 mA and 150 volts stabilized at 20 mA. The valves used are four 5R4GYs and a VR150/30. Two QV06/20s are used as class AB1 modulators and are driven by an ECC81 two-stage voltage amplifier and a 6N7 phase splitter. In addition,



The 70 cm equipment section of the V.H.F./U.H.F. stand included this fine 12-element stack built by G3FZL.
(Photo by G3IIR)

a range of components for the home constructor was exhibited as well as a combined Band I and III filter using a printed circuit. Another interesting item was a temperature controlled oven (designed for professional use but also available to amateurs) which houses all styles of crystal or a tuned circuit and operates from 6.3 volts. It should be of particular application in s.s.b. equipment.

Harwin Engineers, Ltd., exhibited a number of items including their universal Electrical Tester and "Unitags," a convenient means of building up tag strips, which should find wide application in amateur equipment.

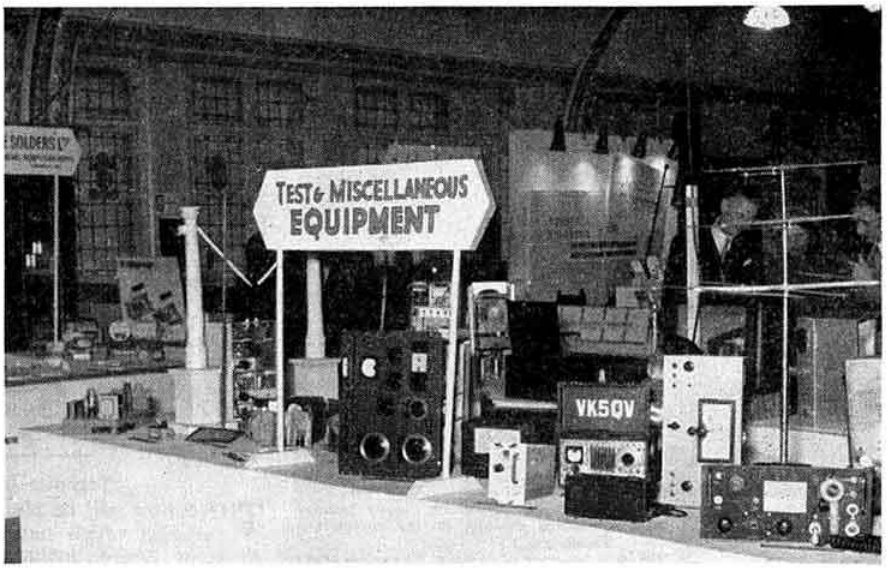
The cabinet and chassis for "The Britannia" communications receiver was one of the many attractive pieces of metalwork exhibited by E. J. Philpotts' Metalworks, Ltd., whose range of styles and finishes covers every requirement of the radio amateur and home constructor. Although a number of standard designs are available, most of this company's products are "tailor made" to customers' own requirements.

Television aerials for Bands I and III, as well as aerials for the amateur, were a feature of the J-Beam Aerials stand and of the special display in the small hall. One of those shown there was a 24 element array for 144 Mc/s consisting of two six-over-six widespaced slot beam aerials one above the other. This formidable creation has a gain of 17 db, over 40 db back-to-front ratio and a horizontal beamwidth of 30°. The vertical beamwidth of only 17° is very helpful in dealing with fading and aircraft flutter. A new system of element mounting makes all the amateur aerials suitable for portable use. The company has recently exported its amateur products to New Zealand and Australia.

New equipment on the AVO stand included the a.m./f.m. signal generator type TFM and the signal generator type III for a.m. only, which covers 150 kc/s to 220 Mc/s. Both these instruments operate on *fundamentals throughout their ranges*. Other items shown included the AVO electronic testmeter, valve testers and the Models 7 and 8 multimeters.

The Primaxa soldering gun with twin spotlights was one of the many interesting items on the stand occupied by Cleminson's Agencies, Ltd., who also showed the Easco "Rectostat" battery charger—a useful item for the mobile enthusiast—and the Easco miniature 12 watt public address equipment, Elstone mains transformers and chokes, Channel (brand) Band III converters and pattern generators. The firm also showed its own Band III aerials and germanium diodes.

In addition to their wide range of solders and solder tapes Multicore Solders, Ltd., made a feature of two useful "Bib" tools—a tape splicer for joining recording tape neatly and accurately and a versatile wire stripper and cutter. The latter was also available as part of an attractive gift pack consisting of a small electrician's screwdriver and a card of solder tape which requires only the heat of a match to make a perfectly soldered joint.



Equipment to be seen in this picture of the Test and Miscellaneous Equipment stand includes a small hi-fi amplifier by G3ECA (extreme left), a 150 watt transmitter by G3IIR and a 7 Mc/s transceiver by G3KGH/VK5QV.
(Photo by G3IIR)

An impressive demonstration on the Measuring Instruments (Pullin), Ltd., stand showed a Series 100 multirange meter which withstood 1,000 per cent overloads more than a thousand times during the Exhibition without being damaged. This meter is a 21 range a.c./d.c. instrument with a sensitivity of 10,000 ohms per volt. Other items of particular interest on this stand were the Pullin Miniature Test Set (5,000 ohms per volt) and the Type S multipole relays which are available for all voltages from 6 to 240 volts d.c. in either standard or hermetically sealed versions.

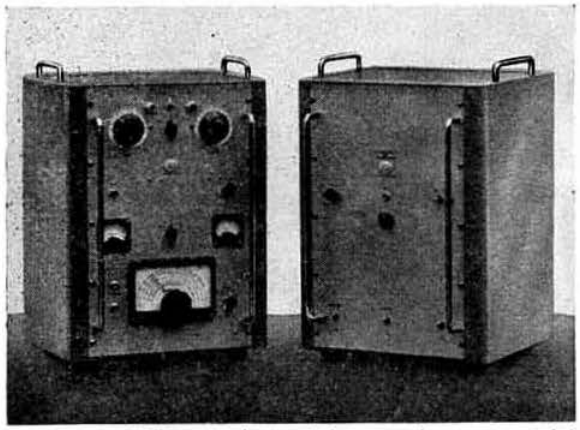
A 144 Mc/s transmitter using a TT20 in the p.a. stage, modulated by push-pull KT66s, in a table-top cabinet was a very fine exhibit on the G.E.C. stand. Other items shown included the Osram 912 Plus high fidelity amplifier and the Jason f.m. tuner unit using Osram valves, as well as microphones, metal cone loudspeakers and wide ranges of Osram valves, television tubes and crystal diodes and Salford and G.E.C. frequency control crystals including overtone types.

A 1250 Mc/s tripler using a 2C39A u.h.f. triode in a co-axial cavity and a transistor audio oscillator providing two alternative output frequencies of 300 and 1000 c/s were important exhibits on the Standard Telephones and Cables' stand on which Brimar transistors, teletubes, thermistors and valves for all purposes including v.h.f. and u.h.f. transmitting and receiving, were on show. A Band III converter for use with the Magnaview television set was another item using Brimar valves: the line-up comprised an ECC84 cascode r.f. stage, ECF82 mixer and oscillator and a 6BW7 i.f. amplifier. The oscillator was of the trough line type.

The Radio Press was represented by Iliffe & Sons, Ltd., publishers of *Wireless World, Wireless Engineer* and many technical books of interest to the radio amateur, and by The Short Wave Magazine, Ltd. On the latter stand, several items recently described in *The Short Wave Magazine* were exhibited including a Beginner's Top Band crystal controlled transmitter, a 1250 Mc/s oscillator and a T-fed slot for the same band (G5RZ).

Television and Radio Publicity

On the opening day a filmed report of the Exhibition was included in the Independent Television News bulletin from the London I.T.A. station. On the Saturday, Neville Barker visited the Exhibition and interviewed the General Secretary for the B.B.C. Radio Newsreel and recorded a short commentary from G5KW/M while in contact with GB3RS on 144 Mc/s.



The Labgear LG.300 transmitter and its companion power supply/modulator, one of the many attractive exhibits on the commercial stands.

(Photo by courtesy of Labgear (Cambridge) Ltd.)

* * *

Despite a somewhat lower attendance than in previous years, the Exhibition was once again a great success, both for the visiting amateur and for the commercial exhibitor. As one manufacturer remarked, "If the attendance on the first three days had been as good as on the Saturday, we should have sold a whole year's production." Tribute indeed to the importance of the R.S.G.B. Exhibition to those seriously interested in supplying the Amateur Radio market.

Acknowledgments

Thanks are recorded to all those who helped to make the Exhibition a success. In particular the following are thanked for their whole-hearted co-operation in loaning equipment, manning stands or undertaking duty on the Exhibition stations:

G. W. Alderman (B.R.S.19900), J. C. Alford (Associate), W. R. Andrews (Associate) B. R. Arnold (G3FP) M. Barlow (G3CVO), F. Barnard (G4FB), G. A. Bird (G4ZU), P. C. Bond (G3BEG), D. M. Bowden (B.R.S.20463), N. Caws (G3BVG), R. C. S. Caws (G2BRL), W. J. Colclough (G3XC), R. P. Cooper, D. N. Corfield (G5CD), E. C. Cosh (G2DDD), M. H. Cox, F. W. Crabtree (G3BK), F. Crisp (G3GZJ), R. C. B. Cutts (G3HRC), J. Davie (G2XG), D. Deacon (G3BCM), E. A. Dedman (G2NH), P. R. A. Dolphin (G3ELH), C. H. L. Edwards (G8TL), C. L. Fenton (G3ABB), R. B. Forge (G3FRG), M. Frost (G3GNL), D. W. Furby (G3EOH), G. G. Gibbs (G3AAZ), W. J. Green (G3FBA) A. M. Gurney (Associate), R. H. Hammans (G2IG), Harrow Radio Society, D. T. Hayter (G3JHM), F. Hicks-Arnold (G6MB), J. Hobbs (G3JQN), K. N. Honeyball (G3HIL), I. B. Howard (G2DUS), J. Hunter (G6HU), I Husen (G3KGH), K. W. Ireland (G3IKW), W. James (G6XM), D. C. Jardine (G5DJ), F. A. Jefferies (G8PX), J. D. Kay (G3AAE), H. F. Knott (G3CU), A. H. Koster (G3ECA) F. G. Lambeth (G2AIW), F. H. Lawrence (G2LW), P. J. Matthews (G3BPM), C. J. McClelland (G6AG), H. T. McFarlane (G8SK), J. P. Mitchell (G3KEQ), A. L. Mynett (G3HBW), C. E. Newton (G2FKZ), G. W. Norris (G3ICI), A. D. Odell (B.R.S.20655), G. Perring (B.R.S.19427), R. W. Peters (G3JXV), S. Poole (G3IMP), H. T. Pope (G3HT), R. T. Reed (G2RX), B. J. Rogers (G3ILI), R. L. Royle (G2WJ), F. F. Ruth (G2BRH), J. Salvage (G3HRO), A. C. Simons (G5BD), M. F. Smallwood (B.R.S.18713), J. W. South (B.R.S.20026), D. K. Smith (B.R.S.12638), H. F. Smith (G2DD), P. Smith (Associate), G. M. C. Stone (G3FZL), E. G. Styles (G3JSE), T. O. G. Talboys (G2ATK), J. P. Thomson (Associate), S. C. Tucker (G5DT), G. L. Turner (G3LA), J. Waithe (Associate), C. T. Wakeman (G4FN), S. F. Weber (B.R.S.19317), R. F. Weston (G2BVW), A. J. Worrall (G3IWA), and E. W. Yeomanson (G3IIR).

Thanks are also recorded to Phil Thorogood (G4KD) to whom much of the credit for the success of the Exhibition is due as Exhibition Manager and to the Management and staff of the Royal Hotel for their willing co-operation.

Co-axial cable for the h.f. station was provided by courtesy of British Insulated Callender's Cables, Ltd., and slot aerials and co-axial cable for the v.h.f. station by J-Beam Aerials, Ltd.

The members of the committee responsible for the organisation of the Home Constructors' Section of the Exhibition were:

C. H. L. Edwards (G8TL), *Chairman*, W. H. Allen (G2UJ), D. C. Jardine (G5DJ), F. G. Lambeth (G2AIW), G. W. (Phil) Norris (G3ICI), B. J. Rogers (G3ILI), R. L. Royle (G2WJ), F. F. Ruth (G2BRH), G. M. C. Stone (G3FZL), E. W. Yeomanson (G3IIR) and John A. Rouse (G2AHL).

Technical Articles Wanted

THE Editor will be pleased to consider for publication articles which have a bearing on any aspect of Amateur Radio, including Amateur Television.

A Simple Wobbulator for the Alignment of Television Receivers

By A. H. KOSTER, Dr. Ing. (G3ECA)*

Apart from its use for general servicing of Band I television receivers, the wobbulator described in this article will be particularly useful to those members whose receivers, both home-built and commercial, will require re-alignment when the B.B.C. Television Service opens its station at Crystal Palace. The new transmitter, as already announced, will use the lower sideband only.

THE instrument to be described permits the band-pass of television sets to be checked and is particularly useful for the re-alignment to the lower sideband of older types of Band I receivers in the London Service Area. The coil data given refer to the latter case. If sets on other frequencies are to be checked, the number of turns will have to be reduced accordingly.

A wobbulator enables the band-pass of a television set to appear visually on a cathode-ray tube so that the results of adjustments can be seen instantly. This is a much quicker method than measuring and manually plotting the diode voltages against a range of input frequencies derived from a signal generator. Basically, a wobbulator is an oscillator which varies its frequency either side of a pre-set centre frequency at a rate of, say, 50 times per second. This signal is applied to the aerial input of the receiver and the output of the video amplifier to the Y-plate of a cathode-ray tube. Simultaneously the spot moves along the X-axis at exactly the same rate and in the same phase as the oscillator is wobbulated. The resultant trace on the oscilloscope shows the familiar form of response curve which, ideally, should be 6 db down at 45 Mc/s, horizontal at 0 db datum from about 44.5 to 42 Mc/s and 40 to 50 db down at 41.5 Mc/s although in practice these values are rarely achieved. In particular the severe drop of at least 40 db from 42 to 41.5 Mc/s is difficult to realise. Usually an appreciable drop at 42 Mc/s occurs which results in a loss of the 3 Mc/s bars and sometimes blurring of the 2.5 Mc/s bars. The wobbulator is a great help in getting as near as possible to the ideal condition.

Varying the Frequency

It is a fairly simple matter to vary the frequency of an oscillator by a few per cent as is required for checking a.m. or f.m. sound receivers. This can be done successfully with phase shift networks in the lower frequency bands or with reactance valves in the higher ones. When it comes to swinging a 40 Mc/s oscillator up to 50 Mc/s then the total deviation is 25 per cent and an electronic wobbulator becomes rather elaborate. Mechanical wobbulating is easier and the arrangement to be described produces a sweep of good linearity, both in respect of voltage and distribution of frequency across the tube face.

Mechanical Wobbulating Device

The wobbulating device consists of a reed which vibrates at 50 c/s. Fig. 1 shows the general arrangement. The main component is the body of a 1000 ohm Post Office type relay.† This operates a steel reed which has a piece of thin brass fixed to the free end at an angle of about 84°. This forms the moving vane of a condenser (C4). The faces of the clamp holding the reed should be covered with a thin layer of paper, otherwise a metallic noise occurs when the reed is vibrating. A second piece of thin brass is folded into a U-shape so that it has 1/32in. clearance both sides of the moving vane, and forms the fixed part of the condenser C4. The whole assembly is mounted on a rigid metal chassis so that the U-piece is near to the valve grid. The connection to the reed is provided via the chassis, the paper and the clamp forming such a high capacity that it has no effect.

The length of the reed is very critical and must be adjusted before mounting the U-shaped piece. At first sight it would appear that a reed could be made to oscillate at 50 c/s with ordinary a.c. mains. However, that is not so in the present arrangement where the core and yoke of the solenoid are of mild steel. The reed cannot differentiate between the positive and negative

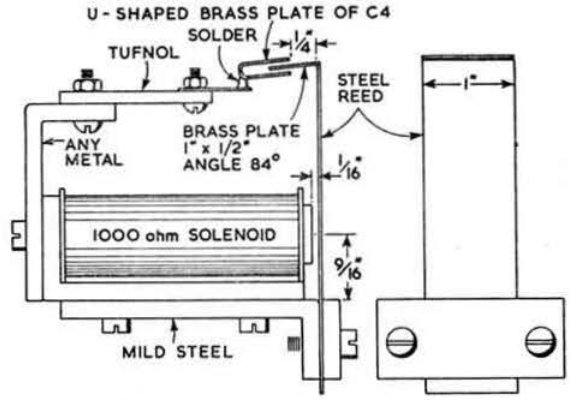


Fig. 1. The mechanical wobbulating device.

going half-cycles and will oscillate at 100 c/s. For several reasons this is undesirable. Therefore the solenoid is energised via MR2 (Fig. 2), which produces 50 negative pulses per second. C3 serves to correct the phase relation between the X- and Y-plate deflections. Fine adjustment of the phase is achieved by VR3 as will be described later. VR1 controls the amplitude at the free end of the reed.

The steel reed is 15/1000in. thick and 1in. wide. If this reed, without the brass top, is pushed slowly through the slackened clamp it will oscillate feebly when its free length is 1½in. from the upper end of the clamp. This is an unwanted 100 c/s oscillation and sounds like the familiar mains hum. When it is pushed through to 3in. a large oscillation of at least ±¼in. at 50 c/s occurs. The pure 50 c/s note is almost inaudible. At 4½in. the reed oscillates on its third harmonic, again at 100 c/s, and the standing wave with its node 2/3 up is clearly visible. The required free length for 50 c/s is about 3in. The brass plate, 15/1000in. thick, 1in. wide and ½in. long is soldered to the end at the prescribed

*195 Woodford Avenue, Ilford, Essex.

†The solenoid of the particular type used by the author is ¾in. diameter and 2½in. long.

angle. The additional weight is equivalent to the inductive loading of a $\lambda/4$ aerial and the reed has to be shortened by pushing it about $\frac{1}{4}$in. back into the clamp. Tightening of the clamp screws can be used for fine tuning of the reed to produce maximum amplitude at the free end. Then the U-shaped piece, 1in. wide, is spot-soldered into position. Some practice is required to ensure that the vane oscillates freely in the gap without touching anywhere. A swing of $\pm 3/16$in. is ample for a frequency change from 38 to 50 Mc/s. A steel ruler 1/32in. thick and $\frac{1}{4}$in. wide can be used as the reed, but the unloaded length then becomes $4\frac{1}{2}$in.

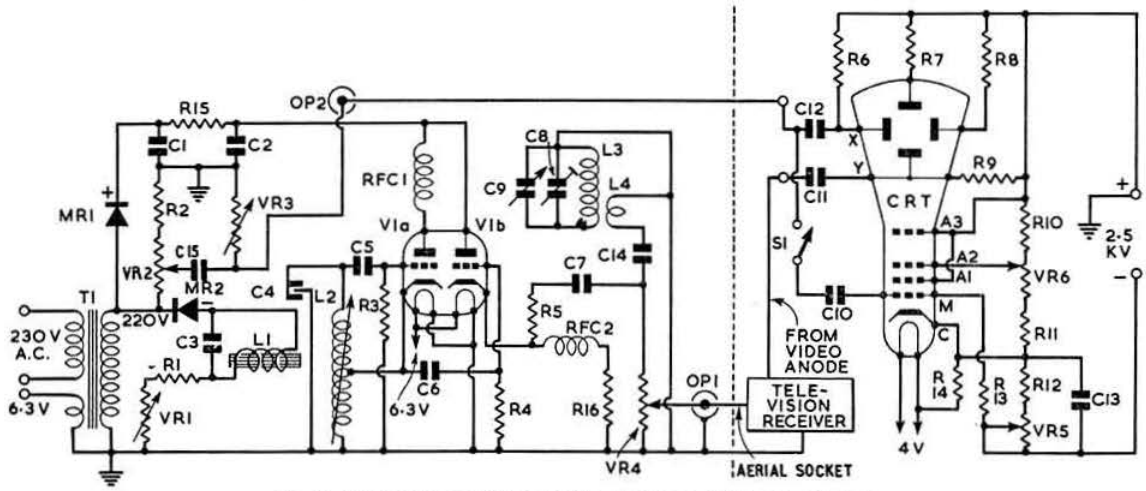


Fig. 2. Circuit diagram of the simple television wobbulator for Band I.

