

R.S.G.B.



BULLETIN

"Stable as a Rock"

MESSES. PANDA RADIO CO.,
58 School Lane,
Rochdale,
Lancs.

P/Lt. M. B. Faraday,
276 Signals Unit,
R.A.F. Habbaniya,
IRAQ.

Dear OMs,

I am now in a position to report on your very FB PR-120-V transmitter.

I am pleased to say it has and is giving very good service under the most adverse conditions. During an afternoon with a temperature of 124 degrees F. in the shade I took the transmitter into the direct sunlight. The metal casing soon became far too hot to touch (180 degrees F.)! An egg was broken on the lid and was cooked in about ten minutes. Under these conditions I had 5 and 9 plus from VU, VS2, ZB1, and 11. The contacts were on 'phone and the VFO remained as stable as a rock (14 Mc/s).

The following week we experienced a sand storm. Dust and sand got in everywhere. About 1 lb. of sand was later removed from the transmitter. It worked perfectly right through the storm.

The first YI-G 21 Mc/s contact was made using this transmitter.

Last week ET5R in Addis Abbaba put out a CQ. The "spivs" came down. I had at the time a 40-metre 4 pole on the transmitter and ET5R was on 14 Mc/s 'phone. I quickly tuned the transmitter on 14 Mc/s and still using the 7 Mc/s dipole gave him a call. About 12 other stations were calling. He came back to me and gave me 8-9 and said: "There were many stations calling me OM, but as you were the loudest I have come back to you." This, on a mismatched antenna!!? The very same thing happened half an hour later when KA20M called CQ.

This transmitter seems to work like a 1 kW transmitter. All reports on 'phone give B.E.C. quality and on c.w. T9. I am more than satisfied and don't understand how you do it.

You are quite at liberty to use the above facts as you will and if you want any other details I will be only too happy to supply.

Yours sincerely,

(Signed) Michael Faraday,
YI2AM, ex-Y15BZ, ex-G5BUX.



The New **PANDA** PR-120-V

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Cables: PANDA-ROCHDALE. Tel.: 47861.

The above is a copy of an original letter entirely unsolicited, received by us, and reprinted without comment. The italics are ours.

T.V.I. CAN BE CURED!



Q. Well, what have you done about T.V.I.?

A. I've built an up-to-date rig using a low-drive tetrode p.a.

Q. Have you screened the transmitter?

A. Yes.

Q. Have you fitted harmonic traps to the troublesome stages?

A. Yes.

Q. Have you fitted a good mains filter?

A. Yes.

Q. What else have you done?

A. Fitted a low-pass filter, using an aerial matching unit, screened links and all the rest of the dodges I've seen printed.

Q. What's the result?

A. That's just the trouble—nothing seems to make any real improvement!

Q. Now tell me the exact symptoms.

A. My own T.V. set and my immediate neighbour's are completely blanketed. Sets slightly farther away are free from interference.

Of course the answer is obvious!

NOTHING can be done at the TRANSMITTER to stop this kind of interference:

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Insert the *Labgear* 'ANTI-SWAMP' FILTER in the T.V. set aerial feeder and the trouble has gone.

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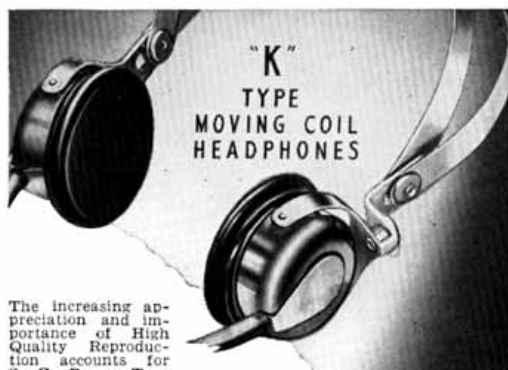
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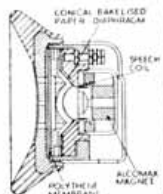
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12

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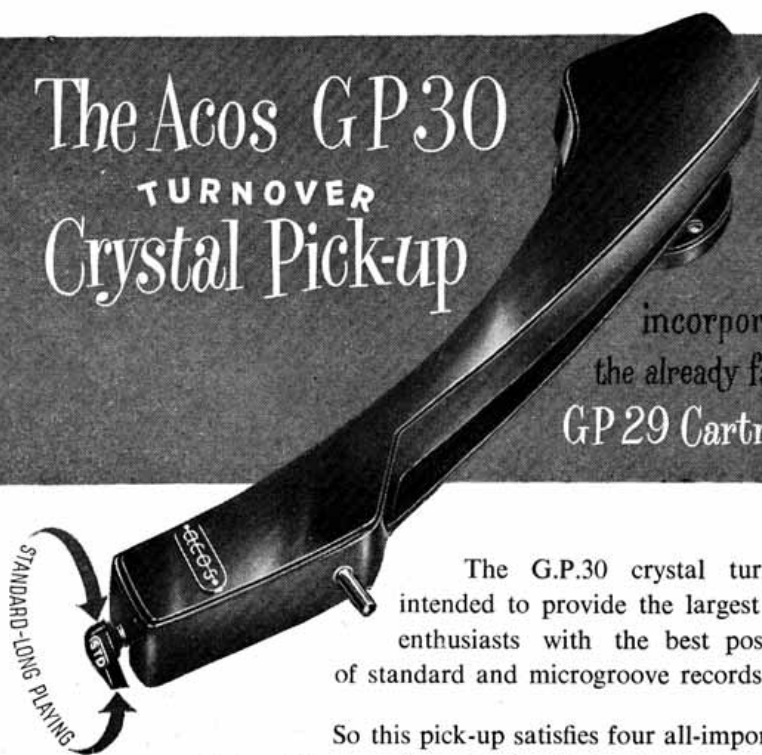
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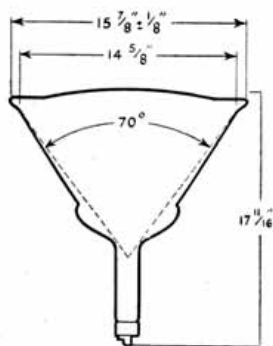
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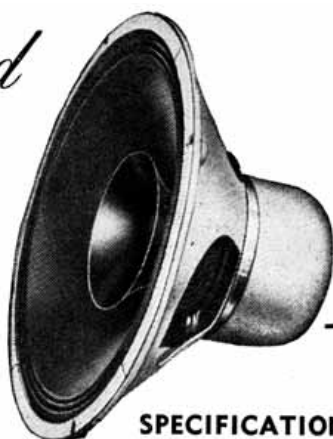
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E.T.M.3

R·S·G·B· BULLETIN

Vol. 28

No. 4

OCTOBER

1952



PUBLISHED ON OR ABOUT THE 15th OF EACH MONTH AS ITS OFFICIAL JOURNAL BY THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN AND ISSUED FREE TO MEMBERS.

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Telephone: *HOL*born 7373

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THE R.S.G.B. IS A MEMBER SOCIETY OF THE I.A.R.U. AND ACTS AS THE REGION 1 BUREAU OF THE I.A.R.U.

Forthcoming Events

REGION 1

- Bury.**—November 13, December 11, 7.30 p.m., Y.M.C.A., The Rock.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo, Liverpool.
Darwen & Blackburn.—October 24, November 21, 7.30 p.m., Y.M.C.A., Limbrick, Blackburn.
Liverpool.—October 25, November 8, 22, 2.30 p.m., Larkhill Mansion House, West Derby, Liverpool.
Manchester (M. & D.R.S.).—November 3, 7.30 p.m., Brunswick Hotel, Piccadilly.
Preston.—October 24, November 7, 21, 7.30 p.m., Three Tuns Hotel, North Road, Preston.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester (S.M.R.C.).—Alternate Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—October 20, November 3, 17, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—Alternate Tuesdays, 8 p.m., Blossoms Hotel, Buxton Road.
Warrington (W. & D.R.S.).—First and third Tuesdays of each month, 7.30 p.m., King's Head Hotel.
Wirral (W.A.R.S.).—October 22, November 5, 19, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

- Barnsley.**—October 24, November 14, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—October 28, November 11, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick & Richmond.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—November 12, 7.30 p.m., Black Bull, Market Place.
Gateshead.—Mondays, 7.30 p.m., Mechanics Institute, 7 Whitehall Road.
Hull.—October 29 (General), 7.30 p.m., R.E.M.E. Canteen, Walton Street.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract.—October 30, November 13, 8 p.m., Fox Inn, Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., Cutlers Arms, Westgate.
Searborough.—Thursdays, 7.30 p.m., L.N.E.R. Rifle Club, West Parade Road.
Sheffield.—October 22, 8 p.m., Dog and Partridge, Trippet Lane; November 12, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spennithorne.—October 22, 7.30 p.m., Temperance Hall, Cleckheaton.
Sunderland.—October 22, November 5, 7.30 p.m., 16 North Bridge Street.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

- Birmingham South.**—October 19, 10.30 a.m., Stirchley Institute.
Coventry.—October 24, A.G.M., 7.30 p.m., Priory High School, Wheatley Street.
Kenilworth, Warwick & Leamington.—October 16, November 20, 7.30 p.m., Dalehouse Lane.
Malvern.—November 3, 8 p.m., Foley Arms.
Rugby.—November 4, 7.30 p.m., Public Library, St. Matthew Street.
Stourbridge (S. & D.R.S.).—November 4, 8 p.m., King Edward's School.
Worcester (W. & D.A.R.C.).—Thursdays, 7 p.m., City Library (basement), Foregate Street.
Wrekin (W.A.R.S.).—Mondays, 8 p.m., Wrekin Service Club, Roseway, Wellington, Salop.

REGION 4

- Alvaston (D.S.W.E.S.).**—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, nr. Derby.
Chesterfield.—October 21, November 4, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—October 22, 29, November 5, 12, 7.30 p.m., Derby College of Arts & Crafts (sub-basement), Green Lane.
Leicester (L.R.S.).—October 20, November 3, 17, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Loughborough.—November 19, 7.30 p.m., Great Central Hotel.
Mansfield.—November 2, 3 p.m., Swan Hotel.
Newark.—October 26, November 9, 7 p.m., Northgate House, Northgate.
Northampton (N.S.W.C.).—Fridays, 6 p.m., November 7, 7 p.m., Club Room, 8 Duke Street.
Retford.—November 2, 3 p.m., Community Centre, Chapel Gate.
Worksop.—November 3, 7 p.m., King Edward Hotel.

REGION 5

- Chelmsford.**—November 4, 7.30 p.m., Marconi College, Arbour Lane.
Ipswich.—October 29, November 12, 7.30 p.m., T.A. Drill Hall, Woodbridge Road.

REGION 6

- Cheltenham (A.R.S. & R.S.G.B. Group).**—October 24, November 7, 21, 7.45 p.m., St. Mark's Community Centre, Brooklyn Road.
Gloucester.—Alternate Thursdays, 7.30 p.m., Spreadeagle Hotel.
North West Mills.—Fridays, 8 p.m., G3HXA, London Road Inn, Catne.
Petersfield & District.—October 30, 7.30 p.m., The Market Inn, The Square, Petersfield.
Portsmouth.—Tuesdays, 7.30 p.m., Signal Club Room, Royal Marine Barracks, Eastney.
Southampton.—November 1, 7.30 p.m., 22 Anglesey Road, Shirley.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.
Swindon.—November 15, 7.30 p.m., Connaught Rooms (off Regent Street).

REGION 7

- Balham.**—October 15, 7.30 p.m., Alexandra Hotel, Clapham Common, South Side, S.W.4.
Barnes & Richmond.—November 11, 7.30 p.m., 308 Upper Richmond Road, East Sheen.
Bexleyheath (N.K.R.S.).—Second and fourth Thursdays, 7.30 p.m., Congregational Hall, Clock Tower.
Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, W.4.
Bromley, Kent (N.W.K.A.R.S.).—First Friday, 7.45 p.m., The Shortlands Tavern, Station Road, Shortlands.
Dulwich & New Cross.—November 3, 7.45 p.m., Cliftonville Tavern, Ilderton Road, S.E.16.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.
East London District.—October 26, 3 p.m., Ilford Town Hall.
East Molesey (T.V.A.R.T.S.).—November 5, 8 p.m., Carnarvon Castle, Hampton Court.
Eltham & Sidcup.—October 20, November 3, 7.30 p.m., Holy Trinity Church Hall, Hurst Road, Sidcup.
Enfield.—October 19, November 16, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—October 21, November 18, 7.30 p.m., 164 Albion Road, Stoke Newington.
Grays.—Apply T.R., 68 Chestnut Avenue, Grays.
Guildford & Woking.—October 6, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Hayes & Uxbridge.—November 7, 7.30 p.m., The Vine, Uxbridge Road.
Hendon & Edgware (E. & D.R.S.).—October 22, 29, November 5, 12, 8 p.m., St. Martin's School, 22 Goodwin Avenue, Mill Hill.
Hoddesdon.—November 6, 8 p.m., Salisbury Arms.
Holloway (Grafton R.S.).—Mondays, Wednesdays, Fridays, 7.30 p.m., Grafton School, Eburne Road, N.7.
Ilford.—October 16, 23, 30, 5.79 High Road, Ilford.
Kensington & Shepherd's Bush.—November 14, 8 p.m., Basement Flat, 38 Royal Crescent, W.11.
Kingston (K.D.A.R.S.).—October 22, November 5, 19, 7.45 p.m., Penrhyn House, 5 Penrhyn Road.
Norwood.—October 18 and every third Saturday, 7.30 p.m., "Windermere House," Westow Street, Crystal Palace, S.E.19.
Purley (P.D.R.C.).—October 23, 7.30 p.m., Railway Hotel, Purley.
Reigate (E.S.R.C.).—October 30, 7.45 p.m., 19 London Road, Reigate.
Slough.—October 16, 7.45 p.m., and every third Thursday, Golden Eagle, High Street, Slough.
Southgate.—November 13, 7.30 p.m., Arnos Grove Secondary Modern School, Wilmer Way, New Southgate.
Sutton & Cheam.—October 21, November 18, 7.30 p.m., The Harrow, Cheam Village.
Uxbridge.—November 7, 8 p.m., Vine Hotel, Hillingdon, Middlesex.
Watford.—October 21, 7.30 p.m., Cookery Nook, High Street.
Welwyn.—November 4, 8 p.m., Mass Meeting of Hertfordshire & Bedfordshire Societies, Council Offices, Welwyn Garden City.

REGION 8

- Brighton (B.D.R.C.).**—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road. (E.B.S.W.C.).—Thursdays, 7.30 p.m., 27 Warren Avenue, Woodingdean.
Chatham (M.A.R.T.S.).—Mondays, 7.30 p.m., Co-operative Hall, Luton Road.
Hastings (B. & H.R.C.).—October 21, November 4, Saxons Cafe Sea Front.
Gillingham (G.T.S.).—Alternate Tuesdays, 7.30 p.m., Medway Technical Institute.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., George Hotel, Hawley Street, Margate.

REGION 9

- Bath.**—October 20, November 17, 7 p.m., Y.M.C.A., Broad Street.

(Continued on page 163.)

R · S · G · B ·

BULLETIN

Volume 28 No. 4

October, 1952

Current Comment . . .

V.H.F.: Advance—and Retreat

ONLY a few months ago, in commenting on this page upon the release of the 21 Mc/s band, we mentioned that the concession came to British amateurs largely as the result of the close and excellent relationship existing between the licensing authorities and this Society's G.P.O. Liaison Committee.

Once again another "successful conclusion" comes to be reported in the granting by the G.P.O. of permission to 420 Mc/s operators to use 150 watts input. For this concession—casting overboard the restrictive 25 watt limit—v.h.f. operators have to thank both the G.P.O., and the Liaison Committee, each of whom had to put in a great deal of hard thinking before the power increase on this shared band could become effective.

* * *

Higher power on 70 centimetres offers a challenge to v.h.f. specialists in the design of equipment, for there are few valves that will stand even the 25 watts input that was permitted hitherto and fewer still that will take 150. But the whole history of amateur activity in the 420 Mc/s allocation is one of steady advance, and problems such as this will, in retrospect, appear less formidable than they seem at the moment.

The 420 Mc/s band is a peculiarly transitional one between metre wavelengths and "pure" centimetre waves. It does rather less well what 145 Mc/s will do, and many operators feel that the effort to construct "semi-centimetre" equipment might be better concentrated on going "wholly centimetric" while they are about it. Against this, of course, it can be argued that 70 centimetres is useful training ground for the still higher frequencies; and, anyway, many people who do not want to go even more centimetric will still like to operate on what is an admirable point-to-point, noise-free radio-telephone band.

For all 70 centimetre operators, whatever their inclinations, the 150 watt concession represents a useful advance.

* * *

So much for the advance. Now for the retreat—and it is on our lower v.h.f. allocation that this

retreat is taking place. It is a retreat from the band edges, and more particularly from the h.f. end. The few operators who used the 2 metre band extremities now tend to congregate in the centre because other operators do not tune their receivers that far out. They can hardly be blamed. Few things are more exasperating than to put out calls that persistently evoke no response.

Two other considerations are important in this connection.

First of all, there is a tendency among a few dozen 2 metre operators to segregate themselves into limited frequency zones, the idea being that other operators elsewhere in the country will know where to look for them—all very well when the band is open but valueless when it exhibits its usual optical-range character (which it does for most of the year). Result: much mutual interference from stations wishing to "work local" and silence in the rest of this very wide band.

Secondly, arising largely from the foregoing condition, any tendency on the part of amateurs not to fill out the frequencies they have will suggest that they do not really need those frequencies. And if they do not others do. For even on v.h.f. a "wavelength shortage" exists just as there does, more acutely, on the h.f. and broadcast bands.

It is folly indeed not to show full occupancy of the frequencies available to us and to huddle like sheep in small portions of the 2 metre band. Those who do not have crystals that multiply into the h.f. section of the 144-146 Mc/s allocation are recommended to buy some; and those who do not search to the full limits are equally recommended to start doing so. Then perhaps we shall be able to claim with some truth that we are using the band to maximum effectiveness.—J.H.

THE 21 Mc/s BAND

The remaining portion of the new 21 Mc/s band was released to U.K. amateurs as from midnight, October 9-10, 1952, for telegraphy operation only. The Society is pressing the G.P.O. to permit telephony operation in this band.

APPARATUS FOR D/F CONTESTS

By G. T. PECK (B.R.S. 15402)*

One of the most recent additions to the R.S.G.B. Contests Diary has been the series of D/F Field Days which, in the last year or two, have gained nation-wide popularity. In this article, Mr. G. T. Peck (winner of the 1951 National Final) outlines the basic principles of direction-finding, and describes portable equipment suitable for use in D/F events.

DIRECTION-FINDING contests are by no means new. As far as can be ascertained, the first event of this nature—held under almost identical rules to those now in force—took place on June 3, 1928, under the joint organisation of the Slade Radio Society and the Sutton Coldfield and Birmingham Auto Club. On that occasion the wavelength used was 200 metres, and the winner took no less than 3 hours 40 minutes to locate the hidden transmitter. Regular D/F contests are now held during the summer months in districts as far apart as Birmingham, Peterborough, Southend and Oxford. Some enthusiastic societies even run tests during the winter, or throughout the night, and in addition to the R.S.G.B. Trophy awarded to the winner of the National Final, a number of challenge cups have been donated to various societies for local contests.

The primary object of these events is to locate, and actually reach, the site of a concealed transmitter operating for short periods in the 1.7 Mc/s band. The only essential information given in advance (apart from the call sign and the operating frequency) is that the transmitter site will not be on private property and that the location will be not more than ten miles from the starting point. For those who have yet to participate, it can be said that the thrill of finding a hidden transmitter in a wide expanse of unknown country within an hour of leaving the start is a never-to-be-forgotten experience. Advantage is usually taken of natural obstacles to make the location difficult to find but, as an example of what can be achieved, in the 1951 Final the transmitter was "run to earth" within 46 minutes of leaving the starting point, during which time it was on the air for only nine minutes.

For various reasons, the tests take place almost entirely in the 1.7 Mc/s band, and as the transmitter may be—but more usually is not—accessible by vehicle, and as only one receiver is permitted in each party, it follows that the apparatus must be readily portable and operated from self-contained batteries. Since, in the later stages of an event, it may be necessary to cover some distance on foot, small physical size and light weight are essential, provided that other desirable features—and particularly absolute reliability—have not been sacrificed.

The method of operation is to obtain a compass bearing of the direction from which the signals appear to be originating, to plot this on a large-scale map of the district, and then to move a distance of several miles—preferably nearly at right-angles to the indicated direction—and so to obtain another bearing which should intercept the first at a point adjacent to the location of the transmitter. This procedure is repeated at decreasing ranges until the location is actually discovered, but, in practice, this often proves less easy than it sounds, as the transmitter and oper-



The author operating his receiver during the recent Romford Nocturnal D/F Contest.

ating crew are usually so well concealed that they are invisible at a distance of a few yards.

Frame Aerial

The only form of aerial with marked directional properties at frequencies around 1.7 Mc/s is the familiar loop or frame, similar to that used in most commercial portable receivers. This will give a "figure of 8" polar diagram, with two points of maximum pick-up when the plane of the aerial is directly in line with the transmitter, and two points of minimum pick-up when it is rotated through 90 degrees. Since it is much easier to estimate small changes in a weak signal than in a strong one, bearings are almost invariably taken on the aerial position giving minimum signal instead of the maximum; 90 degrees being added to the compass reading to achieve the correct direction. It will obviously be desirable to determine in which of the two possible directions the transmitter is situated, and the ambiguity can be resolved by using a short vertical aerial inductively coupled to the receiver r.f. circuits in such a way that in one maximum signal position of the frame, the voltages derived from it and the vertical aerial are in phase, and additive, but when the frame is rotated through 180 degrees the voltages are in opposition and approximately cancel each other. The positive direction of the frame is ascertained in the first instance by taking a bearing on a known station; the direction of maximum signal will then hold for any other station. It should be noted that the vertical aerial is only switched in to resolve the ambiguity and determine "sense." In order to obtain the greatest accuracy, bearings are always taken with the frame alone.

