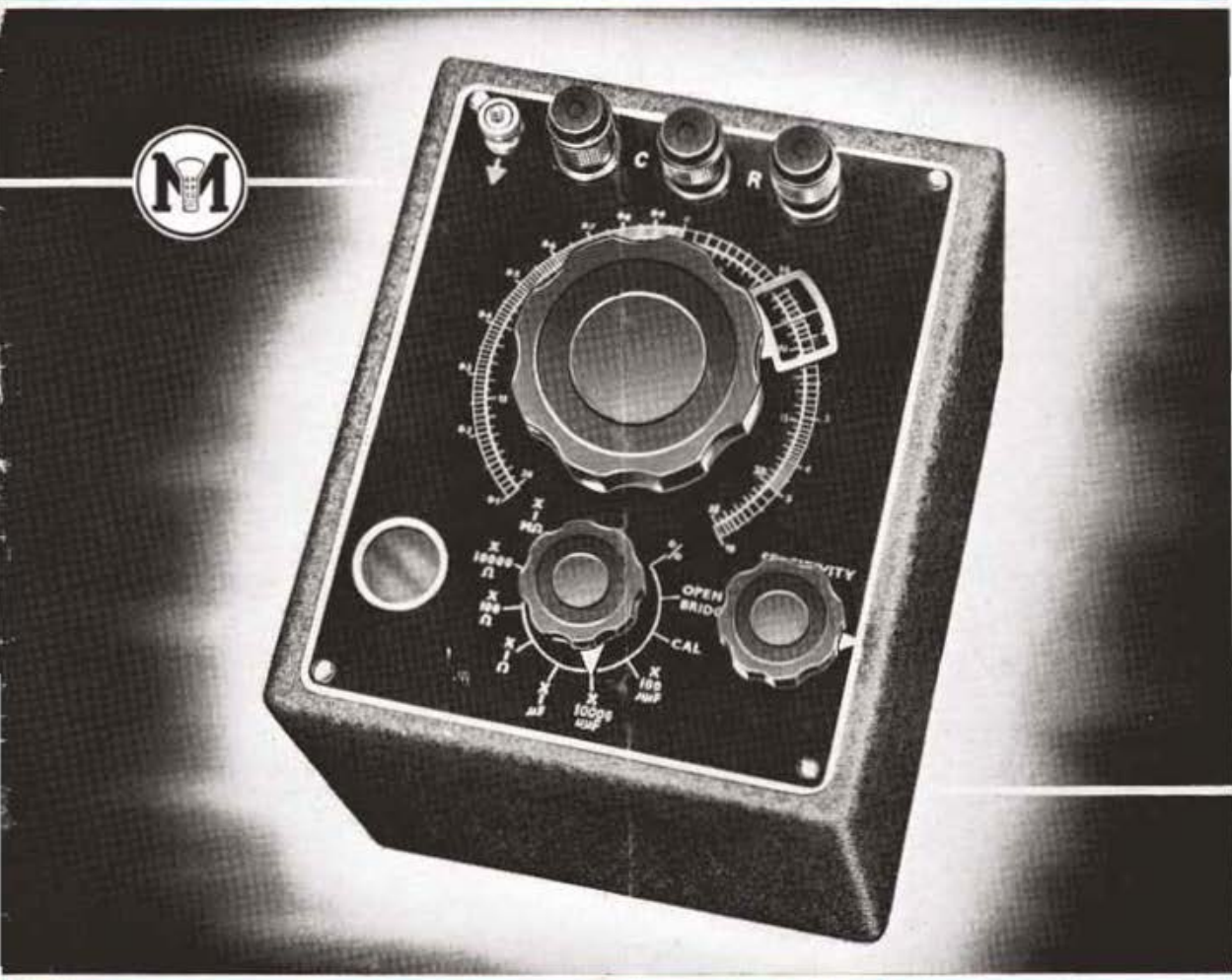
R·S·G·B VOLUME 21 · NO. 1 · COPYRIGHT · PRICE 1/6 JULY, 1945

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN



- A CODE OF GOOD PRACTICE
- IMPEDANCE MATCHING
- RELAYS IN STATION LAYOUT
- FRESHMAN'S GUIDE TO AMATEUR RADIO

NEW MEMBERS

THE COUNCIL HAS PLEASURE IN ANNOUNCING THAT THE FOLLOWING HAVE BEEN ELECTED TO CORPORATE OR ASSOCIATE MEMBERSHIP OF THE SOCIETY

British Isles (Licenced Amateurs)