C1, 2, 32μF, 300 volts wkg.
C3, 0.5μF, 300 volts wkg.
C4, see text.
C5, 7, 50$\mu\mu$F.
C6, 12$\mu\mu$F.
C8, 3–30$\mu\mu$F Philips trimmer.
C9, 3–10$\mu\mu$F variable.
C10, 0.002μF.
C11, 12, 15, 0.1μF, 500 volts wkg.
C13, 1μF, 500 volts wkg., case insulated for 2.5 kV.
C14, 5$\mu\mu$F.
L1, see text.
L2, 9 turns 28 s.w.g. enam., close wound on $\frac{1}{4}$ in. former, tapped 4 turns from earthy end, adjustable brass slug.
L3, 7 turns 20 s.w.g. enam., close wound on $\frac{1}{4}$ in. former.
L4, 2 turns, 28 s.w.g. enam., wound over paper layer at earthy end of L3.
MR1, 2, Metal rectifier, 250 V 30 mA.
R1, 5,000 ohms 1 watt.
R2, 100,000 ohms $\frac{1}{2}$ watt.
R3, 15,000 ohms $\frac{1}{2}$ watt.
R4, 22,000 ohms $\frac{1}{2}$ watt.
R5, 16, 1,000 ohms $\frac{1}{2}$ watt.
R6, 7, 8, 9, 2.2 Megohms $\frac{1}{2}$ watt.
R10, 1.5 Megohms 2 watts.
R11, 180,000 ohms $\frac{1}{2}$ watt.
R12, 10,000 ohms $\frac{1}{2}$ watt.
R13, 500,000 ohms $\frac{1}{2}$ watt.
R14, 100,000 ohms $\frac{1}{2}$ watt.
R15, 20,000 ohms 1 watt.
RFC1, 2, 100 turns, 36 s.w.g. enam., close wound on $\frac{3}{16}$ in. former.
S1, single pole toggle switch.
T1, 220 volts 30 mA, 6.3 volts 0.3 amp.
V1, Brimar 12AT7.
VR1, 2, 25,000 ohms.
VR3, 1 Megohm.
VR4, 100,000 ohms logarithmic type, slow changing end to chassis.
VR5, 100,000 ohms.
VR6, 500,000 ohms.

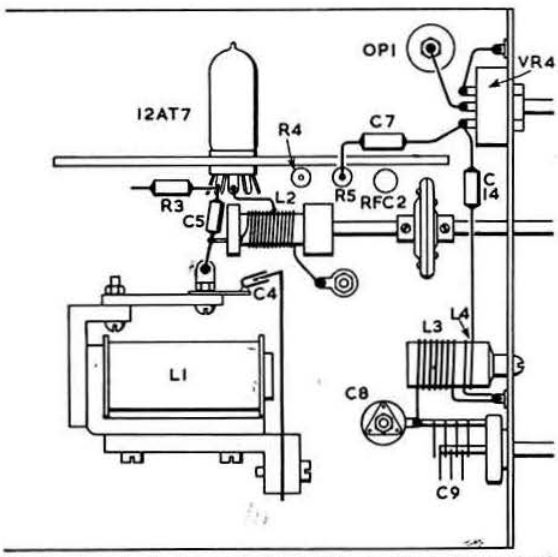


Fig. 3. Layout of the main components in the oscillator circuit.

The Circuit

One-half of a 12AT7 (V1a) serves as an electron-coupled oscillator and is tuned by a brass slug which is connected to a knob so that the centre-frequency can be adjusted at will. The other half is a cathode-follower to minimize external effects when coupling to the receiver under test. L3C8C9 is an absorption wavemeter. C8 is a pre-set trimmer and C9 is a variable condenser which has to be calibrated for values from 38 to 50 Mc/s. This wavemeter produces a "nick" in the trace and indicates exactly where any particular frequency lies. The oscillator itself does not have to be calibrated.

The output OP1 of the wobbulator is connected to the aerial input of the television set. The anode of the video amplifier is connected to the Y-plate condenser of a cathode-ray tube. If an oscilloscope is available it can be used, but since no internal time-base or Y-plate amplifier is required any c.r.-tube with the necessary e.h.t.-supply is satisfactory. The values shown are suitable for a VCR97. The output OP2 of the wobbulator is connected to the X-plate condenser.

Operation

In operation S1 is first left open, and with the contrast control of the television set in its normal position and the brilliance control at zero, VR4 is advanced to

(*Continued on p. 323*)

Fundamental Principles of Modulation

By G. L. BENBOW, M.Sc., A.M.I.E.E. (ex-G3HB)*

In view of the recent relaxations in the rules governing the use of telephony by first year licensees, this article, the first of an informative BULLETIN series dealing with modulation in the amateur transmitter, is particularly timely. Succeeding articles will deal with the practical as well as theoretical aspects of modulation.

ANY system of communication by radio has two complementary requirements:

1. The transmission of energy from one point to another.
2. A means of acting upon this energy in order that intelligence may be conveyed from one point to the other.

The first requirement is met by the transmission of the r.f. carrier wave from a radio transmitter, either omni-directionally or in a given direction by means of a beam aerial. The process of acting upon the carrier wave in order to convey the required intelligence is called "modulation." Thus it is seen that the breaking up of the carrier wave into the dots and dashes of the Morse code could be considered as the simplest modulation process.

The r.f. carrier wave, generated by the transmitter, has the properties of an alternating current, i.e. it has amplitude, frequency and phase. The term "amplitude" is the magnitude of the oscillations which make up the carrier wave, the "frequency" is the number of oscillations per second and the "phase" is the position of a point on the carrier wave with respect to some arbitrary point in time.

Modulation of such a carrier wave may be achieved by causing the periodic variation of either the amplitude, frequency or phase of the carrier wave at a rate which is low compared with the frequency of the carrier wave.

Variation of the amplitude is known as "amplitude modulation," generally abbreviated to a.m. In a similar manner, the terms "frequency modulation" (f.m.) and "phase modulation" (p.m.) arise.

Amplitude modulation is by far the most common modulation system used in Amateur Radio, and for this reason, apart from a brief reference to single sideband operation and pulse modulation, the present series of articles is confined entirely to consideration of the various aspects of amplitude modulation.

*81 Anglesmede Crescent, Pinner, Middlesex

Production of Sidebands

No matter what system of modulation is employed, the process of modulation produces frequencies which are above and below the frequency of the carrier wave. It is seen, therefore, that a modulated carrier wave occupies a definite band of frequencies rather than the single frequency of the carrier. The magnitude of this band of frequencies or the "band-width" depends on the modulation system and the frequency of the modulating signal. In the case of a complex modulating signal (i.e. one composed of many different frequencies), such as that resulting from speech or music, the band of frequencies on either side of the carrier wave frequency are known as "sidebands." The sideband which is higher in frequency than the carrier wave is known as the "upper" sideband. Likewise, the other is called the "lower" sideband. In the case of amplitude modulation, the highest frequency produced is equal to the sum of the carrier frequency and the highest frequency in the modulating signal; similarly, the lowest frequency produced is the difference between the carrier frequency and the highest modulating frequency. It is obvious, therefore, that the total bandwidth occupied is equal to twice the highest frequency in the modulating signal. For example, if the highest frequency in the modulating signal is 15 kc/s, and the carrier frequency is 1000 kc/s, then the sidebands will extend from 1015 kc/s to 985 kc/s, the total bandwidth occupied being 30 kc/s.

Modulation Depth

An amplitude modulated wave is shown graphically in Fig. 1. "a" represents the unmodulated carrier wave, of constant amplitude and frequency, which is to be modulated by the audio frequency wave "b," resulting in the modulated wave "c." The outline of this modulated wave is known as the "modulation envelope." The ratio of *A* or *B*, which are assumed to be equal to *C*, is known as the "modulation depth" or "modulation factor." This ratio may also be expressed as a percentage. As the amplitude of the modulating signal is increased, condition "d" is reached, where the negative peak of the modulating signal reduces the amplitude of the carrier to zero, and the positive peak increases the amplitude to twice the unmodulated value. This represents 100 per cent modulation or a modulation factor of 1. Further

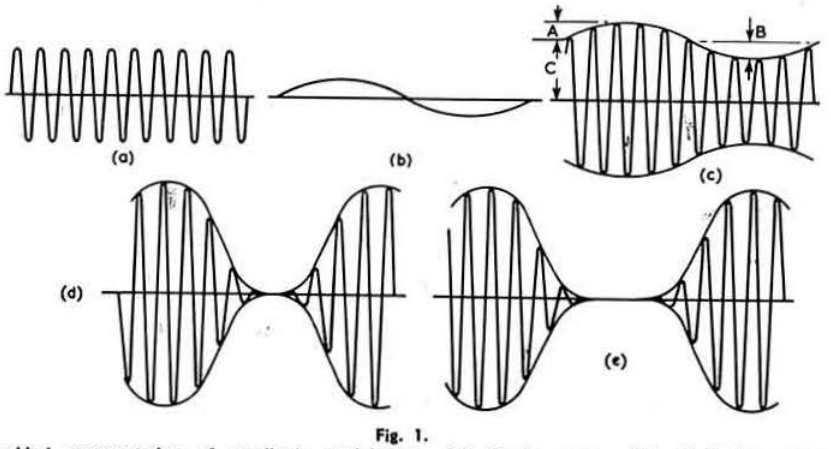


Fig. 1.
Graphical representation of amplitude modulation. (a) Carrier wave. (b) Modulating wave. (c) Modulated carrier wave. (d) 100 per cent modulation. (e) Overmodulation.

increase of the modulating signal produces the condition shown at "e" where the carrier wave is broken up by the negative peaks of the modulating signal. This condition is known as "overmodulation" and should not be allowed to occur under any circumstances. The breaking up of the carrier wave causes distortion or the production of harmonics of the modulating frequencies. These will be radiated as spurious sidebands, so the transmission will occupy a much wider bandwidth than necessary, and will cause considerable interference in nearby receivers. It is obvious, therefore, that the radiation of spurious sidebands due to overmodulation (sometimes known as "splatter" or "spitch") must be avoided at all costs.

Power Required for Full Modulation

If the modulating signal is sinusoidal, it may be shown that the effective power input at 100 per cent. modulation is 1·5 times the carrier power; thus, in order to modulate the carrier fully, the average power in it must be increased by 50 per cent. Hence, it is necessary to supply an audio frequency power of an amount equal to one-half of the carrier power. For example, 75 watts of a.f. power would be required to modulate fully an r.f. stage having a d.c. input of 150 watts. It must not be assumed, however, that the aerial current of a transmitter with 100 per cent. modulation will increase by 50 per cent. The relationship between the modulated and unmodulated aerial currents is given by

$$Im = Io\sqrt{1 + m^2/2}$$

where Im = *R.M.S. value of modulated aerial current.*
Io = „ „ „ *unmodulated* „ „
m = *modulation factor.*

Thus, for 100 per cent modulation,

$$Im = Io\sqrt{1 + \tfrac{1}{2}}$$
$$= 1{\cdot}226\ Io$$

Hence, the aerial current will increase by 22·6 per cent. This increase, of course, is given only by the peak value of the modulating signal.

Speech has a very "peaky" waveform, and so if the modulation depth is adjusted to be 100 per cent at the peaks of the modulating waveform, the average modulation depth will be of the order of 30 per cent. Thus, for telephony, the measured increase in aerial current will be appreciably less than 22·6 per cent.

Modulation depth may also be expressed in terms of the ratio of the a.f. power required for modulation to the unmodulated power supplied to the modulated stage thus,

$$m = \sqrt{2A/W}$$

where A = *A.f. power supplied*
W = *D.c. input to the unmodulated stage.*

Table I gives values, calculated from this expression, for the amount of a.f. power required for various depths of modulation. It will be seen that half the a.f. power required for 100 per cent modulation will give a modulation depth of approximately 70 per cent. The table also lists the increase in aerial current at the various modulation depths.

Table I

Depth of modulation (per cent)	A.f. power (for r.f. power = 1)	Increase in aerial current (per cent)
100	0.5	22.6
90	0.405	18.5
80	0.32	15.1
70	0.245	11.5
60	0.18	8.6
50	0.125	6.0

Bandwidth Required by a Modulated Wave

It has been stated earlier that the total bandwidth occupied by an amplitude modulated wave is the sum of the two sidebands or twice the highest modulating frequency.

For the faithful reproduction of speech and music it is necessary to transmit frequencies in the whole range of the audible frequency spectrum (i.e. from 40 c/s or so to about 15 kc/s). In this case, the total bandwidth required would be 30 kc/s. From the point of view of a communication system, however, intelligibility, not fidelity, is of prime importance. Experiment and experience have shown that, for the intelligible transmission of speech, it is necessary to transmit frequencies up to 2·5-3 kc/s. Thus, the transmitted bandwidth need be only about 5 kc/s.

In the overcrowded conditions of the present-day amateur bands, it is obviously important to ensure that no transmission occupies a greater bandwidth than is absolutely necessary for intelligible communication.

Modulating Impedance

The impedance that an r.f. stage, which is being modulated, presents to the source of the modulating signal, or the modulator, is called the "modulating impedance." It is the ratio of the anode voltage and anode current of the r.f. stage or

$$Zm = Ea/Ia \times 1000$$

where Zm = *modulating impedance.*
Ea = *anode voltage of r.f. stage.*
Ia = „ *current* „ „ „ *(in mA).*

Linearity of Modulation

Ideally, for all modulation depths up to 100 per cent, the amplitude of the r.f. output should be directly proportional to the amplitude of the modulating signal; in other words, the modulation characteristic should be linear. Thus, if a certain negative value of modulating signal reduces the carrier amplitude to zero, then the same value in the positive direction should double it.

Non-linearity is most often manifest as a flattening of the positive modulation peaks and can cause considerable distortion. It may be minimised by careful design and correct adjustment of the modulated stage, particularly the operating voltages, r.f. grid drive and aerial loading.

Mathematical Expression of Sidebands

The mathematical equation for a carrier wave of constant amplitude and frequency which is amplitude modulated by a signal of constant frequency is

$$e = Eo\ (1 + m.sin\ 2\pi fm.t)\ sin\ 2\pi fc.t.$$

where m = *modulation factor.*
fm = *frequency of modulating signal.*
fc = „ „ *carrier wave.*
Eo = *amplitude of unmodulated carrier.*

This equation may be expanded, giving

$$e = Eo\ sin\ 2\pi\ fct + mEo/2\ cos\ 2\pi\ (fc-fm)t - mEo/2\ cos\ 2\pi\ (fc + fm)t.$$

Inspection of this expanded form shows that it is made up of three separate terms. $Eo\ sin\ 2\pi\ fct$ is the original carrier wave, while $mEo/2\ cos\ 2\pi\ (fc-fm)t$ and $mEo/2\ cos\ 2\pi\ (fc + fm)t$ are the lower and upper side-frequencies respectively, corresponding to fm, the frequency of the modulating signal. The total bandwidth of this amplitude modulated wave is $(fc + fm) - (fc-fm)$ or $2\ fm.$, i.e. the bandwidth is equal to twice the modulating frequency.

Single Sideband Operation

It should be noted, from the last equation, that the

carrier wave is not fundamentally essential to communication since the intelligence is contained in the sidebands alone. Thus, the carrier wave need not be transmitted, or it may be " suppressed "; likewise, it is necessary to transmit only one of the sidebands. Although single sideband operation requires more complicated equipment, it has obvious advantages, particularly from the point of view of the bandwidth required.

Pulse Modulation

A fundamentally different type of modulation is what is known as pulse modulation, which became practical as a result of the improved pulse techniques of the wartime development of radar.

In a pulse modulation system, intelligence is conveyed by the use of pulses rather than by the variation of the amplitude of a carrier. The fundamental requirement is the production of a continuous series of pulses upon which intelligence is impressed by one of several means such as

(a) variation of the width of each pulse;

(b) variation of the amplitude of each pulse;

(c) variation of the position of each pulse with respect to a certain point in time.

The equipment required is more complex than for amplitude modulation and detailed discussion is outside the scope of this series of articles.

Apart from television transmission, pulse modulation is likely to find most amateur application at super high frequencies, i.e. amateur bands above 2300 Mc/s.

In the foregoing paragraphs the fundamentals of the process of amplitude modulation have been reviewed. It thus becomes possible to specify the modulation equipment of a communication transmitter. These are:

1. An a.f. power amplifier capable of developing the required power over the minimum frequency range for intelligible speech, and its associated d.c. power unit.
2. A means of coupling, with correct impedance matching, the a.f. power to the transmitter.
3. A microphone.
4. A speech amplifier to amplify the output of the microphone to a suitable level to drive the a.f. power amplifier.

These elements are shown as a block diagram in Fig. 2. The term " modulator " is often applied to the whole of the a.f. section; strictly speaking, it should be applied to the power amplifier alone.

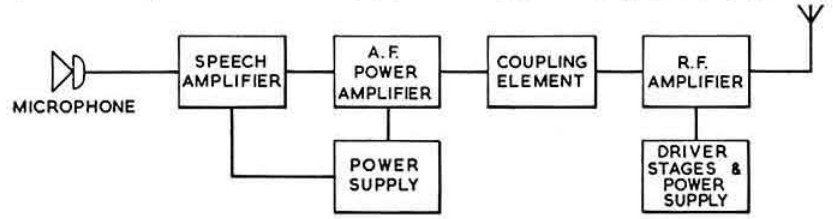


Fig. 2.
Block diagram of an amplitude modulated telephony transmitter.

* * *

In this series of articles it is proposed to deal in turn with each element of the equipment required for amplitude modulation.

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B.B.C. Television and V.H.F. Stations

OWING to late delivery of equipment, erection of permanent aerials at North Hessary Tor and Rowridge television stations will be delayed but it is expected that service from these stations will become fully effective in April and May respectively. For similar reasons the opening of the v.h.f. sound transmitting stations at Meldrum and Divis will be delayed until March but the station at Pontop Pike and the transmitter for the Welsh Home Service at Wenvoe came into service on December 20, 1955, as planned.

It is anticipated that two new transmitters, to carry the Light and West of England programmes, will be brought into service at Wenvoe in the spring. The transmission of the West of England Home Service will be on a temporary basis.

First Communal Business Radio Station

PYE Telecommunications, Ltd., recently opened the first communal business radio system at Meriden, traditional centre of England, 6 miles outside Coventry. The station is designed to enable industrialists who wish to control the movements of their fleets of vehicles to do so both economically and efficiently over an area extending from Leicester to Wolverhampton. The system is claimed to be capable of accommodating an almost unlimited number of users.

Progress in Semi-conductor Diodes

DURING the course of a lecture to The Television Society on November 11, J. I. Missen, M.Sc., A.R.C.S., of the G.E.C. Research Laboratories, demonstrated the capabilities of modern medium area silicon junction rectifiers. The high efficiencies and good reverse current voltage characteristics of the devices were shown in a typical h.t. supply using two rectifiers in series to provide 250 mA rectified current from a 50 c/s mains supply.

The silicon junction device not only gives a higher h.t. voltage than a comparable selenium rectifier, but has the additional advantages of being smaller, free from ageing, and capable of operation at a higher ambient temperature.

Dr. Smith-Rose Appointed Acting Director of National Physical Laboratory

DR. R. L. Smith-Rose, C.B.E., D.Sc., M.I.E.E., Director of Radio Research in the Department of Scientific and Industrial Research, and an Honorary Member of the R.S.G.B., has been appointed Acting Director of the National Physical Laboratory with effect from January 1, 1956, pending the appointment of a new Director to succeed Sir Edward Bullard, Sc.D., F.R.S., who resigned recently.

Bandspreading the B2

By A. G. DUNN (G3PL)*

THE B2 receiver is a compact and sensitive little communications receiver but it has a weakness which makes it tedious to use for amateur work. The tuning dial is very small, and although a magnifying lens is fitted it is trying to the eyes to obtain an accurate dial reading. The number of dial divisions occupied by the three amateur bands which the receiver covers is small. To overcome these defects a simple method of spreading the amateur bands over the greater part of the dial was tried and found very successful.

The receiver has three frequency ranges, each of which includes one amateur band, so simplifying the modification procedure.

The Method

The method used to obtain bandspread is to insert a trimmer condenser in series with each of the two sections of the tuning condenser. The existing trimmers are readjusted to give the required coverage, in conjunction with the series trimmers. In order to keep the modifications down to the barest minimum the bandspread is adjusted as required on one of the three bands; the other two then have to take "pot luck." It would be hardly practicable to obtain full-dial coverage of the 14 Mc/s band as the bandspread on the other two bands would be far too great and only a small portion of either would be receivable. If the 3.5 Mc/s band were given priority the coverage on the other two bands would be approximately 7 to 8 Mc/s and 14 to 16 Mc/s. This would be much better than no spread, but the writer required more spread and the 7 Mc/s band was given priority.

The modification can be carried out without the use of a signal generator if an auxiliary receiver, capable of picking up the signal radiated by the oscillator of the B2 and identifying its frequency, is available. Even this can be dispensed with, but its use saves a lot of time.

The Priority Band

Before starting the modification, the B2 receiver should be properly lined up. The intermediate frequency is 470 kc/s but this does not seem very critical. After connecting the series trimmers as shown in Fig. 1, the procedure is as follows.

With the "Waveband" switch on the 5.2 to 9 Mc/s range, turn the dial to 0. Adjust the series trimmer on the oscillator section of the tuning condenser until the oscillator frequency is 7470 kc/s approximately, as determined by the auxiliary receiver. Adjust the series trimmer in the mixer grid circuit until maximum noise, or signal, is heard. Check by listening that the circuit is tuned to 7 Mc/s (owing to the lack of an r.f. stage, it is easy to tune this circuit to the image frequency). The frequency coverage of the receiver should then be checked and should be about 7 to 9 Mc/s.