Unfortunately, the minimum pick-up position of a simple frame aerial is only accurate under ideal conditions and when the frame is in electrical balance to earth. Unless this is so, the unbalance results in small voltages being developed by the difference in the capacitance currents to earth

* C/o Ernest Turner Electrical Instruments, Ltd., Chiltern Works, Totteridge Avenue, High Wycombe, Bucks.

from one side or the other of the frame, and while this does not materially affect the position of maximum pick-up, it results in lack of definition, or even displacement of the minimum position. There are a number of ways in which this can be overcome: the unbalanced capacities illustrated in Fig. 1a can be compensated by means of a differential condenser (Fig. 1b), or the frame can be completely screened with copper foil or used in conjunction with a similarly screened input transformer (Fig. 1c). In order to avoid a short-circuited turn effect, the screening in both cases should not be electrically continuous, but should include a gap where the screen material overlaps but is insulated from itself to represent a Faraday screen.

Probably one of the most simple and satisfactory methods of providing an input circuit symmetrical to earth under all conditions is to use two screened-grid valves in push-pull (Fig. 1d). Although this necessitates the use of an additional valve, which makes no contribution to effective gain, the simplicity, permanence, and absence of adjustment in this arrangement justifies the small additional current consumption—although any of the methods previously mentioned can be satisfactorily employed. The actual shape and construction of the frame aerial is not of great importance, and whether it is of square or circular form will make no appreciable difference. The size will, of course, largely be determined by the size of the receiving apparatus, which will probably be constructed to fit inside the frame itself, since a separate or external frame will represent one more piece of apparatus to carry without providing any particular advantage. The number of turns of wire will depend to some extent upon the size, but can readily be found by test as the frame winding should tune to the desired frequency with comparatively small capacity; as a guide 5+5 turns on a frame size of 8 in. by 10 in., tuned by a maximum capacity of 100 μ F., should prove satisfactory for 1.7 Mc/s band operation.

To avoid swamping the receiver when very close to the transmitter, it is convenient to connect a number of resistive shunts across each half of the aerial, so maintaining the balance. The resistors should be selected by experiment, but, as a guide, values of 100 ohms and 10 ohms will attenuate the signal to the point where it is only audible at a distance of about one mile and 100 yards respectively, and when in circuit will not appreciably impair the directional properties of the aerial at the short range at which they will be inserted. An additional advantage is that (particularly when the lowest resistance shunt is in use) a movement of only a few yards directly towards or away from the hidden transmitter is immediately apparent in terms of signal strength.

A convenient method of

introducing the "sense" voltage, derived from the vertical aerial, is to use a separate untuned buffer valve with the vertical aerial connected to the grid, and a small coupling coil in the anode circuit consisting of two or three turns around and spaced slightly from the frame aerial. By this means the vertical aerial is isolated from the other circuits of the receiver, but the sense still remains operative even when the attenuating shunts mentioned previously are in use at close range; adjustment of the screen potential (or even the filament voltage) of the buffer valve enables the input from the vertical aerial to be adjusted to equal approximately the voltage derived from the frame aerial.

Receivers

So far little has been said about the receiver itself, but those features which differ materially from normal practice have been dealt with at some length; other features are quite conventional and wide variations of circuit arrangement and construction can be successfully employed. Both straight and super-heterodyne receivers have been used with equal success, the choice between the two being mainly one of individual preference. The former is, perhaps, easier to construct, and its requirements in terms of h.t. and l.t. are moderate, but it may need more precise adjustment; the super-heterodyne, on the other hand, will have no critical adjustments, but will certainly require generous batteries, and will tend to more background noise which may make a very faint signal more difficult to detect. In either case, great sensitivity is unnecessary and in certain circumstances can be a distinct disadvantage. Some form of local oscillator is, however, essential as it is more usual to work entirely on the carrier, and, apart from identification purposes, to disregard the modulation. For the straight receiver,

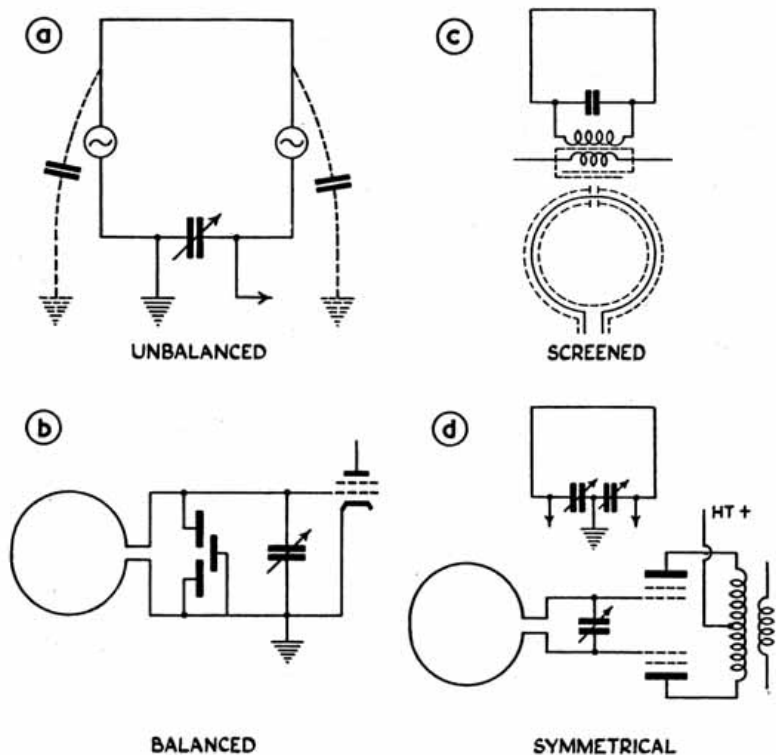


Fig. 1. Types of D/F loop; (a) unbalanced; (b) balanced; (c) screened; (d) symmetrical.

therefore, a regenerative detector is preferable; if a super-heterodyne is employed it will be necessary to use regenerative i.f.'s or to provide some form of b.f.o. Circuit arrangements for both types are given in Figs. 2 and 3.

There are no critical features in construction, and the lay-out can be adapted to make use of almost any available components. The type of valve employed is also not critical, but experience has shown the miniature battery valves on B7G bases to be preferable to the earlier ones with octal bases because of the reduced microphony. It is important that construction should be robust, and that batteries should be secured or wedged firmly in position, as it may often be necessary to carry the apparatus through thick undergrowth, or over obstacles, when occasional rough treatment cannot be avoided; under these conditions light weight and small size are of the utmost value.

Since the frequency of the transmitter is known in advance, it is a great help before a test to be able to set-up the receiver accurately on the desired frequency, providing only a tuning control of limited range to compensate for last minute variations. Any normal band-spread method is applicable, enabling vulnerable controls to be removed from the exterior of the apparatus. The provision of pre-set tuning of high stability greatly reduces the time taken in identification of the transmitter, both at the start and on subsequent transmissions. It is only necessary to provide for external variation of the regenerative detector (or oscillator circuit) by some 10 or 20 kc/s; other circuits are not critical enough to necessitate any means of adjustment during an event.

Compass

As the bearings indicated by the receiver are interpreted in terms of their relation to Magnetic North, it is usual to mount some form of compass permanently on the receiver. Several ingenious methods have been devised for mounting ex-service compasses and map boards in such a way that the magnetic deviation from True North is automatically compensated for as the bearing is read and drawn on the map. It should be remembered, however, that the presence in the receiver of any iron or magnetic mass such as a loudspeaker, moving coil meter, or iron-cored transformer of considerable size can be fatal to accurate bearings, unless the compass is mounted on an extension arm to remove it from the unwanted field. In practice, such a method is most inconvenient, and it is preferable to avoid the inclusion of any magnetic material in the equipment—not forgetting that the headphones themselves should be taken right away from the vicinity of the compass when bearings are being read off.

Operation

Some consideration should be given, particularly at the start, to the selection of the best location from which to operate; in general, this should be as far as possible from large metallic bodies (e.g. fences, water pipes or metal poles) and away from telegraph wires and overhead or underground electric power cables. At the start, also, it may be found that the receivers used by some of the competitors are radiating; for this reason it is advisable to keep at least 20 yards away from such a source of interference. The receiver is

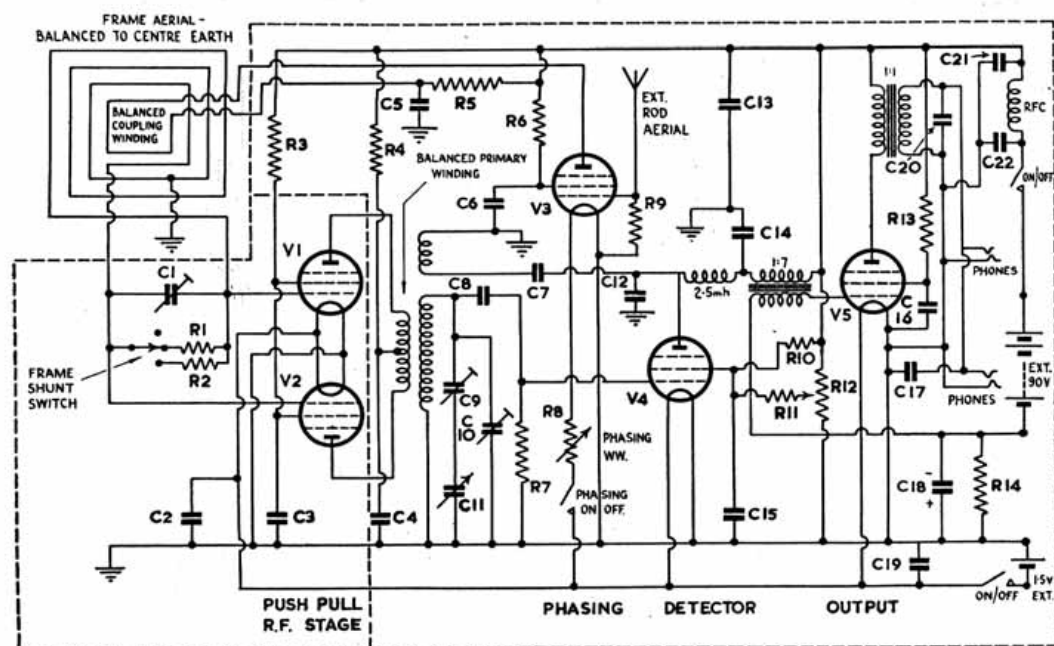


Fig. 2. Circuit of simple straight receiver for direction-finding.

C1, 7, 8, 9, 10, 12. 100 μ F.
 C2, 14, 17, 21. 500 μ F.
 C3, 4, 5, 6, 19, 20, 22. 0.01 μ F.
 C11. 75 μ F.
 C13, 15. 5 μ F, 100 V wkg.
 C16. 0.1 μ F.
 C18. 12 μ F.

R1. 330 ohms.
 R2. 82 ohms.
 R3. 5,000 ohms.
 R4. 2,000 ohms.
 R5. 3,000 ohms.
 R6. 15,000 ohms.
 R7, 9. 1 megohm.
 R8. 50 ohms, wirewound variable.

R10. 220,000 ohms.
 R11. 22,000 ohms.
 R12. 250,000 ohms pot'r.
 R13. 50,000 ohms.
 R14. 1,000 ohms.
 V1, 2, 3, 4. 1T4.
 V5. 154.

usually fixed on some form of turn-table to enable it to be smoothly rotated, and it may be more convenient to do this if a small stand or tripod is used. Although the point has been investigated with some care, no noticeable difference in the accuracy of bearings taken with the receiver actually on or several feet above the ground has been found; this may not be the case, however, if buried cables are present.

Success in D/F contests is fundamentally a question of time; every wasted minute is a minute lost, and by careful planning and forethought a great deal of time can be saved and put to valuable use instead of being spent in indecision or roadside contemplation. Every member of the party should have a clear understanding of his or her particular job—whether it be as driver, operator, navigator, or merely spectator, and a certain amount of advance preparation will avoid many misunderstandings.

During the early stages of a contest, when the transmitter is operating at fixed times, bearings should be obtained away from the car in order to avoid the introduction of undesirable effects, but in the later stages, when the transmitter is operated erratically for short periods, it is a great advantage to be able to listen for the carrier while the car is in motion. Simple ignition suppression may then prove an advantage, and in some saloon cars it may be necessary to provide a small aerial outside the car body which can be temporarily connected to the receiver inside, either by direct connection or by means of an inductive loop.

At first, four or five carefully plotted bearings may be necessary to get within a quarter mile of

the transmitter, but as experience is gained three or in some cases even two may suffice. After retaining the use of the car for as long as possible, the last few hundred yards may have to be covered on foot. The decision as to when to leave the car is of some importance, because the moment one proceeds on foot progress becomes comparatively slow, and, if the distance is considerable, several more transmissions may go by before one gets really close. It is during these last few hundred yards that the use of the aerial shunts previously described can be of such value; when a competitor is really close at hand, the transmitter crew are probably aware of his presence, and are likely to do all they can to mislead him by closing down at inconvenient moments, or by coming on the air again when they think he is well out of the immediate vicinity. At close range, therefore, it is usually unwise to move any appreciable distance in between transmissions. Searching—even of a comparatively small area—is nearly always fruitless and should never be carried out unless the actual spot from which the last favourable indication was obtained can be pin-pointed and returned to for the next transmission.

Golden Rules

In conclusion, two golden rules can be applied: persevere right up to the last moment—never forgetting that, whatever difficulties you may be in, others may be as badly off; and never think you know better than the receiver—if unexpected indications or bearings are obtained check the results carefully, and, if confirmed, proceed in the conviction that they are right.

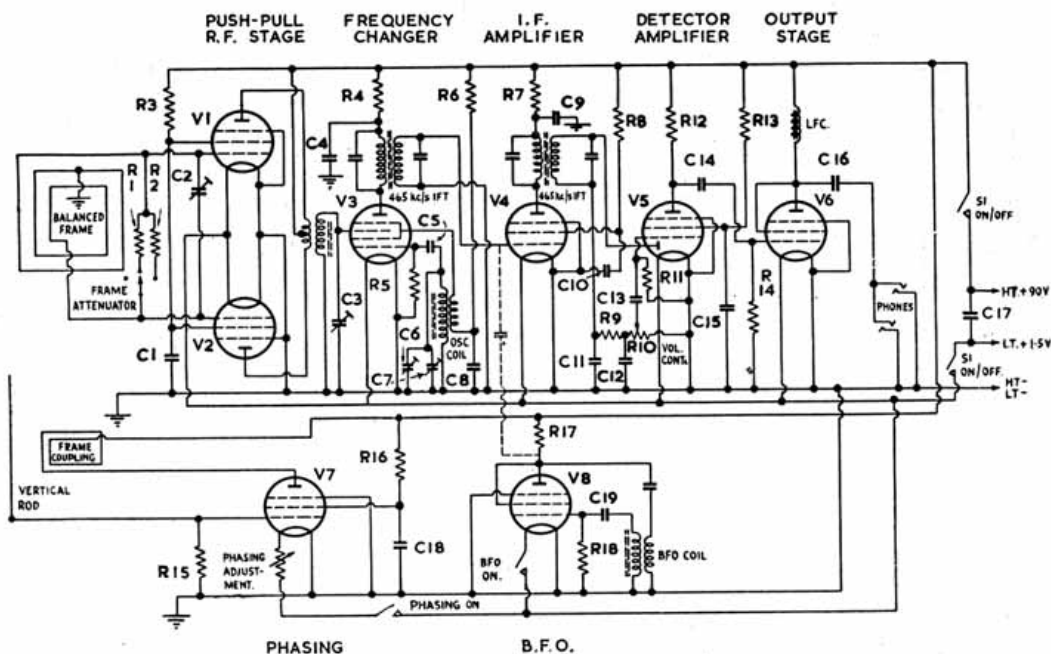


Fig. 3. Circuit of superheterodyne direction-finding receiver.

- C1, 4, 8, 9, 10, 13, 14, 18. 0.01 μ F.
- C2, 3. 50 μ F.
- C5, 11, 12, 19. 100 μ F.
- C6. 20 μ F.
- C7. 75 μ F.
- C15, 16. 0.1 μ F.
- C17. 2 μ F.
- C20. 500 μ F.

- R1. 100 ohms.
- R2. 10 ohms.
- R3. 20,000 ohms.
- R4. 7, 1,000 ohms.
- R5, 17, 18. 100,000 ohms.
- R6. 15,000 ohms.
- R8, 16. 33,000 ohms.
- R9. 50,000 ohms.

- R10. 500,000 ohms.
- R11. 10 megohms.
- R12, 15. 1 megohm.
- R13. 3 megohms.
- R14. 2 megohms.
- V1, 2, 4, 6, 7, 8. 1T4.
- V3. 1R5.
- V5. 155.

QRP with the Wilcox-Gay Master Oscillator

By J. St. C. T. RUDDOCK, B.A., A.M.I.E.E. (G8TS)*

The value of the Wilcox-Gay master oscillator, Type M1-19467-A, as a v.f.o. driver unit has been endorsed by many amateurs on and off the air. In this article the author describes how the oscillator may be modified to form a practical three-band low-power transmitter for the QRP enthusiast.

BASICALLY, the Wilcox-Gay master oscillator which is to be described in this article consists of an 807 valve in an electron-coupled oscillator circuit. The valve is mounted in an inverted position through a hole in the main chassis, which is itself secured to the centre of the front panel. The various components forming the oscillatory circuit are on the top half of the chassis, while those forming the output circuit, tuned to twice the oscillator frequency, are located on the lower half.

Mechanically the unit is very robust, No. 14 s.w.g. steel being used throughout. The front panel and chassis assembly slides in and out of the case along runners, two spigots being included for alignment purposes. The edges of the front panel are turned-over to engage with similar surfaces on the case, four captive screws holding panel and case securely together. An 8-way Jones plug protruding from the rear enables the various supplies to be connected.

Mounted upon the front panel are the main

* "Stoneyford," 80 Byworth Estate, Farnham, Surrey.

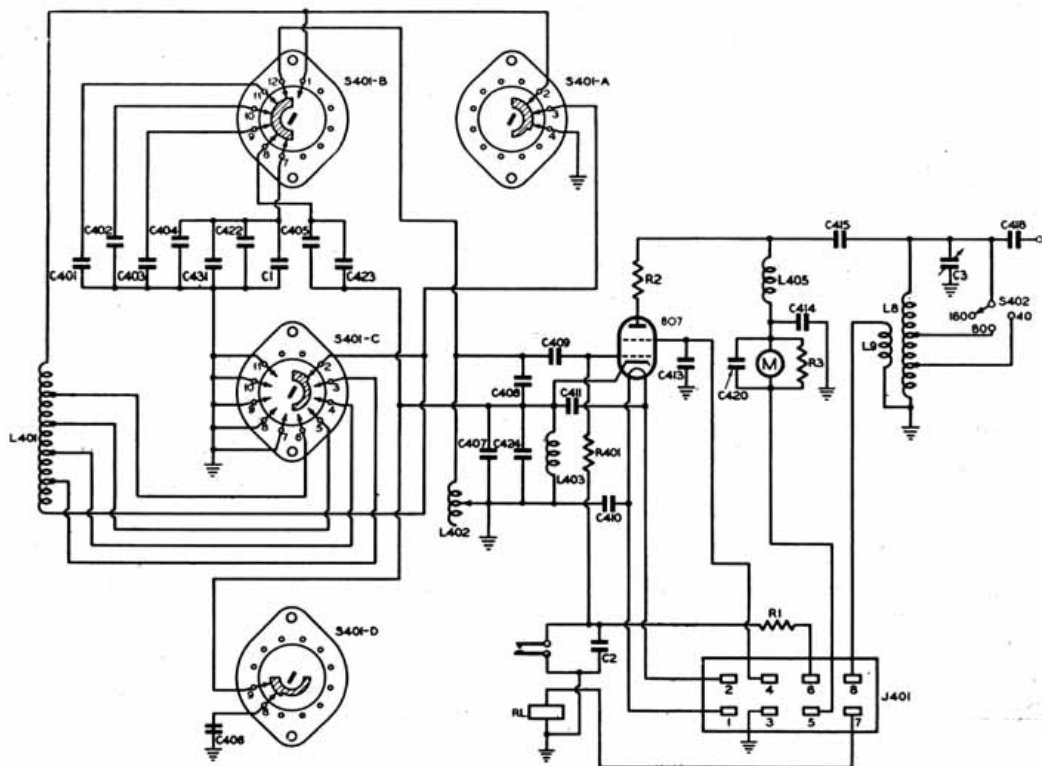


Fig. 1. Circuit of the modified Wilcox-Gay Master Oscillator.

Original circuit components

C401, 30 μF . C402, 60 μF . C403, 70 μF .
 C404, 406, 421, 240 μF .
 C405, 409, 418, 423, 100 μF .
 C407, 424, 170 μF .
 C408, 120 μF .
 C410, 412, 413, 414, 420, 0.01 μF .
 C411, 560 μF .
 C415, 47 μF .
 R401, 100,000 ohms, 3 W.
 S401a, b, c, d, 4-bank 6-position switch
 S402, 3-position switch.
 L401, Tapped oscillator coil.
 L403, 405, r.f. chokes.
 M, 0-10 mA meter.

Components added in modification

C1, 150 μF .
 C2, 0.01 μF .
 C3, 10-160 μF , variable (Eddystone type 1131).
 R1, 220,000 ohms $\frac{1}{2}$ W.
 R2, 33 ohms $\frac{1}{2}$ W.
 R3, 50 mA meter shunt.
 RL, Relay (24 V single-make Siemens).
 L8, 34 turns 18 s.w.g. enam. wire close-wound on 2in diam. ceramic or paxolin former 4in long, tapped at 6 and 14 turns.
 L9, 3 turns p.v.c.-covered wire wound over L8, one turn per section.

transformer having 275-0-275V 80mA, 6.3V and 5V windings being used (Fig. 2). For the grid-bias supply, a portion of the h.t. voltage is rectified by a metal rectifier and smoothed by two $2\mu\text{F}$ condensers (C6 and C7), and a 20,000-ohm resistor (R8).

The alternative screen-grid voltages for the 807 valve are provided by two Mullard type 7475 low-current stabilising valves wired in series and connected to the h.t. positive line via a 33,000-ohm 5W resistor (R7). Switch S2 selects either the 90V or 180V supply for "low" or "high" power working respectively. No 24V supply for energising the relay was included in the original design, as this was already available externally.