G2HN L. H. POTTER, 75 Westerleigh Rd., Yate, Nr. Bristol.
G2JU †E. J. PEARCEY, Colinwood, 126 Pinner View, Harrow, Middlesex.
G2KU †R. M. HERBERT, 9 Foxley Hill Road, Purley, Surrey.
G2PR A. E. WHITEHEAD, 44 King's Ride, Camberley, Surrey.
G2XB P. W. BARNES, 2 The Square, Riverhead, Kent.
G2ZU †F. W. ELLENGER, Westonia, Nelson Rd., Winchester, Hants.
G3CA J. A. BAKER, 216 St. Thomas Road, Preston, Lancs.
G3DA †A. B. BOSWELL, A. M. Radio Station, London Airport, Croydon, Surrey.
G3GF †E. F. READ, 26 Hillside, Little Thurrock, Grays, Essex.
G3KJ †K. D. JACKSON, c/o Dalkey, East End, Fairford, Glos.
G3KO G. R. SNOWDEN, 247 Heysham Road, Morecambe and Heysham, Lancs.
G3LN P. H. ROCK, 258 Yardley Fields Road, Yardley, Birmingham.
G3MV †M. B. EDWARDS, Upwey, 14 West Pk. Hill, Brentwood, Essex.
G3NM †S. R. POUNTNEY, 82 Knockbreda Road, Belfast, N. Ireland.
G3RS C. J. S. JONES, 55 War Lane, Harborne, Birmingham, 17.
G3SD *F. THOMPSON, 14 Sandringham Avenue, Benton, Newcastle-on-Tyne.
G3UR R. N. SYKES, Stonlea, Oldfield Road, Honley, Nr. Huddersfield.
G3VO J. R. BRIERLEY, 39 Glen View Road, Burnley, Lancs.
G3VW †R. H. NEWLAND, 42 Bacon Lane, Kingsbury, London, N.W.9.
G3WS F. S. A. JENKINS, 558 Upper Brentwood Road, Gidea Park, Romford, Essex.
G4CH W. WILDE, 38 Statham Street, Derby.
G4CM †C. G. MIDDLE, c/o 66 South Street, Leighton Buzzard, Beds.
G4DZ †A. E. BUCKLE, Mount Pleasant, Fivehead, Taunton, Somerset.
G4GB †H. HARDY, 12 Lawn Close, Ruislip, Middlesex.
G4HZ E. C. BEALE, Glenshira, Quarrelton Rd., Johnstone, Renfrewshire.
G4MI N. Y. HARPER, 33 Vicarage Road, Amblecote, Stourbridge, Worcs.
GM4MV †L. B. FISHER, 32 Margaret St., Greenock, Renfrewshire.
G4NQ L. H. HUNT, 30 Brandon Rd., Hall Green, Birmingham, 28.
G5DV †H. ANDREWS, 3 Beaufort Rd., Weston-super-Mare, Som.
G4PF W. A. LAWSON, 16 Marina Cres., Netherton, Liverpool.
G4OF A. ROBERTS, Radiohom, Morton, Gainsborough, Lincs.
G5FY G. B. CONNOR, 121 Harrowby Lane, Grantham, Lincs.
G5GC †G. A. H. ECKLES, 25 Southampton Street, Farnborough, Hants.
G5RO †R. M. SUTHERLAND, 72 Mildenhall Drive, St. Leonards-on-Sea, Sussex.
G6FC F. CHRISTOPHERSON, 15 Priory Crescent, Penwortham, Nr. Preston.
G6KA †K. F. HARDIE, 4 Hermitage Close, Snaresbrook, London, E.18.
G6OG F. GEE, 10 Kensington Av., Penwortham, Nr. Preston, Lancs.
G6SQ †J. W. NUTTALL, 11 Cage Lane, New Longton, Nr. Preston.
G6TZ R. BOTTOMLEY, 528 Manchester Road, Linthwaite, Huddersfield.
G6UM P. X. FOX, Newlaithes Road, Horsforth, Yorks.
G8BP W. H. HILL, Newin House, Uplands Avenue, Wolverhampton, Staffs.
G8BR B. RAYNER, 43 Wolverton Road, Haversham, Bucks.
G8CM H. N. YARDLEY, 47 Grove Place, Leamington Spa, Warwickshire.
G8FP W. J. KIRKLAND, 310 Middle Street, Yeovil, Somerset.
G8NJ F. H. CLARKE, 15 Holly Grove, Fletchamstead, Coventry.
G8OG H. DOBSON, 67 Gledhow Lane, Leeds, 8.
G8PH H. C. HOLLEY, P. O. Box 3, Hawthorn, Wilts.
2ABW A. B. FIELDHOUSE, Ribbesford, Bromley, Nr. Brierley Hill, Staffs.
2AVW R. W. BRITTON, 6 Bothal Tce., Stakeford, Choppington Northumberland.
2AYJ R. L. JONES, 16 Kent Avenue, Leigh-on-Sea, Essex.
2BCI H. M. TAINTON, c/o 400 Coulsdon Rd., Old Coulsdon, Sy.
2BGJ †S. C. P. MEARS, 1 Lesney Park Road, Erith, Kent.
2BPY G. DIXON, 37 Leeds Road, Dewsbury, Yorks.
2BZD P. G. SMITH, Downs Edge, Findon, Sussex.
2CPK J. D. MASSEY, 17 Buckingham Road, Tue Brook, Liverpool, 13
2CRL H. CLAMP, 18 Mortimer Street, Derby.
2DCH H. S. WOOLEY, 8 Third Av., Sherwood Rise, Notts.
2DCP G. E. CHILVERS, 102 Austin St., King's Lynn, Norfolk.
2DGJ R. P. FRANKLIN, 435 Lea Bridge Rd., Leyton, London, E.10.
2DKY A. S. BURT, 55 Headswell Av., Redhill, Bournemouth, Hants.
2DUZ H. BRIBBON, 120 Warley Rd., North Shore, Blackpool.
2FDA F. A. C. TODD, 22 The Highlands, Edgware, Mdx.
2FFD D. SKIPWORTH, 61 West Street, Horncastle, Lincs.
2FLO T. A. FINLATOR, Norwood, Alloa, Scotland.
2FSC E. H. PERCY, War Department Constabulary, 40 The Garrison, Purfleet.
2FZL T. W. FORD, 28 Cherry Orchard Way, Maidstone, Kent.
2FYW D. DAVIES, 31 Council Street, Llandudno.
2HDK C. G. WILEMAN, 161 Broadway E., Northampton.