Turn the dial to 180. Adjust the existing parallel trimmer C2E in the oscillator circuit until the oscillator is working on 7.8 Mc/s. If this cannot be done by the trimmer alone, the iron core of the coil should be screwed in a little. The core adjusting screws are accessible by removing the "Waveband" knob and the oblong plate marked "Megacycles." The oscillator coils are at the bottom, that concerned being the middle one. Adjust the mixer grid parallel trimmer C2B and the core of the grid coil if necessary, until maximum noise is heard. Check by listening that signals on about 7330 kc/s are being received and then check the frequency coverage. It should be about 6 to 7.3 Mc/s.

Turn the dial to 0. Reduce the oscillator series trimmer still further, until the oscillator is again on 7470 kc/s. Adjust the mixer grid series trimmer until maximum noise is heard. Check that signals on 7 Mc/s or a little lower are being received.

The frequency coverage should then be 7 to 7.3 Mc/s. Final adjustments should be made to give a small overlap at each end. It is important that the series trimmers are not touched again; they may be sealed to prevent alteration.

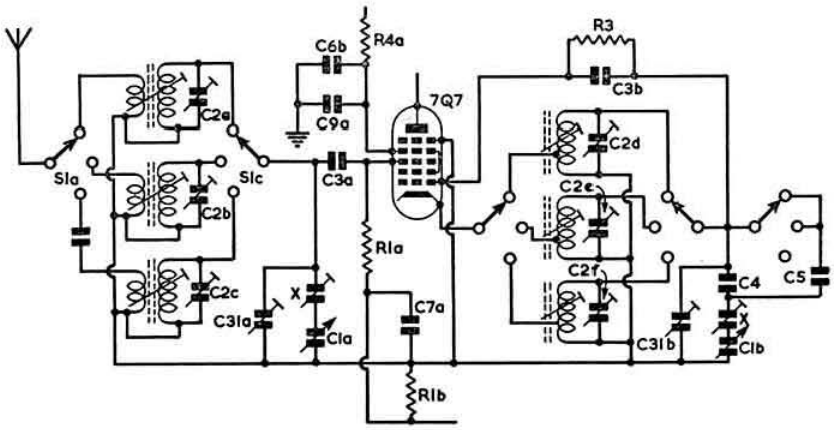

Fig. 1. The frequency changer stage of the B2 receiver showing the modifications to provide bandspread. Component designations are as given in the circular issued to members with the October, 1947, issue of the Bulletin. The extra trimmers marked X are 3-30 $\mu\mu$F each.

The 14 Mc/s Band

This band is covered in the 8.7 to 15.5 Mc/s position of the "Waveband" switch. Turn the dial to 0. Set the oscillator on 14470 kc/s by means of the parallel trimmer C2D, and adjust the mixer trimmer C2A for maximum noise, checking on signals to make sure it is tuned to 14 Mc/s. The coverage should then be about 14 to 14.8 Mc/s but owing to the method of obtaining bandspread the amateur band should cover about 100 degrees. Final adjustments should be made to give a slight overlap at the lower frequency end of the band so that 14 Mc/s comes at about 20 degrees.

The 3.5 Mc/s Band

The same procedure is followed on the lowest frequency range, adjusting the oscillator circuit so that it works on 3970 kc/s and then resonating the mixer grid circuit at 3.5 Mc/s. It will probably be found necessary to adjust the parallel trimmers C2C and C2F to maximum capacity and make final adjustments by adjusting the cores of the oscillator and mixer coils. The cover-

(*Continued on page 323*)

*22 *Meadowbank Road, Hull, Yorks*

Keep Those Leads Short!

By "SENEX"

THE importance of short connecting leads in radio circuits for use at very high frequencies is well known and has been stressed frequently in these pages. The stray reactance of even an inch or two of wire can cause strange effects at v.h.f. Some of these can be totally unsuspected, because they may not cause obvious peculiarities in the tuning up or operation of the equipment.

An example was found recently in a commercial v.h.f. radiotelephone which has been given type approval by the G.P.O. In spite of this, it can infringe the G.P.O. regulations regarding spurious emissions by many decibels, because of long leads.

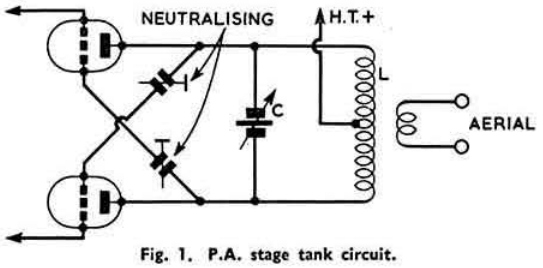

Fig. 1. P.A. stage tank circuit.

The transmitter p.a. stage (Fig. 1) consists of a pair of triodes in push-pull. The tank circuit is formed by a self-supporting coil mounted on the stator terminals of a butterfly split-stator condenser. This assembly is mounted on a bracket two inches above the chassis; the valveholders are mounted through the chassis with the connections underneath. The two anode leads, which are taken through large holes in the chassis deck, are both some three inches long.

The final transmitter frequency is 72 Mc/s, controlled by a 12 Mc/s crystal. During an investigation of TVI it was found that a strong signal was being radiated on 84 Mc/s. This signal was about 4½ S points below the 72 Mc/s carrier in strength, and was obviously caused by energy at the seventh harmonic of the crystal frequency, produced in the frequency multiplying stages, reaching the p.a. stage. There were also weak signals at other harmonics of the crystal frequency, but these were well below the G.P.O. figures for permitted radiation. It was something of a mystery why the seventh harmonic signal should be so strong.

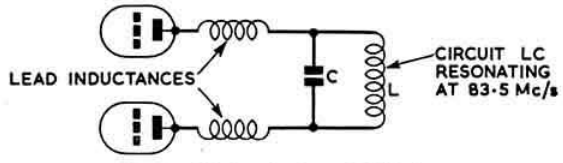

Fig. 2. Effective circuit at 83.5 Mc/s.

Using a grid dip oscillator on the tank circuit disclosed that, in addition to the expected resonance at 72 Mc/s, there was another at about 83.5 Mc/s. This was close enough to the seventh harmonic of the crystal frequency to develop an appreciable amount of power at 84 Mc/s.

The second resonance exists because of the long anode leads in the p.a. stage. The coil and tuning condenser resonate by themselves at 83.5 Mc/s, the inductance of the anode leads acting to isolate this circuit from the effect of the valve capacitances. The effective circuit is shown in Fig. 2.

At frequencies lower than 83.5 Mc/s, the circuit LC is inductive. The total inductance, made up of the inductances of the anode leads plus the effective inductance of the circuit LC, resonates at 72 Mc/s with the stray and valve capacitances, as shown in Fig. 3. Calculated from a well-known formula, the inductance of a three inch length of 16 s.w.g. wire is approximately 1.39 μH.

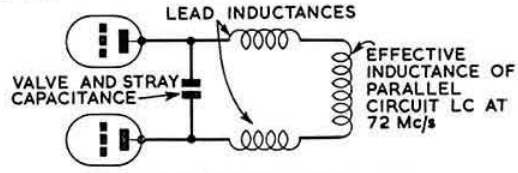

Fig. 3. Effective circuit at 72 Mc/s.

If the anode leads had no inductance, only one resonance would be possible. In practice, reducing the length of the leads to about an inch would reduce the inductance sufficiently to avoid trouble of this sort.

Although this article refers particularly to commercial equipment, it may serve to point once more the moral of the title: "Keep Those Leads Short!"; this kind of thing could happen in *your* rig, and the unwanted signal could be right in the middle of Band II F.M. Broadcasting or Band III television.

New Year Honours' List

AMONG those whose names appeared in the New Year Honours' List were Brigadier Richard Gambier-Parry, C.M.G., Director of Communications, Foreign Office (K.C.M.G.); Captain C. F. Booth, O.B.E., Assistant Engineer-in-Chief, G.P.O. (C.B.E.); Lt.-Col. P. N. G. Whitlam, G6PW (O.B.E.). We offer them congratulations on behalf of their friends in the Society.

Simple Wobbulator—continued from page 318

produce a large trace in the vertical and VR2 to sweep the horizontal direction fully. Normally two traces will be seen which, by adjusting the phase-shift control VR3, can be made to cover each other. S1 is then closed, which blanks out one trace. If the top or bottom of the trace is distinctly flat the video stage is overloaded and VR4 has to be turned down. As very little voltage is needed in normal reception areas, it is preferable for VR4 to have a logarithmic characteristic. The trace will have the familiar general shape of double, upper or lower sideband reception. By tuning C9 the "nick" will move along the trace and reveal the gain of the receiver at any frequency within the television band.

Bandspreading the B2—continued from page 322

age on this band will be about 3.5 to 3.65 Mc/s, which is sufficient for c.w. work. It could obviously be adjusted to cover the telephony band instead, the coverage then being about 3.63 to 3.8 Mc/s.

The system outlined above has the advantage, from the c.w. man's point of view, that the bandspread is greatest at the lower frequency end of each band and therefore gives best results in the c.w. sections of the various bands.

Annual General Meeting

Minutes of the 29th Annual General Meeting of the Radio Society of Great Britain, held at The Institution of Electrical Engineers, London, W.C.2, on Friday, December 16, 1955, at 6.30 p.m.

Present

The President (Mr. H. A. Bartlett in the Chair), Messrs. L. Cooper, C. H. L. Edwards, D. A. Findlay, D.F.C., A.S.A.A., R. H. Hammans, F. Hicks-Arnold, J. H. Hum, R. G. Lane, A. O. Milne, L. E. Newnham, B.Sc., W. A. Scarr, M.A. (Members of the Council). Messrs. F. Charman, B.E.M., V. M. Desmond, S. K. Lewer, B.Sc. (Past Presidents), Messrs. D. N. Corfield, D.L.C. (Hons.), J. W. Mathews, T. A. St. Johnston (Vice-Presidents), Mr. John Clarricoats, O.B.E., J.P. (General Secretary), Miss May Gadsden (Assistant Secretary), Mr. John A. Rouse (Assistant Editor) and about 70 members.

* * *

Apologies

Apologies for absence were received from Messrs. W. H. Allen, M.B.E., W. H. Matthews, W. R. Metcalfe and H. W. Mitchell (Members of Council).

Notice Convening the Meeting

The General Secretary read the Notice convening the Meeting.

Minutes

It was moved by Mr. Lane, seconded by Mr. Hicks-Arnold and resolved that the Minutes of the Twenty-Eighth Annual General Meeting held on December 17, 1954, as published in the January, 1955, issue of the R.S.G.B. BULLETIN, be approved and confirmed.

Annual Report of the Council

It was moved by the President, seconded by Mr. Glaisher and resolved that the Annual Report of the Council as circulated to the members, and published in the November, 1955, issue of the R.S.G.B. BULLETIN be approved and adopted.

Report of the Honorary Treasurer and the Audited Accounts

In moving the adoption and acceptance of the Report of the Honorary Treasurer and the Audited Accounts, Mr. Findlay stated that a letter had been received from Mr. J. Eaton (G3EZZ) in which he suggested " that there is no significant change in figures to warrant an increase in Bank Charges from £37 in 1954 to £70 in 1955." After reading the text of the letter, Mr. Findlay quoted from a letter dated December 28, 1954, from the Society's Bankers in which they drew attention to the fact that the annual charge of 30 guineas made in 1949 had, in recent years, proved inadequate, bearing in mind that the average balance standing to the credit of the Society had fallen to as low as £800 in 1953 and had risen to only £2,000 in 1954. During the year 1954 the number of entries on the Society's account aggregated 4,600, equivalent to 92 Ledger Folios. On a strictly " cost to bank " basis the Society's account had operated at a loss to the Bank of approximately £100. These conditions had obtained since 1950.

The Society's Bankers had originally asked for an annual charge of £135 but after discussion had agreed to accept a figure of £100.

Mr. Findlay stated that the Council had been satisfied with the arguments put forward by the Society's Bankers.

The Honorary Treasurer then referred to the item " Surplus on Disposal of Headquarters' Station." Mr. Findlay explained that the station itself had been dismantled and the components and valves offered to a reliable trade member of the Society for sale on the open market. The components and valves (less a few items not yet sold) realised the sum of £49 12s. 6d. Expenses and commission totalled £23 7s. 11d. The nett amount received by the Society was £26 4s. 7d. The Frequency Meter, Modulation Meter, Clock, Programme Controller, Wheatstone Transmitter, S.640 Receiver, V55R Receiver and Test Set 90A had not been disposed of. The aerial masts were still on the roof of New Ruskin House. The Council had every reason to believe, right up to December, 1954, that the complete station would be taken over by the Air Ministry, installed at R.A.F. Station, Locking, Somerset, and operated from there as a Headquarters' station by members of the R.A.F. Amateur Radio Society. For Service reasons the Air Ministry could not accept the station. It then became necessary, at short notice, in order to accommodate the enlarged Council due to take office in January, 1955, to dispose of the station proper without delay. As the transmitter had been a gift to the Society the Council decided it would not be good policy to advertise it for sale.

The motion to approve and adopt the Honorary Treasurer's Report and Audited Accounts was seconded by Mr. G. Leicester.

During the subsequent discussion Mr. Dales enquired whether the necessary increase in expenditure, visualised by the Treasurer in his Report, would be of a temporary nature. Mr. Findlay stated that the increases are likely to be of a permanent nature.

Mr. Deacon spoke in general terms on the Accounts and enquired the nature of the proposed increases in expenditure. Mr. Findlay stated that as a result of the Autumn Budget postal charges on the BULLETIN would increase by about £400 in a full year. The Council's decision to appoint a Deputy General Secretary would also lead to increased expenditure. Mr. Findlay expressed the view that the Society can no longer afford to be without a Deputy General Secretary.

In answer to a question by Mr. Yeomanson, the Honorary Treasurer stated that the whole rack and panel comprising Headquarters' transmitting station had been disposed of.

Mr. Glaisher enquired whether any attempt had been made to dispose of the station in the overseas market.

The President explained that it would not have been good policy to dispose of the station in the manner suggested.

Mr. Deacon referred to the fact that profit on the Amateur Radio Exhibition had fallen and to the fact that audit fees had been increased.

Mr. Findlay explained that Exhibition revenue had fallen because there had been less support in recent years from the radio industry. He stated that the 1956 Council would shortly be studying views put forward by the 1955 Exhibition (Home Constructors' Section) Committee on the question of future exhibitions.

The President pointed out that the question of audit fees would be dealt with later in the meeting.

Mr. Deacon enquired the nature of the items included under the heading " Sundries."

Mr. Findlay explained that this heading covered a very wide variety of miscellaneous items which could not

Round and About

G6LX (Croydon) who reports that he has been operational for some months, started off with a home constructed Ferroxcube filter rig (500 kc/s LC elements) which is probably the first of its kind in this country. Although power was limited to a few watts at first, a 4-125A class AB1 linear amplifier has since been added. Most activity has been on the DX bands with a couple of short visits to 3.7 Mc/s. On 21 Mc/s 37 states have been worked, while on 14 Mc/s 27 countries have been contacted, all being two-way s.s.b. G6LX reports that 3A2AH (Monaco) has single sideband rigs under construction, a phasing rig based on the Multiphase 10B and a G2NH crystal filter.

News comes from VE2AEE (ex-G3IXL) now settled in Montreal, who expects to be operational on 3.7, 14 and 21 Mc/s early in the New Year. The transmitter is to be a switched band unit with 6BA7 mixer feeding a 6CL6 class A amplifier to drive a pair of 6146s in parallel feeding a long wire aerial. At first, the power will be limited to 120 watts. Operating times will be from 6 p.m. to 9 p.m. E.S.T. (23.00 to 02.00 G.M.T.) when he will be looking for G stations. New calls heard on the bands include G3GHE, G4RT, G2CKM, G2JZ and G3FJN.

* * *

Details of activity, equipment and circuit arrangements are required for this feature. News items should arrive not later than March 15 for inclusion in the April issue of the BULLETIN. Reports from newcomers to single sideband will be particularly welcome.

Well Done G8IG!

"Bert" Allen first G to win WAZ Phone Award

THOSE members whose main interest is in the DX field will be the first fully to appreciate the outstanding achievement which we chronicle this month; the winning by a British amateur, C. G. Allen (G8IG) of the Worked All Zones Award, all of the contacts having been made on two-way telephony.

Although this is a U.S. award, no United States or Canadian amateur has yet equalled this performance and, in fact, only one other amateur in the world, namely, "Robbie" of VQ4ERR, has done it before.

Bert Allen, who lives at Keston, near Bromley, Kent, has many other operating awards to his credit. Fifth E-DX, fourth WAS in Europe, WAA, WAVE, etc., and has 215 countries confirmed for DXCC. In 1947 he won the VK/ZL Contest on 'phone and the following year, both the c.w. and 'phone sections.

In his middle fifties and looking much younger, Bert is a Director and Sales Manager of McMichael Radio Ltd., and has been with them since 1923, when he was the original operator of G2MI, then the firm's call-sign.

Originally trained as a ship's operator, he has travelled all over the world, having spent his sea-going life in Naval Transport. Incidentally, he is a superb telegraphist; the writer has seen him taking perfect copy, with an ordinary fountain pen, at 45 w.p.m. and seen the pen drop at 48 w.p.m. because he could not write any faster!

"Bert" Allen, G8IG, displays the 40 cards that enabled him to claim the WAZ award.

The transmitter used by G8IG to make almost all the contacts which contributed to his 'phone WAZ was crystal-controlled on 14 and 28 Mc/s and consisted of a 6L6, 807, 807 driving two 35Ts in push-pull, modulated by a pair of TZ40s—everything ambling along, well within its rating. The receiver is worthy of note being a rebuilt AR88, fully bandspread on all the amateur bands and incorporating a 100 kc/s calibrator, an audio filter with cuts at 1200 and 500 kc/s and a phasing control. The station includes a Cossor double-beam oscilloscope, a BC221 frequency meter, a wire recorder and other auxiliary gear. The mains input is Variac controlled and the entire station is relay operated from the operator's desk.

A new transmitter, now in use, is a band-switched rack-mounted affair using a single LS150 and the same TZ40s as modulators.

Before moving to Keston, G8IG was situated in Nightingale Lane, Bromley, where he possessed one of the first three element rotary beams in the country. The aerials now in use are a long-wire and three-half-waves out-of-phase on 14 Mc/s.

Adjacent to the actual shack is a well-equipped workshop, for Bert is not just a DXer but knows how to use machine-tools, as examples of his fine workmanship around the place bear witness.

It is pleasing to see a high executive in the world of professional radio unashamed to be known as a radio amateur keenly interested on the technical and operating sides of the hobby and at the same time ready to enjoy all the fun that goes with it. Those who want to see the "Ham Spirit" personified need go no further than Bert Allen. In offering him our sincere congratulations—we say, long may he prosper.

A. O. M.

Dave Marks (W2APF) off on World Tour

OLD Timer Dave Marks (W2APF), of Albany, New York, and his wife are about to start on a three months' world tour by air which will take them to the U.K., the Continent, Asia, Africa and Australia. They hope to meet local amateurs at each port of call.

U.S.A. MEMBERS

Please remind your friends that R.S.G.B. Membership costs only $3 a year.

Pension Scheme was based on retirement at 65 years of age. The Secretary's statement was received with acclamation.

Mr. Newton commented on falling attendances at recent Amateur Radio Exhibitions run by the Society. He suggested that the type of exhibition many members want is not provided by the Society. The President informed Mr. Newton that the Council would shortly be giving consideration to future exhibitions.

Mr. Frost suggested that the Society should not send stereotyped acknowledgment cards. The President considered that all communications should be acknowledged.

Mr. Leicester moved a vote of thanks to the President and Council for their valued services and offered best wishes to the new Council. The motion was carried with acclamation.

Mr. Bartlett on behalf of his colleagues thanked Mr. Leicester for his kind expression of appreciation.

Mr. P. F. Jobson (G3HLF) received the National Field Day Trophy on behalf of Gravesend Group, the 1955 winners. *(Photo by G3IIR)*

Mr. Thorogood referred to comments made by Mr. C. Ian Orr-Ewing, M.P., when addressing the Radio Industries' Club recently. He had spoken of the R.S.G.B. as being a "breeding ground for young engineers and scientists."

The meeting terminated at 7.30 p.m., after which the President presented a number of Trophies and Awards.

Presentation of Trophies and Prizes

AT the conclusion of the Annual General Meeting on December 16, 1955, the President (Mr. H. A. Bartlett) made the following presentations:—

Gravesend Group ...	N.F.D. Shield and Replica
Croydon Group	N.F.D. Replica
Slaithwaite Group ...	Bristol Trophy
Mr. J. J. Yeend (G3CGD)	Houston Fergus Trophy
Mr. T. C. Reynolds (B.T.H. Rugby Radio Society)	1950 Council Trophy
Mr. Mapplethorpe (G3AZJ) on behalf of Mr. P. D. Morris (G3ISZ)	R.A.E.N. Rally Plaque
Mr. L. J. Kennard (G3ABA)	Miniatures

LONDON MEETINGS

The following programme of meetings at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, has been arranged.

January 27, 1956: Presidential Address by R. H. Hammans (G2IG). "The Communications Aspects of Single Sideband."

February 24, 1956: 420 Mc/s Evening arranged by members of the London U.H.F. Group.

March 23, 1956: "COLOUR TELEVISION" by P. Carnt, B.Sc.(Eng.), A.M.I.E.E. (Research Laboratories, The General Electric Company Ltd.).