Connection between the master oscillator and the power unit is via a six-core cableform, the oscillator end being fitted with an 8-pin Jones socket to match the plug on the chassis.

Aerial Tuning Unit

The r.f. oscillatory output is transferred from the m.o. to the aerial tuning unit by a length of 80-ohm coaxial cable terminated with a plug (the corresponding socket being mounted on the rear of the box). As shown in Fig. 2, the inductance L10 is series-tuned on 1.8 Mc/s, and parallel-tuned on 3.5 Mc/s and 7 Mc/s. The necessary change-over is effected by the band-selector switch (S3).

To assist tuning when voltage-feeding the aerial, a 6V $\frac{1}{4}\text{W}$ bulb, fed from a single loosely-coupled turn (L12) on the coil, is included. The various components were built into a brass box approximately $4\frac{1}{2}$ in. high by 3 in. wide by 5 in. deep.

Installation and Operation

The aerial tuning unit can be situated at some distance from the m.o. (e.g. near to the aerial lead-in), but at the writer's station it was found more convenient to extend the aerial so that its tuning was more easily under control.

A warming-up period of some 10-15 minutes is normally sufficient to allow the oscillator to settle down. The location of the three bands on oscillator switch positions 1 and 4 should not prove difficult; typical scale figures on the prototype were:

Freq. kc/s	Oscillator switch pos'n	Oscillator tuning	Multiplier switch pos'n
1750	1	272	1
2000	1	958	1
3500	1	2548.5	2
3800	1	2679.5	2
7000	4	1781	3
7300	4	1950	3

Each band should be calibrated with the aid of an accurate frequency meter. Since the oscillator on band 1 operates at half-frequency (i.e. between 850 and 1950 kc/s), check points are afforded by beating the output with B.B.C. and other known signals operating in that portion of the medium-wave band.

With the screen-grid voltage selector switch set to "high power," tuning the multiplier condenser should cause the meter to dip, the amount of dip being more pronounced on the 1.8 Mc/s and 3.5 Mc/s bands. Tuning of the aerial tuning unit follows normal practice. Using a 136 ft. long-wire aerial and low-resistance earth, an aerial current reading of 0.15A for an input power of about 8 watts was obtained on 1.8 Mc/s, dropping

to 0.085A on 3.5 Mc/s. Tuning on the 7 Mc/s band is more critical, and the 6V lamp proves a useful indicator.

The addition of an aerial change-over relay, wired in parallel with that in the m.o., permits break-in operation. When switching from "high" to "low" power on the 3.5 Mc/s band, a change in note of less than 100 c/s was reported.

Although it has been in use for only a short period, the equipment has adequately demonstrated what can still be accomplished using low power and a good radiating installation. Frequency stability and ease in changing from band to band, not to mention freedom from T.V.I. complaints, have proved the merits of this modified Wilcox-Gay master oscillator.

Identify Yourself on the Road
by Flying a
R.S.G.B. PENNANT

Large size 6/6; small size 5/6
(postage 3d. extra)

Presentation to Miss Lightfoot

DURING the course of the September Council Meeting, Miss Hazel Lightfoot received the congratulations of the President on her forthcoming marriage. Mr. Charman thanked her for her past services to the Society and on behalf of those who had subscribed, presented her with a canteen of cutlery. Members of the Council individually offered her their congratulations. Miss Lightfoot (now Mrs. Bryan Harris) thanked the President and his colleagues for their generous gift. (Mrs. Harris also wishes to thank those members not on the Council who subscribed to her wedding present.—Ed.)

The Radar Association

THE Autumn Dance of the Radar Association will be held at the Royal Hotel, Woburn Place, London, W.C.1, on Friday, November 14th, 1952 at 7.30 p.m. Dress optional. The M.C. will be Phil Thorogood, G4DC.



During their recent visit to Copenhagen G6CJ and G6CL were met at Kastrup Aerodrome by a number of Danish and British amateurs, the latter on holiday in Denmark. In the group can be seen G3RQ, 2DUV, 3EIX, 3FIT, 3ATU, 6CJ, 5DV, OZ5GG and G6CL.

A Simple Electric Bug Key

By Lieut.-Cdr. (L) A. G. CHAMBERS, R.N., M.Brit.I.R.E. (G15NO)*

THE simple electric bug key described in this article, offers the advantages of an electronic key without the need for bulky valve or power supply, and can be built-up from the average junk box at a cost of £1 or less. The gadget measures $3\frac{1}{2} \times 6\frac{1}{2} \times 2\frac{1}{2}$ in. and could, if required, be made smaller. It is self-contained, and similar in operation to the American mechanical bug key.

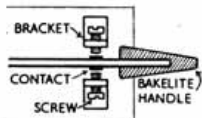
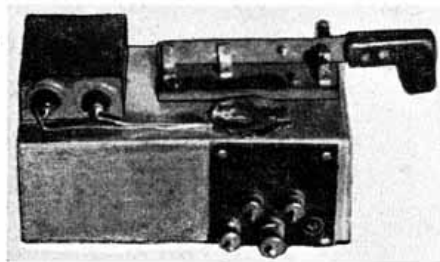


Fig. 1.
Construction and arrangement of dot and dash contacts on keying arm.

Construction

The side swiper-arm is made from two pieces of 1/32-in. phosphor-bronze strip held firm by two angle-brackets. Two heavy duty contacts are mounted on either side of the arm, just in front of the handle, which is made of bakelite. The adjustable dot and dash contacts consist of No. 4 B.A. brass screws tapped through the uprights of two small brackets on either side of the swiper-arm, as illustrated in Fig. 1.



Top view of unit showing the key and the 2 μF. condenser C.

Four terminals are mounted on an insulated panel on one side of the metal case supporting the mechanism, two for mains input, and two for the keying line. [It is recommended that the terminals carrying the mains supply be protected by some form of covering.—ED.]

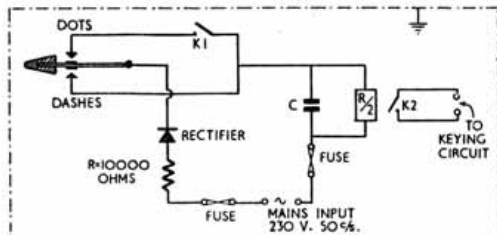


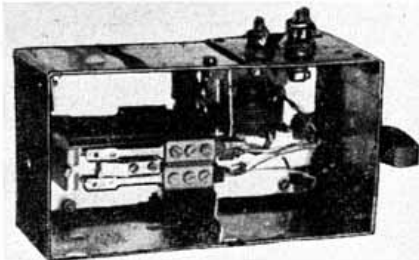
Fig. 2.
Circuit diagram of the simple electric key.

R/2 (Fig. 2) is a 10,000 ohm Post Office relay with one contact made, the other broken. Any other relay with similar contacts can, of course, be used, but this one was chosen by the writer for its low current consumption, so that a small rectifier could be used. A 10,000 ohm resistor is used to drop the rectified mains voltage to 100 V. As a

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precaution, two fuses are included in the circuit, and the case, which is made from 1/32 in. aluminium, is earthed.

Condenser C has a value of 2 μF., which gives a Morse speed of from 15 to 18 words per minute. Since the capacity governs the dot repetition rate, a range of speeds can be obtained if desired by including a number of condensers of various values selected by a rotary switch.



View of underside of chassis, showing position relay R/2 and metal rectifier.

Operation

When the arm of the key is pushed over to the "dot" position, current from the mains is rectified and passes through contact K1 (which is closed in its quiescent state), energising the relay and at the same time charging up condenser C. The relay now operates, breaking contact K1 and making K2 (the keying contact). The energising circuit to the relay is thus broken, but the return of the contacts to their original quiescent position is delayed by the condenser, which discharges through the resistance of the relay winding. This cycle of operation is repeated successively, the value of C governing the number of dots per minute. In the dash position of the swiper-arm, the contact K1 is short-circuited, and the relay remains energised as long as the position is maintained.

The key is operated in the usual way for automatic keys—dots being made by the pressure of the thumb on the handle of the swiper-arm, and dashes with the first finger. For left-handed people, it is an easy matter to reverse the contacts—an advantage of this gadget over the orthodox mechanical type.

Contact K2 is taken, via the external terminals on the case, to the normal keying position of the transmitter.

Side Slip

IN the article *The Measurement of Noise Factor in Receivers* published in the September, 1952, issue of the BULLETIN the following errors occurred:

Page 93: The formula $\frac{20 (I_2 - I_1) R}{1,000}$

should read: $\frac{20 (I_2 - 2I_1) R}{1,000}$

in each case and the last sentence on the same page should read ". . . and this voltage output can then be obtained from the receiver by increasing the noise-generator anode current by 6 mA. Thus $I_2 - 2I_1 = 3$ mA. . ."

FOURTH ANNUAL R.S.G.B. 420 Mc/s TESTS

ALTHOUGH more stations were active this year than last, the number of entries received was appreciably less than for previous events. The most likely cause of this paradox would seem to be that many operators found conditions unsuited for other than "line-of-sight" contacts and tended to lose interest in what, in many cases, proved to be a routine tour of the "locals" followed by fruitless efforts to "dig out" at least one signal marked by the rapid scintillation fading that so often denotes G-DX on this band.

The increasing complexity of most 420 Mc/s equipment led to a drastic reduction in portable operation (from almost 50 per cent. in 1949 to under 12 per cent. in 1952) and, in the absence of spectacular conditions, this trend results in the loss of those unexpected medium-distance contacts that contribute so much to the enjoyment of a u.h.f. event. The same tendency also appears to have led to a decline in 420 Mc/s activity on the part of those who, living in low-level fixed locations, do not feel that an occasional /P outing justifies the effort required in building the stabilised equipment that, today, has become almost a *sine qua non* of 420 Mc/s operation. This important question is referred to again later in this report.

Results

Lest these remarks should lead the non-u.h.f. reader to suppose that in normal conditions, such as those existing during this year's Tests, 420 Mc/s is only suited for across-town working, his attention should be drawn to such contacts as GW2ADZ—G8QY/P (80 m), G3APY/P—G8QY/P (77 m), G3APY/P—GW5MQ (75 m), GW2ADZ—G2OI (60 m), GW5MQ—G3A00 (52 m), and the two-way reception of signals between G2FKZ, G3FZL and GW2ADZ over distances exceeding 160 miles.

To such regular participants as G2FKZ, G2WS, G3PY, G3FZL (who have taken part in all Tests to-date), and G2QY, G5CD, G8QY and GW2ADZ must be welcomed a number of more recent 420 Mc/s recruits. These included G3GZM/P who finished his rig only in time to operate during the last few hours of the Tests—yet succeeded in having a 45-mile contact with G8QY/P from a 1400 ft. a.s.l. location; and G2AOK/A who had his first 420 Mc/s QSO during the day. G2OI, G2WJ, G3AYT and G3A00 also submitted their first "Tests" logs.

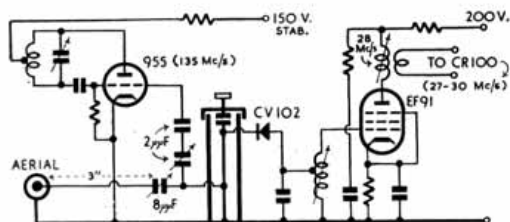


Fig. 1. The simple but effective type of 420 Mc/s converter used by G3A00. The local oscillator, operating at 135 Mc/s, does not require a frequency multiplier stage. The performance of this type of converter can be improved by the addition of a pre-amplifier using, for example, the 12AT7 valve.

Receivers

Though, inevitably, a number of the more elaborate receivers and converters developed in earlier years remain substantially unaltered, there is plenty of evidence of continued experiment; this is particularly true of work on simple but efficient converters and r.f. stages using "normal" types of valves such as the 12AT7.

Since it is believed that many would-be u.h.f. enthusiasts are still handicapped by a lack of knowledge on what the other man is doing on the band, Appendix A—somewhat more extensive than is usual in such reports—has been prepared of the receivers used in the Tests.

Transmitters

Transmitters in their design follow the general trend noticed last year; all were stabilised and the percentage of straight amplifiers in the final stage continues to increase. Power output available at the transmitter (though, of course, not necessarily all appearing in the aerial!) includes 6-7 watts from an 832 p.a. at G3GZM, 3 watts from a CV53 in a modified 105 unit at G2WJ,

ARTHUR WATTS TROPHY

AFTER examination of the entries submitted for the 1952 R.S.G.B. 420 Mc/s Tests, the Contests Committee has recommended to Council that the Arthur Watts Trophy be awarded jointly to G2FKZ, G3FZL and GW2ADZ, and has also recommended that Certificates of Merit be awarded to G3APY and G8QY.

16 watts from an ME1003 p.a. (25 W input) at G2FKZ, 8 watts from the double disc-seal triode, type 3B401/J, in a power doubler (24 W input) at G3FZL, and approximately 10 watts from a similar valve at GW2ADZ working into a special coaxial cavity arrangement designed by G4LU. '2ADZ comments on the fortitude of his 832 driver stage which has run "cool" at 50 watts input without a single replacement in 18 months!

Five-stages seems to be about the minimum required, at the present stage of development, to reach 420 Mc/s from standard types of crystals: '2FKZ, on the other hand, who has no less than three stages running on 216 Mc/s, uses altogether eight stages including a penultimate doubler stage consisting of four CV53s.

Aerials

A trend towards the multi-element stacked array is evident this year, particularly for fixed stations where the larger "catchment" area of the stack more than compensates for the difficulties of phasing and erecting. For portable work, however, the Yagi—despite its sharper horizontal lobe—is still favoured by such veteran operators on the band as G3APY. A wire-netting reflector was in use at G2WJ, who had an 8-element stack 40 ft. above ground. GW2ADZ has 16 elements of 1/2-in. copper rod stacked in pairs a half-wave apart, 30 ft. high; this, it is claimed, gives an exceptionally broad beam. Both these arrays

—and a number of the other less ambitious efforts — incorporate “balun” matching transformers.

An exceptionally interesting innovation this year was the first helical beam to be used during the Tests—a six-turn arrangement (right-hand helix) and ground plane, 40 ft. high, fed by 132-ohm co-axial feeder, erected only a short time before by G5CD. During the event a number of experiments were carried out with this array, part of the time also being spent trying various methods of matching the feeder to the transmitter and to the alternative push-pull and single-ended pre-amplifiers. The results may be summarised as follows: (a) The directivity of the beam is of the same order as that of a 6-element Yagi. It appears, however, to have a less well-defined maximum and sharper cut-off at the sides of the lobe; (b) When a Yagi array is used to receive signals from a helical array, the directivity of the Yagi is unchanged; however, when the signals are received on a multi-element curtain the directivity of the curtain is, to some extent, vitiated. 'CD suggests that may be because the curtain picks up some vertically polarised signal which is not directional on the circular polarised wave radiated by the helical beam.

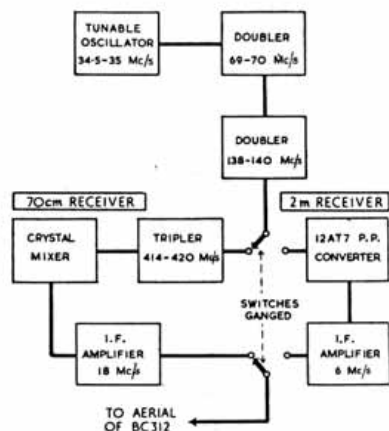


Fig. 2. Block schematic of G3GZM's 420 Mc/s and 144 Mc/s converter, designed so that similar dial readings are obtained on both bands for stations tripling from their 144 Mc/s frequencies. The crystal mixer includes home-made co-axial lines, and both i.f. amplifiers used 6AK5 valves.

Propagation

The most impressive observations on u.h.f. propagation this year are contained in the comprehensive reports submitted as a combined entry by G2FKZ, G3FZL and GW2ADZ. These stations have continued their investigations into various aspects of the relationship between meteorological and u.h.f. and v.h.f. conditions, and in particular the possible connection between the anabatic and katabatic winds and what has been termed the “London effect.” While it would be beyond the scope of this report to attempt either to evaluate fully or to reproduce in detail the conclusions reached by this keen group of experimenters, it is hoped the following notes may indicate the trend of their investigations to-date:

Briefly, it is claimed that measurements of vapour pressure, provided these are made with apparatus well clear of the ground, give a good idea of the air mass present and, when compared with the general synoptic position, provide a good indication of possible super-refraction con-

ditions; furthermore, in certain conditions, a relatively sudden fall in vapour pressure will coincide with or immediately precede good propagational conditions on 420 Mc/s and usually also on 144 Mc/s. Attempts have been made throughout the past year to investigate the diurnal change of vapour pressure in relation to: (a) nocturnal cooling; (b) warm or cold air sectors; (c) polar or equatorial air mass origin; (d) warm or cold-fronted passage; and (e) subsidence or turbulence.

During the Tests, hourly transmissions were made by G2FKZ, G3FZL and GW2ADZ on a pre-arranged schedule from 2100-0000 and 0700-2200. '2ADZ's signals were heard in London by both '2FKZ and '3FZL at 2100 (21st), 2300 (21st), 1200 (22nd), 1300 (22nd) and 1400 (22nd); '2FKZ was heard by the GW at 2200 (21st) and 2000 (22nd) and '3FZL at 2000 (22nd). It is interesting to note that reports of a passage of a cold front over the London region at about noon on the Sunday were received from the Air Ministry and were also reflected on local instruments. The 1200/1400 B.S.T. reception of '2ADZ's signals was marked by very low signal strength and was subject to both scintillation and slow deep fading—simultaneous fades being recorded at both London stations despite their ½-mile separation and considerable difference in height, a factor that suggests that the signals from '2ADZ were following a comparatively simple path.

After the Tests, the vapour pressure dropped late on the Sunday evening and also on the Monday and Tuesday evenings: conditions on both 144 and 420 Mc/s (and also on the TV band) were well above normal from the Tuesday to Friday with GW2ADZ peaking to over S8 on 420 Mc/s. G2FKZ points out that by study of the vapour pressure movements, the Group had two days' warning of the imminence of favourable propagational conditions.

GW2ADZ also mentions that the rapid fading (or scintillation) is different from that found on any other band and “has to be heard to be believed.” This has led to the adoption of a special code-system to speed up the exchange of information.

To facilitate the comprehensive investigations being carried out by these stations, a contour map of the 165-mile path was drawn. It was also calculated that the effect of the curvature of the earth is to place a “hill” of over 3600 ft. midway between London and Llanymynech. The report also reminds us of the simple formula for calculating optical range:

$$\text{optical range} = 1.4 \sqrt{\text{height transmitting aerial}} + 1.4 \sqrt{\text{height receiving aerial}}$$

The normal effects of diffraction permit the 1.4 ($\sqrt{2}$) factor to be increased in each case to between 1.6 and 2 for the calculation of the radio range.

Some Suggestions and Conclusions

Suggestions put forward include the possibility of linking the event with a 2-metre contest and the confining of c.c. activity to within a much narrower band (432-433 Mc/s). Another point raised is whether most participants spend too much time listening and not enough transmitting.

The Tests have also thrown into prominence certain questions that will require most careful consideration by all u.h.f. enthusiasts and also, incidentally, by the Contests Committee next year.

420 Mc/s Tests, 1952—Results

Call	Location	Stns. Worked	Stns. Heard	Max.QSO Distance (miles)
G2OI	Eccles, Lancs. 67 ft. a.s.l.	8	1*	63
G2QY	Pinner, Middx.	10	2	40
G2FKZ	London, S.E.22 200 ft. a.s.l.	12	8	45
G2WJ	Nr. Dunmow, Essex	5	1	40
G2WS/P	Nr. Caterham, Surrey 650 ft. a.s.l.	6	—	25
G3A00	Denton, Nr. Manchester	8	—	52
G3APY/P	(i) Crich, Derbyshire (ii) Meryton Low, Staffs.	1	1	75
G3AYT	Hyde, Cheshire	9	1+1*	76
G3FZL	London, S.E.22 60 ft. a.s.l.	5	1+1*	44
G3GZM/P	Tenbury Wells, Worcs.	11	8	45
G5CD	London, N.W.11	1	1	45
G8QY/P	Ilmington Downs	4	4	16
GW2ADZ	Llanymynech	5	—	80
		2	3	80

* Harmonic of 2-metre station.

Also active: G2AOK/A, 2BRH, 2DD, 2JT, 2MV, 2NH, 2RD, 3DA, 3FP, 3HAZ, 5RD, 5RW, 5TP, 6DP, 6NF, 6RH, 6VX, 8KZ, 8SB, 8TL, GW5MQ.

There are, for example, very definite divergences of opinion regarding the fundamental aims and the most useful duration of the Tests. Those members who are primarily interested in propagation and advanced u.h.f. techniques would like to see the period—and the organisation of the Tests—considerably extended; on the other hand, those who view the Tests more simply as an unvalued opportunity to try out equipment during a period of concentrated activity would not be adverse to reducing their length.

The answers to these points are bound up in the central problem of the further development of the 420 Mc/s band. There are indeed disturbing signs—already commented upon by G2UJ—that a fair proportion of the members who, in the past, have given this band a reasonable trial, now reluctantly decide that the results up to the present do not justify the effort involved. After all, it is being said, why devote so much energy to what—judged purely by practical results over the past five years—appears to be on the whole just a slightly less attractive version of the more flexible and less “tricky” 144 Mc/s band?

Would it not be more advisable, these members urge, to “popularise” 420 Mc/s as an s.e.o. and super-regen (or easily-built converter) band for portable or “simple” gear—and for amateur television and other experimental techniques—leaving, say, a 1 Mc/s band for G-DX and propagation work. Such opinions may seem heretical to those who have done so much hard, pioneer work in developing u.h.f. apparatus to its present state of efficiency, but it must be admitted that throughout the history of Amateur Radio, the vast majority of its adherents have been attracted more by practical results than by abstract research, or even sheer “cussed” determination to better equipment, admirable though these qualities may be. Unless 420 Mc/s research can be spurred on by definite achievements or characteristics that could not be equalled with less trouble on 144 Mc/s, then it must be reluctantly concluded that the appeal of 420 Mc/s is likely to diminish rather than to increase.