* *Denotes known to be on Active Service.*
† *Denotes Re-elected.*

A CORDIAL WELCOME IS EXTENDED TO THE

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NEW MEMBERS WHOSE NAMES ARE LISTED

British Receiving Stations (B.R.S.)

79 †D. J. BEATTIE, Municipal Buildings, Penzance, Cornwall.
803 †H. HALE, 59 Devonshire Avenue, Leeds, 8.
2191 †J. P. TYNDALL, 46 Church Way, Weston Favell, Northampton.
3476 †D. H. BARLOW, 5 Warwick Park, Tunbridge Wells, Kent.
4404 †T. H. PLATER, 43 Timberhill, Norwich, Norfolk.
9601 B. SHAW, c/o B.B.C., Daventry, Northants.
9602 G. H. JACKSON, 4 Moors Road, Scunthorpe, Lincs.
9603 D. B. RICHARDS, 73 Mill Green Road, Welwyn Garden City, Herts.
9604 G. C. WEBB, 50 Addington Road, West Wickham, Kent.
9605 T. SMART, 300 Rawlinson St., Barrow-in-Furness, Lancs.
9606 W. E. ROBERTS, 1 Granville Street, Leamington Spa, Warwicks.
9607 P. F. HARRINGTON, "Sir Robert Peel," Hampden Road, Kingston-on-Thames, Surrey.
9608 *R. GIBBONS, 5 Garston Drive, Watford, Herts.
9609 G. H. M. TAYLOR, c/o Y.M.C.A., 10 The Quadrant, Coventry.
9610 G. R. CLARKE, 13 Newstead Grove, Sherwood Street, Nottingham.
9611 A. T. M. VAUGHAN, 55 Alexandra Road, Kings Hill, Wednesbury, Staffs.
9612 *R. A. SHERET, 2 Highfield Rd., Tolworth, Surbiton, Surrey.
9613 J. R. ELLIS, 7 Teviot Crescent, Hawick, Scotland.
9614 *R. HAWKINS, 50 Hill View Road, Sutton, Surrey.
9615 F. NICHOLLS, Five Grange Close, West Monkseaton, Northumberland.
9616 T. BILTCLIFFE, 6 Redcar Road, Smithills Dean, Bolton.
9617 R. J. TALBOT, Shornells, Hollywood Lane, Wainscott, Nr. Rochester, Kent.
9618 A. J. R. EVERETT, High Street, Colyton, Devon.
9619 R. E. WHIFFEN, 62 North Walls, Winchester, Hants.
9620 D. BURRELL, 53 Holmwood Road, Freezywater, Enfield, Middlesex.
9621 J. DONALDSON, 123 Ellerman Avenue, Twickenham, Mdx.
9622 V. C. A. EDWARDS, 17 Warwick Road, Coulsdon, Surrey.
9623 W. H. HUMPHRIES, 142 Harvills Hawthorn, Hill Top, West Bromwich, Staffs.
9624 N. CLEGG, 11 Wembley Avenue, Thornton, Bradford.
9625 J. S. KNOX, 180 Willerby Road, Hull, Yorks.
9626 J. D. BURNET, 31 Erridge Rd., Merton Park, London, S.W.19.
9627 L. K. AYRE, 11 Brosil Av., Handsworth, Birmingham 20.
9628 *R. DODD, 63 Rudyard Road, Knotty Ash, Liverpool 14.
9629 MRS. M. DAY, 30 Market St., New Mills, Stockport, Ches.
9630 *J. E. S. ALLEN, 17 Market St., Dowlais, Glam., S. Wales.
9631 T. HOGARTH, 82 Thornsbeach Rd., Catford, London, S.E.6.
9632 *H. D. PUGH, 32 Matlock Road, Lostock Est., Stretford, Manchester.
9633 L. A. NEWMAN, 245 Goodhart Way, West Wickham, Kent.