Mr. H. T. McFarlane (G8SK)	Miniature
Mr. J. P. Mitchell (G3KBQ)	Miniature
Messrs. C. E. Newton (G2FKZ) and A. J. Worrall (G3IWA) ...	Norman Keith Adams Prize
Mr. F. Hicks-Arnold (G6MB)	Bevan Swift Memorial Prize

Trophy and Prize Winners who were unable to attend the meeting included:—

Mr. H. L. Wilson (EI2W)	Wortley Talbot Trophy
Mr. G. J. Dent (VQ4AQ)	B.E.R.U. Senior Trophy
Mr. J. C. van Wyk (ZS6R)	B.E.R.U. Junior Trophy
Mr. F. J. U. Ritson (G5RI)	Col. Thomas Trophy
Mr. F. J. U. Ritson (G5RI)	Braaten Trophy
Mr. P. G. Day (G6PD)	Somerset Trophy
Mr. C. J. Oliver (GW5SL)	Milne Trophy
Mr. I. T. Cashmore (G3BMY)	1930 Committee Cup
Messrs. R. Mayman (G2ABR) and K. L. S. Dalby (B.R.S.16949) ...	R.A.E.N. Rally Plaques

Messrs. G. M. C. Stone (G3FZL) and H. W. Parker (G2ADZ) who were joint winners with Messrs. Newton and Worrall of the Norman Keith Adams Prize.

The new Bristol Trophy was won by Slaithwaite Group, the leading single-station entrants in National Field Day. In this picture Mr. E. Wood (G2DBW) is receiving the Trophy from the President (Mr. H. A. Bartlett, G5QA). *(Photo by G3IIR*

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

LAST month, the proceedings at the highly successful conference of v.h.f. representatives of Region I I.A.R.U. Societies, held in Brussels on November 19 and 20, 1955, were briefly reported in this feature. However, members would no doubt like to know more about the decisions reached at that meeting which was attended by K. Lickfield (DL3FM), P. Plion (F9ND), R. H. Hammans (G2IG), F. G. Lambeth (G2AIW), R. Furrer (HB9LE), H. Lauber (HB9RP), J. Mussche (ON4BK), R. Vanmuysen (ON4VY), J. Geerts (ON4LN), C. de Leeuw (PA0BL), Z. Vernic (YU2CF), and J. Kauric (YU2DV). The writer acted as Secretary of the meeting, the Agenda for which was published in the December issue of the BULLETIN.

The conclusions reached on each item on the Agenda, after much discussion, are summarized as follows:—

(1) It is hoped to overcome the difficulty of finding stations in the u.h.f. bands by allocating uniform ranges of frequencies in the 435 and 1260 Mc/s bands. Member societies were asked to assist in deciding on these allocations.

(2) A winter "Relay Contest" to combat low activity is running in France. The French Society, R.E.F., suggested that other societies might like to try similar events.

(3) Claims for long-distance records should be submitted in the first instance to National Societies who will attest them and forward them to I.A.R.U. Region I Bureau for confirmation. This method was suggested as other means had proved inconclusive.

(4) The V.E.R.O.N. representative asked that all operators should be exhorted to tune the whole of the 144-146 Mc/s band, as there are many stations operating above 145 Mc/s. For example, in Switzerland, portables have to work above 145 Mc/s while Britain and France have plans which embrace the whole band.

(5 & 5a) Listeners should have a special rating on v.h.f./u.h.f. They are a valuable part of the set-up and should be permitted to take part in contests. Many delegates called for certificates for proficiency in both transmitting and listening on the v.h.f./u.h.f. bands and it was agreed to recommend to I.A.R.U. that achievement certificates for the sum of distances worked should be issued. It was suggested that two should be offered: one for 20,000 km. (12,500 miles) and one for 8,000 km. (5,000 miles).

(6) A Dutch laboratory had offered a Challenge Trophy which would be awarded to the winner of the European V.H.F. Contest each year. Prizes of crystals would also be awarded to the winner and runner-up.

(7) The matter of re-printing of technical articles appearing in the various society journals was raised, and it was agreed that, in general, permission would be granted on written request, provided no special reason made this impossible. There is no objection to the "lifting" of news of general interest, but the source should be acknowledged.

(8) It was suggested that the "S" point should be standard on the basis that S5 = 0.5 microvolt and that S9 is 5 microvolts based on matching to 75 ohm co-axial cable.

(9) Rules for Region I V.H.F. Contests were discussed and certain amendments made. These rules have been accepted by many Member Societies on the Continent and the R.S.G.B. has agreed to examine them with a view to later acquiescence if found possible. (The amended rules were printed in the December, 1955, BULLETIN.)

(10) The locations of stations competing in the various contests should be ascertained by reference to latitude and longitude based on Greenwich. It was suggested that such locations should be printed on QSL cards when possible.

(11) It was recommended that the first and third weekends in each month (20.00-23.00 G.M.T.) should be devoted to organised transmitting and listening on the 144 and 435 Mc/s bands, transmission directions to be determined by reference to a watch dial, thus: North at the hour, following the minute hand round at 5-minute intervals. Listeners would know where aerials were facing at any given time. The procedure could be adopted also on any other dates.

(12) It was agreed that everything possible should be done to encourage interest in v.h.f./u.h.f. by younger radio enthusiasts. Publicity should be increased to electronic engineering and allied students in schools and bodies such as the Boy Scouts, etc.

(13) It was agreed that full publicity should be given by the societies represented to preparations for trans-atlantic tests on 144 and 435 Mc/s.

Apart from the tangible results mentioned above the meeting was particularly worthwhile in that, for the first time, European I.A.R.U. Societies made known to each other their views on v.h.f. problems. It is hoped that this friendly interchange of opinions will lead to increasing co-operation, to the benefit of all v.h.f. and u.h.f. workers in Europe. It is only by such co-operation that the fullest advantage may be gained from the amateur allocations in the v.h.f., u.h.f. and s.h.f. regions.

Two Metre News

This month reports are somewhat conflicting, but it is pretty certain that although the band has not been very lively the operating possibilities have usually been fair. At odd times stations well over 100 miles distant could be worked, but overall, there has been present the "gloom" of winter, which is a usual part of the November and December v.h.f. picture. Please keep the activity going—the band is usually better than you think!

B.R.S.6327 (Earlsfield) says that G2HCG has improved his signals enormously since erecting a new aerial, and would like some information on it. '6327 recently heard a very interesting QRP contact between G2DD (1.5W) and G2HDY (less than that!), both quite potent signals. **'16075** (Shirley, Southampton) has been talking about u.h.f./v.h.f. to the local R.S.G.B. Groups and has had little time to listen. During time spent in rebuilding and modernizing a 2m converter it was found that the ECC85 is excellent as a direct coupled grounded grid cascode.

*21 Bridge Way, Whitton, Twickenham, Middlesex.

It should be noted that the h.t. is lower for the ECC85 than for the 6BQ7A and should be limited to 180 volts. Southampton Group has an activity time between 18.00-19.30 G.M.T. on Sundays. Stations taking part look for calls outside the area as well.

G3JPX (Basildon, Essex), who is now on 2m, has a rather startling activity suggestion: it is that 2m operators, whenever possible, should call or listen *every hour on the hour*. This would take care of the needs of shift workers, of whom '3JPX is one, who find an empty band at many times during the day. We are glad to pass on this suggestion. Incidentally, '3JPX's station must be one of the cheapest on record. The transmitter is a type 50 (1143) and the modulator is also from the TR1143. The receiver, a BC624, and the rest of the outfit cost only about £5. It shows what can be done. **G3JGJ** (Plympton) found December 4 the best activity day for some time and worked GW2FRB for a "first." Many other QSOs from Cornwall to Somerset were also made. '3JGJ is on 2m from 19.00-20.00 daily. In view of his poor position B.R.S. reports will be welcomed and acknowledged. '3JGJ thinks that if more DX skeds were arranged and publicized activity would greatly improve. If members send details of their skeds they will be published.

G5MR (Hythe, Kent) pleads for more c.w. activity and says that contrary to old practice the ratio of c.w. stations on 2m in France is now higher than in England. He often hears unresolvable phone carriers which would provide easy c.w. QSOs. There is no objection to phone but *exclusive* phone can be unfortunate sometimes. **G8LN** (Plumstead) thinks 2m is getting a little more populated during the evenings but there is room for much improvement. '8LN is looking forward to working more of the Basildon, Essex, group. Essex is well represented on 2m and it seems that some of the Top Band enthusiasts are thinking of transferring their efforts to 2m. As some amateurs still think large and expensive gear to be necessary it can be reiterated that only a pair of 6AK5s, 6C4s or TT11s are required, if nothing else is available! **G3EMU** (Canterbury), after having almost given up listening on 2m was suddenly presented with an opening (December 5) which enabled him to work ON4BZ and PA0FB. They could hear no other Gs, and '3EMU heard no other Continentals on that occasion. He would like hints on the neutralization of QV06/20s for p.a. use.

G3JWQ (Ripley, Derbys) has had some success since October but is now suffering from low activity although, as he says, the band has been in fair condition at times. Some of his QSOs are impressive for 8 watts input. **G3KHA** (Knowle, Bristol) says conditions have been variable but never very good, with a moderate amount of local working but general activity low. G3AZT (Rugby) has been heard for the first time, so that it looks as if G8VN and 3KHA will soon make contact.

G3EFY (Exeter) is a newcomer on 2m after several attempts and has so far only worked the local stations. However G2BMZ and '3FIH have been heard on an indoor dipole; a new aerial (slot) should improve matters. His frequency is 144.72 Mc/s and the input 18 watts to an 832. **G3FKO** (Bath) says that a Bristol, Bath and West Country net operates on Thursday nights at 22.30 in the 145.5 to 145.65 Mc/s Zone. This is preceded by such 2m R.A.E.N. working as is required between Bristol and Bath from 22.00 to 22.30. '3FKO operated portable from Aberporth, Cardiganshire and Pembrokeshire on November 22, 25, 26 and 28, with an input of 3.5 watts to a pair of 6AK5s. Several stations were worked at reasonable distances.

G8VN (Rugby) reports "low activity and fair to poor conditions." On November 26 some DX was worked as far away as Yorkshire and London. Usually, however, 50 miles has been the limit!

G5CP (Chesterfield) says his regular Sunday morning sked with G6XM (York) continues at S9+ both ways. '5CP asks what has happened to G5MA, and adds he would like to resume the sked with him from his new QTH. **G6XM** (York) is on most evenings from 18.30 to 19.30 but hears little from the London area. He thinks this is due to lack of stations rather than conditions because G3FAN (I.o.W.) is often heard working '2HCG (Northampton). '6XM is taking the opportunity of modernizing the valves in the p.a. section, and is getting ready for 70 cm. Another crystal has been acquired and he is now on 144.58 Mc/s. In due course it is hoped to operate between 144.250 and 144.280 Mc/s.

G3WW (Wimblington) has really been working quite a lot on 2m and deserves praise for sticking it out in the present slack conditions. Towards the end of his report 28 Mc/s begins to intrude, and the writer wonders whether that is where some of the other 2m "regulars" have gone. '3WW recently worked '3FOQ (Ely) for a first QSO on 2m since 1951. In all, 770 stations have been worked by '3WW on the band. The list proves that at least in Cambridgeshire conditions haven't been so poor!

G3FIH (Bath) has worked 32 stations in spite of a "quiet month." Nearly all this activity has been during TV hours which is praiseworthy, as some operators still seem to find it impossible. More activity between 20.00 and 21.00 would be a great advantage. **G5BM** (Cheltenham) in company with G3YZ worked mobile on the way to the R.S.G.B. Amateur Radio Exhibition; G3KFT and '8ML were also with the party. Contact was maintained intermittently between the two cars throughout the journey to London; their contact with GB3RS was very useful in guiding them to the Royal Hotel. Apart from this, '5BM found November 18/19, 21, 25, 27 and 29 to be the best days on 2m There were extremely wide variations of barometric pressure during the period (e.g., 1036 millibars on November 18 and 983 millibars on December 14). Many well-known 2m stations (says '5BM) regularly end a CQ without giving any idea as to where they will commence tuning the band; many still do not seem to tune above 145 Mc/s. This has been proved by fruitless calls in the correct frequency zone whilst calls at the same period *below* 145 have resulted in QSOs!

G2AHY (Crowthorne) is on the air most evenings from about 18.15 to 19.00 G.M.T. with 25 watts to a 4 element Yagi. Frequencies are either 145.12 or 145.34 Mc/s. The p.a. is an under-run 829B with a pair of 6V6s as modulators. Although there didn't seem to be much activity 19 stations were worked during the month. **G2DJM** is moving to Derby this month.

News from Scotland

GM2FHH (Aberdeen) has had a very thin time, and has been trying to get some of his locals on 2m. GM3HTL should be active shortly, so that '2FHH will at least have someone to talk to! **GM6WL** (Glasgow) reports a good turn out on December 15 by the Edinburgh Group, when he gave his postponed talk. Among those present were the President of the Lothians Radio Society (GM3BDA) and old-timer GM6SR. There has been little activity around Glasgow, but GM3DDE (Corstorphine) came on recently and gave the Glasgow boys a break from local QSOs. **GM6WL** has completed a 25 cm converter, but is still in the throes of trying to get a tripler working from 70 cm.

Fun in the North West

G2NY, '3GPT and **GI3GXP** (Kilkeel) have been run-

ning a nightly sked at 19.00 since early November. There have been 100 per cent. phone contacts since. GI3GXP is looking out for contacts further afield with 10 watts to a 6-over-6 slot beam. G3GPT has a sked with '2ADZ every Sunday at 10.00 G.M.T. EI9C and EI2W are putting good signals into Lancashire just now. **G3GPT** (Longton) reports for the first time and has a slight grouse regarding phone permits for new licensees. He thinks that a little c.w. practice hurts no one (agreed) and suggests that it would have been better to permit 'phone working but to have insisted on a certain amount of c.w. at the same time. '3GPT still works PE1PL at noon *daily* Mondays to Fridays, but although the Dutch station is always 100 per cent. readable, 3GPT's best report was 539 on November 23. However, this, according to '3GPT, is worth 599 from some stations! As regards "QRM Corner" he thinks there are more to come, and suggests that newcomers avoid 144.2 to 144.3 Mc/s; the overspill can be accommodated in 145.8 to 146 Mc/s!

Seventy Centimetre Reports

A welcome arrival is a first activity report from **G2WS** (Tadworth) who has had a number of good contacts including several with G6NB (Brill) at 50 miles, G2WJ (Dunmow) at 48 miles and G5UM (Knebworth) at 38 miles. These result from '2WS's late evening (22.50) CQs on 70. A slot aerial will be in service shortly. G2WS says 420 Mc/s experimenters may not perhaps always realise that special smoothing is required for receivers working on this band. In his case the power pack used with T9 results on 144 Mc/s gave T6 or worse on 420. A subsidiary smoothing unit consisting of two 25 Henry chokes and three large capacitors cleared up the trouble and gave T9 signals. **G2XV** (Cambridge) says that activity is at an all-time low; he has accordingly found time to tinker with a higher powered p.a., and is also planning modifications to the beam. '2XV would like to arrange skeds with 70 cm stations in Hunts, Notts, Warwicks, Suffolk and Kent, i.e., any skeds would be considered from "interesting" counties. Is G2OI still keeping his nightly sked on 70 cm? **G3BVG** (Ealing) is active on 434.17 Mc/s.

G5DT's paraboloid for 1250 Mc/s was one of the dominating features of the V.H.F./U.H.F. stand at the R.S.G.B. Amateur Radio Exhibition. On the right of the picture G2FKZ answers a query on u.h.f. impedance matching.

(Photo by G3IIR)

G8PX (Oxford) after speaking to G3EOH at the R.S.G.B. Exhibition now has, as a result, sufficient drive for his G8SK-type 70 cm transmitter. '8PX seems to work into Surrey very well (because the beam points that way!) and can work G3KEQ whenever he is on. G3FP has also been worked. A report has been received from '6NF, and it is hoped a QSO will soon result. The '8PX 70 cm input should shortly be 60 watts.

G3JGJ (Plympton) would welcome reports and co-operation from any local amateur or listener for tests on 70 cm. His address is Boringdon House, Plympton.

There seems to be a general belief among non-u.h.f. workers that the 70 cm band is good only for cross-town chats—and fairly small towns at that! The belief is possibly a relic from the days when self-excited equipment was largely in use, and ranges were necessarily short. That is not so today, says G5UM. Given reasonable freedom from excessive screening, operators on the 435 Mc/s band can guarantee communication over 40 to 50 miles irrespective of conditions. For example, on December 17, 6 stations in the London area were on for about an hour and a half and most had mutual contacts with one another, from G2WS about 20 miles south of London and G5UM 24 miles north. Because this sort of thing can be repeated at any time it makes more important than ever the keeping of fixed schedules to maintain activity, so that there is something to hear for those who only listen. And could not some of these schedules be early in the evening in order to avoid this "sitting up late" business? The regularity of G5DT is admired by all London area operators: he is on nearly every night at 19.00 on 434.9 Mc/s.

G5LL (Mablethorpe) has been on 70 cm since July last but so far has worked only G3ARX (local) and G5YV. The operating frequency is 433.6 Mc/s. The aerials (8 element stack with mesh reflector, and a 6-over-6 slot) are only 25ft high, but everything seems to be working satisfactorily — only signals are required! Please listen for '5LL at 21.15, transmitting southward at 21.30. The transmitter at present is an 832 driven by the 2m equipment. **G2ARX** will be back on 70 cm soon from a new QTH. **G5BD** has a receiver for the band.

1250 Mc/s

Radio REF reports that a cross-band QSO over 80 km has been made between F8OL (Paris) and F8GH (Beauvais). F8OL transmitted on 1260 Mc/s and F8GH on 145 Mc/s. Congratulations to both. The 1260 Mc/s transmitter (crystal controlled) was equipped with a 2C39A tripler driven by a 420 Mc/s exciter. This furnished about 5 watts output on 1260. Taking feeder losses into account, the r.f. radiated by the "Cornet" aerial was approximately 2.5 watts. The receiving equipment consisted of a 1260 Mc/s crystal controlled converter using a simple co-axial mixer and 1N21B feeding into a 145 Mc/s cascode converter followed by a communications receiver. The noise factor of this combination was 11 db.

A report has been received from **G3CGQ** (Luton) who, with G3FUL and others, has done much pioneer work on this band. Many tests have been made on '3CGQ's receiver which has proved very successful

locally, and they are now awaiting better weather to prospect further afield. As regards stabilised gear, '3CGQ has produced a converter which will receive the third harmonic of '3FUL's 420 Mc/s transmitter. It consists of a triple superhet with a tunable first i.f. of 144 to 146 Mc/s. '3CGQ thinks that as much of the band as possible should be used with as many operators as possible. S.c.o. transmitters and wide-band receivers would be the wisest plan, as this would get people on the band who are otherwise scared off by the "high techniques" of multi-valve equipment.

News from Australia

From *Amateur Radio* (Journal of the Wireless Institute of Australia) it is learnt that 56-60 Mc/s was made available to Australian amateurs as from November 1, 1955, and that the 50 to 54 Mc/s band will be closed to VK amateurs as from January 31, 1956.

Two-metre records in Australia are held by VK6BO and VK5GL and VK6BO and VK5QR—1,328 miles in each case!

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Many thanks for the kind wishes expressed by readers at the turn of the year which are greatly appreciated and heartily reciprocated.

Please post reports and Activity Table scores (see November issue) to arrive by January 21.

London U.H.F. Group Dinner

ALTHOUGH extremely bad weather prevented many members attending the Fourth Annual Dinner of the London U.H.F. Group at the Bedford Corner Hotel, London, on January 5, there was an attendance of 35.

Dr. R. L. Smith-Rose, recently appointed Acting Director of the National Physical Laboratory, who was the guest of honour, said in a short address that whenever he sees the enthusiasm of the amateur u.h.f. worker he asks himself how he can make use of that enthusiasm. Answering his own question, Dr. Smith-Rose said that there is great scope for the amateur experimenter in the u.h.f. field. Knowledge of the propagation of radio waves between 300 and 3000 Mc/s is very meagre and additional information is urgently required. It is particularly important to find out how signals of these frequencies behave in different types of open country and in towns where buildings, gas holders and other constructions affect propagation. Dr. Smith-Rose commented that even in towns of the size of Reading or Slough it is impossible to predict the field strength from a given transmitter in any particular street. He remarked that amateur mobile operators should not be discouraged if signals from a station fade out at a certain distance—it is highly probable that a little further away they will be stronger than before they disappear. Here again was a line of experiment for the amateur to investigate.

There is also considerable work to be done by the amateur at longer distances where signals are dependent on weather conditions. Signal strengths should be recorded regularly and compared with the daily weather charts. At these longer distances, information of this kind is required in order to decide how far apart two stations must be if they are to operate on the same frequency without causing mutual interference. It is probable that this distance may differ in Southern England and Northern Scotland. Information on the propagation of u.h.f. signals across water, such as estuaries, bays or even large reservoirs, is also required. The knowledge gained from amateur experiments on these lines is likely to be most valuable in the future.