Appendix “A”—Receivers

G2FKZ: CV88 (r.f.), CV102 (mixer), EF91 (32/36 Mc/s first i.f.), EF91 (2nd f.c.), 6J6 (l.o.), 2 x 6SK7 (1.6 Mc/s i.f. stages), 6J6 (b.f.o.), 6SQ7 (detector), 6J5 (output). The 400 Mc/s c.c. first injection signal from a 22.222 Mc/s crystal in a 6AM6 stage, 6AM6 (tripler), 6J6 (doubler), CV53 (tripler).

G2OI: 446A (r.f.), Valve diode mixer in concentric line, and c.c. injection. 30 Mc/s first i.f. fed into an S27.

G2QY: 3A/146J (optional r.f.). Push-pull CV103 crystal diode mixer, 6J6 (l.o.), 17 Mc/s first i.f. fed to a BC348.

G2WJ: 446A (r.f.) with coaxial lines (ex-ASB8), CS3A crystal mixer, c.c. injection through a 408 Mc/s coaxial filter (17 Mc/s crystal in a 6J6-6J6-6J6 unit), 6AK5 and 6J4 (grounded-grid) 24/30 Mc/s head amplifier into an AR88.

G2WS: Crystal valve mixer in a coaxial line. 6J6 l.o., 70-71 Mc/s), 6J6 tripler, 12 Mc/s first i.f. to main receiver.

G3A00: 4-wave coaxial input line with CV102 mixer. 955 (l.o. on 135 Mc/s), EF91 broadband head amplifier (27/30 Mc/s) to CR100. Although 3A00 has tried a number of different oscillator/injection arrangements, results with the simple circuit shown in Fig. 1 are as good as any yet tried.

G3APY: The quadruple superhet described in the 1951 report remains substantially unchanged for 420 Mc/s though it now incorporates an additional section for reception on 144 Mc/s.

G3AYT: 12AT7 (e.g.t.) with balun match to 80-ohm coax, CV101 cavity mixer, EF54 head amplifier (12 Mc/s) to modified BC454. The 12AT7 r.f. stage was hurriedly constructed for the Tests but proved highly satisfactory and a second similar stage was built during the event.

G3FZL: CV88 (r.f.), CV253 (mixer), 6AM6 (first i.f.), 6AM6 (second f.c.), 6J6 (l.o.), 1.4 Mc/s i.f., detector and output stages. First injection unit comprises 22.222 Mc/s crystal, 6AM6, 6J6, 6J6 and CV53.

G3GZM: Crystal mixer with home-made coaxial lines, tunable oscillator (34.5-35 Mc/s) with two doubler and one tripler stages, 6AK5 head amplifier (18 Mc/s) to BC312. This is a combined 144 and 420 Mc/s converter: see Fig. 2.

G5CD: Either push-pull or single-ended e.g.t. to modified Bendix receiver with 12AT7 e.g. r.f. and 12AT7 mixer. (See September, 1951, issue of the BULLETIN.)

G8QY: (a) 446A r.f. (optional), 446A r.f., diode mixer with c.c. injection using three 7.5 Mc/s crystals in a CV6 overtone oscillator with two CV6 tripler stages, broadband head amplifier (26-29 Mc/s), into HRO.

GW2ADZ: CV102 mixer with coaxial cavity (6J6 l.o. fundamental 140 Mc/s), EF54 head amplifier (8 Mc/s), Eddystone 640.

Appendix “B”—Transmitters (Final Stage)

Power amplifiers: 5CD (QQV06-40), 2QY (3A/146J), 2WJ (CV53), 3APY (CV53), 2FKZ (ME1003), 3GZM (832).

Power doublers: 2ADZ (3B401J), 3FZL (3B401J).

Power triplers: 3A00 (832), 8QY (CV82), 2WS (QQ06 40), 3AYT (832), 201 (832).

Wireless World Diary, 1953.

The Wireless World Diary for 1953, now on sale price 6/1½ (Morocco leather), 4/7 (Rexine), contains 80 pages of reference material, plus the usual diary pages of a week to an opening.

Region 1 Field Day

The Region 1 Field Day was won by the Bury Group with a score of 98 points. Stockport finished second (91) and Chester third (86). The winners collected 72 points from 3.5 Mc/s contacts. Other groups participating were Bolton (75), Whitehaven (73) and Warrington (63).

LONDON REGIONAL MEETING SATURDAY, NOVEMBER 1, 1952

Cornwall House Refreshment Club, Cornwall House, Stamford Street, London, S.E.1.

Programme:

Bar Open	-	-	-	2.30 p.m.
Business Meeting	-	-	-	3.30 p.m.
High Tea	-	-	-	4.30 p.m.
Business Meeting	-	-	-	6.00 p.m.
Telecinema	-	-	-	7.15 p.m.

Tickets (6/6) now available from District, Town or Area Representatives. Tickets for Telecinema (3/-) also available from local Representatives.

By W. H. ALLEN, M.B.E. (G2UJ)*

Two-Metre Field Day

AS for most contests, conditions were no better than average on Sunday, September 21, but the event was, nevertheless, well supported. G3EHY worked 12 of the portables including G3MY/P (nr. Sheffield) and G2HCG/P (10 miles from Northampton). The latter, it is understood, worked 85 stations in more than 30 counties with the aid of a 25-watt transmitter feeding a stack of 4 slot aerials with reflectors; their best DX was GM6WL/P. G3ABA/P (nr. Meriden, Warks.), was also reputed to have worked a Scottish portable station. At the other extreme GC2CNC (Jersey, C.I.), although active throughout the contest, made no contacts and, moreover, heard no signals whatever. G4IB/P, situated near Paddock Wood, Kent, with G4FB and G2UJ as "crew," had very little success, although a fair number of stations were heard, including ten portables among which were G3ABA/P and G3AVF/P (Bovey Tracey, Devon).

G8VZ, finding that his one and only crystal frequency fell almost on top of that of G2HCG/P, very sportingly went off the band during the whole contest period.

Much time and effort was unprofitably expended during the contest due to the failure of many stations to use QLH/QLH procedure. Some indication of the order in which the calling station will search the 2 Mc-wide band is almost essential, unless replies to CQ calls are to continue for a couple of minutes or so.

The Two-Metre Band

G3WW (Wimblington, Cambs.), made 63 contacts during the R.S.G.B. 2m Contest on July 26/7 but understands that G5YV made more. While on holiday 'WW visited various 2m stations as widely separated as G5YV, 2FIS, 3EHY and 2UJ. The band was well open on August 29/30—the night when EI2W and DL3VJ/P broke the European record—and 3WW worked stations in, among other places, Yorkshire, Durham, Warwickshire, Hampshire, Germany (DL3VJ/P) and Dublin (EI2W). The latter passed on a report from GI3BIL that 'WW had been heard for hours in Belfast, but the GI was inaudible in Wimblington. Similarly, G4LX (Newcastle) hears G3WW regularly but has never been worked in return.

Recently when DL's were coming in well on 'phone in Cambridge G4MW and G2XC (who was with him) believed they heard an HA on 'phone.

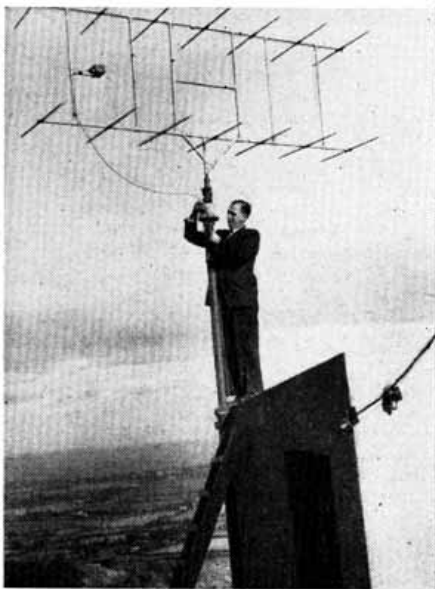
During the past month G5YV (Leeds) worked G3BEX/P on the Devils Dyke, near Brighton, and, on the evening of September 13, DL1LB and DL6SV. Due to poor conditions during the first 10 days of the month, little was heard over 100 miles distant. A sked has been run nightly since April at 2230 B.S.T. with G2AJ (Biggin Hill, Kent), and has now reached 100 QSO's. All "misses" having been due to one of the stations being unable to go on the air, and not once

because of adverse conditions. 5YV agrees, therefore, with G3EHY that up to a total of 200 contacts are possible most nights between stations with good locations, efficient receivers and aerials, and preferably 50 to 100 watts of power.

G3BW (Whitehaven, Cumbs.), despite uncertain conditions in the past month, managed to raise, among others, GM2DRD (Forfar) and G5MA/P (Rutland)—which again brings to our notice how G5MA (or GW5MA) gets around! Undoubtedly those who enjoy working into otherwise sparsely populated territory—in a 2m sense—have much to thank him for. May Bob's travels long continue!

As an example of how a good operator, even when well removed from centres of activity, can get out on the 2m band, G3BW has now worked stations in 60 counties—56 of them in the past year.

G3EHY and GI3GQB, 268 miles apart, enjoyed 22 "solid" contacts out of a possible 29 during the month commencing August 6. It was noted that whenever a north-westerly air stream flowed over the country, or the temperature fell below 50°, long-distance contacts became difficult. After an S8 exchange of signals with the Belfast station at 2245 B.S.T. on September 14 both stations went on to call CQ in various directions for over an hour. Although each could hear the other during



[Photo: "Irish Times," Dublin

Record Breakers

EI2W with his 7-over-7 Yagi beam, with which he and DL3VJ/P set up a new European two-metre record of 651 miles.

Regional V.H.F. Ladder

TWO-METRE BAND

To qualify for entry in the Two-Metre Regional V.H.F. Ladder, members must have worked stations in at least seven R.S.G.B. Regions since July 1, 1952. The rules, and a list of Regions and Counties or Areas forming them, were published on page 544 of the June, 1952, "Bulletin."

Psn.	Call & Location	Worked		
		Regions	Stations	Countries
1.	G3BW <i>Whitehaven, Cumb.</i>	15	63	5
2.	G5YV <i>Leeds, Yorks.</i>	13	189	9
3.	G3WW <i>Wimblington, Cambs.</i>	13	181	9
4.	G3EHY <i>Banwell, Som.</i>	13	122	5
5.	G2HIF <i>Wantage, Berks.</i>	13	85	7
6.	G4RO <i>St. Albans, Herts.</i>	11	111	4
7.	G6LI <i>Ludborough, Lincs.</i>	11	59	6
8.	G2YB <i>Caversham, Berks.</i>	10	125	4
9.	G3FD <i>London, N.14.</i>	10	80	7
10.	G2FNW <i>Melton Mowbray, Leics.</i>	10	72	3
11.	G3HBW <i>Wembley, Middx.</i>	10	69	4
12.	G6YU <i>Coventry, Warks.</i>	10	46	3
13.	G2FJR <i>Sutton Bridge, Lincs.</i>	9	83	3
14.	GW8UH <i>Cardiff, Glam.</i>	9	52	3
15.	G2DKH/P <i>Stanley, Co. Durham.</i>	9	45	4
16.	G3ACS <i>Manchester 8.</i>	9	36	3
17.	G3BHS <i>Eastleigh, Hants.</i>	9	35	2
18.	G3CBO <i>Denham, Bucks.</i>	8	96	3
19.	G6XX <i>Goole, Yorks.</i>	8	45	3
20.	G3FIJ <i>Colchester, Essex.</i>	8	42	6
21.	G3BVU <i>Witney, Oxon.</i>	8	27	1

most of this time—and the band was by no means devoid of activity—neither raised another station. It certainly looks as if band searching is not very thorough or some receivers are not all that their owners think them.

Regarding G6LI's views on 2m DX given last month, 3EHY has experienced on many occasions a sudden opening commencing just after midnight, and lasting perhaps an hour before disappearing as suddenly as it came. Such openings generally favour a north or north-easterly path and may occur after poor conditions in the earlier part of the evening. So even if the DX isn't there just after dusk—keep searching!

G5YV also took advantage of his holiday to visit a number of the southern 2m stations and wishes to record his special appreciation of the hospitality shown him and his family by G5MA and 8OU. The latter, now that he has a 24-element beam in action, works Leeds with about the same consistency as G2AJ. EI2W was heard in contact with DL3VJ/P on August 29 but although Leeds is some 200 miles nearer the Irish station, no trace of his signal could be heard, although he was well received at the time in Cambridge.

On September 14, G6LI (Ludborough, Lincs.), worked GM3EGW at S5 and heard a PA0 at 2130 B.S.T. On the following evening a few 75-mile contacts were made and GW6NB/P was

heard very weakly, but according to G2FKZ the 70 cm. band was wide open. Otherwise September proved disappointing despite the high barometric pressure.

Five countries in five calls on 2m sums up the evening of August 29 for G2HIF (Wantage, Berks.), who lists DL6EP (S6), EI2W (S9), GI3GQB (S4) and ON4BZ (S9). The fifth country was G. He hears G2OI and G5YV whenever the band is not absolutely dead, but wonders where the rest of the northern stations were during August.

G2FJR (Sutton Bridge, Lincs.), found conditions good on September 16 from 2200 B.S.T. onwards, with Surrey stations queuing up for Lincolnshire. Considerable fading was noticeable on incoming signals, but not in the opposite direction. The aerial in use was a 6-element stack with small plane reflector only 14 ft. a.s.l.; his frequency is 144.32 Mc/s.

G3HBW (Wembley, Middlesex) worked a number of stations on August 23/24 including F8GH (Beauvais) and G3FFV (York) at 180 and 173 miles respectively. GW5MA/P (Brynawr, Brecknock) was contacted on September 7. During the Field Day he worked G3APY/P and 3ERD/P, both in Derbyshire, but on the whole conditions seemed very poor.

G3FD suggests a fixed-station contest on the 2m band during the early part of next year to prove that DX may still be worked even in the so-called "closed season." GC2CNC is again active each evening either at 1915 or 2215 B.S.T. on 145.13 Mc/s c.w. only.

70 cm. Notes

G2WJ (nr. Dunmow, Essex), now licensed for TV, has already radiated his first "still" pictures on 436 Mc/s using a grid modulated CV53.

G6YU (Coventry) will shortly be active on 434.025 Mc/s. Others who may be on the band by the time these notes appear are EI2W (Dublin) and GC2CNC (Jersey) who, having got his tripler running satisfactorily, is completing a rebuild of the remainder of his transmitter. G2BVW, FNW, 3BKQ and FFC are all active in Leicestershire with c.c. transmitters and receivers.

V.H.F. Research Society of Ireland

A meeting attended by 32 out of the present total of 70 members of this society was held at Clonmell, Co. Tipperary, on August 23—the largest gathering of radio amateurs in Eire for many years. A number of talks of v.h.f. interest were given, including "Beam Aerials" by the President, EI2W, "Transmitters and Receivers" by GI3BIL and GI3GQB and "V.H.F. Nets" by EI2G. A further meeting at Curragh Camp, Co. Kildare, was planned for the end of September and will be followed by one in Northern Ireland.

* * *

Acknowledgement is also made of letters from G2DHV, 3AGS and 3GBO.

Readers are reminded that entries for the V.H.F. Ladders should arrive by the 20th of each month, and other reports not later than the 23rd, in order to leave sufficient time for compilation before press day.

Have You Worked WINKW?

Chair-warmer Harold Ryall, WINKW (76 Fox Hill Road, Nahant, Mass., U.S.A.), who recently lost all his QSL's in a fire, would greatly appreciate receiving replacements from R.S.G.B. members who have worked his station. This request comes via Harry Beadle, G8UO, of Keighley, Yorks.

Notes and News

THE first G-W6 contact on 21 Mc/s. would seem to have been made by G3FPQ when he worked W6DFY at 1848 B.S.T. on August 24. The next one recorded was by G3AJP at 2204 B.S.T. the same day. In spite of a poor aerial G3ETQ of Doncaster has managed to work EA8BM. G3ASL comments on the fine "ham spirit" shown by SM5ACC recently when he helped 'ASL to maintain a very difficult QSO, quite unasked.

G5JL reports that on five days out of seven all through the summer, the ZL's have been workable on 7 Mc/s in the early mornings. Other 7 Mc/s DX worked by 'JL has included CE7AA, VP9AW, VP9AL, KV4AQ, ZD2DCP and HK5CR all around 7030. HB1JJ/HE was active on 7025. KZ5DE was heard on 3510 at 0330 G.M.T. ZC4GT on 7040 is looking for G contacts. JY1AL has been heard on 14090. GM3DBX has been elected the first Honorary Member of the recently-formed German American Amateur Radio Club run by U.S. personnel in Germany. G5VT says OY3FP (who is now OX3FP and was also OZ3FP) is not a pirate as was at first suggested. 'VT would like to have the latest address of ZK1BC.

G3FPQ worked all continents in five hours on 21 and raised VP9G, VQ4HJP, ZB1BJ and ZB2I on 3.5. VQ3BM, active every other morning at 0400 G.M.T. on 14061, is looking for G's. He is the only VQ3 on c.w. G2DPY gives the QTH of VQ5CL as Box 231 Kampala: he is on 14 Mc/s. MID is again on c.w. and VR4AE has been heard at 0730 B.S.T. working KH6's. 'DPY wonders who was GR2DM—called by half the world recently. G3CEU says U.S. broadcast stations are coming in well on 1.5 Mc/s between 0300 and 0500 G.M.T. He has heard WCKY in Cincinnati, WPTR in New York and many others. G3FXB of Hove gives the QTH of HP1LA as Box 1567 Panama City. VQ5CY, who comes from Worthing, can be reached at Box 12 Kampala. G3AAM passes along the information that G2BXP was the only G to work YA3VB on his first trip. YA5XY was JY1XY. G2FAY (62 Chestnut St., Chadderton, Oldham), would like to hear from someone who can loan him the handbook on the Halli-crafter Sky-Challenger. He has just received his card from VK1YG.

ZC4VP (ex-G3EJ) who holds the 14th licence to be issued in Cyprus, is at present on d.c. mains. G2DPY says that there are five stations in Trieste. MF2AA, 'AB, 'AC, 'AF, 'AG (ex-VQ4ALF). 'AB and 'AC are not active at the moment. QTH of ST2HK (ex-VQ4HK) is Box 516 Khartoum. 4X4BC proposes to operate soon from SV5 and possibly from SV6. ZS6ZU/P is on Marion Island.

G3BID worked AP2L on 14110 at 1912 B.S.T. QTH is Box 151 Karachi. Other nice ones were YS10, 2300, 14155; PJ2AA, 2215, 14110; FM7WF, 2235, 14130 and VS7WA, 1902, 14110.

21 Mc/s

G2DHF has his 132 footer working nicely on 21. G2DPY has worked all W districts except W6 and W7. He often hears ZD9AA calling CQ with no takers. He has also heard CX2CO, KH6ARA and UG6 as well as other stations in the U.S.S.R. G5CP, just back from a trip to W and VE, has W.A.C. on 21. He gave TA3AA his W.A.C. VK9GW has been worked by a number of G's. Mal. Geddes, ZE3JO, has yet to work Oceania, North and South America. He says G6ZO and G6GN are the most consistent stations heard in ZE.

G2BJY does not think much of the conditions which prevailed during August, except on the 25th when W1, 2, 3, 4, 5, 6, 9 and 0, all fairly weak, were heard and worked. W5LF was the outstanding one. The best day for ZS was September 12. New ones on the band were MI3JB, ZB1BM, TA3AA. He wonders what has become of G6HL who was so active when 21 opened.

Who's Who

G2CUR (ex-MD5AK, VQ4CUR, VQ1CUR) is now DL2TL. ZC4OR is now G3IMM, c/o Met. Office, Hemsby, Norfolk. F9QU tells us that FM8AD arrived back in Martinique on August 22 and is on the air with 'phone and c.w. Major Whatman, G2BQ, ex-MD2BC, is back in the U.K. permanently and hopes soon to be active again.

VS2DQ (ex-ZC1AL) has shown us the Malayan licence which allows operation in the following bands: 1722-1993; 3507-3993; 7012-7288; 14005-14345; 21010-21440; 28020-29680; 50050-53950 and 144050-145950. We are surprised to see that the Malayan authorities still insist on the guard bands, which our own G.P.O. discarded long ago after representations were made by the R.S.G.B. Malayan amateurs should get after their licencing authority as soon as possible and press for the full band widths to which they are entitled! It is our experience that Government and commercial stations of many countries are far more



Rare Birds.
From left to right: ZD6BB, 6EF, 6DU, 6HN, 6RD, 6JL. The only amateur in Nyasaland not included in the group is ZD6HJ.

prone to stray out of their allotted bands than are the amateurs.

ZC2MAC who now has his cards, according to G3ATU, is operating as VS7MC. The licence issued by the Singapore Government took so long to come through that he had actually left Cocos Island before it arrived! He has now discovered that his call sign should have been ZC2AB, so he has had both calls printed on his cards! We hear from GM3DHD that VR5GA passed away soon after returning to New Zealand. Many will remember the strong signal which gave so many their first QSO with Tonga. G2HKU says VE8EM is at R.C.A.F. Station, Whitehorse, Yukon. He QSL's with a pictorial card. On 7 Mc/s 'HKU has worked ZL4JA, YU1AFG, ZB1KQ and ZB2I and has heard HC1FG on 7005 working G4CP on 'phone. He wonders if anyone ever had a card from ZD2LMF.

VK9XK is now back in Australia with his old call VK3XK, can be reached at 6 St. Vincent's Street, Glenhuntly, S.E.9, Vic. He was a light-house inspector responsible for the maintenance of 31 lights, hence his rather rare appearances on the air. Even so he worked 129 countries and made over 4,000 contacts.