CLOSING DATE FOR AUGUST ISSUE IS JULY 30TH. REPORTS SHOULD BE POSTED TO REACH D.R.'s & SCRIBES BY JULY 26TH

AROUND THE DISTRICTS

Forthcoming Events

July 21	District 15, 3 p.m., at The Excelsior Hotel, 1 Ladbroke Gardens, Ladbroke Grove, Notting Hill, W.11.
July 22	District 4 (Nottingham), 6 p.m., at 2FXY, 3 Broadway East, Oakdale Road, Carlton (No. 3 bus to terminus from Council House). Discussion on " Post-war Planning " and sale of surplus gear.
July 22	District 4 (Leicester), 2.30 p.m., at G2IX, 19 Francis Avenue, Braunstone.
July 22	Provincial District Meeting, District 6, 12.30 p.m., at Rougemont Hotel, Exeter, Devon.
July 25	District 2, 8 p.m., at the " Dog and Partridge," Trippet Lane, Sheffield. Sale of surplus gear.
July 25	District 15 (Hayes), 7 p.m., at The Labour Hall, Southall. Lecture by Mr. Murphy on " Signal Generators."
July 25	Scotland " A " District, 7 p.m., in the Institute of Engineers and Shipbuilders, Room B, 39 Elmbank Crescent, Glasgow.
July 27	District 15 (Harrow), 7 p.m., at BRS6527, 153 Belmont Road, Harrow, Mddx.
July 29	District 5, 3 p.m., at 17 Colston Avenue, Centre, Bristol.
Aug. 12	District 15 (West London), 5.30 p.m., at BRS6275, 51 Rusthall Avenue, Bedford Park, Chiswick, W.4.
Aug. 12	Romford Radio Society, 3 p.m., Y.M.C.A., North Street, Romford.
Aug. 22	District 15 (Hayes), 7 p.m., at The Falcon, Uxbridge Road, Uxbridge. Lecture by G3NR on " Manufacture of Quartz Crystals."
Aug. 26	District 4 (Nottingham), 6.30 p.m., at 2AOO, 78 Henry Road, West Bridgford. " Post-war Planning."

A cordial invitation is extended to Society members to attend any of the above meetings.

DISTRICT 1 (North Western)

D.R.: H. W. Stacey (G6CX), " Sandleas," Eddisbury Road, West Kirby, Cheshire. Hoylake 337.

Ashton-under-Lyne.—At the June meeting when three new members were enrolled from the Manchester area, the Chairman, BRS4567, gave an interesting lecture on V.H.F. illustrating various points on very simple and concentric lines. His explanation of the dimensions and elements of the " J " type aerial were well received. G3PM and 6DV supported the lecture by demonstrating their newly-built V.H.F. receivers which by Lecher wire measurements were found to be in the region of 224–230 Mc/s.

The T.R. welcomes a letter from BRS8071 now in Palestine who reports upon his efforts to contact R.S.G.B. members.

The next meeting will be held on Sunday, July 15, at 2.30 p.m. at the A.C.S. Educational Rooms, Stamford Street. G5PX.

Whitehaven.—An enjoyable meeting, held at G8RZ on June 8, was attended by 3BW, 3SY, 2DWG and Mr. Dodds. G3BW was appointed T.R. Further meetings are being arranged and new members are asked to get in touch with him at 53 Hill Top Road, Arrowthwaite, Whitehaven. The thanks of all present at the meeting are expressed to 8RZ and his wife for their kind hospitality.

Oldham.—There is nothing of importance to report arising out of the May meeting. The next will be held on July 29 at 6.30 p.m. at G3TN, 51 Gainsborough Avenue, Oldham. G2MQ

Rochdale.—Only two replies have been received to the recent appeal for local support, one of them being from Sgt. A. E. Sutton, G3BA, writing from B.L.A.! He sends best wishes to 5XF. BRS7083.