Dr. Smith-Rose went on to mention that radio astronomy was based on the "hiss" phenomena, first observed by a British amateur, Denis Heightman (G6DH) in 1935. Little attention was paid to these observations by Heightman until the war years when it was noticed that noise increased if directional aerials were pointed towards the sun. Dr. Smith-Rose said he believed radio astronomy was wide open for future amateur investigation. The subject is particularly fascinating when it is remembered that often the radiation being observed has taken hundreds of years to arrive from sources which have long since ceased to exist. The highly sensitive receivers already developed by amateurs for u.h.f. use should prove very successful in this type of work.

A vote of thanks to Dr. Smith-Rose for his inspiring talk was proposed by Phil Thorogood (G4KD), Chairman of the London U.H.F. Group who announced during the evening that the President of the R.S.G.B. (Reg Hammans, G2IG) had informed him that the Society is to hold a V.H.F./U.H.F. Convention in London, probably on May 26. Mr. Thorogood thanked the Group Committee for their work in organizing the First International V.H.F./U.H.F. Convention in London in May, 1955, and C. E. Newton (G2FKZ) for producing the first issue of the *Proceedings* of the Group which had proved a great success as a means of disseminating technical information on u.h.f. equipment. He hoped that a second issue would be ready in time for the next Convention.

Ken Ellis (G5KW) passed on greetings from a number of Continental stations worked the previous evening and said that European amateurs would like to see more British activity in the afternoons.

A vote of thanks to G4KD for his own work on behalf of the Group was proposed by Frank Smith (G2DD).

Two Metres Wide Open

AS this issue went to press, conditions on 144 Mc/s were excellent again for long distance communication. G5KW/P, operating from Welling, Kent, during the evening of January 4, worked G3WW, G3JWQ (Derby), G2ANS, G3GPT, G5BD, ON4BZ, PA0FB, EI2W, DL1SEA (near Osnabrück) and heard both sides of a QSO between ON4BZ and DJ1XX. G3JZN (near Manchester) was heard but not worked. ON4BZ worked GI3GXP, believed to be the first GI-ON 2 m contact. Early on January 5 DL1SEA is reported to have worked GI3GXP.

At noon on January 5, G5KW (East Acton) worked DJ1XX, PA0FB and PE1PL with whom he had three contacts during the day. PA0FB, who also worked G2HCG and G3JXN at mid-day, was a consistent signal in the London area for 13 hours until 2 a.m. on January 6. For seven hours his signals were S9! After returning home from the London U.H.F. Group Annual Dinner, G5KW worked PA0FB who said he had had 27 contacts with British stations principally in the North and Midlands as there had been so little activity in the South.

PA0FB himself reports that 2m conditions began to improve on the Continent on January 4 when many Belgian and German stations were worked from Holland. On January 5 many British stations were worked and G8MW was heard calling SM6AM. PA0HRX worked a number of German stations including DL3VJ, while ON4LN had contacts with 11 different G stations. On 70 cm PA0WAR worked G2WJ on January 5 and G6NB (who was using only 1 watt input) on the 6th. PA0FB says that 9S4AL (Saarbrücken) is ready for 2 m.

Further details of this interesting opening will appear in next month's *Two Metres and Down*.

Worked and Heard on Two

DUE to pressure on space the usual *Worked and Heard on Two* feature has been held over.

THE MONTH ON THE AIR

By S. A. HERBERT (G3ATU)*

AS is usual at the Festive Season, time on the air has to be shared with time devoted to more topical pursuits and the post-bag is correspondingly light. The swing towards the h.f. bands is well maintained, with twenty providing most of the exotic touch. However, a small mail deals with Top Band matters and is so interesting that we start off up there.

One-Sixty Metres

The North Atlantic path is beginning to open at last and not only to the U.S.A. Rather naturally, week-ends are likely to provide maximum activity and **B.R.S.20106** pulled in Ws 1BB, 2WZ, 2GGL, 3RGQ, 3FBV, 3EIS, 3MSK, 9PNE, K2BWR, DL1FF, SP3CU and KZ5PB. **G3IGW**(Shelf) got across to W1BB and heard W4ZQ on December 11. A week later, Mike heard SP3CU, KZ5PB *and* YN1AA. G3IGW intends to make another trip to Scotland next Easter, accompanied by G3JML and G3KKP. As all GM counties have been represented at least once, G3IGW would like to know from county-chasers which ones they need. If those interested will write to him at Stile House, Shelf, near Halifax, and list three or four counties they want to work, he will arrange things accordingly. **HB1CM/HE** should have been to HE when you read this; we hope he had good fortune and good conditions during his trip.

Twenty Metres

The period under review started quietly enough, but twenty, being the band it is, soon began to produce a satisfying amount of DX, including some rare stuff, whose appearance undoubtedly added to the country totals of quite a few lucky ones. Early mornings were usually good for ZL, VK, JA and occasionally for KH6, VE6 and KL7, but the North Pacific path remains obstinately closed: the days of VR1 are not yet with us! Later in the morning, the Caribbean area was represented by FY, PJ, YV, KV4 and the like. On one or two occasions signals from KV4AA were arriving almost equally well from both directions. Indeed, the echo effect was so pronounced that copying him was almost impossible at times. Around mid-day, Far Eastern signals began to arrive, but the simultaneous appearance of East Coast Ws made the going a trifle tough. VS1, 2, VU, XZ and VS6 were around, as was 3W8AA, whose frequent appearances on c.w. were greeted in a manner befitting an AC4! In mid-afternoon, W6 and 7 have been consistently good. VK1IJ (MacQuarrie) is active and was heard weakly at 14.00—around 14040 kc/s, while FB8ZZ (New Amsterdam) uses the same frequency and has been S6–7 (16.00). VQ8AG (Mauritius) and VP5DC (Turks Is.), have provided early evening interest around 14010–20 kc/s after which the band usually packed up, although there *were* times when it stayed open until after midnight. At that time on one notable occasion, the c.w. end was full of JAs and KAs, all working Ws as fast as they could go. Shades of 1947! That then is a general picture of twenty metre happenings. Now, for the details, we turn to individual reports.

*Roker House, St. George's Terrace, Roker, Sunderland.

B.R.S.20106 (Petts Wood) heard two unusual ones—YK1AK and ZD9AC on phone, while on c.w. he logged FB8ZZ, KG6ABN, VS9AS, LU2ZV, VE8AW, HP1EH, JA and KL7. **B.R.S.20135** (Newport, I.o.W.) comments on the trying occasions when VK, ZL and VS come through, all mixed up with G, SM and DL. His phone log includes HZ2AEH, EL2B, FM7WN, OY2Z, VE8TL, ET2US and ZS9G. **B.R.S.20487** (N. Finchley) heard VK, ZL, KL7 and two Corsicans—F9RY and F9WT—on phone. Both the F9s announced verbally that they were in fact on Corsica, but neither used the " /FC " appendage, which is apparently used mainly by stations on c.w.

B.R.S.20249 (Sutton) heard what he hopes will prove to be a new country, when ZA1ZO came up on phone, working a G. This was at 20.20, on an occasion when weak Ws and a few IIs were the only signals coming through. The ZA asked for a QSL via the Bureau, which may not mean a thing. However, here's hoping. ZS phones have been consistent and ZS3AB deserves more attention then he has been getting of late. On c.w., VQ5EK was good, but soon vanished underneath some strong Ws. **B.R.S.20317** (Bromley) heard ZA1AA—this one on c.w., as were PZ1BS, ZS3HX, CX6AD, LU2ZV, KG1CG, ZD2DCP and UO5KAA. Bill missed CR5SP (St. Tome Is.) on phone, but did manage ZS9G, KG1FR, FM7WF, ST2DB, EL6I, VE8NT, VE8LY, W9RVJ/VE8 and MP4KAB. **B.R.S.20788** (Glasgow), still in frightening proximity to the B.B.C., added an r.f. stage to his receiver and was awarded by steady phone from VK5WL and VK6DX, with CN8MM and CR8AU for good measure.

G2DH (Manchester) was delighted to get a call from VE2LI who is ex-G5LI and a frequent pre-war visitor to the '2DH menage, where the two of them used to enjoy working 28 Mc/s DX. **GI3JIM** (Belfast) talked to Dick of OX3UD, who reiterates his 100 per cent QSL policy, but remarks that the first ship to get through the ice to his part of the world is scheduled for July.

Last month's remarks as to possible amateur operation with the Fuchs Antarctic Expedition brings interesting information from Wally Dunn, **G2LR** (Carshalton Beeches). Wally who is Vice-President of the R.A.F. Amateur Radio Society says that—in fact—*two* stations are with the Expedition. VP8AO (Ralph Lenton) and VP8BO (" Taffy " Williams), both hope to be active from " Shackleton," Vahsel Bay, by January–February, 1956. " Taffy," an R.A.F. wireless fitter, is running the Expedition's radio arrangements and hopes to be in touch with G8FC (R.A.F.A.R.S. Headquarters' Station) on 14025 kc/s. As he will use a Rhombic aerial and a T1509 250 watt transmitter, we should hear quite a noise from him when conditions are right.

G3ATU notices c.w. activity from KH6 and ZL in the evenings—18.00 to 19.00, YA1AM (14.30), KG6AAY (14.00) and CP3CA (T8c–23.00, with a monumental h.f. drift). VP5DC (Turks Is.) is active. QSL via W4NMO. VP5GB is also on Turks, but VP5BM has left and is now signing VP2LH.

The odd bits of wire have been removed from the ends of the '3ATU Vee, which is now apparently put-

ting a potent signal into Viet-Nam, as 3W8AA was heard to complain bitterly of QRM from that (innocent!) offender. Which seems about all, except for the suggestion to those people who say they never hear U.S.S.R. phone that they should look on the c.w. portion of the band. They'll hear plenty there, especially at week-ends and pretty archaic some of it sounds!

Ten Metres

The most interesting happening of late has been the appearance of signals from VK and ZL—surely a good omen at this stage of the sun-spot cycle. Ws are still regularly to be heard from mid-day on and Africans break through from time to time, so there seems no reason to complain. **G6CJ** (Stoke Poges) declares the band well and truly open, having made contact with ZL3GQ (09.00), thereby completing his first *six-band* QSO!

R. J. R. Crocker (Plymouth) says the "Good Ship DX" is making heavy weather just now, but the crew are in good shape and hailed VK3IY (12.00), VK6MK (12.00), VS6CL (09.30), CR9AH (10.00), ZS3AB, TI3LA, ZC4RX and CO2TV. On phone, **B.R.S.20106** logged VK2AKV, VK6GU, VQ2AT, ZE and ZS3, while on c.w. he picked up ZS3E, CR6AI, OA4ED and a UJ8. For **B.R.S.20135,** phone meant all W districts except 6 and 7, VKs 2AHM, 2GU, 6MK, 6NF, 6NC, 4X4BO, OQ5VD, ZD4BR, OD5AB, HC1ES (P.O. Box 1251, Quito), YN4CB and UA1BE, who was working a G and who asked for a QSL card. The "U" situation remains an enigma, with some Us free apparently to work all and sundry, while their compatriots are still restricted to "WSEM." They all seem to be working YU again now, and a small guess would put VU next on the "free" list. U.K. stations might find next spring quite interesting! **G2DH** found a week-end opening and worked his first W in years—W1DLF, followed by ZD6RM, both on the key. G3ATU heard weak phone from VP1EE (14.00).

Fifteen Metres

Here, things are looking up, with activity every day of the week—a pleasant change from last year's tale of nothing doing until a Saturday. Now, with more and more stations on, there comes the problem of making oneself heard through the racket! **B.R.S.20135's** phone list includes VK9DB, CR9AH, VP6FR, PZ1RM, KP4WW, VK, ZL2, 3, 4 and VS6, while **B.R.S.20106** adds FM7WQ, HP1GD, VE5EN, CS3AC, ZS9G and, on c.w., VP5DC, VS6CO, 6DE, VK9XK, 9DB, ZS3E and 3A2CZ. **B.R.S.20487** heard UQ2AN, ZL and VK4SF on A3. **R. J. R. Crocker** mentions A3 DX such as KR6MP (09.00), MP4BBX, VO6N, YN1KK, VE5QF and EL1FT/MM (Atlantic). **G2DH** stuck to A1 for QSOs in one day with VK3ALL, VK4ZB, ZL2LB, FF8AJ, ZD6BX, VQ4SS, LU2DAW, OH6OA, and some K6s, but he couldn't find a single Asian to complete his W.A.C. Some time later, a business colleague mentioned that he had a relation in Australia who held a VK call. It turned out to be none other than VK3ALL, worked a few days previously!

Forty Metres

Daylight conditions are now such that it is once more possible to indulge in perfectly satisfactory inter-G working (in the spaces between the broadcasting stations!), but as dusk falls, the band fills up with sundry European types whose idea of fun is to indulge in long and repetitious calls to anyone with a loud enough signal. This tends to make DX working something of a hair-tearing occupation, but there is usually something down in the mess to reward the patient ones. **B.R.S.20106** found VK7DW (18.43), FG7XB (02.40), CO2AK, KP4KD, 4UH, W9 and UA9s CC, DN, KCC and KQA there on c.w., while **B.R.S.20249** heard ZB1BJ at S7 on phone, working c.w. stations. **B.R.S.20317** pulled in VQ4EO, CO3BU, VE1 and W, but missed UA0GF.

Eighty Metres

If anything, eighty is in a worse state than forty, with bedlam in all parts and somewhat naturally, it comes in for little comment. However, **B.R.S.20106** managed some c.w. DX by logging VE2LI, UA9DH and OY2Z. **A1328** (London, W.1.) is at present restricted to the band as his receiver, a R.C.A. AVR-20 aircraft set,

Frequency Predictions for January, 1956

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
28 Mc/s	1330—1500	1200—1430	1100—1500	0900—1400	0830—1245	0900—1130	0930—1030	0800—0830
21 Mc/s	1215—1730	1030—1900	0900—1900	0800—1730	0800—1530	0800—1345	0800—1330	0730—1200
14 Mc/s	1100—2000	0930—2100	0830—2100	0730—1930	0700—1800	0700—1600	0730—1600	0800—1500
7 Mc/s	2000—0900	2200—0300	2200—0800	1900—0600	1800—0800	1800—0400	1800—0200	1500—2000
3.5 Mc/s	2200—0800	0000—0800	0000—0800	0200—0500	2000—0600	0300	0300	1630—1800

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T.

covers only 2.3 to 6.7 Mc/s. He is building a convertor for the other bands and meantime heard phone from W2OXL, OE, SP and an I1.

Overseas News

K. J. T. Sands (**B.R.S.17575**), active from Bahrain as **MP4BBX,** uses the old QTH of MP4BBV, now back in the U.K. He started operating on December 1, using 60 watts phone on 14, 21 and 28 Mc/s. Europeans, ZLs and VKs have been worked on 14 Mc/s, with most of the world except W on 21, but so far, no QSOs have resulted on 28 Mc/s, where activity seems low. However, '4BBX hopes to remain active for the next two years, so he should make plenty of contacts on ten before he leaves. **G3FNF** has left the U.K. for Lahore, Pakistan, for a tour of duty of eighteen months. He hopes to be able to operate from there and he already has a beam earmarked to help his 25 watts! He will look especially for Gs and will transmit on 7007, 7012, 7020 and 7025 kc/s and their harmonics. **G3IXV** flies out to Kenya this month, to take up an appointment in Nairobi. He intends to be active from there at an early date. **4S7PT** (Colombo) is finding the going rough as far as Europe is concerned. His last European QSO was in September, but ZS, LU, PY, YV and ZL all roll in there. Pete got a shock when G3IAG/MM called him while 700 miles away and worked him both on phone and c.w. with an input of 1 watt! ZC2PJ is back in Ceylon, leaving Cocos-Keeling temporarily without amateur representation. **W6YY** hears directly from ZL2GX that the Kermadec trip is off until later this year, owing to transport difficulties. Further details next month.

3W8AA

Reference has already been made to activity from this station and so to the available facts. A background to the story is provided by an announcement in November, 1955, *QST* that the A.R.R.L. has added to the Countries List Laos (XW8), Cambodia (3W8) and Viet-Nam (FI8). French Indo-China (FI8) no longer counts for DXCC credit after July 19, 1955. Shortly after the publication of this announcement, 3W8AA appeared on about 14060 kc/s and has been very active for five weeks (at the time of writing). He gives his QTH as Boite Postale 109B, Hanoi, Viet-Nam and his name as Phan. Contacts are assured of a QSL " when I get urs ". A goodish operator, he is obviously no stranger to the amateur bands. So far, so good. Now from Ceylon, 4S7PT and the other local boys were getting him at S9 and were happy about the whole thing until XW8AB came on and told them that there was no such station in Hanoi. Confusion in the camp. Summing up—his signal indicates that he *is* somewhere in the Far East and his activity seems a good thing. (Pirates as a rule pop up briefly and then vanish.) On the other hand, 3W8 is Cambodia and Hanoi is in Viet, while XW8AB, 300 odd miles away, gives the " thumbs down ". Time will tell and we shall be interested to hear if any confirmations start arriving from B.P.109B.

* * *

And that brings us to the end of things for 1955. The New Year will be in full swing when you read this and may all its DX be genuine. Good hunting and send your comments please to arrive by January 21. 73 to you all.

Good News for DX Enthusiasts

THE Director of the International Radio Consultative Committee (C.C.I.R.) in Geneva has drawn attention to the unexpected and very rapid rise of the observed " provisional sunspot numbers " which took place in November, 1955. This rise far exceeded all known predictions. In this connection, there is an empirical rule which states that the forthcoming sunspot maximum will be higher the faster the sunspot numbers increase during the build-up cycle. Members will remember that the last minimum was in 1954.

The present build-up is occurring at an exceptionally rapid rate and in all probability the next sunspot maximum will be of outstanding intensity.

Professor Waldmeier, Director of the Zurich Astronomical Observatory, expects the highest monthly sunspot number to be about 150 or even larger. Moreover, he expects the coming sunspot maximum to surpass all the sunspot maxima so far observed and predicts that this maximum will be reached as early as the middle of 1957—that is, 2½ to 3 years early, based on the 11-year cycle.

If the foregoing conclusions are correct, the maximum usable frequencies for long-distance communications will likewise attain a peak limit much sooner than expected. It is for this reason the attention of all concerned is drawn to this unexpected phenomenon which is likely to be particularly interesting to radio amateurs. G3BCM.

QRP on Top Band

G3DOP (Binley, Coventry) reports that he has recently worked a number of stations on Top Band using 1 watt input and a 132ft end fed aerial which is only 28ft high at one end sloping down to about 20ft at the other. His contacts include HB9TA (RST459 in, RST349 out); OK1KKR (RST449 and RST589); and GC3KAV (RST349 and RST3/469). British stations worked from Binley include G3PU (Weymouth), G3AZY (Somerset), G3EGJ (Essex) and G3JDV (London), the minimum report being RST569.

At the Annual General Meeting in December, Mr. L. J. Kennard (G3ABA), winner of the First and Second Two Metre Field Days, 1955, received two miniatures from the President.

(Photo by G3IIR)

CQ Single Sideband

By H. F. KNOTT (G3CU)*

NOW that the techniques of single sideband transmission have become firmly established, it is not surprising that the experience gained by those using the system is being put to further use in the improvement of receiver performance.

On the whole, receivers at present available to amateurs are far from ideal, due largely to sharply peaked i.f. response characteristics and poor skirt selectivity. It is therefore necessary for the individual amateur to use his own ingenuity to obtain improved reception of both A3 and A3a signals. Until recently the phasing principle of detection and post-detection combination to discriminate between sidebands was favoured, for this could take the form of an a.f. adaptor and could be coupled to most receivers with only a modest amount of work. With this arrangement either sideband can be selected; in addition, reception of phase modulation and c.w. is possible as well as exalted carrier reception of a.m. There is one major disadvantage (due to lack of i.f. selectivity) which is a form of cross modulation, and for this reason the system has fallen into disuse.

The alternative and by far the most successful method, as it gets to the root of the trouble, is the installation of one or two sections of a half lattice crystal filter which requires a pair of crystals per section spaced about 1.9 kc/s. The two digit series of the FT241A type crystals satisfies this condition. Two sections of a half lattice filter in cascade are usually necessary and will give from 50 to 60 db attenuation of the out-of-passband signals. The response characteristic of a filter of this form, adjusted to be symmetrical, has steep skirts and a reasonably flat top. The bandwidth is 3 kc/s at 6db down and approximately 6 kc/s at 70 db down. The benefits are at once apparent, adjacent channel selectivity and improved signal-to-noise ratio with decreased bandwidth being just two that come to mind. With a passband of only 2.5 kc/s at the half power point and a sideband correctly centred, the carrier of an A3 signal will not be accepted; however this is no real disadvantage for then all signals may be received as s.s.b. and the carrier reinserted at the demodulator, which should be of the product detector type for best results.

At present there are in this country several amateur-built s.s.b. receivers as well as commercial ones which use bandpass filters. G2IG, one of the first to construct a receiver of this type, uses a single section with good results, while G3GRO has two sections and G3FHL three sections. Sideband selection is obtained by switching the h.f. oscillator frequency. As it is not always convenient to modify an existing receiver the alternative is to build a separate i.f. strip incorporating the filter rather on the lines of the "Q5'er." Better selectivity and narrower bandwidths of course call for greater care in netting, and stable oscillators, a point that most s.s.b. operators have already mastered.