Visit to YU

G3DTX recently returned from a holiday in Yugoslavia. He had noticed in the BULLETIN that G6WX had been there on an official visit and thought it might be somewhere new to try out for his holiday. He consulted G2MI who was able to contact YU1AG and advise him of

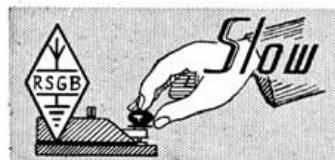
his intention. The journey was made by motorcycle and Trieste was reached in four days. He travelled by steamer to Split and then went by road to Dubrovnik. From there the route lay over the mountains to the capital. Within half an hour of arrival at his Hotel, George of YU1AG and Fery of YU1AK were there to greet him and they were soon joined by Mirko, YU1AD and his guest, Eric of OZ7BG. A visit was paid

An Ode to an Unmodulated Carrier

*"The other day when on the air,
I heard a chap who wasn't there.
He wasn't there again today
I wish to h—l he'd go away."*

[From G3YK, with acknowledgement to E17Y from whom it originated]

to YU1AK's station where they made a few contacts and then ensued a real hamfest in which a particularly potent brand of plum brandy played a notable part! In the evening he visited YU1AG's station but skip was short and they were unable to work into G. Saying "goodbye" to Mirko and Eric, he was taken by George and his family for a perfect meal under huge trees in an open air restaurant. He pays the warmest tribute to the very generous hospitality which was extended by the YU amateurs and quotes it as just one more example of the true "ham spirit" which knows no national boundaries.



Slow Morse Practice Transmissions

The following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence. More volunteers are still required for parts of the British Isles not already covered, particularly in the London Area. Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. L. Edwards, A.M.I.E.E. (C8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

* Each station will operate in turn.

B.S.T.	Call	kc/s	Town
Sundays			
09.00	G3LP	1850	Cheltenham
10.00	G6MH	1990	Southend-on-Sea
	G3AAZ	1780	Welwyn
10.30	G3EPK		
	G5UM		
10.30	G3GIO	1915	Guildford
11.00	G2FXA	1900	Stockton-on-Tees
14.00	G5AM	1900	Witnesham,
			Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
20.30	G6LX	1875	Croydon
	G3BLP		
21.00	G3BHS	1720	Eastleigh, Hants
21.00	G3BLN	1900	Bournemouth
22.00	G3GIO	1915	Guildford
22.15	G2BRH	1900	Ilford
22.30	G8TL	1896	Ilford
Tuesdays			
19.00	G3IBL	1883	Derby
	G3HGY	1830	Coventry
19.30	G5PP		
	G5SK		
20.30	GW3BKP	1745	Wrexham
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G2BND	1890	Dalston, E.
22.00	G2FXA	1900	Stockton-on-Tees
22.00	G3GIO	1915	Guildford
22.45	GM3GUS	1800	Dunfermline
23.00	G2XG	1735	Chingford
Wednesdays			
14.00	G3ADZ	1910	Southsea
19.00	G3ADZ	1900	Southsea

B.S.T.	Call	kc/s	Town
Wednesdays (continued)			
19.30	G3HBX	1870	Warwick
	G6XA		
21.30	G3HKC	1770	Birmingham
22.00	G3DLC	1800	Grays, Essex
22.00	G3HXN	1850	Cambridge, Glos.
22.00	G3GIO	1915	Guildford
Thursdays			
19.00	G3NC	1825	Swindon
19.30	G3GRM	1815	Derby
	G2DOF	1830	S. Birmingham
	G3DTG		
19.30	G3ENH		
	G6KI		
	G8JI		
20.00	G3FVH	1920	Hull, Yorks
20.30	GW3BKP	1745	Wrexham
21.30	G6DL	1760	Birmingham
22.00	G2NK	1730	St. Mary Cray
22.00	G2FXA	1900	Stockton-on-Tees
22.00	G3GIO	1915	Guildford
22.30	G3OB	1803	Manchester
22.45	GM3GUS	1800	Dunfermline
Fridays			
19.00	G3BLN	1900	Bournemouth
20.00	G3CSG	1870	Wirral
21.00	G3BHS	1720	Eastleigh, Hants
	G3AUT	1785	Rugby
22.00	G3AUF		
	G3CBV		
	G3GTX		
22.00	G3GIO	1915	Guildford
Saturdays			
14.00	G3ADZ	1910	Southsea
22.00	G3GIO	1915	Guildford
23.00	G2FXA	1900	Stockton-on-Tees

MEMBERS USING THIS SERVICE ARE REQUESTED TO SEND LISTENER REPORTS TO THE STATIONS CONCERNED

The Radio Amateurs' Examination

Model Questions and Answers

Part 3.—Alternating Current

ALTERNATING currents play a far greater part in radio circuits than do direct currents. Almost every dial on a receiver or transmitter is used to adjust either the alternating voltage or current present, whether this be at r.f., a.f., or mains frequency; in fact, the only reason why direct current is supplied at all to such equipment is to enable the valves to handle the necessary alternating quantities.

Some basic knowledge of alternating quantities is therefore essential, and the contents of Chapter VII of *Electrical and Radio Notes* should be carefully studied. An excellent book is *Alternating Currents*, by L. T. Agger (MacMillan, 10/6)—this treats the fundamental principles with great clarity and provides numerous examples for practice by the beginner.

By

B. W. F. MAINPRISE
B.Sc. (Eng.), A.M.I.E.E. (G5MP)*

The meaning of the terms, *cycle*, *frequency* and *periodic time* should be noted and the relationship between wavelength and frequency memorised.

If λ (the wavelength in metres) be multiplied by f (the frequency in cycles per second), the result is a constant equal to the speed of light, namely, 300 million metres per second. The conversion of frequency to wavelength is thus a simple calculation.

Find the wavelength corresponding to a frequency of 7,000 kc/s (or 7 Mc/s).

$$f \times \lambda = 300,000,000$$

$$\text{Therefore } \lambda = \frac{300,000,000}{7,000,000} = 42.9 \text{ metres.}$$

What is the frequency of a station operating on a wavelength of 1500 metres?

$$f \times \lambda = 300,000,000$$

$$\text{Therefore } f = \frac{300,000,000}{1,500} = 200 \text{ kc/s.}$$

* * *

Peak and Root-Mean-Square Values

It will be found that alternating voltages and currents may be expressed in terms of either their peak or their root-mean-square values according to circumstances. A question may be set on the need for such values.

Why are alternating currents generally expressed in root-mean-square values?

Consider the sine wave (full line) and the peaky wave (broken line) shown in Fig. 1: both are of equal amplitude and are said to have the same peak (or maximum, or crest) value. Over the greater part of each cycle, however, the current represented by the peaky wave remains at a lower value than that of the sine wave; consequently, the heat produced by such a current when flowing through a resistance will be less.

The two factors which limit the power that can be absorbed or dissipated by a radio component are the pressure to which it is subjected and the

heat produced in it, just as the same two factors limit the power handled by any component of an engine. For this reason, it is desirable to express alternating currents in such a way that their heating effect can be compared regardless of waveform, and can especially be compared with that produced by direct current.

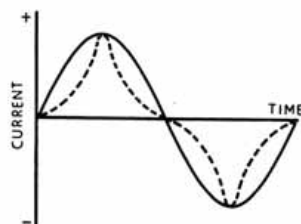


Fig. 1.
Although the two current waveforms shown have the same peak value, the sine wave (full line) will have a greater heating effect than the peaky wave (dotted line).

The heat produced during each alternating cycle is proportional to the square of the current and can be calculated by dividing the waveform into a number of vertical strips (Fig. 2). The value of current represented by the height of each strip is squared, the value of the mean square throughout the cycle being noted. If this figure be multiplied by the time taken for each cycle to be completed, and by the resistance of the circuit, the power dissipated during each cycle is obtained: this can readily be converted to calories.

The square root of the mean square of the current (*i.e.* the root mean square) provides a convenient way of expressing and comparing alternating quantities. A current of 5A r.m.s. will then have the same heating effect, regardless of waveform, as a direct current of 5A. Alternating quantities may be assumed to be specified in r.m.s. values unless the contrary is clearly indicated.

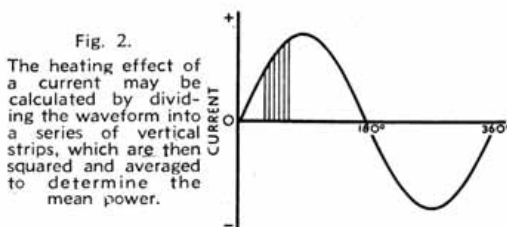


Fig. 2.

The heating effect of a current may be calculated by dividing the waveform into a series of vertical strips, which are then squared and averaged to determine the mean power.

What conversion factor enables the peak value of a sine wave to be obtained from its r.m.s. value?

The r.m.s. value should be multiplied by $\sqrt{2}$ (=1.414). Thus, a sine wave having an r.m.s. value of 100 volts will have a peak value of $100 \times 1.414 = 141.4$ V.

To obtain r.m.s. values from peak values, the latter should be divided by $\sqrt{2}$, which is equivalent to multiplying by 0.707. A peak voltage of 50 would accordingly have an r.m.s. value of $50 \times 0.707 = 35.35$ V.

Reactance

(i) *Inductive reactance.*—When an alternating current flows through a coil or inductance, it sets

* 48 Earlsfield Road, Hythe, Kent.

up a changing magnetic field which, cutting the turns of the coil, induces in them a voltage (or e.m.f.) acting in opposition to the applied voltage, thus limiting the current without absorbing power. The current flowing through a coil due to an applied alternating voltage will be less than might be expected by application of Ohm's Law. This additional opposition to current flow is called the *inductive reactance* of the circuit, and is denoted by the symbol X_L . Its value in ohms may be calculated from the formula:

$$X_L = 2\pi fL \text{ ohms,}$$

where f is the frequency of the alternating supply in cycles per second, and L is the inductance of the coil in henrys.

It will be seen that inductive reactance *increases* as frequency and inductance *increase*.

Find the reactance of a coil having an inductance of 2 henrys at a frequency of (a) 200 c/s, (b) $20/\pi$ kc/s.

$$(a) \quad X_L = 2\pi fL = 2 \times \pi \times 200 \times 2 = 2,510 \text{ ohms.}$$

$$(b) \quad X_L = 2\pi fL = 2 \times \pi \times 20,000/\pi \times 2 = 80,000 \text{ ohms.}$$

(ii) *Capacitive reactance.*—When an alternating voltage is applied to a condenser, current flows through what is—so far as d.c. is concerned—effectively an open circuit, due to the alternate charging and discharging of the condenser plates. The electrostatic charge of the condenser constitutes an e.m.f. acting in opposition to the applied

voltage and limiting the current: the larger the capacity of the condenser, the greater the charge that can be accommodated, and, in consequence, the greater the current flowing in the circuit. This opposition to the current flow is called the *capacitive reactance* of the circuit, and is denoted by the symbol X_C .

$$X_C = 1/2\pi fC \text{ ohms.}$$

where C is the capacitance in farads.

Note that capacitive reactance *decreases* as frequency and capacitance *increase*.

The formula for determining voltage and current is similar to Ohm's Law:

$$E = IX; I = E/X; X = E/I,$$

where X is either capacitive or inductive reactance, without resistance.

Find (a) the reactance of a $4\mu\text{F}$ condenser at a frequency of 50 c/s, and (b) the current it would pass on a 200V supply.

$$(a) \quad X_C = \frac{1}{2\pi fC} = \frac{1}{2 \times \pi \times 50 \times 4 \times 10^{-6}}$$

(Note the 10^6 converting microfarads to farads).

$$= \frac{10^6}{400\pi} = 796 \text{ ohms.}$$

$$(b) \quad \text{Current passed} = \frac{\text{Voltage}}{\text{Reactance}} = \frac{200}{796} = 0.251\text{A (or } 251\text{mA).}$$

CQ Single Sideband

By H. F. Knott (G3CU)*

FOR some time many important questions relating to single-sideband operation have been awaiting discussion, and a suitable opportunity presented itself recently when a gathering of up to a dozen s.s.b. adherents took place in Shropshire. Numerous points were considered, in particular the future of single-sideband, and the problems confronting the newcomer.

A question of some urgency was whether or not one particular sideband (*i.e.*, upper or lower) should be used on each band. It was agreed that while a certain amount of flexibility should be maintained so that a sideband might be switched in the case of, say, troublesome QRM, an agreement to use either the upper or the lower sideband might have definite advantages. It would help in the design of a filter rig (to change sidebands when using the phase-shift system is comparatively simple), or in the adjustment of a selectable sideband receiver for the purpose of transmitting or receiving s.s.b. signals.

The problem also arises in the heterodyning of a signal from one frequency to another, due to the existence of the sum and difference frequencies, *e.g.*, with an initial signal on 5.2 Mc/s and the local oscillator on 8.9 Mc/s, the sum frequency becomes 14.1 Mc/s and the difference frequency 3.7 Mc/s. However, where the sideband appears on the l.f. side of the "reference" carrier in the first instance, it would automatically be inverted and appear on the h.f. side in the second case.

It was therefore agreed to recommend that below 10 Mc/s the lower sideband be used, and above that frequency the upper sideband. This is, in fact, the condition existing at present in amateur practice; the commercials, too, operate a similar change, but not necessarily for the same reasons.

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Views on this subject would be welcome.

Activity on 14 Mc/s.

When looking for s.s.b. stations in the Western Hemisphere, 14,300 kc/s should be monitored, as this appears to be the frequency on which the American stations are to be found. Those interested in Australasian contacts are advised to check between 14,150 and 14,160 kc/s.

JA2MB (Tokyo) has been heard regularly, even up to 1100 B.S.T., running 600 watts peak into a 3-element beam. Europeans known to be active include G2ALN, 2IG, 2NX, 3COJ, DL4WC, 4KA, LA6J, OE13CC and OZ7T.

L.F. Activity

G3FHL reports that G3FRN is now on 3.5 Mc/s with his G2NX-type filter rig, using crystals in the region of 5.8 Mc/s. His activities are, at present, limited to local contacts, using the output from his mixer only. 3FHL has now worked 24 s.s.b. stations two-way, and hopes to increase that number when he comes up on "Top Band" soon. He proposes to use a modified s.s.b. jnr. phasing exciter operating on 1,880 kc/s.

GM3GHF (Glasgow) has now completed his phasing exciter and will soon be on 3.5 Mc/s. Originally, he built a W1JEO crystal filter, but achieved little success. It looks as though he may be the first Scottish station to use s.s.b.

The writer hopes to attend the R.S.G.B. Amateur Radio Exhibition where there will be the usual display of s.s.b. equipment. If, and when, present he will be glad to answer any questions on the subject.

R.S.G.B.
Amateur Radio Call Book
This new edition is the most accurate and up-to-date list of British Amateur Radio stations ever published.
Price 3/6, By Post 3/9
FROM HEADQUARTERS

SOCIETY NEWS

Sixth Annual R.S.G.B. Amateur Radio Exhibition

THE Sixth Annual R.S.G.B. Amateur Radio Exhibition will be opened by Colonel Sir Ian Fraser, C.B.E., M.P. (Past President) at 12 noon on Wednesday, November 26, 1952.

As in former years, the Exhibition will be held at the Royal Hotel, Woburn Place, London, W.C.1, and will remain open for four days.

In view of its popularity last year, the Council has again decided to stage a comprehensive Home Constructors' Section. A brief description of the gear to be shown will appear in the November issue of the BULLETIN, which will also contain a catalogue of exhibits.

The Exhibition will open at 11 a.m. daily, and close at 9 p.m. A charge of 1s. will be made for admission.

Members willing to assist on the Headquarters' stand are asked to communicate with the General Secretary, indicating the times and dates at which they will be available.

The 21 Mc/s Band

AS from midnight October 9-10, the band of frequencies 21200-21450 kc/s became available to British Isles amateurs for A1 (Telegraphy) emissions only. This permission has been granted on a basis of non-interference with other services still operating in the band. A reminder has also been issued regarding the care which must be taken to avoid the emission of second harmonics in the television band.

No release date has yet been announced for the use of A3 (Telephony) in the 21 Mc/s band nor for the release of the channel between 3635 and 3685 kc/s. Although these matters are being actively pursued with the authorities, it must be emphasised that they are not entirely within the jurisdiction of the G.P.O., as any decision reached has to be agreed to by a number of other interested parties.

"Television Interference"

HEADQUARTERS can no longer supply copies of Mr. Phil Rand's booklet *Television Interference*. Although 500 copies were sent to the Society the stock was exhausted within a few weeks. Members who were unable to obtain a copy from Headquarters should write direct to Mr. Rand at Laboratory of Advanced Research, Remington Rand Inc., South Norwalk, Conn., U.S.A., enclosing three international reply coupons for postage.

The New Boy Scout Training Licence

DETAILS of a new wireless transmitting licence for Boy Scout training are now available. The licence (Form E-in-C 1317), issued in conjunction with the portable station certificate (Form E-in-C 1412), authorises (a) the establishment of a wireless transmitting and receiving station to work not more than a given number of portable transmitting and receiving sets within a radius of ten miles, (b) the exchange between the stations of messages about the affairs of the Scout Movement for the purpose of training members of the Boy Scouts Association in wireless telegraphy. The annual licence fee is 10/-.

DEADLINE

Contributors are asked to note that the closing date for copy intended for the November issue is October 28, 1952.

Messages may be sent only on one frequency within the band 144-146 Mc/s, subject to non-interference with Government services. The permissible power input is 5 watts for one (fixed) station, and 1 watt for each additional (portable) station. Radio-telephony is not permitted, except with the consent in writing of the Postmaster-General. Portable stations will use the call sign of the fixed station with the suffix /1, /2, etc., as appropriate.

The conditions relating to frequency control and measurement are the same as for the amateur transmitting licence (Form E-in-C 447): where the transmitter is not crystal-controlled, the station must be equipped with a reliable frequency meter of a type approved by the Postmaster-General, having an accuracy of not less than ± 0.1 per cent.; where the station is crystal-controlled, a reasonably reliable frequency meter for checking that the transmitter is working normally is adequate.

Other conditions specified in the licence are, in general, the same as for the amateur transmitting licence, i.e., in respect of log-keeping, secrecy, inspection by authorised officers of the G.P.O., sending periods, message content, etc.

All communications and enquiries concerning the Boy Scout Training Licence should be addressed to: The Engineer-in-Chief, Radio Branch, General Post Office, London, E.C.1, quoting the reference WM3/3.



During the recent E.D.R. Silver Jubilee celebrations in Copenhagen the President and General Secretary of the R.S.G.B. met representatives of a number of other European I.A.R.U. Societies to discuss matters of mutual concern. In this picture, seated from left to right are: DL1FQ, SM5WJ, PA0NP, OZ6PA (President, E.D.R.), G6CJ, G6CL and LA3XA. Others in the group include: OZ2NU, 3FL, 3FM, 3U, 4H, 5AC, 7DR, 7EU, 7GL, 9R and DR319. (1)

North-Western Regional Meeting

ONE hundred and twenty-six members attended the Region 1 meeting at the Bradford Hotel, Liverpool, on September 14. Early arrivals gathered in the Mediterranean lounge and inspected a display of components provided by manufacturers and local retailers.

After a traditional English meal of roast beef and Yorkshire pudding, the Regional Representative (Basil O'Brien, G2AMV) welcomed the members of the official party from headquarters consisting of Messrs. C. H. L. Edwards, G8TL, H. A. Bartlett, G5QA, and John Clarricoats, G6CL. The C.R.s and T.R.s from Region 1 were then introduced, and a welcome was extended to Mr. F. Southworth, GW2CCU, Region 11 Representative, the Denbighshire C.R., and to IIBZZ. The R.R. expressed the regret of all present that the President (Mr. F. Charman) had been prevented by indisposition from attending.

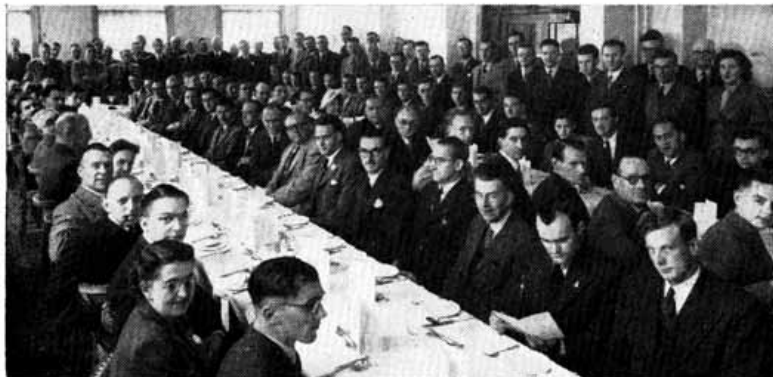
The presentation of local trophies then took place, Mr. Edwards handing the Region 1 Field Day Trophy to Mrs. Dorothy Kelly, G3FYT (who

be pirates. It was stated that the G.P.O. was co-operating in the suppression of these unwanted signals. The business meeting concluded with a few words of appreciation to the Headquarters representatives for their assistance and guidance in the matters raised.

After tea, which provided further opportunities for informal chats, a draw for some 40 prizes took place. Most of the prizes had been donated by the exhibitors and other manufacturers and retailers. A large proportion of those attending the meeting were in the fortunate position of having something to carry home!

At this stage, those who had long distances to travel left to catch their trains; local members, however, stayed on to hear an interesting and well demonstrated lecture by Mr. Hipple, G3BNO, on frequency measurement. The audience were especially intrigued by the Lissajous figures produced by the lecturer, and they provided much scope for discussion.

The evening brought to a close a very enjoyable weekend which also included a dinner and theatre party at which local representatives entertained the Headquarters delegates. — G2AMV.



Part of the large company which gathered at the Bradford Hotel, Liverpool, on Sept. 14, 1952.

[Photo: Associated Photo Services]

accepted it as T.R. on behalf of the Bury Group), and Mr. O'Brien the Regional Representative's Trophy to Ian Lamb, G6LD, T.R. for Blackpool—the highest placed Region 1 Group in N.F.D.

All members of the Headquarters party spoke at the business meeting, the General Secretary in particular covering a wide range of subjects. Questions were then put to the speakers and a discussion took place on many topics of general interest, including "Top Band" operation and two-metre work. Reference was made to the call signs of stations operating locally and believed to

London O.R.M.

IN view of the approaching Coronation, the organisers of the forthcoming O.R.M., to be held in London on November 1, are arranging for the ladies and friends of members to be taken on a guided visit to Westminster Abbey during the period set aside for the business meeting.

At about 7.15 p.m. members and friends will be able to visit the Telecinema for a special showing of experimental and stereoscopic films. As accommodation in the cinema is limited, tickets (price 3/- each) should be obtained prior to the day from local representatives.

A few tickets for the O.R.M. are still available, price 6/6 each (children under 14 years 3/6), also from local representatives.

Liverpool O.R.M.