Preston.—Mr. A. Adams, 11 Priory Crescent, Penwortham Hill, Preston, the pre-war T.R., hopes to revive local meetings. Will those interested please get in touch with him as soon as possible ? G5AD.

Darwen.—At the last meeting G2HW delivered an address on valves which was much appreciated by the 12 members present. Three new members joined the Society and there is great activity following publication of the recent notice about license applications. G8FI.

Liverpool.—Members will be sorry to hear that F./O. Jim Davies, G2OA, is in hospital for five or six weeks but they will be pleased to learn that he has been Mentioned in Dispatches (Congrats O.M.). The meeting held on June 30 will be reported upon in the next issue. The July meeting will be held at the Stork Hotel, Queens Square, Liverpool, on Saturday, July 28, at 3 p.m. G6CX.

Liverpool members get together. Mr. H.W. Stacey (G6CX) No. 1 D.R., second from left.

DISTRICT 2 (North Eastern)

D.R.: C. A. Sharp (G6KU), 56 Moore Avenue, Wibsey, Bradford. Bfd. 10772. *Scribe: H. Beadle (G8UO), 13 Chandos St., Keighley.*

Barnsley.—G4JJ, now in the U.S.A., has contacted W1BHI, 1BVI, 1TW and 9WNY.

Bradford.—G3KF has VE4ACB at his station. 3HA is back in N. Africa after visiting Sardinia where he inspected a Commercila radio station at Gaglian. 4CL wishes to contact anyone with a working knowledge of relay-break-in.

Bramley.—G4MC now with the Air Force in Ceylon, regrets missing the Cairo Convention.

Halifax.—BRS10020 (L./Cpl. A. Turner) who is in Germany with the famous " Desert Rats " would like to correspond with local members ; his address is 41 Backhold Drive, Siddal.

Huddersfield.—4976 was recently visited by 2HDY and friend.

Skipton.—8676 has been on leave. Whilst in Northern Ireland he met G4RX, G15SJ, 6TK, 5445, 7728, 8350, 8351 and 8796. 4RX was Signals Officer at the same station.

Sheffield.—At the meeting held on June 27, a talk, with demonstration, was given by Dr. A. H. B. Cross, G3FN, on " The replacement of dropping resistors by series condensers in heater circuits " based on an article in *Electronic Engineering.*

Wakefield.—G6ZN, now a L./Sgt., has spent several evenings with 5LH. He is pleased to see that 3RB is home again.

General.—G3RY reports that Philips of Eindhoven are still working. 8UO will be in York from July 28 to August 3, and will be pleased to contact anyone there. Please write to the address at the top of these notes. Letters from 8FW, 8676 and 10020 are acknowledged. G8UO.

DISTRICT 4 (East Midlands)

The highlight of the past month was the very successful P.D.M. held in Nottingham, a full report of which will be found elsewhere. History was made on that occasion when our President (G6GR) presented the N.F.D. Trophy to the Deputy D.R. (G8DZ), thereby gratifying the wish of all who had taken part in the 1939 N.F.D.

Nottingham.—More support is solicited for future informal mid-week meetings as they will provide an excellent opportunity for new members to gain first hand knowledge of Amateur Radio. Those interested should contact the Deputy D.R.

Another meeting in the Post-War planning series will be held during July, for details see " Forthcoming Events." Code classes continue at Beeston under the guidance of 5514.

Leicester.—It is regretted that new members do not support the monthly meetings more consistently. In this connection the T.R. appeals to all concerned to read, note and act on the " Forthcoming Events " calendar.

News is to hand from G2RI, 2AA, 5MY, 6IM, 8VA, 2HBG 3588.

Mid-week meetings are very popular with the " few " and when an opportunity presents itself code practice is taken. Where is " The Vicar " (G5UQ) these days ?

Derby.—G5YY and 2OU visited Birmingham for the District 3 P.D.M. and renewed acquaintance with many old friends. G6XM is taking a course in Canada.

Members requiring code instruction should get in touch with G2OU.