DX Bands

Better conditions on 21 Mc/s have increased s.s.b. activity on the band with as many as thirty stations, operating fixed, mobile and /MM. W4DGW/MM is the most consistent signal and is to be heard operating from off the West Coast of Africa; stations from the East Coast of the United States are regularly received. ZL and VK contacts have been made and G3GKF (Surrey) has worked ZL2GL for the first G-ZL two-way s.s.b. on 21 Mc/s. To agree with the A.R.R.L. operating practices it has been suggested that single sideband stations should work between 21,400 and 21,450 kc/s, and that on 28 Mc/s, a *calling* frequency of 28,600 kc/s should be adopted with a move to a higher frequency after contact has been established.

While on the subject of DX it should be mentioned that during the past few weeks the usual quota of W stations have been worked on 3.8 Mc/s. G2NH and DL6WL have kept a regular evening schedule with W1PNB and W3JM. G3JPE worked W1PNB at 22.00 G.M.T. on Christmas Day, and reports that although British signals are received in the U.S.A. North American signals are not always audible in the U.K. at the same time. W3MXL and W2FYT have also been regularly worked.

Mixer Circuit

To convert a single sideband signal from one frequency to another it is necessary to use the heterodyning or mixing process, in which two r.f. voltages of different frequencies are combined in a non-linear device so that either the sum or difference of the two frequencies is present in the output. The required product is then selected by a suitable tuned circuit. The mixer can consist of either a triode or multi-element valve, or even a diode, either vacuum or germanium. When using a non-linear device for this service it is important that the output amplitude of the desired product should be in linear amplitude with respect to its corresponding input signal. This condition may be obtained when the mixing oscillator voltage is several times greater than the level of the s.s.b. signal; a ratio of about 10:1 is satisfactory.

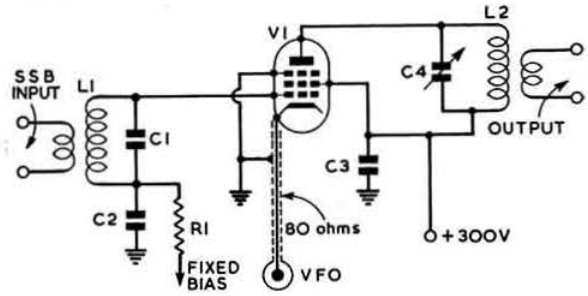

Fig. 1. The simple mixer circuit for s.s.b. used by G3CWC. C1, see text; C2, 0.001μF mica; C3, 0.01μF; C4, see text; L1, 2, see text; R1, 1000 ohms ½ watt; V1, 6AG7 or 6CH6.

The circuit shown in Fig. 1 has been used by G3CWC for some time with good results, despite its simplicity. It was originally intended for a 9 Mc/s s.s.b. signal and a 5 Mc/s v.f.o. giving 3 volts r.m.s. into an 80 ohm line to the cathode of the 6AG7. From other frequencies suitable high C values for L1C1 and L2C4 may be chosen. The bias (this may take the form of cathode bias) is adjusted to give a standing anode current of 3 mA, so that, on peaks of speech, the anode current rises to 15 to 20 mA.

Information Please

G3IEY (Warwick) is building single sideband equipment and would like to contact anyone who has used R.C.A. type 805 triodes as linear amplifiers. G3ILI and G3CCH are devoting considerable attention to s.s.b. operation on 144 Mc/s and would appreciate details of a suitable T.R. switch for this frequency. The conventional arrangement in use on the h.f. bands has certain disadvantages.

*15 Hampden Road, Wantage, Berks.

Round and About

G6LX (Croydon) who reports that he has been operational for some months, started off with a home constructed Ferroxcube filter rig (500 kc/s LC elements) which is probably the first of its kind in this country. Although power was limited to a few watts at first, a 4-125A class AB1 linear amplifier has since been added. Most activity has been on the DX bands with a couple of short visits to 3.7 Mc/s. On 21 Mc/s 37 states have been worked, while on 14 Mc/s 27 countries have been contacted, all being two-way s.s.b. G6LX reports that 3A2AH (Monaco) has single sideband rigs under construction, a phasing rig based on the Multiphase 10B and a G2NH crystal filter.

News comes from VE2AEE (ex-G3IXL) now settled in Montreal, who expects to be operational on 3.7, 14 and 21 Mc/s early in the New Year. The transmitter is to be a switched band unit with 6BA7 mixer feeding a 6CL6 class A amplifier to drive a pair of 6146s in parallel feeding a long wire aerial. At first, the power will be limited to 120 watts. Operating times will be from 6 p.m. to 9 p.m. E.S.T. (23.00 to 02.00 G.M.T.) when he will be looking for G stations. New calls heard on the bands include G3GHE, G4RT, G2CKM, G2JZ and G3FJN.

* * *

Details of activity, equipment and circuit arrangements are required for this feature. News items should arrive not later than March 15 for inclusion in the April issue of the BULLETIN. Reports from newcomers to single sideband will be particularly welcome.

Well Done G8IG!

"Bert" Allen first G to win WAZ Phone Award

THOSE members whose main interest is in the DX field will be the first fully to appreciate the outstanding achievement which we chronicle this month; the winning by a British amateur, C. G. Allen (G8IG) of the Worked All Zones Award, all of the contacts having been made on two-way telephony.

Although this is a U.S. award, no United States or Canadian amateur has yet equalled this performance and, in fact, only one other amateur in the world, namely, "Robbie" of VQ4ERR, has done it before.

Bert Allen, who lives at Keston, near Bromley, Kent, has many other operating awards to his credit. Fifth E-DX, fourth WAS in Europe, WAA, WAVE, etc., and has 215 countries confirmed for DXCC. In 1947 he won the VK/ZL Contest on 'phone and the following year, both the c.w. and 'phone sections.

In his middle fifties and looking much younger, Bert is a Director and Sales Manager of McMichael Radio Ltd., and has been with them since 1923, when he was the original operator of G2MI, then the firm's call-sign.

Originally trained as a ship's operator, he has travelled all over the world, having spent his sea-going life in Naval Transport. Incidentally, he is a superb telegraphist; the writer has seen him taking perfect copy, with an ordinary fountain pen, at 45 w.p.m. and seen the pen drop at 48 w.p.m. because he could not write any faster!

"Bert" Allen, G8IG, displays the 40 cards that enabled him to claim the WAZ award.

The transmitter used by G8IG to make almost all the contacts which contributed to his 'phone WAZ was crystal-controlled on 14 and 28 Mc/s and consisted of a 6L6, 807, 807 driving two 35Ts in push-pull, modulated by a pair of TZ40s—everything ambling along, well within its rating. The receiver is worthy of note being a rebuilt AR88, fully bandspread on all the amateur bands and incorporating a 100 kc/s calibrator, an audio filter with cuts at 1200 and 500 kc/s and a phasing control. The station includes a Cossor double-beam oscilloscope, a BC221 frequency meter, a wire recorder and other auxiliary gear. The mains input is Variac controlled and the entire station is relay operated from the operator's desk.

A new transmitter, now in use, is a band-switched rack-mounted affair using a single LS150 and the same TZ40s as modulators.

Before moving to Keston, G8IG was situated in Nightingale Lane, Bromley, where he possessed one of the first three element rotary beams in the country. The aerials now in use are a long-wire and three-half-waves out-of-phase on 14 Mc/s.

Adjacent to the actual shack is a well-equipped workshop, for Bert is not just a DXer but knows how to use machine-tools, as examples of his fine workmanship around the place bear witness.

It is pleasing to see a high executive in the world of professional radio unashamed to be known as a radio amateur keenly interested on the technical and operating sides of the hobby and at the same time ready to enjoy all the fun that goes with it. Those who want to see the "Ham Spirit" personified need go no further than Bert Allen. In offering him our sincere congratulations—we say, long may he prosper.

A. O. M.

Dave Marks (W2APF) off on World Tour

OLD Timer Dave Marks (W2APF), of Albany, New York, and his wife are about to start on a three months' world tour by air which will take them to the U.K., the Continent, Asia, Africa and Australia. They hope to meet local amateurs at each port of call.

U.S.A. MEMBERS

Please remind your friends that R.S.G.B. Membership costs only $3 a year.

Council Proceedings

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 Tuesday, November 15, 1955, at 6 p.m.

Present.—The President (Mr. H. A. Bartlett in the Chair), Messrs. L. Cooper, C. H. L. Edwards, D. A. Findlay, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, R. G. Lane, W. H. Matthews, W. R. Metcalfe, A. O. Milne, L. E. Newnham, W. A. Scarr and John Clarricoats (General Secretary).

Apologies for Absence

Apologies for absence were submitted on behalf of Messrs. W. H. Allen and H. W. Mitchell.

* * *

Membership

(a) *Resolved* (i) to elect 57 Corporate Members and 9 Associates; (ii) to grant Corporate Membership to 4 Associates who had applied for transfer; (iii) to waive for a period of twelve months the subscription of a member on the ground that he suffers from blindness.

(b) The Secretary reported that of the 587 members whose subscription became due on August 1, 1955, 98 became overdue on October 31, 1955. Of this number 19 were London, 54 were Country and 23 were Overseas Corporate Members and 2 were Associates. Of those overdue 11 London, 22 Country and 6 Overseas members held call-signs.

The Secretary submitted details of the 21 members (including 1 Associate) who had written to resign during the 5 weeks ended November 12, 1955. Of this number 4 had resigned on financial grounds, 11 gave no reason and 6 stated they had lost interest in Amateur Radio.

Applications for Affiliation

Resolved to grant affiliation to the following Societies and Clubs:—Bedford School Radio Club, East Berkshire College Radio Society, Kinloss R.A.F. Amateur Radio Club.

Headquarters Station

Consideration was given to a resolution passed at a meeting of the Bristol Group regarding the disposal of Headquarters station.

The Secretary was authorized to explain to the Bristol Group the reasons which had prompted the Council to dispose of the station through the good offices of a trade member rather than through the medium of an advertisement in the Society's Journal.

Meeting of V.H.F. Managers

Correspondence was submitted from the President of the Belgian Society (U.B.A.) regarding a proposal to hold a meeting of V.H.F. Managers in Brussels during the weekend of November 19-20, 1955.

After a long debate it was resolved (a) to confirm Mr. F. G. Lambeth's appointment as V.H.F. Liaison Officer for the R.S.G.B.; (b) to authorize Mr. Lambeth's attendance at the Brussels meeting as the R.S.G.B. representative.

V.H.F. ad hoc Committee

Resolved to set up an ad hoc Committee consisting of four members of the Council and Mr. F. G. Lambeth to explore the present organization of v.h.f. work in the United Kingdom and to make suitable recommendations to the Council.

Messrs. W. H. Allen, J. H. Hum, W. H. Matthews and W. A. Scarr were appointed to serve on the Committee.

Blazer Badge

Resolved to order from Burlington Textiles one gross of Society Blazer Badges to a design suggested by Mr. R. L. Varney (G5RV).

News Bulletin Service

The Secretary reported that considerable difficulty was being experienced at Headquarters in obtaining items of news for the News Bulletin Service. For Bulletin No. 8, transmitted on November 13, 1955, only one item of news had been communicated direct to Headquarters.

Following a general discussion the President appealed to all Members of the Council to contribute news items themselves and to draw the attention of local members to the difficulties mentioned by the Secretary.

QSL Sub-Managers

Resolved to grant honoraria totalling £71 8s. 0d. to 12 QSL sub-managers in accordance with the list submitted by Mr. Milne.

BULLETIN *Advertising*

Consideration was given to correspondence from two members living in Lowestoft regarding a letter one of them had received from the Society's Advertisement Manager.

Resolved (a) to authorize the Secretary to ask Mr. Freeman for his comments on the correspondence, (b) to advise the members concerned that enquiries are being made.

Morse Code Probationary Period

The Secretary reported that the Postmaster-General had agreed, as an experiment, to do away with the requirement that new licensees must work on telegraphy for the first 12 months of their licence. (An announcement based on the G.P.O. letter appeared in the November, 1955, issue of the BULLETIN.—ED.)

BULLETIN *Printing Costs*

Haycock Press Ltd. had advised the Society that increases in printing costs were expected to follow negotiations proceeding between the Masters Printers' Federation and the appropriate Trade Unions.

I.A.R.U. Region I Division

The Secretary submitted a Report of the meeting of the Executive Committee of I.A.R.U. Region I Division held in Amsterdam on October 20 and 21.

(An account of the meeting appeared in the November, 1955, issue of the BULLETIN.—ED.)

Resolved to receive the Report and to name the Society's two delegates to the Stresa Conference at a meeting of the Council early in 1956.

Cash Account

Resolved to accept and adopt the Cash Account for October, 1955, as prepared and submitted by the Secretary.

Reports of Committees

Contests

Resolved to authorize publication of National Field Day rules for 1956.

(The Chairman of the Committee in submitting the rules explained that slight amendments to the scoring had been made in an attempt to meet certain criticisms which had been received from Scotland.)

Exhibition (Home Constructors' Section)

Resolved to accept, and adopt as Reports, the Minutes of Meetings of the Committee held on October 24 and November 7, 1955.

The Reports dealt chiefly with the Amateur Radio Exhibition.

Finance and Staff

Resolved to accept, and adopt as a Report, the Minutes of a Meeting of the Committee held on October 27, 1955, and to adopt the two recommendations contained therein. The first dealt with small merit increases for two lady members of the staff. The second recommended the Council not to put forward at the present time a proposal to increase the Home Corporate Membership subscription to £1 10s. 0d.

Headquarters' Staff

The Secretary reported that he was experiencing great difficulty in obtaining clerical assistance. Approaches had been made to Labour Exchanges, Agencies, etc., all to no avail. The Secretary explained that there is a dearth of typists who are prepared to accept a salary of £6 10s. 0d. a week for work in Central London particularly when the work calls for alternate Saturday duty. Mr. Clarricoats pointed out that Society records, in addition to BULLETIN work, were being seriously affected by the lack of staff.

The Secretary appealed to members of the Council to let him know if they could suggest ways and means of improving the present difficult situation.

The meeting terminated at 9.10 p.m.

Society News

Election of Council, 1956

IN the Ballot Paper sent out on November 15, 1955, members were asked to vote for not more than *five* of the nine Ordinary Members who had been nominated to serve on the 1956 Council. The correct number should have been *four*.

The Council have been advised that the fairest way of rectifying the mistake is for members to be sent a new Ballot Paper, as before, with the same nine names, and for members to be asked to vote for a maximum of *four* candidates. Accordingly a new Ballot Paper is included in this issue of the BULLETIN, together with the necessary instructions.

The election of Mr. R. H. Hammans (G2IG) as President, Mr. D. A. Findlay, D.F.C., A.S.A.A. (G3BZG) as Executive Vice-President, Mr. W. R. Metcalfe (G3DQ) as Zone A Representative and Mr. J. Taylor (GM2DBA) as Zone F Representative, all of whom were unopposed, was in no way affected by the mistake and all four were formally declared elected by the President (Mr. H. A. Bartlett) at the Annual General Meeting on December 16, 1955.

The Council much regrets the mistake, which was brought about owing to a miscalculation.

Region 5 Representation

BY two votes to one, Mr. T. A. T. Davies (G2ALL), of Meadow Side, Comberton, Cambridge, was elected to the office of Region 5 Representative. His opponent was Mr. C. L. Fenton (G3ABB) of Chelmsford.

The Council is to look into the rules governing the election of Regional and other Representatives when a Ballot is involved.

Town Representation

ALL Town Representatives who were elected or appointed to serve in that office during the period from January 1, 1954, to December 31, 1955, automatically went out of office on the last mentioned date unless they had been re-nominated.

Certain T.R.s who took office during 1955 appear to be under the impression that they were elected for a period of two years as from the date of their election and are consequently still in office. This is not the case.

The only T.R.s at present in office are those whose names were published in the December, 1955, issue of the BULLETIN or in the list published on page 343 of this issue.

Nominations for vacant offices should be made in the prescribed form and sent to the respective *Regional Representatives* (not to Headquarters) as soon as possible.

DX Proficiency Certificates

ON receipt of a stamped addressed envelope Mr. Ron Perks (G4CP), 7 Poplar Avenue, Tividale, Dudley, Worcs, who is the Society's Honorary Certificates' Manager, will be pleased to give advice to members regarding the rarer types of DX proficiency certificates.

Mr. Perks has accepted an invitation from Headquarters to produce a comprehensive list of all DX proficiency certificates with the ultimate aim of presenting the information in booklet form. Members who possess rare certificates are invited to communicate with Mr. Perks.

R.A.E.N. Message Pads

IN order to make room at Headquarters for other Sales Department items, R.A.E.N. Message Pads are now offered at cost price, namely, 1s. 9d. each plus 6d. postage. E.C.O.s may purchase quantities of a dozen and upwards at a special low price which will be quoted on request.

Each pad contains 100 message forms ruled in accordance with the procedure laid down by the R.A.E.N. Committee.

Society Tie—New Price

DUE to changes in Purchase Tax and postage rates the price of the Society tie has been increased to 16s. 6d. post paid.

Thanks

THE General Secretary and the other members of Headquarters staff wish to thank those who remembered them at the Festive Season by sending cards and messages of goodwill.

R.S.G.B. News Bulletin Service
GB2RS 3600 kc/s
Sundays—10.00 G.M.T.

Tests and Contests

Second Top Band Contest, 1955

THE first few hours of the Second Top Band Contest, held on November 12-13, can fairly be summed up by the Shakesperian quotation which used to adorn the QSL card of an American station: "Exhalations Whizzing in the Air." With more than 320 stations contributing to the occasion, the low-frequency end of the band remained packed tight until 02.00, when, with the ending of the experimental "short period" contest, activity dropped sharply. Just how sharply is indicated by the results tables which show that only a few stations were able to add more than about 40 points to their 02.00 totals during the succeeding 6 hours, compared with up to 120 points gleaned during the period 21.00-02.00.

In the circumstances, it is not surprising that the leading placings in both the long and short period contests depended mainly upon the ability to score rapidly in the early portion and that, as a result, the top two places in both events go to the same stations: G8GF (W. A. Higgins, Kingswinford, Staffs) with 125 points at 02.00 and a final total of 165 points was three points ahead of G3BMY (I. T. Cashmore, Blackheath, nr. Birmingham) at 02.00 and a mere one point ahead at 08.00. Third and fourth places also go to the same stations but with the positions reversed: G3IGW (nr. Halifax) led G5TN (Weston-super-Mare) in the overall scoring by one point despite being eight points behind at 02.00 but then G5TN was forced to retire at 06.40.

The leading stations were scoring at the rate of 25 to 30 contacts an hour to begin with, dropping to 2 to 4 contacts an hour around 04.00, by which time bed had claimed all but the determined "long period" contestants, most of whom had by then already exchanged reports: but this is the time when the weaker signals, which tend to be lost under the QRM in the early hours, come into their own. Comparatively little overseas activity was reported: the regulars HB9CM and OK1AEH were the most reliable; ZB1HKO was active during at least part of the contest (he was worked by OK1AEH) but had little luck with British stations. Both events attracted approximately the same number of entries.

Early risers can usually be relied upon to put a fillip into the last few hours, but this time severe interference from a powerful unknown source wiped out almost the entire band for a number of entrants during the period 07.00-08.00. This unidentified signal—reported from such widely separated stations as G3FWW (Scarborough), G3BMY (Birmingham), G3HTI (Cleethorpes), G3ETP (Lowestoft) and G3JBK (Bexleyheath)—is described as a non-local heavily frequency modulated carrier giving multiple tuning beats centred around 1880 kc/s with 500-1000 c/s tone ("somewhat reminiscent of the arrival of the meteorites in *Quatermass 2*").

The equipment used at the leading stations was:

G8GF: e.c.o(6J5)-p.a. (807); half-wave end fed aerial; HRO receiver.

G3BMY: v.f.o.-b.a.-b.a.-p.a. (807); half-wave end fed aerial; CR100 receiver.

G3IGW: Clapp (6AB7)-p.a. (6L6), 7 watts; 400ft. tapped wire; Eddystone 750.

G5TN: v.f.o. (6J5)-p.a. (807); three aerials, 260ft., 132ft. and ¼-wave; CR100 and HRO receivers with 100ft. aerial.

Comments

The experimental short period contest brought forward a number of interesting comments, which will obviously require careful analysis in determining future policy: the majority are definitely in favour of a contest which does not require all-night operation, but there is a substantial number (drawn mainly from those who prefer the longer period) who feel that holding the two events concurrently is not altogether satisfactory.