COPIES of photographs taken at the Liverpool O.R.M. on September 14 can be obtained from Associated Photo Services, 12a Mount Pleasant, Liverpool 3, price 5/- each. Groups 12 in. x 8½ in.; presentations 8 in. x 6 in.

Election of County Representatives The London Region

PROPOS the announcement published last month, dealing with the election of County Representatives, Members are reminded that the London Region (No. 7) comprises all territory within 25 miles radius of Charing Cross as well as the whole of Surrey. Members resident in Middlesex are, of course, in the London Region.

R.S.C.B. BULLETIN, OCTOBER, 1952.



[Photo: Associated Photo Services]

Trophy Presentations

At the recent Liverpool O.R.M. Council Member C. H. L. Edwards (G8TL), presented the Region 1 Trophy to the Bury T.R., Mrs. Dorothy Kelly (G3FYT). At the same meeting Regional Representative Basil O'Brien (G2AMV) (right) presented his Trophy to the Blackpool T.R. Ian Lamb (G6LD).

National Radio Show, 1952

AS in previous years, the main feature of the National Radio Show held recently at Earls Court, London, was television. Receivers of every conceivable variety were displayed, screen sizes ranging from 9-inch (direct-view) to 4 ft. by 3 ft. (projection). The majority of the new sets are tunable to any of the five U.K. television channels.

The Services staged ambitious displays. The R.N.V.(W).R. was, as usual, a feature of the Royal Navy stand, together with radar and submarine communications equipment. Computing and range-finding was demonstrated with the aid of simple but ingenious apparatus using servo-mechanisms.

Highlights of the Army stand included a 20 ft rocket, an anti-aircraft gun responding instantly to the touch of a button, a "Land-rover" mobile wireless station, a demonstration of anti-aircraft radar using models, an electronic-writing "graphoscope," and a test set for recording visually the a.f. characteristics of a circuit. Both the Army and the Royal Air Force stands operated radio-teleprinter links to overseas Commands (including the Middle East and Korea), visitors being invited to send a message free of charge to friends or relatives serving in these areas.

A display of QSL cards on the Royal Air Force stand indicated the scope and activities of the R.A.F. Amateur Radio Society, but most of the display area was given over to exhibits illustrating new techniques and developments in component manufacture; one resin-moulded unit for use in guided missiles contained 16 valves and 171 components in only 47 cubic inches of space. Demonstrations of crystal-grinding techniques, Gee radar, and a radio-controlled model jet aircraft (using miniature jet engines) were attractively presented.

The B.B.C. was very much in evidence with a large television studio in which rehearsals and live transmission of shows took place, watched by an audience of nearly 1000 visitors. Further B.B.C. stands featured a demonstration of radio sound effects, and "see and hear yourself" camera and recording facilities.

A number of technical colleges and institutes combined to stage a technical training display, illustrating by means of working experiments the basic principles of radio and optics. The exhibits included a demonstration of standing-wave measurements in wave-guides and the visual determination of polar diagrams using miniature aerials.

Among other items of interest were the radio-controlled boats (Philips), automatic production-line condenser testing (T.C.C.), television receiver detection (G.P.O.), underwater TV (Pye), Radio Sonde, and an electronic keyboard capable of reproducing the timbre and tone of more than 30 musical instruments (Selmer). These were some of the highlights of a radio show which was undoubtedly the best and most comprehensive of the post-war period.

Liberian Broadcast Reception Survey

FURTHER to the announcement on page 55 of the August issue concerning the recent survey made to determine the range of the Liberian broadcast transmitter ELBC, the Liberian Government Public Relations Officer in London states that a certificate will be sent to those who co-operated.

New Radio Propagation Disturbance Warnings

SINCE July 1, 1952, the National Bureau of Standards, U.S.A., has broadcast a new series of radio disturbance forecasts via the N.B.S. standard frequency broadcasting station WWV. The broadcasts contain information about the condition of the ionosphere at the time of the announcement and the state of communication conditions over North Atlantic radio transmission paths during the following twelve hours.

The forecasts are prepared four times daily and are transmitted in Morse code at 19½ and 49½ minutes past each hour on the WWV standard frequencies of 2.5, 5, 10, 15, 20 and 25 Mc/s. A letter and a number, indicating current and future conditions respectively, are radiated, using the N.B.S.-C.R.P.L. scales of W, U and N (disturbed, unsettled, normal), and 1 to 9 (impossible to excellent).

Further details concerning the forecasts may be obtained from the National Bureau of Standards, U.S. Department of Commerce, Washington, 25, D.C., U.S.A.

Army Wireless Reserve Squadron Formed

THE announcement that an Army Wireless Reserve Squadron, associated with the Royal Signals (Supplementary Reserve), has been formed will no doubt interest many licensed amateurs and others possessing technical or operating experience. Officers and other ranks may be recruited from anywhere in the United Kingdom and the training liability is 15 days annually.

Further details are available from the Commandant S.R. Depot and Training Centre, Blacon Camp, Blacon, Chester, or from the O.C. Squadron, Major D. W. J. Haylock, 230 Devonshire Avenue, Southsea, Hants. Major Haylock holds the call sign G3ADZ.



G3CVO (holding the microphone) interviews a visitor in front of the television camera at the "O.B." TV stand at the Dagenham Town Fair, 1952. The camera controls are visible, the operator's hand being on the optical focusing lever, while the box (lower foreground) contains a field telephone for intercom with receiving and monitor site.

Tests and Contests

Direction-Finding Field Days

TWENTY-FIVE entries were received for the Qualifying Event held near High Wycombe on August 17, 1952. The attendance constituted a record both in the number of competitors and in the total number of enthusiasts taking part. The transmitter—concealed in the heart of a large rhododendron bush at Burnham Beeches, barely 6½ miles from the start—could only be reached by a tortuous route, the difficulties being increased by the fact that early bearings intersected the River Thames at several points.

Despite these obstacles, however, H. Drury of Romford located the transmitter at 15.08, to be followed shortly afterwards by R. D. Charlton of Twickenham and J. Salter of High Wycombe, who arrived from different directions at 15.08½ and 15.09 respectively. Seventeen competitors in all were successful, the arrival times of the others being: S. Phillips 15.22, I. T. Haynes 15.23, L. A. Griffiths 15.32, A. J. Hallett 15.35, C. H. Young 15.35½, J. K. Finch 15.35½, P. Jude 15.38, C. A. Reddick 15.38½, J. M. S. Watson 15.39, J. J. Grant 15.44, G. Walford 15.45, J. Collings 15.48, R. Grubb 16.13, D. G. Alexander 16.15 (all times in B.S.T.)

After an excellent tea at the Little Abbey Hotel, near Great Missenden, prizes, kindly donated by G4NT, were presented to the three leading contestants and to the first lady arrival. The weather throughout was perfect.



Mrs. Peck presenting the Challenge Trophy (donated by G. T. Peck at rear) to Mr. H. Drury, winner of the High Wycombe D/F Qualifying Event.

THE Edgware Qualifying Event was held on September 7, 1952, in atrocious weather. Torrential rain, falling from 13.15 to 14.25 B.S.T., adversely affected the performance of the transmitter which was hidden in a thicket near London Colney, some 9½ miles from the start. Due to the fact that the microphone became waterlogged, the modulation could not be heard beyond a half-mile radius from the station.

Despite the rain, however, ten competitors with their crews assembled at Hendon Park and, after two false starts, seven of them succeeded in locating the transmitter. By finishing time it was difficult to decide whether the contestants or the transmitter crew had suffered the most from the elements!

The arrival times of the successful competitors were as follows: H. Drury 15.29, A. E. Glozier 15.32, G. T. Peck 15.38, R. D. Charlton 15.40, R. K. Seabrook 15.50, A. J. Hallett 15.55, J. M. S. Watson 16.02 (all times in B.S.T.).

About 30 very damp people sat down to tea at Bono's Restaurant, after which prizes donated by the Edgware and District Radio Society were presented to the three leading competitors.

R.S.G.B. Direction Finding Field Days NATIONAL FINAL—RESULTS

- (1) J. A. Whalley (Slade Radio Society)
- (2) R. K. Seabrooke (Southend)
- (3) A. E. Glozier (Romford)

Full list and report next month.

THE Third Annual 2-metre D/F Contest organised by the Edgware and District Radio Society, was held on Sunday, September 14. The transmitter, hidden in thick undergrowth on Stanmore Common, was invisible at a distance of five yards.

The winner was R. Haygreen—an old member of E.D.R.S. and winner of previous v.h.f. D/F contests—who arrived in the record time of one hour and six minutes. Other successful contestants were K. Smith, A. Timme (G3CWW) and S. Fryer (G3ERO).

Sixth All-European DX Contest, 1952

THIS year the I.A.R.U. Societies in Europe have agreed that the Danish Society, E.D.R.—now celebrating its 25th anniversary—shall be responsible for the organisation of the annual All-European DX Contest. The contest was initiated in 1947 by V.E.R.O.N., and has been run each year in turn by R.E.F., C.A.V., S.S.A., and the R.S.G.B.

The rules of the contest, which is open to licensed amateurs throughout the world, are identical to those published on page 123 of the September, 1951, issue of the BULLETIN, with the following modifications.

In Rules 3, 11 and 13, reference is made to the E.D.R. Contests Committee in place of the R.S.G.B. Contests Committee. The 21 Mc/s band is included in Rule 4—the frequencies specified being 21,000 to 21,200 kc/s for telegraphy.



S.S.B. enthusiasts at a recent holiday gathering of operators of single-sideband stations. Left to right (rear): G3FDC, G3CU, G3FHL, and G3BQQ; (front) G3CWC and PA0KC.

and 21,150 to 21,450 kc/s for telegraphy and telephony. The times and dates of the contest (Rule 5) are: *Telegraphy*. — 0001 G.M.T. on Saturday, December 6, to 2400 G.M.T. on Sunday, December 7, 1952; *Telephony*.—0001 G.M.T. on Saturday, December 13, to 2400 G.M.T. on Sunday, December 14, 1952.

A copy of the full rules may be obtained, on application, from: E.D.R. Contests Committee, Post Box 335, Aalborg, Denmark, which is also the address to which contest entries should be sent, the closing date being December 31, 1952.

SECOND TOP BAND CONTEST

RESULTING from the many comments received concerning the method of scoring for this popular event, the Contests Committee have introduced a radical change in the scoring system, based on a suggestion made by Mr. H. J. M. Box, G6BQ. The rules are, however, generally the same as before, apart from minor alterations of detail.

All comments were carefully considered when the rules were formed, and the Committee thanks correspondents for their interest.

Rules

1. The contest is open to all fully paid-up members of the Society resident in G, GC, GD, GI, GM and GW.
2. The contest will run from 2100 G.M.T. on Saturday, November 8, to 0800 on Sunday, November 9, 1952.
3. Entries will only be accepted if submitted on foolscap or quarto paper and set out in the form below:—

TOP BAND CONTEST, NOVEMBER 8-9, 1952

Name Call Sign
 Address Region
 Transmitter
 Aerial System
 Receiver

Contact No.	Time G.M.T.	Call Sign of station worked	My Report on His Signals	His Report on My Signals	Region No.	Claimed Score	Leave Blank
1		G2	599	599	06		
2		G3	599	599	07		

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the Contest and I agree that the ruling of the Council of the R.S.G.B. shall be final in all cases of dispute.

Signed

4. Details at the top of the entry form must be completely filled in and the declaration signed, otherwise the entry will be disqualified.
5. Entries should be addressed to the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, and should bear a postmark not later than Monday, November 17, 1952.
6. Proof of contact may be required.
7. The contest is confined to two-way telegraphy contacts only.
8. Only the entrant will be permitted to operate his apparatus during the contest.
9. An exchange of RST report and Region number will be required before points for a contact can be claimed. The report and region number must be sent as a six-character group, e.g. 579R07 or 579R11 for Regions 7 and 11 respectively. All reports must be acknowledged with "R."
10. Only one contact with a specific station during the contest will count for points.
11. The system of scoring will be as follows:
 - (a) The first 20 contacts with each Region score two points each; subsequent contacts score one point each.
 - (b) Contacts with European stations other than G, GC, GD, GI, GM and GW score 3 points each.
 - (c) Contacts with stations outside Europe score 6 points each.
12. The power input to the final stage of the transmitter or to any preceding stage must not exceed 10 watts.
13. Stations can be disqualified for unethical operating procedure reported by a monitoring station.
14. An award will be made to the station in the British Isles with the highest total score. Certificates of merit will be awarded to the stations placed second and third.

RADIO AMATEURS' EXAMINATION, 1952

THE number of entries for the 1952 Radio Amateurs' Examination set by the City and Guilds of London Institute was 70 fewer than in the preceding year. The statistics in the table below show also a slight decrease in the percentage of passes obtained. The candidates' work was again of a fairly high standard, the majority of the questions being attempted.

Candidates	1952		1951		1950	
Home	534	100.0%	604	100.0%	823	100.0%
Passed	423	79.3%	505	83.6%	653	79.4%
Failed	111	20.7%	99	16.4%	170	20.6%
Overseas	12	100.0%	8	100%	10	100%
Passed	7	58.4%	8	100%	7	70%
Failed	5	41.6%	N/A	—	3	30%

The Examination Paper

Question 1. What precautions are taken in a radio transmitter to prevent interference from (a) harmonics, (b) key clicks, (c) overmodulation? (15 marks.)

Question 2. Describe how a crystal of known frequency can be used to determine the frequency of a transmitter. Using a crystal having a resonant frequency of 100 kc/s, how would you determine the frequency of a transmission in the 14 Mc/s band? (15 marks.)

Question 3. (a) Why is a detector necessary to obtain audio-frequency signals from an amplitude-modulated radio-telephony transmission? (b) Describe one form of valve detector circuit, illustrating your answer with a diagram. (15 marks.)

Question 4. (a) What is meant by the resonance of a tuned circuit? (b) If the effective series inductance and capacitance of a vertical aerial are 20 microhenrys and 100 picofarads respectively and the aerial is connected to a coil of 80 microhenrys inductance what is the approximate resonant frequency? (15 marks.)

Question 5. State the conditions necessary to meet the requirements of the Post Office Licence for (a) Inspection of Station. (b) Procedure to be followed in the use of call signs when making and answering calls. (10 marks.)

Question 6. A communications-type receiver is found to cause interference locally to both (a) reception on 14.465 Mc/s, (b) reception of the London television programmes (41.5 Mc/s sound carrier frequency; 45.0 Mc/s vision carrier frequency). Explain how the interference can be caused in each case and how it could be eliminated. (10 marks.)

Question 7. What are "standing waves" in a feeder system connecting a transmitter to an aerial and why are they undesirable? How can they be detected and minimised? (10 marks.)

Question 8. Explain the meaning of the following terms applied to a radio receiver: (a) selectivity, (b) sensitivity. (10 marks.)

According to the Examiner's report, questions 1, 2 and 5 were fairly well done by most of the candidates. Questions 3, 6, 7 and 8 were well done by practically all candidates. The first part of question 4 (descriptive) was satisfactorily answered, but only about 70% of the candidates dealt successfully with the second part (calculation); of the remaining 30%, some did not attempt this part at all, others obtained the correct numerical solution but inserted the decimal point in the wrong place, while the rest gave totally incorrect answers.

Silent Key

With deep regret we record the sudden death, on August 30, at the early age of 28, of John B. Morris, GW3ELE. During the war he served in the Signals Branch of the R.A.F., and was recently employed in the Radio Section of Air Technical Publications, Ministry of Supply, in which department his cheerfulness and ability readily won him high esteem from all who knew him. His death followed an operation at Woking Hospital.

We extend our deepest sympathy to his widow and relatives.

G2AIIH.

COUNCIL PROCEEDINGS

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on Wednesday, August 6, 1952, at 6.15 p.m.

Present.—The President (Mr. F. Charman in the Chair from 7 p.m.), Messrs. H. A. Bartlett, L. Cooper, C. H. L. Edwards, D. A. Findlay, J. H. Hum, F. G. Lambeth, H. McConnell, A. O. Milne (in the Chair until 7 p.m.), R. Walker and John Clarricoats (General Secretary).

Apologies.—Apologies for absence were submitted on behalf of Messrs. T. L. Herdman, W. A. Scarr and P. W. Winsford.

National Field Day.

Mr. C. A. Sharp, G6KU (Region 2 Representative), reported that certain difficulties which had arisen between the Contests Committee and the Newcastle on Tyne group in connection with their N.F.D. entry had been brought to a satisfactory conclusion. The Secretary was instructed to thank Mr. Sharp for his help in dealing with this matter.

Membership.

Resolved:—

- to elect 58 Corporate Members and 18 Associates;
- to grant Corporate Membership to 3 Associates who had applied for transfer.

Applications for Affiliation.

Resolved to grant affiliation to the Ballymena Radio Club (N. Ireland), St. Richard's Radio Club (Middlesbrough) and No. 3618 F.C.U. (County of Sussex) R.A.A.F. Amateur Radio Club (Eastbourne).

Emergency Communications Network.

Consideration was given to a suggestion put forward by a member resident in Berwick-on-Tweed that the Society should again approach the Government with a view to the setting-up of an emergency communication network formed from personnel drawn from the ranks of Amateur Radio.

Resolved to thank the member concerned for his interest and to advise him that:—

- the Society has received information that the Government's communication requirements, in the event of an emergency arising, are now fully provided for with standardised equipment;

- in the view of the Council the best contribution public-spirited amateurs can make to the national problem of providing emergency communications is for them to offer their services to the Civil Defence or Home Guard authorities.

Amateur Radio Exhibition.

Resolved:—

- to invite representatives of the radio industry and distinguished guests to a private luncheon after the opening of the Exhibition;
- to charge an admission fee of 1/-;
- to reserve suitable stand accommodation for the display of equipment loaned by members;
- subject to the necessary consents being obtained, to establish a "live" Amateur Radio station at the Exhibition.

"Modulators and Modulation Equipment."

Resolved:—

- to defer publication of "Modulators and Modulation Equipment" until the spring of 1953;
- to purchase the copyright of the book from the author, at the agreed rates.

I.A.R.U. Calendar No. 44.

Resolved to vote in favour of the election to membership in the International Amateur Radio Union of the Radio Society of Southern Rhodesia, Liga dos Radio-Emissores de Mocambique and Savez Radio-amatera Jugoslavize.

Membership and Representation Committee.

Resolved to receive and adopt, as a Report, the Minutes of a Meeting of the Committee held on July 4, 1952, and to accept a recommendation dealing with the appointment of representatives where nominations have not been received prior to the closing-date for such nominations.

Contests Committee.

Resolved to receive and adopt the Report of the Contests Committee which met on May 22, June 12 and July 17, 1952. The report dealt with the organising and judging of Contests. The Meeting terminated at 8.55 p.m.

Affiliated Societies

The following clubs are now affiliated to the R.S.G.B.:
HOFFMAN GLOUCESTER ATHLETIC & SOCIAL CLUB (RADIO & ELECTRONIC SECTION), c/o S. R. Boakes, Hoffman Works Stonehouse, Glos.

No. 6 RADIO SCHOOL APPRENTICES RADIO CLUB, c/o R. Morrison, Secretary, No. 6 Radio School, R.A.F. Cranwell, Lincs.

No. 3618 F.C.U. (COUNTY OF SUSSEX) R.A.A.F. AMATEUR RADIO CLUB, c/o Cpl. S. A. Sykes, 17 The Goffs, Eastbourne, Sussex.

ST. RICHARD'S R.C. SECONDARY MODERN BOYS' SCHOOL RADIO CLUB, c/o T. Griffin, Woodlands Road, Middlesbrough, Yorks.

BALLYMENA RADIO CLUB, c/o S. B. Caldwell, Firdale, Tullygarley Road, Ballymena, Co. Antrim, N. Ireland.

Can You Help?

● J. J. Maling (G5JL), 98 Waltham Avenue, Hayes, Middlesex, who wishes to borrow the service manual for the Philips radiogram model 603A.

● A. L. Taylor (B.R.S. 19225), 12 Endsleigh Drive, Middlesbrough, Yorks, who wishes to borrow the service manual for the Army Type 12 Set (Sender).

NOMINATIONS FOR COUNCIL 1953

IN accordance with the Articles of Association the following Corporate Members have been nominated by the retiring Council to serve on the 1953 Council:—

Officers:

President: Mr. Leslie Cooper, G5LC.

Acting Vice-President: Mr. A. O. Milne, G2MI.

Hon. Treasurer: Mr. D. A. Findlay, G3BZG.

Hon. Secretary: Mr. C. H. L. Edwards, G8TL.

Hon. Editor: Mr. J. Hum, G5UM.

Members:

*Mr. I. D. Auchterlonie, G6OM.

Mr. H. A. Bartlett, G5QA.

Mr. F. G. Lambeth, G2A1W.

*Mr. R. H. Hammans, G2IG.

Mr. H. McConnell, GM2ACQ.

Mr. R. Walker, G6QI.

Mr. P. W. Winsford, G4DC.

*New Nominations as per Article 43.

Not later than October 31st next, any ten Corporate Members (but not more than ten) may nominate any other duly qualified Member, by delivering their nomination in writing to the Secretary, Inc. Radio Society of Great Britain, New Ruskin House, Little Russell Street, London W.C.1, together with the written consent of such Member to accept office if elected, but each such nominator shall be debarred from nominating any other Member for this election.

LONDON MEETINGS, 1952/3

All meetings are held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2. Buffet Tea from 5.30 p.m. Meetings commence at 6.30 p.m.

Friday, October 31, 1952: Messrs. Dorsett & Wenn. TOPICAL AND TECHNICAL FILM SHOW.

Friday, November 21, 1952: Paul H. Sollom, B.Sc., A.C.G.I., G3BGL.

"THE SKY-BEAM PROPAGATION PROBLEM."

Friday, December 19, 1952: Annual General Meeting.

Friday, January 30, 1953: R. H. Hammans, G2IG. "SINGLE SIDEBAND TRANSMISSIONS."

Friday, February 27, 1953: F. Hicks-Arnold, G6MB. "OSCILLOSCOPES."

Friday, March 20, 1953: F. Charman, B.E.M., G6CJ. "V.H.F. AERIAL DEVELOPMENTS."