Mansfield and Sutton.—It is regretted that owing to a change of QRA, Mr. J. E. Davies will be unable to continue as T.R. The

9634 *C. G. BARRY, 6 Prospect Drive, Llandaff, Cardiff.
9635 *H. E. HOLBROOK, 47 Ardern Avenue, Dawley, Shropshire.
9636 R. J. TAYLOR, 7 Dovedale Rd., Offerton, Stockport, Ches.
9637 *J. C. ROUND, Barnsyde, Scotter, Gainsborough, Lincs.
9638 C. O. GOWING, Withens, Littleton, Winchester, Hants.
9639 *A. FORSTER, 25 West Park, Middle Harrington, Sunderland, Co. Durham.
9640 F. T. BROWN, 18 St. Mary's St., Whitchurch, Shropshire.
9641 S. HOLMES, 90 Buxton Road, Heaviley, Stockport, Ches.
9642 *W. RIGBY, 745 Atherton Road, Hindley Green, Wigan, Lancs.
9643 F. U. COOP, 638 Devonshire Road, Blackpool, Lancs.
9644 K. N. SENIOR, 80 Green Bank Crescent, Edinburgh.
9645 J. S. BRYDEN, 317 North Circular Rd., Neasden, N.W. (trans. from Associate Grade).
9646 *F. W. WATTS, 8 Fort Street, Barnstaple, N. Devon.
9647 D. H. DAVIES, 47 Mount Pleasant, Flint, N. Wales.
9648 *C. H. LANGTON, c/o 2 Alma Place, Lodge Lane, Dunkinfield, Ches.
9649 E. KENT, P.O. Box 25, Barnet, Herts.
9650 *E. A. WARDROP, 134 Osborne Road, Portswood, Southampton.
9651 R. C. SCOTT, Club Cottage, Kings Moor Road, Gt. Parndon, Nr. Harlow, Essex.
9652 *L. G. COLLINS, 45 Hawthorn Avenue, Palmers Green, London, N.13.
9653 E. H. WATLING, 1 Frinton Drive, Woodford Green, Essex.
9654 *K. P. KEAR, 16 Wilson Street, Gorton, Manchester 18.
9655 *D. A. HAMNETT, 9 Anchorsholme Lane, E, Cleveleys, Blackpool.
9656 P. J. CLEMENTS, 17 Rydal Av., Whitchurch, Shropshire.
9657 P. T. HOWSE, 28 Harborne Road, Warley, Birmingham 32.
9658 T. E. TUFTON, Acklam House, Acklam Rd. S., Middlesboro, Yorks.
9659 P. G. CAMERON, 21 Bridge Lane, Bramhall, Ches.
9660 *T. R. WALLACE, 1 Westbury Avenue, Southall, Mdx.
9661 *K. D. HALL, Station Road, Carnaby, Bridlington, Yorks.
9662 A. A. F. GOOKEY, 12 Upper Park Road, London, N.11.
9663 *T. J. CROWHURST, 13 Alan Close, Dartford, Kent.
9664 G. KETLAROFSKY, c/o B.B.C., Borough Hill, Daventry, Northants.
9665 *A. F. PADFIELD, 24 Church Rise, Chessington, Surrey.
9666 *H. BUTLER, 40 Holmsley Avenue, South Kirkby, Nr. Pontefract, Yorks.
9667 *D. H. DAWSON, The Castle Stables, South St., Wareham, Dorset.
9668 *J. EDWARDS, 5 Norwood Terrace, Shipley, Yorks.
9669 *D. H. RICHES, 11 Essex Street, Unthank Rd., Norwich, Norfolk.
9670 *S. D. HOFF, 290 Melton Road, Leicester.
9671 *G. S. NELSON, 3 Tranby Avenue, Hull Road, York.
9672 M. M. D'ARCY, The Bungalow, Love Lane, Woodford Bridge, Essex.
9673 *E. J. ALBAN, 17 East Street, Newtown, Huntingdon.
9674 *J. BEARDSHALL, 99 Summer Lane, Wombwell, Nr. Barnsley, Yorks.
9675 C. H. RUSSELL, 12 Thorn Lane, Heaton, Bradford.
9676 W. J. HARRIS, 18 Waterloo Road, Newport, Mon.
9677 K. H. VARNEY, 149 Whitehouse Common Road, Sutton Coldfield, Warwicks.
9678 F. COOPER, 19 Rectory Av., Prestwich, Manchester.
9679 J. F. ROBINSON, 52 Farnham Rd., Handsworth, Birmingham 21.
9680 J. W. W. ELLISON, 18 Crescent Way, Norbury, London, S.W.16.
9681 *G. W. HUNT, Puddledock, Sutton Poyntz, Weymouth, Dorset.
9682 *A. S. COX, Station Road, Hemyock, Cullompton, Devon.
9683 *B. G. L. BRAUN, 63 Currey Road, Greenford, Middx.
9684 *F./Lt. G. A. GILBERT, R.A.F.
9685 *E. J. TUFNALL, Barton Gardens, Dawlish, S. Devon.
9686 F. W. CARTER, 27 Drayton Gdns., West Drayton, Mdx.
9687 *H. WILD, 62 Russell Road, Salford 6, Lancs.
9688 K. W. DAVENPORT, 12 Hook Road, Bungalows, Ampfield, Nr. Romsey, Hants.
9689 R. W. HONIATT, 21 Great South West Rd., Hounslow, Mdx.
9690 *R. G. L. MORRIS, 37 Sebright Av., London Rd., Worcester.