"Congratulations on the Short Contest . . . the most enjoyable contest yet."—G3JEQ. "Short contest . . . should be retained as permanent feature."—G3BHS. "Long contest should finish at 06.00."—G3KKH. "My first contest . . . thoroughly enjoyed it."—G3JZG, G2HDR and G3CSG. "Short contest could usefully be held on a separate date."—G3BMY. "New arrangement very good . . . but am doubtful of wisdom of allowing contestants to enter for both events."—G3FHN. "Excellent idea, hope it becomes a permanent feature."—G8BN. "A good idea, particularly for the Old Timers

Short Period Contest Results

Psn.	Call-sign	Points	Psn.	Call-sign	Points
1	G8GF	125	23	G3HTI	63
2	G3BMY	122	24	G5MR	61
3	G5TN	121	†	GW3KCQ	60
4	G3IGW	120	25	G8DF/A	60
5	G3JEQ	119	26	G4CM	59
6	G5JU	118	26	G2JB	59
7	G2JF	114	28	G3FZC	56
8	G3ERN	100	29	G3KLH	53
9	G2AOL	94	29	G2HP	53
9	G3BFP	94	31	G3JII	51
*	G3HCX	92	31	G3JBK	51
11	G3GZB	88	33	G3IYT	49
12	G4DC	82	34	G2HCZ	48
*	G3ELZ	77	35	G3GNL	46
13	G5MP	75	36	G3HQX	45
13	G3FHN	75	37	G3BHR/A	44
13	G3FRV	75	38	G3CWW	39
16	G3DGN	74	39	G3KKH	37
16	G6UR	74	40	G3CAS	36
18	G3JJG	71	41	G2XP	35
†	G3JZG	70	42	G3HZG	32
19	G3HIW	70	42	G2AYG	32
*	G3CSG	69	42	G8BN	32
20	G2AFV	69	*	G2HPF	24
21	G4XC	65	45	G2HDR	20
22	G2KK	64			

* *Late Entry.* † *Entry invalid—no declaration.*

Full Period Contest Results

Psn.	Call-sign	Points	Psn.	Call-sign	Points
1	G8GF	165	25	G3FZC	83
2	G3BMY	164	25	G3HQX	83
3	G3IGW	162	27	G2JB	82
4	G5TN	154	*	G3FVW	81
5	G3ERN	144	28	G3CWW	77
6	G6VC	142	28	G3BHR/A	77
7	G3GZB	134	30	G3FAB	76
*	G3HCX	133	30	G3AKY	76
8	G3JML	123	32	GM8MJ	75
*	G3ELZ	119	32	G3KHR	75
9	G3KKZ	118	34	G3BHS	74
10	G5MP	115	35	G2XP	72
11	G6UR	114	35	G3KKH	72
12	G3YF	110	37	G2ZR	71
13	G2KK	105	38	G3GAW	68
14	G4XC	104	39	G3GOX	60
15	G3AZ	102	40	G3JKB	57
16	G3ILO	101	40	G2AYQ	57
17	G5MR	100	42	G3FDS	56
18	G3HTI	96	43	G6OO	52
19	G3JBK	92	44	G2FPR	49
20	G6UT	91	45	G8CO	40
21	GM3EHI	87	*	G2HPF	34
21	G2HCZ	87	46	G3ICH	32
21	G3HDZ	87	*	G5UM	15
21	G3KLH	87	47	G3JME	12

* *Late Entry*

who have had their share of stopping up all night."—G2HP. "A single contest finishing at 05.00 or 06.00 is the answer."—G5JU. "My vote—keep the long contest going and continue the short one if necessary."—G3CWW. "Tends to slow things down at the time when they are at their slowest."—G3GZB. "Struck by absence of stations after 02.00 . . . would a split contest alter this?"—G6VC. "In the early hours the weaker signals just did not stand a chance . . . good fun though."—GM2CHN. "Activity is sparse enough in the last few hours without encouraging mass close down at 2 a.m. . . . I prefer the longer period . . . give some bonus to GM stations."—G3IGW. "Short contest is a worthwhile innovation."—G2JF. "Running a short and long contest concurrently is excellent."—G5MR. "Having two young children am much in favour of the short option . . . using an automatic key with my left hand, no constant picking up and putting down a pencil."—G3DGN. "I like the idea of the short contest."—G5TN. "How can interest be stimulated in the quiet regions? One suggestion is to run the event as a regional competition as well as an individual one."—G2AYG. "Short contest—first-class innovation."—G3ETP. "Would like to see a Top Band 'phone' contest."—G3ILO.

Activity Table

The following activity table shows that the event was particularly well supported by the newer stations:

G2 (two ltr)	19	G3F	17	G5	15
G2 (three ltr)	25	G3G	14	G6	13
G3 (two ltr)	10	G3H	24	G8	8
G3A... ...	16	G3I	28	GD	1
G3B... ...	14	G3J	45	GM	5
G3C... ...	11	G3K	29	GW	5
G3D... ...	9	G4	5	Other ...	9
G3E... ...	10				

Check Logs

Check logs are gratefully acknowledged from G2HKU, G3ATU, G3ESP, G3ETP, G3GJX, G3IYQ, G3JVJ, G3KPJ, G6CJ, G6QM, GM2CHN, OK1AEH and OK2KBR.

A.R.R.L. International DX Contest

AMATEURS all over the world are cordially invited to take part in the 22nd A.R.R.L. International DX Contest to be held during four week-ends in February and March this year. The phone section will take place during the week-ends of February 11 to 12 and March 10 to 11, and the telegraphy section during the week-ends of February 25 to 26 and March 24 to 25. In all cases, the contest starts at 00.01 G.M.T. on the first date and ends at 24.00 on the second.

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.

The rules of the contest are exactly the same as for last year. Stations other than Ws and VEs will call "CQ W/VE" and attempt to make contest exchanges with U.S. and Canadian participants. Overseas stations will transmit 5 or 6 digit numbers, the first digits indicating the signal report and the last three the power input. For example, a station running 100 watts input might send "569100" on c.w. or "56100" on phone. U.S. and Canadian amateurs will transmit the RS or RST plus their State or province or some abbreviation of it. For example, a W4 in Virginia might send "579VA" on c.w. or say "57 Virginia" on phone.

Entries should be sent to the American Radio Relay League as soon as possible after the contest. Contest log forms are available on request from the A.R.R.L. Communications Department, 38 La Salle Road, West Hartford, Connecticut, U.S.A.

Full details and all the rules appear in the January, 1956, issue of *QST*.

Contests Diary

1956

January 28–29	-	B.E.R.U.
February 11–12	-	Affiliated Societies
May 6	-	Two Metre Field Day No. 1
June 2–3	-	National Field Day
(Closing date for entries: March 31, 1956)		
June 17	-	420 Mc/s Contest No. 1
July 7–8	-	Two Metre
August 19	-	Two Metre Field Day No. 2
September 2	-	Low Power Field Day
September 2	-	1250 Mc/s Tests
September 9	-	420 Mc/s Contest No. 2
October 6–7	-	Low Power Contest
November 10–11		Top Band No. 2
November 24–25		21 Mc/s Phone Contest

London Members' Luncheon Club

THERE was a good attendance at the meeting on December 16 which was attended by Herb. Bartlett (G5QA), President, R.S.G.B., Doug. Findlay (G3BZG) Hon. Treasurer, R.S.G.B., and Bob Ford (AC4RF). Stanley Vanstone (G2AYC) was in the chair. During the course of the meeting both G5QA and AC4RF addressed members.

The London Members' Luncheon Club is an informal group which holds meetings at the Bedford Corner Hotel, Tottenham Court Road (a few minutes' walk from either Tottenham Court Road or Goodge Street Underground stations) usually on the third Friday in the month. Members gather in the bar from 12.30 p.m. onwards and lunch is served at 1 p.m. The meeting is generally over by about 2 p.m. There is no membership fee, the only charge being for lunch. Those intending to be present at a meeting are asked to phone Frank Fletcher (G2FUX) on Ruislip 2763 or R.S.G.B. Headquarters (HOLborn 7373) at least 24 hours in advance if possible.

There will be no meeting of the club in January the next regular meeting being on February 17. A special New Year's Party will be held at the Bedford Corner Hotel on February 3 at 6.30 for 7 p.m. Tickets, price 17s. 6d. each, may be obtained from Frank Fletcher (G2FUX), 11a Ickenham Road, Ruislip, Middlesex.

Gloucester County Dinner

THE Gloucester County R.S.G.B. Dinner will be held at the Midland and Royal Hotel, Station Road, Gloucester, on February 4, 1956, commencing at 7.30 p.m. Tickets are available, price 10/6, from the T.R.s for Gloucester, Cheltenham and Stroud, and from the C.R., E. A. Perkins (G3MA), 40 Calton Road, Gloucester.

LONDON MEMBERS' LUNCHEON CLUB
DINNER-DANCE
Bedford Corner Hotel, Bayley Street, Tottenham Court Road
Friday, February 3, 1956. 17/6

Bib Gift Pack. Multicore Solders Ltd. are marketing a gift pack which contains a Bib wire stripper, insulated screwdriver and a card of Ersin Multicore match-melting tape solder. The three items are mounted on a gift card and packed in a cellophane envelope. The retail price is 5/-.

New Valves. The Mullard series of noval based valves for use in a.c. mains-operated f.m./a.m. receivers has been supplemented by an equivalent range having a common heater current rating of 100 mA. The new range comprises the UCC85 r.f. double triode, the UCH81 triode-heptode, the UF89 high slope variable-mu pentode, the UABC80 triple diode triode and the UL84 high slope 12 watt output pentode.

New Junction Transistors. The General Electric Co. Ltd. has introduced three new germanium alloy *p-n-p* type junction transistors—the EW58 which is intended for low voltage (up to 5 volts) audio frequency applications, the EW59 for supply voltages up to 20 volts and the EW53 for up to 10 volts. The EW59 can be used as a small signal amplifier at frequencies up to 0.5 Mc/s; in class B audio stages outputs of up to 300 mW can be obtained at low distortion. The EW53 is a smaller version of the EW59.

"Ranger" Mobile Equipment. With the introduction of the "Ranger" mobile equipment for business radio. Pye Ltd. has taken a noteworthy step towards the better use of available frequencies. Hitherto 100 kc/s bandwidth has been accepted as standard but with the new equipment, channels 25 kc/s wide are sufficient. At the present time there are 10,000 business mobiles in the United Kingdom; if a changeover to 25 kc/s channelling is made it will be possible to accommodate 132,000 in the same frequency allocations.

Slow Morse Practice Transmissions

G.M.T.	Call	kc/s	Town
Sundays			
09.00	G3GYV	1900	Hartford, near Northwich
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
10.30†	G3DGN / G3GZB	1930	North London
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	G3JBU	1850	Northampton
12.00	GI5UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
22.00	G3ARM	1919	Guildford
Mondays			
19.00	G3NC	1825	Swindon
19.00	G3JBU	1850	Northampton
20.45	G3EKW	1915	Nottingham
21.00	G3BLN	1900	Bournemouth
22.15	G2BRH	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
21.45†	G3ETP / G3JMX	1875 / 1860	Lowestoft
22.30	G3IIR	1915	Norwood
Wednesdays			
18.30	G3GCY	1830	R.A.F., Dishforth
19.00	G3HUB/A	1902	Chelmsford
22.30	G3FBA	1910	Bath
Thursdays			
19.00	G3NC	1825	Swindon
20.00†	G2CPS / G2CNX / G3GWT	1910	Hull, Yorks.
20.30	G3JQM	1878	Barwick, Yeovil
22.30	G3ADZ	1940	Southsea
Fridays			
18.30	G3GEN	1900	Gloucester
19.00	G3BLN	1900	Bournemouth
20.00†	G3CSG / G3EGX / G3ERB	1875	Wirral
20.30	G3ICX	1915	Sutton Coldfield
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
21.00	G3HWI	1987	Blackburn, Lancs.

† *Alternately.*

Slow Morse transmissions are organised by Mr. C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex. Members using the service are requested to send listener-reports to the stations concerned.

"More Early Experiences in Amateur Radio"

THE coherer referred to in the article bearing the above title, published in the October, 1955, issue of the R.S.G.B. BULLETIN, should have been described as a Branley (not Bramley) type.

Technical Book List

THE Publishers' Circular Ltd., 106 George Street, Croydon, Surrey, has recently issued a list of 500 English and American technical books fully annotated under 33 classifications. The price is 2s. 6d. per copy.

Can You Help?

● C. B. Raithby (G8GI), School House, Martin, Lincoln, who would like to know a source of supply of the remote control unit type MR-1B for the Bendix receiver type RA1B or the appropriate plugs? He also wishes to borrow the service manual for this receiver.

Letters to the Editor . . .

International Goodwill

DEAR SIR,—I am always intrigued by correspondence such as was contributed by G3COI to the December issue.

I don't think I have the honour of his acquaintance but I wonder what manner of man he is?

As we grow in years, and, let us hope, also in wisdom, we discover that everyone is slightly potty. We all have our irrationalities. Some of us, in fact most of us, at one time or another, dress up in funny clothes, especially hats, and perform the most amazing antics in some military, civic or social sphere. We observe conventions and traditions, which, to G3COI's cold reasoning are quite puerile. We even set about each other from time to time and for the most puerile reasons, murder a few millions of ourselves!

Let us therefore not be too intolerant of the folk who like to think that they are spreading a little international goodwill and friendship, even if this involves sending one another bits of coloured pasteboard.

G3COI is a strange fellow if he does not collect something. Most of us do, be it stamps, rare china, fine paintings, jade, cigarette cards or even QSL cards. He should count himself fortunate that it is within his power to give pleasure so easily as to send his QSL card to someone who really wants it. After all, if one receives a card, it is a reasonable proof that the S9 report we had from some rare DX was not really the work of the practical joker in the next street with his oscillator.

Yours faithfully,

Bromley, Kent. ARTHUR O. MILNE (G2MI).
R.S.G.B. QSL Manager.

DEAR SIR,—On this controversial subject of QSL cards, I would like to put forward my sentiments on behalf of fellow B.R.S. members who do send listener reports. Do the "100 per cent QSL" operators include short-wave listeners in their calculations? I am sure that quite a few do not. I realise that the "rare DX man" must be swamped with these reports from the world over, and it is therefore difficult to reply to them all.

Like G2HKU (November BULLETIN) I like to enjoy my hobby, but a QSL return of less than 1 in 4 over 18 months is not calculated to achieve this. In fact, out of nearly 600 reports sent, only 131 have brought a card in return. The worst offenders, barring Ws, are British stations when worked out in percentages.

I endeavour to make my reports as informative as possible, especially where U.K. stations are concerned. The majority of my cards for them are on Top Band and RST579 perhaps, over a distance of 100 miles or more is not to be spurned surely? Come now you Gs, show your appreciation if only for the patience of the listeners.

Yours faithfully,

Sutton, Surrey. MALCOLM HARRINGTON (B.R.S.20249).

Checking Contest Entries

DEAR SIR,—May I be permitted to comment on the letters dealing with the publication of Contest Results from G5MP and G3CUY printed in the December BULLETIN? Both of your correspondents credit the Contests Committee with being gluttons for punishment and think that far more checking is done than is actually the case. In fact, only the first, second, and third places are checked exhaustively. This may mean that 8 or 9 logs have to be examined thoroughly as the checking process is carried on until 3 logs are found which have a clear lead over all others. The logs further down the list are then adjusted to allow for any points lost (or gained—for this does happen sometimes) in the process of judging and the report and statement of the result prepared for publication.

G3CUY deals specifically with N.F.D. and in quoting the figure of 100 hours for judging he is not far from the truth. Let us consider what this means to the Contests Committee. The seven members of the 1955 Committee are all business men and are unable to spare more than one evening a week for Contest Meetings. Some, of course, cannot attend as often as this, and when N.F.D. judging is proceeding—coming as it does through the holiday season—we are lucky if 5 or 6 members are present. This "labour force" puts in approximately 18 man hours per meeting, so the actual judging usually takes six weeks plus the time taken to prepare the tables and write the lengthy report. It is always a rush to have all this done by the third week in August—which is the deadline for publication in the September issue of the BULLETIN, particularly when it is remembered that B.E.R.U. and some of the v.h.f. and u.h.f. contests are being checked at the same time.

The reason why the 1955 N.F.D. results were printed a month later than usual was entirely due to the fact that there was a doubt about some contacts claimed by a leading entrant, but correspondence with several overseas stations produced evidence which proved the group to be correct. Such checks take time, but they do ensure that the results as declared by the Contests Committee are as accurate and reliable as they can possibly be

Yours faithfully,

London, N.W.9. S. E. FRYER (G3ERO),
Hon. Secretary, Contests Committee, 1955.

TVI in Fringe Areas

DEAR SIR,—I note from the Annual Report of the Council that the membership has again dropped heavily. I do not agree, however, that this is entirely due to the increased subscription rate. It becomes increasingly evident that, in fringe areas, TVI is putting Amateur Radio off the air—resulting, ultimately, in a decrease of membership. To confirm this point one need only listen on the amateur bands during TV hours.

My QTH is approximately 70 miles from the Kirk o'Shotts transmitter and all the local amateurs are obliged to keep off the air during TV hours despite attempts to TVI-proof their transmitters.

I would suggest that the Council give priority to the problems associated with TVI by contacting the G.P.O. with a view to finding out:—

(1) The strength of TV signal that is considered to be satisfactory,
(2) The position of an amateur in a fringe area, or in an area not recognised to be covered by a TV transmitter, who, after he has done all he can to "kill" harmonics, is still interfering with TV.

I have been a member of the R.S.G.B. for a number of years and hope to continue my membership but I am not hopeful that during the current year the membership curve will begin to show an upward trend—on the contrary.

Yours faithfully,

Berwick-on-Tweed,
Northumberland. STAN BRIGHAM (G2FXB).

[*Editorial Note.*—For many years past the Society's G.P.O. Liaison Committee has maintained very close contact with the Post Office on all aspects of TVI and very good progress has been made in improving the official attitude to amateurs faced with TVI problems. It has been found possible in nearly every case where the interference can be cured at the receiver, for the G.P.O. to withhold blame from the amateur, but despite all efforts to deal with the "fringe area" problem the Post Office feel bound to maintain that the television viewing public must be protected against interference radiated by amateur transmitters.

The obvious improvement in amateur techniques and the more liberal and just Post Office interpretation of the regulations undoubtedly point to a happier future than Mr. Brigham's rather downhearted letter would indicate.]

Amateur Radio and the Air Training Corps

DEAR SIR,—I was most interested in the letter from Mr. Maurice J. Frost (G3GNL) headed "The Younger Generation," published in the December BULLETIN.

Air Ministry recently recommended Squadrons of the Air Training Corps to form Amateur Radio clubs. Such a club is being formed in Holloway, North London.

Numerous radio amateurs of tomorrow will emanate from these clubs, and by reason of their intensive c.w. training, they should be well worthy of being labelled "operators."

Yours faithfully,

No. 9F (Islington) Squadron, W. H. C. JENNINGS (G2AHB)
Air Training Corps, (*Flight Lieutenant—R.A.F.V.R.(T),*

Regional & Club News

Aberdeen.—A meeting of the Group will be held at GM4GX, 172 (top floor), Market Street, on January 27 commencing at 7.30 p.m. Preliminary discussions on plans for N.F.D. will take place at the meeting on February 17 at the Y.M.C.A., Union Street. Visitors and prospective members will be very welcome at both these meetings. *Town Representative:* G. Jamieson (GM3HTL), 93 Craigton Road, Mannofield, Aberdeen.

Aberdeen Amateur Radio Society.—Lectures and demonstrations are features of the meetings held on Fridays at 7.30 p.m. at 6 Blenheim Lane. In addition, the society has its own licence (call-sign GM3BSQ), workshop and canteen facilities. Prospective members may obtain full details from the *Hon. Secretary:* A. G. Knight (B.R.S.19114), 6 Blenheim Lane, Aberdeen.

Bristol.—" Another Angle on Decibels " was the title of the talk given by R. E. Griffin (G5UH) at the December meeting which was to have been addressed by W. H. Allen, M.B.E. (G2UJ) who was indisposed. At the meeting on January 20, L. G. Froud will give a talk on " Post Office Ship-Shore Radio Services." For the meeting on February 3, an R.S.G.B. Recorded Lecture—" Modern Disc and Tape Recording " by H. A. M. Clark (G6OT)—has been arranged. In the ballot for the local committee the following members were elected: B.R.S.19985, G2BYA, G2HDR, G2IK, G3CHW, G3GON, G3KPT and G6GN. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

British Amateur Television Club (Midlands Group).—The third meeting of this new group will be on February 9 at the home of the *Honorary Secretary*, F. J. Rawle, 16 King's Road, New Oscott, Sutton Coldfield. Considerable progress has already been made and flying spot transmissions on a closed circuit accomplished. Local members interested in Amateur Television are invited to attend meetings.

Bury.—A meeting is to be held at the George Hotel, Kay Gardens, at 8 p.m. on January 31 in an attempt to revitalize the R.S.G.B. group. The office of *Town Representative* has been taken over by J. E. Hodgkins (G3EJF), 24 Beryl Avenue, Tottington. No further meetings will be held at 52 The Drive, Seedfield.

Cardiff.—At the February meeting (see *Forthcoming Events*) GW3HJR will give a talk on " Hints and Kinks." Morse classes are being started. *Town Representative:* R. Morris (GW3HJR), " The Shack," St. Cenydd Road, Caerphilly, Glamorgan.

Coventry Amateur Radio Society.—Meetings at 9 Queens Road are arranged for 7.30 p.m. on January 16 (" Station Descriptions "), January 30 (" Two Metre Demonstration "), February 13 (" Aerials and Switches," G5GR) and February 27 (Junk Sale).