REGIONAL AND CLUB NEWS

BRIGHTON & DISTRICT RADIO CLUB.—Programme highlights for the future include: a demonstration of the *Soundmirror* tape recorder by Thermionic Products, Ltd. (October 28); a talk on B.B.C. television stations by Mr. Godfrey, of Brighton Technical Institute, (November 11); and a lecture on "Aerial Fundamentals" by H. Thomas, G6QB (November 25). *Hon. Secretary:* R. T. Parsons, 14 Carlyle Avenue, Brighton 7.

BRISTOL.—A lively discussion took place at the September meeting concerning the proposed new Articles of Association. Afterwards F. H. Chambers spoke on "The Evolution of G2FYT"—an account of his life and experiences as a radio amateur.

BURY.—A Morse Improvement Class is held at the end of each meeting. On November 13, Ian Auchterlonie, G6OM, will give a talk.

COVENTRY.—The R.R. (J. N. Walker, G5JU) will be in attendance at the forthcoming A.G.M. of the Group to be held on October 24. It is hoped local members will make an effort to attend. Members of the Group assisted G3ABA/P to put a station on the air during the second 144 Mc/s Field Day.

COVENTRY AMATEUR RADIO SOCIETY.—At the recent A.G.M. the following officers were elected: *Chairman:* L. Gardner (G5GR); *Hon. Treasurer:* H. Chater (G2LU); *Hon. Secretary:* K. Lines (G3FOH). On October 27 G2LU will discuss "Wobblers." Meetings are held at the Y.W.C.A., Queen's Road, commencing 7.30 p.m.

EDINBURGH AMATEUR RADIO CLUB.—Meetings are held on Wednesdays at 7.30 p.m. in Unity House, Hillside Crescent, Edinburgh. Intending members and visitors are welcomed.

ELTHAM & SIDCUP.—At a recent meeting a representative of the Telegraph Construction and Maintenance Co. spoke on "Telcon Transmission Lines." The future programme includes a lecture on AVO meters by a representative of that company (October 20), and the A.G.M. (November 3).

HOFFMAN GLOUCESTER ATHLETIC & SOCIAL CLUB.—At the recent A.G.M. the following officers were elected: *Vice-President:* H. Durrant; *Chairman:* D. Rees; *Hon. Treasurer:* S. Hall; *Hon. Secretary:* S. Boakes. The current programme includes lectures with demonstrations on "Electricity in Industry." Later, radio theory, receiver maintenance, and amateur transmitting (under the Society's call sign G31FH) will be covered. Talks by manufacturers' representatives, and visits to local radio stations, are being arranged. Details of membership may be obtained from the Hon. Secretary at Hoffman Works, Stonehouse.

NEWBURY & DISTRICT AMATEUR RADIO SOCIETY.—At the recent A.G.M. the following officers were elected: *President:* W/O J. Ridenour (W8HSA) (stationed with the U.S.A.A.F. at a local air base); *Chairman:* R. Stoodley (G3IEI); *Hon. Treasurer:* G. Ball; *Hon. Secretary:* A. W. Grimsdale (G3CJU), 164 London Road, Newbury. This is the first time the office of President has been filled since the Society was formed in 1948, and in electing W/O Ridenour to that office, the Society hopes to strengthen the ties of friendship with fellow amateurs serving with the U.S.A.A.F. at local air bases.

Meetings are held on the last Friday each month, in the canteen of Messrs. Elliot, West Street, Newbury.

NOTTINGHAM.—A meeting of Society members will be held at 28 Rodney Road, West Bridgford (the home of A. E. Clipstone, G8DZ) at 7.30 p.m. on October 23 to re-form the R.S.G.B. Group. The attendance of as many members as possible is cordially requested.

PURLEY & DISTRICT RADIO CLUB.—At a recent meeting C. E. Newton (G2FKZ) described the effect of weather conditions on u.h.f. working. A junk sale will be held on October 23. *Hon. Secretary:* A. Frost, 18 Beechwood Avenue, Thornton Heath, Surrey.

ROCHDALE RADIO & TELEVISION SOCIETY.—Morse instruction will commence on November 7. Meetings are held at 1 Law Street, Sudden, Rochdale, at 7.45 p.m. on Fridays. *Hon. Secretary:* J. Riley, 1 Darley Bank, Britannia, Bacup.

SCARBOROUGH AMATEUR RADIO SOCIETY.—The Hon. Secretary (Percy Briscoe, G8KU) was recently presented with a car plaque bearing his call sign in appreciation of his services to the Scarborough Amateur Radio Society and to the Scarborough Short Wave Club, out of which the present Society grew. G8KU has held office continually (except for the war years) since 1934.

SLADE RADIO SOCIETY.—On October 24, G. T. Peck of Ernest Turner Electrical Instruments, Ltd., will lecture on "The Radio Control of Models" at the Imperial Hotel, Birmingham, the function being organised in conjunction with the Midland Amateur Radio Society. On the following day, again at the Imperial Hotel, the two Societies will hold a Jubilee Dinner to commemorate the Silver Jubilee of Slade Radio and the coming of age of M.A.R.S.: the Lord Mayor and Lady Mayoress of Birmingham will be Guests of Honour. "Tape Recording" will be the subject

for discussion at the meeting on November 7 at the Aston Technical College. *Hon. Secretary:* M. Fowler, 25 Crossway Lane, Perry Barr, Birmingham 22B.

SOUTH MANCHESTER RADIO CLUB.—Future lectures include: "Valves and their Manufacture" (Mullard Film-strip) on October 24, and "Single-Sideband Transmission and Reception," by E. W. Taylor (G2ALN) on November 7. *Hon. Secretary:* F. Hudson, Ladybarn House, Mauldeth Road, Fallowfield, Manchester 14.

STOCKPORT RADIO SOCIETY.—The Society successfully operated a portable station during Region 1 Field Day. Recent activities included a visit to the Holme Moss television station, and lectures by H. J. Eaves (G6UQ) on "Television," and F. A. Boyes on "Audio." *Hon. Secretary:* G. R. Phillips, 7 German Buildings, Buxton Road, Stockport.

Regional and Club News

Contributions to this feature should be concise, typed—using double-spacing—and sent to reach Headquarters by not later than the 28th of the month preceding publication.

WELWYN GARDEN CITY.—Groups and societies from Hertfordshire and Bedfordshire will be the guests of the Welwyn Group at a mass meeting to be held at 8 p.m. on November 4, in the Council Offices, Welwyn Garden City (next to the Fire Station). *Hon. Editor:* Jack Hum (G5UM) and Council Member R. Walker (G6QI) will be present, and the programme will include a showing of the 1952 N.F.D. film. Members and visitors are cordially welcomed to this event.

Representation

The following are additions or amendments to the list published in the February, 1952, issue:—

County Representative

Region 4.—Leicestershire & Rutland.

K. G. Chapman (G3AFZ), 292 Gwendolen Road, Leicester.

Town Representatives

Region 3.—Staffordshire.

Rugeley, Tamworth, Walsall, Cannock & Lichfield.—E. Arnold Matthews (G3FZW), 1 Shortbutts Lane, Lichfield.

Region 5.—Suffolk.

Ipswich.—L. E. Flint (G3DMN), Marlayna, Woodbridge Road.

Region 8.—Kent.

Ashford.—J. C. Foster (G2JF), Wye College, Wye.

Vacancies

Mr. F. E. Atkins has resigned as Channel Islands Representative. Messrs. A. V. Greenwood (G3DCQ), R. J. Harvie (G2DRP) and J. P. O'Brien (GW2BCH) have resigned as Town Representatives for Chingford Brighton and Llandudno respectively. Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by November 15, 1952.

SPECIAL NOTE.—All County Representatives retire from office on December 31, 1952. (See announcement on Page 115 September issue.)

FORTHCOMING EVENTS (Continued from page 138).

Bristol.—October 17, 7.30 p.m., Carwardine's Restaurant, Bristol 1.

Exeter.—November 7, 7 p.m., Y.M.C.A., 41 St. David's Hill.

North Devon.—November 6, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.

Penzance.—November 6, Railway Hotel.

Plymouth.—October 18, November 15, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.

Torquay.—October 18, November 15, 7.30 p.m., Y.M.C.A., Castle Road.

West Cornwall.—October 16, November 6, Fifteen Balls, Penryn.

Weston-super-Mare.—November 4, 7.30 p.m., Y.M.C.A.

Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—November 10, 7.30 p.m., The British Volunteer, The Hayes.

REGION 13

Edinburgh (L.R.S.).—October 30, November 11, 25, 7.30 p.m., Edinburgh Chamber of Commerce, 25 Charlotte Square.

REGION 14

Falkirk.—October 24, November 7, 21, The Temperance Cafe, High Street.



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TRANSFORMERS & CHOKES: Immediate delivery from stock at pre-increase prices; Woden, UM1 54/-, UM2 73/6, UM3 (sold out new stock at 110/-), UM4 215/-, Mains DTM11 39/-, DTM12 48/6, RMS11 30/-, RMS12 40/-, DTM15 75/-, DTM17 109/6, Drivers DT1 (sold out new price 40/-), DT2 39/6, DT3 34/-, Filament DTF12 2.5 V 10 A 38/6, DTF14 5 V 4 A 31/6, DTF17 7.5 V 5 A 37/6, DTF18 5 V 3 A 6.3 V 4 A 38/6, DTF20 10 V 10 A 59/6. Chokes: DCS14 12 H 350 mA 102/-, DCS20 20 H 350 mA 140/-, DCS17 20 H 60 mA 28/6, DCS18 20 H 150 mA 41/6, PCS13 5-25 H 350-50 mA 58/6. New ex-Government 230/50 c/s 2000-0-2000 at 450 mA, porcelain stand-offs, 9 x 9 x 9 5in core, carriage paid £6. Chokes suitable for the above, 15 H at 400 mA, DC res 90 ohms, 6 x 7 x 9, $\frac{2}{3}$ in core 35/-, carriage paid. Potted cast, case 10 H at 200 mA 12/6, DC res 150 ohm, similar types 15 H 150 mA 1,800 ohm 15/-, ditto 2,000 ohm 15/-, G.E.C. Filament 4 V 5 A 8/-, ditto 4 V 5 A, 4 V 5 A 17/6. The following range are all completely potted in die cast cases. All 230 V primaries, 275-0-275 30 mA 4 V 2 1/2 A, 4 V 5 A 15/-, 265-0-265 120 mA, 6.3 V 7 A, 4 V 2 1/2 A 20/-, 445-0-445 200 mA 25/-, 265-0-265 30 mA, 3,300 at 50 mA, 4 V 10 A, 4 V 2 1/2 A, 4 V 1 A 35/-, 365-0-365 120 mA 4 V 2 1/2 A, 6.3 V 42 A 20/-, 1540 V 1.75 mA, 4 V 1 A, 2.05 V 2 A 15/-, Filament 4 V 3 1/2 A 4 V 6.9 A 14/-, heavy duty 230 V

input, output 55 V tapped 5 V at 36 A £3. Modulation, Parmeko PP805s to pair 813s 450 W at 50/-, Woden 6L6 anodes to 500 ohm line 17/6, Thermador Modulation 450 W pp 805s to 4,000, 4,500 or 5,000 ohm load 70/-, Thermador plate 210-250 input, output 2280-1725-1420-0-1420-1725-2280 at 800 mA, weight 150lb £8 10s., carriage paid. The following are by Parmeko or Gresham Trns. Co. and represent the highest standard of British production. All are fraction of today's cost. Primaries are all 200/250 V 50 c/s 2000-0-2000 at 200 mA or 4000 tapped 3500-3000-2500-2000. 9 1/2 x 9 1/2 x 8, weight 70lb., 75/-, 200C-2-2000 at 500 mA or 4000 tapped 3000-2000, 13 x 10 x 7 1/2, weight 100lb., £6. 5800 V tapped 200C, 3000, 3500, 4000 at 800 mA, 16 1/2 x 13 x 12, 180lb., £6. L.F. Choke for the above 10 H at 800 mA, 8 1/2 x 6 x 7, 50lb., 70/-, 19500-0-19500 at 6.1 kVa, oil filled, 6in stand-offs, 230 V 50 c/s, single phase, cn built-in rollers, weight 6 cwt.. For collection, only £12. We have a large selection similar to the above, oil filled, from 3000-0-3000 with filament windings, single and 3-phase. Full details on request. Auto. 200 to 250 V/115 V 5kVa in external metal cases, 20 x 16 x 11, weight 180lb., £6. Ditto 230 V/110 V, 400 W, 35/-, Plate 5850 ct. 445 mA, 13 x 10 1/2 x 7 1/2, 85lb., £5. L.T. and filament, all 200 V/250 V primaries, 22 V ct. at 30 A, 7 x 7 x 7, 35lb., £2, 22 V ct. at 15 A, 30/-, 4 V 14 1/2 A, 4 times, 13 kV test, 10 1/2 x 11 x 8 1/2, 70/-, Ditto, 4 V 4 1/2 A, 4 V 11 1/2 A, 4 V 29 A, 11 x 11 x 8 1/2, £3. Ditto 8 V 10 A, 4 V 10 A, 2 V 10 A, 1 V 10 A, 5 V 10 A, twice, 7 x 6 x 6, 30/-, Primary current limiting chokes, a.c. amps 1.6. Tapped to produce voltage drops of 80, 120 and 150, 4 x 4 x 3 1/2, weight 4lb., at 10/- each. Similar to the above for 400 V primaries, 10/-, Fil. 2 1/2 V 10 A for 866s, 22/6. 10 V ct., at 10 A for 813s plus 4 V for pilot, 25/-.

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6G6G	7/6	ATP4	7/6	KTW63	8/6
6H6	4/-	B36	10/6	L63	6/6
6J5G	6/6	CV54	6/6	ML4	7/6
6J6	12/6	CV67	25/-	MS/PEN	10/-
6K7G	8/6	CV174	25/-	MS/PEN B	10/-
6K8GT	12/6	CV1001	6/6	PEN46	10/6
6L6G	11/6	CV1582	10/6	S130	10/6
6N7GT	10/6	D1	2/6	SP41	2/6
6SH7	5/6	DH77	10/-	SP61	5/-
6SL7GT	9/6	E1148	5/-	STV280/40	12/6
6SN7GT	10/6	E1271	25/-	SU2150 A	6/6
6U5G	10/6	E1320	10/6	U18/20	9/6
6V6GT/G	8/6	E1436	10/6	V872	6/-
6X5GT	9/6	EA50	3/6	V960	6/6
12K8GT	12/6	EB34	2/9	V1120 B	12/6
12SH7	5/6	EC92	6/6	V1907	5/-
25L6GT	10/6	EC54	6/6	VR105/30	11/6
28D7	6/6	ECL80	12/6	VR150/30	10/-
807	10/6	EP36	7/6	W77	10/6
954	6/-	EP54	6/6	Z77	11/6

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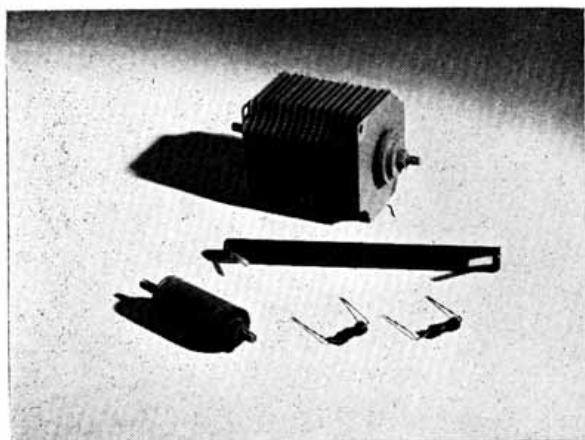
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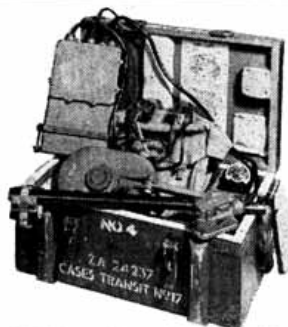
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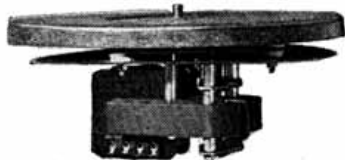
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1/2"	NP	1/11	1/2"	NP	1/2
1/2"	SC	2/-	1/2"	SC	2/1
3/8"	SC	1/11	3/8"	NP	2/3
3/8"	NP	2/1	3/8"	CS SC	1/4
1/2"	NP	2/3	1/2"	NP	1/6
1"	NP	2/6	1"	NP	1/7
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1/8"	NP	2/1	1/8"	NP	2/3
1/8"	NP	2/1	1/8"	NP	2/9
1/4"	NP	2/2	1/4"	NP	3/-
1/4"	NP	2/6	1/4"	CS	1/8
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1/8"	NP	3/-	1/8"	SC	3/-
1/8"	NP	3/3	1/8"	NP	5/-
1/4"	SC	3/3	1/4"	RH	4/9
1/4"	NP	4/3	1/4"	CS NP	4/-
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BRASS			STEEL		
Size	Head	Price	Size	Head	Price
1/16"	CH NP	2/-	1/16"	CH CP	2/-
1/8"	NP	2/6	1/8"	CS	2/-
1/8"	CS	1/8	1/8"	CH	2/2
1/4"	CH	2/3	1/4"	RH	2/2
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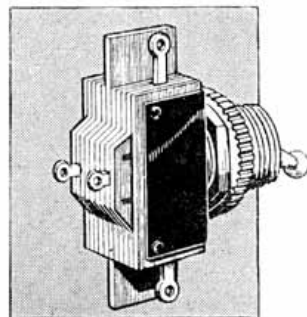
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16uF 500 V 3/11	8-8uF 350 V 3/9
24uF 350 V 3/3	8-8uF 450 V 3/11
32uF 350 V 3/3	8-16uF 450 V 4/6
8-16uF 500V 4/11	16-16uF 450V 5/3
25uF 25 V 1/3	16-32uF 350V 5/3
25-25uF 25 V 1/9	32-32uF 350V 4/11
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Primaries 200-230-250 V. 50 c/s Screened.

TOP SHROUDED, DROP THROUGH

260-0-260 V 70 mA. 6.3 V 3 A. 5 V	14/11
260-0-260 V 80 mA. 6.3 V 2 A. 5 V	14/11
350-0-350 V 80 mA. 6.3 V 2 A. 5 V	17/9
350-0-350 V 90 mA. 6.3 V 3 A. 5 V	21/9
250-0-250 V 100 mA. 6.3 V 4 A. 5 V	23/9
300-0-300 V 100 mA. 6.3 V 4 V 4 A. c.t. 0-4-5 V 3 A	23/9
350-0-350 V 100 mA. 6.3 V 4 V 4 A. c.t. 0-4-5 V 3 A	23/9
350-0-350 V 120 mA. 6.3 V 4 A. 5 V	28/9
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All with 200-250 V 50 c/s primaries: 6.3 V 2 A 7/6; 0-4-6.3 V 2 A 7/9; 12 V 1 A 7/11; 6.3 V 5 A 10/11; 6.3 V 6 A 17/6; 0-2-4-5-6.3 V 4 A 16/9; 12 V 3 A or 24 V 1.5 A 17/6; 0-5-6.3 V 5 A, four times, giving up to 24 V 5 A, up to 12-6 V 10 A, up to 6.3 V 20 A, by series or parallel connections. 55/-.

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All with 200-250-250 V 50 c/s Primaries: 0-9-15 V 1.5 A 14/9; 0-5-15 V 3 A 16/9; 0-9-15 V 6 A 22/9; 0-4-9-15-24 V 3 A 22/9; 0-9-15-30 V 3 A 23/9.

SMOOTHING CHOKES

250 mA, 8-10 H, weight 12 lb.	16/9
250 mA, 3 H, 50 ohms	8/9
100 mA, 10 H, 200 ohms	7/6
80 mA, 10 H, 350 ohms	5/6
60 mA, 10 H, 400 ohms	5/6
50 mA, 50 H, 1,000 ohms	9/11
40 mA, 5 H, 150 ohms	3/6
1 A, 25 H, l.t. type	4/9

CLAMPED UPRIGHT MOUNTING

250-0-250 V 80 mA. 6.3 V 3 A. 5 V	17/9
350-0-350 V 100 mA. 6.3 V 3 A. 5 V	21/6

FULLY SHROUDED UPRIGHT

250-0-250 V 60 mA. 6.3 V 2 A. 5 V 2 A.	17/6
Midget type 20-3in.	17/6
350-0-350 V 70 mA. 6.3 V 2 A. 5 V	18/9
250-0-250 V 100 mA. 0-4-6.3 V 4 A	25/9
0-4-5 V 3 A	25/9
250-0-250 V 100 mA. 6.3 V 6 A. 5 V	29/9
300-0-300 V 100 mA. 0-4-6.3 V 4 A	25/9
0-4-5 V 3 A	25/9
350-0-350 V 100 mA. 0-4-6.3 V 4 A.	25/9
0-4-5 V 3 A	25/9
350-0-350 V 150 mA. 6.3 V 4 A. 5 V	33/9
350-0-350 V 150 mA. 6.3 V 2 A. 6.3 V 2 A, 5 V 3 A	33/9
350-0-350 V 160 mA. 6.3 V 6 A. 6.3 V 3 A, 5 V 3 A	45/9
350-0-350 V 250 mA. 6.3 V 6 A. 4 V 3 A, 0-2-6 V 2 A. 4V 3 A. for Electronic Eng. Telescop.	67/6
425-0-425 V 200 mA. 6.3 V 4 V 4 A.	51/-
ct. 6.3 V-4 V 4 A. c.t. 0-4-5 V 3 A. suitable Williamson Amplifier	51/-
425-0-425 V 250 mA. 6.3 V 6 A. 6.3 V 6 A. 5 V 3 A	65/6
325-0-325 V 200 mA. 6.3 V 0.5 A. 6.3 V 1.5 A. for Williamson Preamplifier	17/6

ELIMINATOR TRANSFORMERS

Primaries 200-250 V 50 c/s, 120 V 40 mA 7/11
0-120-0-120 V 30 mA, 4 V 1/2 A 12/9

E.H.T. TRANSFORMERS. 2,500 V 5 mA, 2-0-2 V 1.1 A, 2-0-2 V 1.1 A, for VCR97, etc. 37/6

OUTPUT TRANSFORMERS

Midget Battery, Pentode 66: 1 for 354, etc. 3/6
Small Pentode, 5,000 Ω to 3 Ω 3/9
Small Pentode, 8,000 Ω to 3 Ω 3/9
Standard Pentode, 5,000 Ω to 3 Ω 4/9
Standard Pentode, 8,000 Ω to 3 Ω 4/9
Multi-ratio 40 mA. 30:1, 45:1, 60:1, 90:1, Class B Push-Pull, 50 mA, 10-12 Watts 6V6 to 3 Ω 16/9
Push-Pull 10-12 Watts 6V6 to match 6V6, to 3-5-8 or 15 Ω 16/9
Push-Pull 15-18 Watts to match 6L6, etc., to 3 Ω or 15 Ω Speaker 22/9
Push-Pull 20 Watts, high-quality sectionally wound, 6L6, KT66, etc. to 3, 7.5, or 15 Ω (secondary in 4 sections of 3.7 Ω each) 51/9
Williamson type, exact to author's specification 85/-

WE CAN QUOTE FOR QUANTITIES OF STANDARD OR SPECIAL TYPES. S.A.E. PLEASE WITH ALL ENQUIRIES.