9691 *G. W. BURGESS, The Mead, Poulton Rd., Bebington, Ches.
9692 *D. CROWLEY, 1 Links Avenue, Rhos-on-Sea, Colwyn Bay, N. Wales.
9693 *J. HENDERSON, The Firs, Manningford Bruce, Nr. Marlborough, Wilts.
9694 E. CAPSTAFF, 105B Clarence Road, Grays, Essex.
9695 R. W. WALKER, 66 Lovaine Place, Sandyford, Newcastle-on-Tyne.
9696 *A. E. HAYES, 25 Tinwell Road, Stamford, Lincs.
9697 *J. W. RUSHTON, 74 Garden Road, Dunstable, Beds.
9698 T. FOORD, The Beeches, Hurst Green, Sussex.
9699 G. GORNALL, Yewtree Villa, Garstang, Nr. Preston, Lancs.
9700 D. MCGOWAN, 3 Prospect Place, Sketty, Swansea, S. Wales.
9701 *H. LENNOX, 26 Brown St., Paisley, Scotland.
9702 W. G. FARNSWORTH, 1A Newton Street, Bensham, Gateshead 8.
9703 *W. D. SMITH, 126 West Parade, Lincoln.
9704 *G. J. BROWN, c/o 306 Kettering Road, Northampton.
9705 J. STIRLING, 55A Reading Road, Northolt Park, Greenford, Middlesex.
9706 *W. J. NEALE, 33 Stibb Green, Burbage, Marlborough, Wilts.
9707 J. R. PIERREPONT, 12 Albany Terrace, Leamington Spa, Warwicks.
9708 J. R. SCOTT, 7 Chatsworth Road, Harehills, Leeds 8.
9709 *J. L. WILBRAHAM, 30 Hoppet Lane, Droylsden, Manchester.
9710 *F. W. ADDERLEY, 39 Lodge Rd., West Bromwich, Staffs.
9711 P. HUMPHREY, Moreton House, Redruth, Cornwall.
9712 C. H. SARGEANT, 95 York Road, Hull, E. Yorks.
9713 E. B. TAYLOR, 191 Brodie Ave., Mossley Hill, Liverpool 18.
9714 *P. FOSTER, 3 Hughenden Tce., Garstang Rd., Preston, Lancs.
9715 N. STEVENS, 53 Madeley Road, Ealing, London, W.5.
9716 C. A. CARSON, 118 Quarmby Rd., Quarmby, Huddersfield.
9717 P. F. BAKER, 36 Gardiner St., Gillingham, Kent.
9718 *E. A. BARRETT, 52 Devon Rd., Copnor, Portsmouth.
9719 *C. B. WEBB, 35 Dunbar Avenue, Beckenham, Kent.
9720 *G. A. SMERDON, 2 Magdalene Rd., Upton, Torquay, Devon.
9721 L. P. BERRY, Newington, Avenue Road, Torquay, Devon.
9722 MISS W. E. REESON, Oakdene, Blake Dene Road, Parkstone, Dorset.
9723 G. E. P. SHEPPARD, 7 Stanley Mount, Brooklands, Ches.
9724 *J. L. SMITH, c/o 95 North Hanover St., Glasgow C.
9725 W. F. JOHNSON, 3 Eric Road, Willesden, London, N.W.10.
9726 *W. D. COUTTS, c/o 71 McDonald Road, Edinburgh 7.
9727 D. M. HARVEY, 4 Belford Gardens, Edinburgh 4.
9728 G. A. EMPTAGE, 39 Beatrice Avenue, Lipson, Plymouth.
9729 *M. S. D'ARCY, 7 Westgate, Peterborough, Northants.
9730 L. H. SCOTT, 5 South View, St. Georges Rd., Hull, Yorks.
9731 A. J. BRENNAN, 54 Brunt St., Rusholme, Manchester 14.
9732 C. G. E. ORCHARD, 35 Devon Road, Swindon, Wilts.
9733 T. A. WALLACE, 57 Wampool Street, Silloth, Cumberland.
9734 R. T. BARKER, Ivy Cottage, Skinburness, Silloth, Cumb.
9735 L. EASTWOOD, Lynwood, Allonby, Maryport, Cumberland.
9736 J. PATTINSON, 1 Rose Vale Terrace, Netherton, Maryport, Cumberland.
9737 *B. O. GOSWELL, 25 Darlington Gardens, Shirley, Southampton.
9738 A. C. BINSTEAD, 72 Nixon Avenue, Whitehall, Ramsgate, Kent.
9739 S. GALLON, 217 Saltwell Road, Gateshead 8, Co. Durham.
9740 H. BUTLER, 36 St. Martins Avenue, Peverell, Plymouth.
9741 *T. G. DALE, 51 Grange Gdns., Peterhead, Aberdeenshire.
9742 J. LEIPER, 1 St. Andrew Place, Brechin, Angus.
9743 *J. D. KEEN, Police House, Hanslope, Nr. Bletchley, Bucks.
9744 *E. J. HOOPER, 279 Leeds Road, Huddersfield, Yorks.
9745 W. G. M. SHERMAN, 9 Osborne Road., Brimsdown, Enfield, Middlesex
9746 J. H. SUTTON, 71 Yew Avenue, Yiewsley, Middlesex.
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M. SCHWEITZER, c/o B.B.C., Borough Hill, Daventry.
C. B. SIDDALL, 122 Chester St., Brampton, Chesterfield, Derby.
F. THORNTON, 17 Thorpe Rd., Pudsey, Nr. Leeds, Yorkshire.
F. L. YOUNG, 105 Exchange Road, West Bridgford, Nottingham.