Crystal Palace and District Radio Club.—This club has been formed by members of the Norwood and District R.S.G.B. Group to widen the scope of local activities. Norwood Group will continue to function within the structure of the new club. Initially, meetings will continue to be held on the third Saturday in each month but it is anticipated that additional meetings will be arranged in the near future. The first official meeting will be held at Windermere House, Westow Street, S.E.19, at 8 p.m. on January 21, when there will be a lecture and demonstration of " Hi-fi Equipment " by George Hicks (G4JP). Visitors and prospective members are invited to attend. Full details may be obtained from the *Hon. Secretary (pro tem.):* G. M. C. Stone (G3FZL), 10 Liphook Crescent, Forest Hill, London, S.E.23.

Leicester Radio Society.—At the A.G.M. the following officers were elected: *President:* R. Frisby (G2CFC); *Chairman:* R. D. McQueen (G3DVP); *Hon. Secretary:* J. Tranmer; *Hon. Treasurer:* S. D. Hoff (G3AWM); *Publicity Officer:* M. H. Kind (G3GXZ). Meetings are held at the Holly Bush Hotel, Belgrave Gate, on alternate Mondays at 7.30 p.m., the next being on January 16. The future programme includes lectures on mobile work, radio frequency heaters, industrial electronics and a 144 Mc/s v.f.o.

Lothians Radio Society.—Forthcoming lectures include " Band III Converters " by F. Tuck (GM3BBW) on January 26, " Radio and Television Interference and the Radio Amateur " by W. T. Bell of the G.P.O. Engineering Dept., on February 9, and " Police Radio " by Chief Inspector N. W. Bruce, B.E.M., on February 23. Meetings commence at 7.30 p.m. and are held at 25 Charlotte Square, Edinburgh. Classes in preparation for the R.A.E. and Morse Test are in progress and a library has been started. *Hon. Secretary:* John Good, 24 Mansionhouse Road, Edinburgh, 9.

Midland Amateur Radio Society.—The Annual Christmas Party was held on December 20, F. E. Barlow acting as a Mock Auctioneer. " A Ham on the Burma-Siam Railroad " is the title of a talk to be given by T. P. Douglas, M.B.E. (G3BA), at the Midland Institute, Paradise Street, Birmingham, on January 24. *Honorary Secretary:* C. J. Haycock (G3JDJ), 360 Portland Road, Birmingham, 17.

Nottingham & District Amateur Radio Society.—At the December meeting, J. Hobson (G5QZ), lectured on " Beam Aerials." R. Billham, Chief Engineer of Rediffusion (East Midlands), Ltd., will discuss " The Principles of Wire Broadcasting " at the meeting on January 20. Details of the Nottinghamshire County Contest to be held on January 22 in the 1.8 and 3.5 Mc/s bands may be obtained from F. M. L. Hyde, 77 Sherwood Vale, Nottingham. *Hon. Secretary:* M. Dransfield (G3JKO), 1 Cavendish Crescent South, The Park, Nottingham.

QRP Society.—The Society is adopting a new format for its monthly journal *QRP* which will include loose leaf sheets covering all aspects of low power Amateur Radio so that members may build up a *QRP Handbook*. *Hon. Secretary:* John Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

Royal Air Force Amateur Radio Society.—More than 50 members, including Wing-Commander W. E. Dunn (G2LR), Vice-President, and Wing-Commander Mc.P. Adams, Chairman, attended the Society's A.G.M. at Adastral House, Air Ministry, London, on November 25. Future A.G.M.s will be held to coincide with the R.S.G.B. Amateur Radio Exhibition. *Hon. Secretary:* R. F. Weston, R.A.F.A.R.S. (G8FC), R.A.F., Locking, Somerset.

South Manchester Radio Club.—Lectures for those taking R.A.E. are held at 8 p.m. on Mondays at Ladybarn House, Mauldeth Road, Manchester 20. Other meetings at the same address are arranged for January 27 (" Transistors " by P. Cone) and February 10 (" Radar and its Applications "). *Hon. Secretary:* M. Barnsley (G3HZM), 17 Score Street, Bradford, Manchester 11.

Slade Radio Society.—" Generation and Transmission of Electric Power " is the title of a lecture illustrated with lantern slides to be given by a representative of the Central Electricity Authority on January 20. On February 3, T. P. Douglas, M.B.E. (G3BA), will speak on " Some Aspects of Amateur V.H.F. Construction ". A Junk Sale is arranged for February 17. All meetings are held at The Church House, High Street, Erdington, Birmingham 23 commencing at 7.45 p.m. The club room is open every day of the week while instructional classes are held on Mondays, Tuesdays and Wednesdays. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

Torbay Amateur Radio Society.—At the December meeting, a somewhat smaller audience than usual found the recorded lecture " Interplanetary Travel " by W. A. Scarr, M.A. (G2WS), exceptionally interesting. On January 21, at 7.30 p.m. at the Y.M.C.A., Torquay, there will be another R.S.G.B. Recorded Lecture, this time on " Antennas " by F. Charman, B.E.M. (G6CJ). *Hon. Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the October, 1955, issue of the BULLETIN: —

Amateur Radio Society of Barbados, c/o W. A. Richardson, Wendmar, Flint Hall, St. Michael, Barbados, B.W.I.

University of Bristol Amateur Radio Society, c/o A. R. Wright, University of Bristol Union, The Victoria Rooms, Bristol 8.

Representation

THE following are additions to the list of Regional and Town Representatives published in the December, 1955, issue of the BULLETIN:—

Regional Representatives

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

Region 13—
James Taylor, M.P.S. (GM2DBX), The Pharmacy, Methilhill, Fife, Scotland.

Town Representatives

Region 3—Birmingham
Handsworth and West Bromwich
W. G. Johnson (G2BJY), 22 Lynton Avenue, West Bromwich.

Region 1—Lancashire East
Bury
J. E. Hodgkins (G3EJF), 24 Beryl Avenue, Tottington.

Lancashire West
Blackpool
H. G. Newland (G5ND), 161 Penrose Avenue.

Region 4—Lincolnshire
Boston
A. Oughton (G8BQ), 49 Fydell Street.

Region 7—London North
Welwyn Garden City
J. Hum (G5UM), Wyldes, Bulls Green, nr. Knebworth, Herts.

London South-West
Dorking and Leatherhead
W. J. Walsh (G3HZJ), 4 Meadowbrook Road, Dorking, Surrey.

Region 9—Somerset
Weston-super-Mare
L. J. Avory (G2FQP), 20 Swiss Road.

Can You Help

● E. Eaton (GW3KLU), Kelsterton Hall, Flint, North Wales, who would like to hear from any member able to supply conversion data for the Bendix TA.12B transmitter?

● F. L. Firth (G8JD), 2 Daisy Way, High Lane, via Stockport, Cheshire, who wishes to obtain the circuit diagram and any other information on the Responser R.D.F. No. 1?

● A. F. Smith (ZL2ABP), 48 William Street, Napier, New Zealand, who wishes to obtain details of the circuit, valve line-up and i.f. of the Receiver type 78 Ref. No. 10D/1307?

Silent Key

The sudden death last month of Alderman William Hodgson Malcolm, J.P., has deprived the City of Coventry of an outstanding public personality, and the Amateur Radio movement of one of its greatest enthusiasts. For many years "Bill" Malcolm (the name by which he was known among his many friends) operated an amateur station under the call G6WX.

For 49 years Mr. Malcolm was employed by the General Electric Company having begun his career at Salford before moving to Coventry in 1921.

In the course of a very full life, Alderman Malcolm did considerable public service. He became a Conservative member of the Coventry City Council in 1928 and was elected Mayor in 1948. During that year he arranged for a West Midlands O.R.M. to be held on premises under the control of the City Council.

Alderman Malcolm was appointed a Justice of the Peace in 1942 and was Chairman of the Juvenile Panel of Magistrates for several years. He was also a prominent Freemason. Two years ago he was elected President of Coventry Football Club. He had many other interests all of which he supported with characteristic enthusiasm.

In recent years most of his Amateur Radio work was carried out on 14 and 28 Mc/s. He always showed great interest in the activities of the local group, although he was unable to take part in them himself because of other commitments.

Local amateurs wish to convey their sympathies to Alderman Malcolm's son—Mr. Donald Malcolm.

New Books

NOISE by A. Van der Ziel. Page size 8½in. x 5½in. 450 pages. Published by Chapman and Hall. Price 60/-.

This book is concerned with noise in electronic devices and reduces solutions to most noise problems to an analysis of simple networks. It is part of the Prentice-Hall Electrical Engineering Series.

* * *

RADIO SERVICING POCKET BOOK. Edited by E. Molloy and J. P. Hawker. Page size 6½in. x 4in. 212 pages. 188 tables and illustrations. Published by George Newnes, Ltd. Price 10/6.

This new book provides essential information and data needed in the day-to-day work of repairing and servicing modern broadcast receivers. Special interest attaches to the fact that the latest v.h.f/f.m models are dealt with.

The book contains more than 70 pages of tabular data, listing valve connections, direct valve and battery equivalents, colour codes and conversion tables. There is also a 46-page section giving the leading particulars of nearly 1,000 popular post-war radio receivers including more than 60 models for the v.h.f/f.m. transmissions in Band II.

Both the experienced engineer and the newcomer to service work will find this book of great value.

The diagrams are well drawn and the text clear and easy on the eye.

* * *

A BEGINNER'S GUIDE TO RADIO by F. J. Camm. Page size 7¼in. x 4¾in. 160 pages. 104 illustrations. Published by George Newnes, Ltd. Price 7/6.

Specially planned for teachers and students, this elementary first course in radio transmission and reception is written in language which the very beginner will understand. The student is taught how to build simple receivers and the theory and function of each part is explained as the student builds.

The book is divided into 27 lessons.

* * *

B.B.C. HANDBOOK, 1956. Page size 7½in. x 4½in. 287 pages. Published by the B.B.C. Price 5/-.

The Handbook sets out to provide a clear and reliable guide to the workings of the B.B.C., to survey the past year in British broadcasting and to bring together as much information about the B.B.C. as can be assembled between the covers of a small book. A full account is given of the organisation of the External Services and the re-broadcasting of B.B.C. programmes throughout the world.

The student of broadcasting will find in the 1956 Handbook all the information he requires about the B.B.C.

* * *

AUSTRALIAN RADIO AMATEUR CALL BOOK. 1955 Edition. 140 pages. Published by the Victorian Division of the Wireless Institute of Australia. Price 4/6.

Contains a comprehensive list of VK call-signs, names and addresses. Additional features include names and addresses of Overseas QSL Bureaux and details of Awards and Certificates issued by Societies and Magazines.

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—January 24, 7.30 p.m., 25 Abbey Road, Blackpool.
Bury.—January 31, 8 p.m., George Hotel, Kay Gardens, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby. — Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.o.M.A.R.S.).—January 18, February 1, 15, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—February 1, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Room "G," Wavertree Community Centre, Penny Lane, Liverpool, 18.
Manchester (M. & D.R.S.).—February 6, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester. **(S.M.R.C.).**—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 14.
Preston.—January 27, February 10, 24, 7.45 p.m., The Copper Kettle, Garstang Road, Barton.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
Southport.—Thursdays, 8 p.m., Sea Cadets Camp, Esplanade, Southport.
Stockport (S.R.S.).—January 18, February 1, 15, 29, 8 p.m., The Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.R.S.).—January 19, February 2, 16, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington.
Wirral (W.A.R.S.).—January 18, February 1, 15, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Bradford.—January 24, February 14, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—February 8, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—January 31, February 14, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., 4 Woodhouse Square.
Middlesbrough. — Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract.—January 17, January 31, 8 p.m., Queen's Hotel, Tanshelf.
Rotherham.—Wednesdays, 7 p.m., "Cutlers' Arms," Westgate.
Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street.
Sheffield (S.A.R.C.). — January 25, 8 p.m., "Dog and Partridge," Trippet Lane. February 15, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—January 25, February 11, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—February 3, 7.30 p.m., A Committee Room, Messrs. Cadbury Bros., Bournville Lane. **(M.A.R.S.).**—January 17, 7 p.m., Midland Institute. **(Slade).**—January 20, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—January 27, 7.30 p.m., Priory High School, Wheatley Street. **(C.A.R.S.).**—January 16, 30, February 13, 7.30 p.m. 9 Queens Road. **(Courtaulds).**—Wednesdays, 5-8.30 p.m., Courtaulds, Ltd., Foleshill Road.
Malvern.—February 6, 8 p.m., "Foley Arms."
Redditch.—January 24, February 9, 8 p.m., "Scale and Compass," Birchfield Road.
Solihull.—January 16, 30, February 13, 7.30 p.m., Defence H.Q., Sutton Lodge, Blossomfield Road.
Stoke.—January 25, 8 p.m., "Lions Head," John Street, Hanley.
Stourbridge (St.A.R.S.).—February 7, 8 p.m., King Edward VI School.
Walsall.—January 25, February 8, 8 p.m., Technical College, Bradford Place.
Wolverhampton.—January 16, 30, February 13, 8 p.m., Nechells Cottage, Stockwell Road.

REGION 4

Alvaston. — Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Boulton Lane, Alvaston, Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Room 4, 119 Green Lane.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Room 5, College of Further Education, Field Road.
Leicester (L.R.S.).—January 23, February 6, 7.30 p.m., Hollybush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—February 1, 7.30 p.m., Technical College, Cathedral Street.
Mansfield.—February 7, Denmans Head Hotel, Market Place, Sutton-in-Ashfield.
Newark.—February 5, 7 p.m., Northgate House, Northgate, Newark.
Northampton (N.S.W.C.). — Fridays, 7 p.m., Clubroom, 8 Duke Street.
Nottingham.—January 20, February 17, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—February 1, 7.30 p.m., 21 Hankey Street.
Retford.—February 2, 7 p.m., Sun Inn, Cannon Square.

REGION 5

Chelmsford.—February 2, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Lowestoft and Beccles (L. & B.A.R.C.).—January 25, February 8, Y.M.C.A., Lowestoft.

REGION 6

Cheltenham. — February 2, 8 p.m., Great Western Hotel, Clarence Street. **(A.R.S.).**—Wednesdays, 8 p.m., Club Room, St. Mark's Community Centre, Brooklyn Road.
Gloucester (G.R.C.). — Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road.
High Wycombe. — January 25, 7.30 p.m., G6JK, 17 New Drive, Totteridge.
Oxford (O. & D.A.R.S.).—January 25, February 8, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth. — Tuesdays, 7.30 p.m. British Legion Club, Queen's Crescent, Southsea.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

London. — January 27 (Presidential Address), February 24 (420 Mc/s Evening), 6.30 p.m., I.E.E., Victoria Embankment.
London (L.M.L.C.). — February 3, 7 p.m. (Dinner Dance), February 17, March 16, Bedford Corner Hotel.
London (U.H.F. Group). — February 2, 7.30 p.m., Bedford Corner Hotel.
Acton, Brentford and Chiswick. — Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Barnes, Putney and Richmond.—February 3, 337 Upper Richmond Road, S.W.14.
Bexleyheath. — January 26, February 9, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—February 3, 8 p.m., Shortlands Hotel, Station Road, Shortlands.
Chingford.—January 20, February 3, Venue from G4GA (SIL 5635) or B.R.S.19675 (SIL 6055).
Croydon (S.R.C.C.).—February 14, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking. — Tuesdays, 7.30 p.m., 5 London Road.
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East Ham.—February 7, 12 Leigh Road.
East London.—January 15, February 19, Town Hall, Ilford.
East Molesey.—February 1, Carnarvon Castle Hotel.
Enfield.—January 15, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—January 17, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Guildford and Woking.—January 29, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Harlow and District. — Tuesdays, 7.30 p.m., rear of G. E. Read (G3ERN), 6 High Street, Harlow, Essex.
Hendon and Edgware.—Wednesdays, 8 p.m., 21 Goodwins Avenue, Mill Hill.
Hoddesdon.—February 2, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—Mondays and Wednesdays (R.A.E.), Fridays, 7 p.m., Grafton School, Eburne Road, N.7 (January 27 "Simple Phone Rigs" (G5GO), February 10 "Amateur D/F" (G3HT)).
Ilford. — Thursdays, 8 p.m. (G2BRH), 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—January 21, 7.30 p.m., Windermere House, Westow Street, Crystal Palace.
Southgate and Finchley.—February 9, Arnos School, Wilmer Way.
Slough.—February 7, Venue from G2HOX or G3BTP, 13 Quaves Road, Slough.
Sutton and Cheam (S. & C. R. S.).—January 17, February 21, "The Harrow," Cheam Village.
Welwyn Garden City.—February 6, G2NR, 22 Elmwood, Welwyn Garden City.

REGION 8

Brighton (B. & D.R.C.).—Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road.
Isle of Thanet (I.o.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.

REGION 9

Bath.—January 23, February 20, 7.30 p.m., 12 Pierrepoint Street.
Bristol.—January 20, February 3, 17, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol, 1.
Exeter.—February 3, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth (W.C.R.C.). — Alternate Tuesdays, 7 p.m., Falmouth Technical Institute.
North Devon.—February 2 (G3BO), Rosebank, Westcombe, Bideford.
Plymouth.—January 21, February 18, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—January 21, February 18, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—February 8, 7.30 p.m., R.A.F.A.R.S., R.A.F. Locking.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—February 13, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath and Port Talbot.—February 7, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline.—Thursday, 7.30 p.m., 34 Viewfield Terrace, Dunfermline.
Edinburgh.—January 26, February 9, 23 Chamber of Commerce Rooms, 25 Charlotte Square, Edinburgh, 2.

REGION 14

Falkirk and Stirling.—January 20, February 17, 7.30 p.m., The Temperance Café, High Street, Falkirk.
Glasgow. — January 27, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2.

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G3ATI †R. W. PINFOLD, Station Road, Upper Poppleton, York.
G3EKH †G, B. OSWALD, 3 "Briardale," Edgware Way, Edgware, Middlesex.
G3FHK †D, F. BAMPTON, 2 Alder Crescent, Parkstone, Dorset.
G3FJV †F, G. DUTTON, 3 Victoria Road, Skegness, Lincs.
G3KGH †I, E. HUSER, c/o Australia House, Strand, London, W.C.2.
G3KHZ D, COX, Estate House, Freeby, nr. Melton Mowbray, Leics
G3KJI E, W. POLLARD, Kiln Farm, Syresham, Brackley, Northants.
G3KJL R. M. FLECKNEY, 1 East View, Wayletts Hill, Takeley, nr. Bishops Stortford, Herts.
G3KJN †1922700 CPL. WINTER, I.G., Hut 15, R.S.F., R.A.F., Kinloss, nr. Forres, Morayshire.
G3KJQ D, J. GARNER, "Glenariff," Start Lane, Whaley Bridge, via Stockport.
G3KJW *P. E. W. ALLELY, 26 Marlston Avenue, Lache Park, Chester.
G3KKA J. McMANUS, 79 Park Street, Thame, Oxford.
G3KKY T. E. WOOLLEY, C.A.C.C., Croydon Airport, Surrey.
G3KKZ *P. CHAMPION, 7 Leonard Road, Streatham Vale, London, S.W.16.
G3KLI F. C. BEADLE, 56 Balliol Road, Welling, Kent.
G3KLS C, HARTE, 50 Nevern Square, Earls Court, London, S.W.5.
GW3KCQ J. N. E. WILLIAMS, 10 Treherbert, Cwmanne, Lampeter, Cards.

* * *

G2CIW †J. F. Moseley, 17 Priams Way, Stapleford, Cambridge.
G2CNN †P. M. Branton, Red Lion Hotel, Wareham, Hants.
G2FPW †G. R. Catling, 11A Parkhouse Gardens, Twickenham, Middlesex.
G3GPT B, Barstow, "Heathfield", School Lane, Longton, nr. Preston, Lancs.
G3IGO D, H. Taylor, 14 Buckland Avenue, Slough, Bucks.
G3KGF J. S. Foster, 8 Berkshire Road, Norton, Stockton-on-Tees, co. Durham.
G3KKM K. R. Barton, 4 Wargrave Road, Clacton-on-Sea, Essex.
G3KLB A. H. Jones, 62 Woodlands Road, Cheetham, Manchester, 8.
G3KLH D. G. Alexander, "The Haven", Eynsham, Oxford.
G3KLQ P. F. Yeates, 28 Willingham Avenue, Ermine Estate, Lincoln.
G3KLZ *D. G. Enoch, 15 Victor Road, Heaton, Bradford, 9, Yorks.
G3KMP C. A. May, 3 Upper Glen Road, Hollington, St. Leonards-on-Sea, Sussex.
G3KMU, G. G. Taylor, 22 Gressenhall Road, Southfields, S.W.18.
G3KMW T. R. Parry, 179 Ridgacre Lane, Quinton, Birmingham, 32
G3KNF H, G. Fisher, 458 Alum Rock Road, Birmingham, 8.
G3KNR J. A. Tullet, "Madeira", Seasalter Beach, nr. Whitstable, Kent.
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GM2HFY †W, G. Duncan, 23 Noran Avenue, Dundee, Angus.
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GM3KLW J. Fraser, 8 Thistle Street, Edinburgh.
GM8AT †W, M. Beattie, 43 Invercauld Road, Mastrick, Aberdeen.
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* * *

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ZC4WR R. A. WHITING, P.O. Box 219, Limassol, Cyprus.

* * *

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(Continued on page 352

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