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ADVERTISEMENT RATES. Members' Private Advertisements 2d. per word, minimum charge 3/-. Trade Advertisements 6d. per word, minimum charge 9/-. (Write clearly. No responsibility accepted for errors.) Use of Box number 1/6 extra. Send copy and payment to **National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4,** by 25th of month preceding date of issue.

A Ham station for sale, including BC.610, BC.614. Speech amplifier, condenser microphone. Vibroplex key. G.E. Variac controlling input from 20 W up. Two 110 V auto-transformers. Wilcox Gay v.f.o. Class D No. 1 wavemeter for 220 V a.c. H.R.O. Senior, p.p. and speaker. Commander receiver and speaker. The transmitter is fitted with heavy wood base mounted on casters for easy moving, and the complete station can be seen by appointment at G2XY, HARRY LITTLEWOOD, 985 Scott Hall Road, Leeds. Phone 63020. (620)

A MATEUR, selling up, offers large stock of complete items and components at ridiculously low prices. Rotary beam, modulator, r.f. unit, power pack, valves, chokes, transformers, etc. S.A.E. for list.—Box 639, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (639)

A MATEURS, short wave, television, send for free list components, instruments, aeriels, etc.—THE RADIO EQUIPMENT CO. (Dept. RS), Castor Road, Brixham, Devon. (393)

A R.77E, in first-class condition. "S" meter, etc., and instruction manual; £40 or near offer.—STADDON, Minchinhampton, Stroud, Glos. (637)

A TENTION, R.A.F. and ex-R.A.F. personnel. Are you a member of the R.A.F. Amateur Radio Society? No? Then please write the Secretary, R.A.F.A.R.S., R.A.F., Locking, Somerset, for full details, and for copy of official magazine, "QRV," price 2s. (621)

IMPORTANT NOTICE

All replies to Box Nos. should be sent to the NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4.

B C.348 for sale, with power pack, 230 V, £12. Buyer collects (Worcs.).—Box 654, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (654)

B C.348 in good order with metered power pack, £16.—B.R.S. 19287, 6 Victoria Drive, Llandudno Junction. (648)

B C.454, modified, power pack, £3. RF.26, £2. Celestion 10 in. loudspeaker with transformer, £1. Celestion 2 1/2 in., £1. Transformers all 200/250 input: 500-0-500 170 mA, 4 V 4 A, £1; 500-0-500 100 mA, 6 V 4 A, 5 V 3 A, 4 V 4 A, £2; 350-0-350 80 mA, 6 V 3 A, 5 V 2 A, £1; 250-0-250 60 mA, 6 V 1.5 A, 5 V 2 A, 15s. Condensers: .1 µF 4 kV, 5s.; 4 µF 800 V, 5s. each; 4 µF 600 V, 5s. each; 8 µF 1,000 V, 7s. 6d. Valves: 6AG5 (3), VP23 (3), AR8 (1), PEN25 (1), 5s. each; 6N7GT, 10s. Pifco radiometer, 15s. Meters: 2 1/2 in. sq., 50 mA 7s. 6d., 20 V 5s., 5 mA 5s.; 2 in. round, 30 mA 10s.; 3 in. round, 10 mA 15s., 3 mA 15s. R.1155 tuning condenser, 2s. 6d. All above used, good condition. New valves: KT8c, £1; 35Z4, 7s. 6d.; DL35 (2), SP61 (4), 10s. each.—B.R.S. 19340, 79 Wilsthorpe Road, Long Eaton, Nottingham. (629)

BOUND to satisfy. BULLETINS bound, 6s. 6d. per volume, post free. Attractive low-priced QSL cards supplied. Sample.—H. W. ROBINSON, G2BBT, 35 Forty Acres Road, Canterbury. (632)

BULLETINS for sale, June, 1944, to present date. November, 1946, and January, 1949, missing, otherwise perfect. Offers to Box 659, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (659)

B II transmitter/power pack, complete, £7. New 813, £2. Two-meter transmitter, 100 W, 829B final, £15.—Details, G3CGO, 94 Alexandra Avenue, Luton, Beds. (631)

COMPLETE station, commercially built, 230 a.c. or 12/24 d.c., 3/15 watts. Bank switched transmitter/receiver, 1-10 Mc/s, v.f.o./crystal mod., Universal aerial coupler, relay operated microphone. All valves. Manual. Seen and delivered London. 25 gns.—Box 651, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (651)

COMPLETE 1949-1950-1951 copies of BULLETIN—offers, 100 V 150 mA power supply components; S.A.E. details, 120 W p.p., 807s, P.A. deck, phone/c.w., standard chassis and panel, metered, coils 20/10 meters, spare set valves, £5. Buyer collects. Transmitter push-button remote control and keying unit, 10s. Postage paid.—G3ENH, 74 Hawkesley Mill Lane, Birmingham 31. (633)

C R.100, working, requires slight attention, £15 or offer. R.1116 battery double superhet., 15-2,500 metres, £5 10s. W.1191 wavemeters, less crystal and valves, £3. R.1147A, 35s. R.1147B, 45s. R.1294, 10-60 c.m.s., £10. BC.221 Octal crystal, £1 5s. Also H.R.O. spares, crystals, valves, 522s, etc. S.A.E. list.—ARMSTRONG, 40 The Oval, Mirehouse, Whitehaven. (636)

EDDYSTONE S.640 receiver with speaker and phones. Ex-Govt. r.f. unit, Type 26, with power pack. Ex-Govt. Morse trainer with key, 24 V d.c. rectifier. Six Morse records. Two G.P.O. line selector switches. Weymouth coil pack. Also other items. The lot, £22.—"Chailey," Bramley Drive, Bramhall, Stockport, Cheshire. Phone Bramhall 238. (643)

EDDYSTONE 640, little used, one owner, new condition, "S" meter, £20. London area.—Box 660, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (660)

EDDYSTONE 750, mint condition, original packing, nine months, £40. Meissner signal shifter, v.f.o., 20 metres output, internal power pack, £12 10s. BC.348 chassis, complete valves, rack mounting, £8. Lionel bug key, £3. Miniature butterfly trimmers required.—"Southcliffe," Highwood Road, Parkstone, Dorset. (638)

EDDYSTONE 750, with matching speaker, absolute mint condition, little used. First £42 secures despatch, crated, per passenger train.—320 Trowell Road, Wollaton, Nottingham. (Telephone: Nottingham 79097, evenings.) (653)

E T.4336 transmitter, as new, unmodified, complete with Wilcox Gay v.f.o., used about 70 hours only. Best offer secures. CNY.1, transmitter and power pack working order, receiver requires attention, £8 10s. Command transmitter and modulator built into case, requires power pack, £2 15s.—Box 657, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (657)

EXCHANGE new R.1481 receiver for c.w. bands crystals; or sell.—ALBAN, 85 Inverness Terrace, London, W.2. (613)

EXCHANGE 1/2 in. electric drill, 230 V; electric record player, auto. stop; midget a.c./d.c. set; 808 (2); RK20A (2); RK46 (2); PT15 (2); Woden 1,250 V 250 mA transformer; 300 mA choke; for useful gear. Offers.—G2DTQ, Mansfield, Notts. (635)

FOR SALE or exchange.—BC.348L. New condition. Wanted: receiver to cover 15 metres.—CLARKE, "Westaway," Lower Lane, Newton-with-Scales, Nr. Kirkham, Lancs. (618)

FOR SALE.—S.640 receiver, complete with speaker, in excellent condition; £18 cash.—GM3GLM, 110 Arbles Road, Motherwell. (642)

FOR SALE.—Type 145 oscillator and power pack. Type 1131 modulator and power pack. Will exchange for receiver or B2.—G3BLZ, 40 Union Street, Wednesbury, Staffs. (646)

HAMBANDER. £7. Q-fiver, £3.—BARRON, 9a Regent Street, Shanklin, I.O.W. (611)

HAM offers £40 for AR.88; £15 for BC.221. Also requires boxed valves. Will collect.—Box 490, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (490)

HAM requires transmitter, receiver and BC.221 frequency meter. Collection arranged.—Box 497, NATIONAL PUBLICITY CO. LTD., 36-37 Upper Thames Street, London, E.C.4. (497)

L ABGEAR coils: DSL/14, DSL/28, base DSLB, 15s. each. Clydon split stator, TRM.60, £1. Amphon 10 range test meter, a.c./d.c., £3 15s. RF.26 unit, £2. All new and unused.—157 Wanstead Park Road, Ilford, Essex. (645)

OFFERS wanted.—B.2 with phones and key—no power pack. Wanted: 811s or 812s.—G3FDG, "Watville," Watling Street, Wellington, Shropshire. (619)

PATENTS and Trade Marks. Handbooks and advice free.—KINGS PATENT AGENCY LTD. (B. T. KING, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146a Queen Victoria Street, London, E.C.4. Phone: City 6161. 50 years' refs. (98)

PHILIPS 10-valve a.c. Export Model 362A/34; 550-1,500 Mc/s; 1,500-4,200 Mc/s; 4-13 Mc/s; 10-31 Mc/s; 30-60 Mc/s. Recently overhauled; spotless.—Offers to Mrs. T. MORRISH, Wayside Cottage, Kimbury, Berks. (617)

QSLs and log book (P.M.G. approved); samples free. State whether G or BRS.—ATKINSON BROS., Printers, Elland. (97)

QUALITY QSLs.—Largest range of samples, "G" or SWL.—Try G6MN, The QSL Printer, Worksop, Notts. (152)

RADIOCRAFT bandswitched transmitter, 80, 40, 20, 10, crystal osc./p.a. r.f., 6AG7/6L6 mod., 6J7, 6J5, 6L6, a.c., p.p., with SZ4 metered; as new; transmitter in T.U. size case, with valves; £16.—Box 658, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (658)

RADIO World Digest. Short-wave programmes, comprehensive list of world broadcasts in English, topical articles on radio and T.V. First Friday of every month. 6d. Newsagents, bookstalls or 137 Blackstock Road, London, N.4. (608)

R.1355 for "Inexpensive Television"; unused with valves and conversion data for all T.V. channels; 30s. Orsam DA100 with base, 25s. Carriage extra.—G3DCQ, 8a Sunnydene Avenue, Highams Park, London, E.4. (610)

SALE.—Complete station, p.p. 813 transmitter and smaller rigs. AR.88LF, BC.221, test gear. Large quantity components, meters, valves, etc. Write for details.—Box 627, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (627)

SALE.—Complete transmitter, 3 807 FD, 807 BA 813 final, TZ40 modulator, early stages switched. First-grade components throughout. Tunes 80, 40, 20, 15 and 10 metres at 150 W. 36 in. rack mounted. Separate Franklyn v.f.o. and speech amplifier housed in FB diecast cabinet. No reasonable offer refused. Also Type "D" test meter. Prefer buyer to view, but free delivery up to 100 miles.—KEITH-MURRAY, 2 Walrond Road, Swanage, Dorset. (625)

(Continued on Page 172)

Appointments vacant

CROWN AGENTS FOR THE COLONIES

INSPECTORS OF POLICE (Radio Duties) required by Government of Uganda. Appointment will be on probation for permanent and pensionable employment. Salary in scale £612 rising to £893 a year (including temporary allowance). Outfit allowance £30. Uniform allowance £10 a year. Free passages. Liberal leave on full salary after tour of 30/36 months. Candidates, between ages 21 and 30, must be at least 5 ft. 8 in. in height without footwear, of good physique and normal vision without glasses. They must have good practical experience in the operation, maintenance and repair of modern low and medium-power h.f. and v.h.f. radio transmitting and receiving equipment and of petrol/electric and diesel power generating equipment. Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.29571.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (628)

CROWN AGENTS FOR THE COLONIES

JUNIOR WIRELESS OPERATOR required by the Falkland Islands Dependencies Administration for service in South Georgia for one tour of 18 or 30 months in the first instance. Commencing salary according to age and qualifications in scale £310 rising to £370 a year. Free board and lodging. Free passages. Leave on full salary. Candidates, unmarried, must hold a P.M.G. Second Class Certificate of Proficiency in Wireless Telegraphy and be able to maintain Radio Transmitters and Receivers, Creed High Speed transmitting apparatus and Marconi Auto Alarm equipment. Apply at once by letter stating age, full names in block letters, and full particulars of qualifications and experience and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.29484.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (630)

CROWN AGENTS FOR THE COLONIES

WIRELESS AND TELEGRAPH SUPERVISOR required by the Nigeria Government Railway Department for one tour of 18 to 24 months in first instance. Option of appointment either (a) on agreement with a prospect of permanent and pensionable employment on salary £750 rising to £1,175 a year (including expatriation pay) or (b) on a temporary basis at salary £807 rising to £1,269 a year (including contract addition and expatriation pay) with a gratuity on satisfactory completion of final service of £25 or £37 10s. according to salary, for each completed period of three months' service. Outfit allowance £60. Free passages for officer and wife and assistance towards cost of children's passages or their maintenance in this country. Liberal leave on full salary. Candidates must have a sound knowledge of International wireless operating, of telegraph working, and of the general running and supervision of a Telegraph and Wireless office. They should have experience of the working and handling of traffic over wireless and telegraph networks, together with technical knowledge of modern h.f. radio transmitters and receivers and of telegraph circuits. Candidates employed by the General Post Office should apply through departmental channels.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.29579.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (662)

JUNIOR Technicians are required in the Test Department of a well-known Cambridge electronic instrument company. Knowledge of operation of normal measuring instruments desirable. State previous experience and approximate wage required to Box 661, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (661)

WANTED for North London District. — Capable Radio Engineer to take charge of production and testing of Quartz Crystals for Radio Frequency Control.—Write full particulars, salary, etc., to Box 545, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (545)

Appointments wanted

A MATEUR now employed in Southern Africa with Post Office, but returning U.K. October, seeks post as Technical Writer or Technical Clerk; has considerable experience in this field. Good references. London area.—Box 609, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (609)

SALE.—Manuals for AR.88D, AR.77E, SX.28, H.R.O. Senior, H.R.O.7, BC.342 receivers. Bendix TA.12D transmitter. Wanted: Manual for CR.100.—Box 626, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (626)

SALE.—1355 with r.f. unit 26, works, 250 V a.c., 2-valve pre-amp. "Holme Moss" frequency; 2 kV e.h.t. unit; time bases; 60 ft. co-axial cable, 80 ohm; above all complete with valves, £5. AR.77E receiver, £25.—J. MADGIR, 13 College Terrace, Brandon Colliery, Durham. (614)

S 640 receiver with crystal calibrator, L.S. and "S" meter; perfect condition; £28 or offers to F. H. ROBINSON, 33 Sherwood Road, Birmingham 28. (634)

TYPE 145 v.f.o. and p.p., £7 10s., or will sell separately. AVO valve tester for sale; no manual; £12 or offer.—Box 652, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (652)

WANTED.—B.2 in A1 condition, complete.—Details and price to Box 615, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (615)

WANTED.—BC.342 or BC.348, less valves. For sale: 144 Mc/s crystal-controlled converter, £5. Photo available. S.A.E. please. Receiver, 80 kc/s to 19 Mc/s, £8 10s. Buyer collect.—SMITH, Waterloo House, Addington Grove, Sydenham, London, S.E.26. (641)

WANTED.—BC.610 Hallicrafters, ET.4336 transmitters, SX.288, AR.88s, receivers and spare parts for above. Best prices.—Write Box 864, SPIERS SERVICE, 82 Centurion Road, Brighton, Sussex. (498)

WANTED by Ham.—S.27 in unconverted, mint condition for cash or exchange for a pair of BC.611 walkie-talkies, as new.—M. CONU, B.R.S. 15036, 5 Orchard Gardens, Putson, Hereford. (Telephone: 3798.) (656)

WANTED.—Circuit for B.2 minor transmitter/receiver A Mark III, serial No. 34098, also circuit for receiver type CIH-46159-A (TCS-6), serial No. 4881, also case for BC.221-Q, serial No. 4799, and charts for same. Urgent.—Details to G3IWS, 143 Hampton Road, Southport, Lancs. (647)

WANTED.—ET.4336 transmitter, reasonably good condition, with or without speech amplifier. Buyer prepared pay collection, packing and transport to Scotland. Reasonable price.—Box 623, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (623)

WANTED.—Frequency meter, BC.221 or equivalent. Good condition. Buyer will collect.—SOLLITT, c/o Mining Dept., Leeds University. (655)

WANTED.—H.R.O. coils, receivers, power packs, AR.88Ds, AR.88LFs, SX.288, BC.348s, AR.77s, etc.—Details please to R.T. & I. SERVICE, 254 Grove Green Road, Leytonstone, E.11. (LEY 4986.) (101)

WANTED.—R.C.A. speech amplifiers type MI-11220 J or K and aerial tuning units BC 939A. Coils and tuning units for BC.610 transmitters.—Offers stating quantity and price to P.C.A. RADIO, The Arches, Cambridge Grove, W.6. (496)

WANTED.—SCR.522, working, power supply. Reliable 145 Mc/s converter, D.C./a.c. rotary converter, 220 V, 600-1,000 W meter, 0-250 V a.c.—Offers by airmail to VS2DQ, Baling Estate, Kuala Ketil, Kedah, Malaya. Postage will be refunded. (624)

WANTED.—1952 "QST," January, February, May, July; also Eddystone manuals No. 1, No. 3, No. 5 and No. 7, etc.—Price, etc., to BLATHERWICK, 20 The Drive, Roundhay, Leeds 8. (616)

WANTED.—250 new unused EF50s. Must be cheap. Other ex-Government and manufacturers' surplus purchased.—Details to Box 622, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (622)

WODEN 250 mA swinging choke, 32s. 6d. 20 H 120 mA, 10s. 829, 27s. 6d. CV1069, 15s. Eddystone bug, 37s. 6d. Brookes 7001, Q.C.C. 7031, 7051, 11s. 6d. each, 30 ft. co-axial, 6s. 6d. Regentone eliminator WIC, 37s. 6d. Philips All-wave Universal, 130s. 11-valve Double Super by G21Q, 28-3.5 Mc/s, £15 15s. Massive 1,200 V transformer, RZ1/150, tapped 700 V; offers. Wanted: AR.88D or similar.—G6BB, 35 Criffell Avenue, London, S.W.2. (649)

£60 offered for unmodified AR.88D, in mint condition only. Write giving full particulars. Also required: Manual for BC.639A receiver and cover for Type 3 power unit. For sale: Eddystone 640 with "S" meter, £26. Class "D" wavemeter, £7 10s. Power unit, Type 633, 130 V stabilised and 6.3 V, £2 10s. Taylot 65B signal generator, £9 10s. Buyers collect; S.E. London area.—Box 640, NATIONAL PUBLICITY CO., LTD., 36-37 Upper Thames Street, London, E.C.4. (640)

21 SET receiver/transmitter, complete in metal case. Spare valve case full. Fine Q.R.P. rig, frequency 4.2-7.5 and 19-31 Mc/s, £10.—FELLOWS, 83 Broadway, Mill Hill, London, N.W.7. (650)

750 Eddystone, perfect working order, one owner, little used, condition indistinguishable from new; £45.—WEBSTER, Oakburn, Blackwell, Darlington. (644)

1131 V.H.F. transmitter p.a. stage with two new 834s.—Offers to MEEKS, 37 Pevensey Road, Eastbourne. (612)

AMATEUR TRANSMITTING LICENCE**Pass the G.P.O. MORSE CODE TEST
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- (2) **Candler Junior Course** for Beginners.

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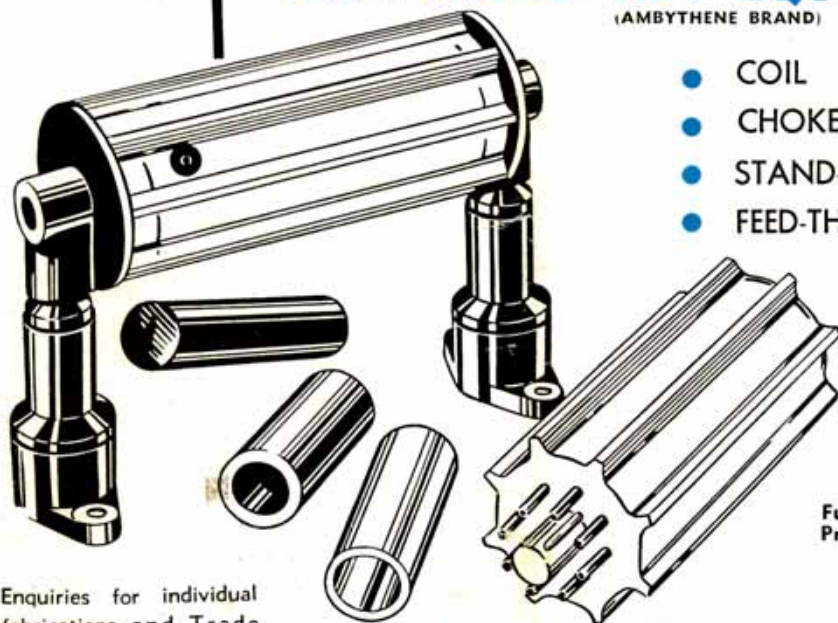
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