Note.—Changes of address which have taken place since election are not recorded in this list.

Deputy D.R. extends grateful thanks to Mr. Davies for his past services and invites a willing member to step forward in his place. G6VD.

DISTRICT 5 (Western)

D.R.: R. A. Bartlett (G6RB), 31 King's Drive, Bishopston, Bristol. Bristol 46960.

Bristol.—The June meeting produced an attendance of 22, the best recorded since before the war. Among those present was G5UH back from a long spell of service in the Middle East and Italy. We were also pleased to see several other familiar faces, missing from our meetings for a long time. A highly interesting discussion on amplifier design and construction was started by G6VF, followed by a demonstration on apparatus recently constructed by him.

Cheltenham.—A welcome report comes from G8DT who tell us that 8ML has recently built an amplifier and that 5BK and 8LB are still around.

Gloucester.—BRS5508 has been endeavouring to arouse enthusiasm and reports some success despite depleted numbers owing to service calls. G6RB.

DISTRICT 6 (South Western)

D.R.: W. B. Sydenham, B.Sc. (G5SY), Sherrington, Cleveland Road, Torquay. Torquay 2097.

Will all members please keep in mind the Provincial District Meeting at Exeter on Sunday, July 22, and kindly send in names as soon as possible. It is hoped that there will be a very good attendance, as many problems will be discussed, and the President, General Secretary, and other members of Council will be present.

Torquay.—The T.R. has been pleased to receive visits from several members now on their annual return to the District. F./O. Smerdon, ZL1GI, has been contacted, and the T.R. hopes to meet Fred Hawthorn, ZL1GX, when he is in the vicinity again. BRS9720 is shortly leaving us for an overseas destination.

Taunton.—By kind permission of Mr. Taylor, members and friends were able to visit his wireless inspection department and saw many novel ideas working. The visit was thoroughly enjoyed by all. Those present included G3SB, 4OM, 5AK, 5GT, 5LM, 6LY and 2DRW.

Penzance.—At the meeting held on June 12, attended by G6LV, 6ZT, 8NA, 2FZZ, BRS9063, 9411 and 9894, it was decided that future meetings should be held fortnightly on Tuesday nights. It was suggested that an endeavour be made to arrange visits to places of interest in the District and that a "Brains Trust" be formed to assist members with their problems. The meetings are now held in the British Legion Club, Chapel Street, Penzance. BRS5857, of Aberdeen, whilst on holiday, was kind enough to visit the T.R. G5SY.

DISTRICT 7 (Southern)

D.R.: W. E. Russell (G5WP), "Milestones," Mayford, Woking, Surrey. Woking 1589.

Croydon.—The June meeting was attended by 27 members, including G2DP, 2HP, 2LW, 2VB, 3FD, 3ST, 4NI, GW4LN, G5XH, 610, 8RN, 2BDA, 1545, 1729, 3003, 4324, 4584, 5953, 6894, 7943, 8417, 8955, 8996, 9110, 9563, FRS112 and Mr. Hyslop. A collection for the P.O.W. Fund realised £1 11s. Welcome home to BRS2600 from a POW camp. We were pleased to see 1729 after 5 years' absence, also GW4LN from District 10.

The T.R. hopes to visit Cowes, I.O.W., during the first week in August and to contact local members. See "Forthcoming Events" for details of next meeting. G2DP.

Coulsdon.—9514 has designed and built an oscilloscope, complete with all the extras; it is working very well.

Local members desiring code instruction are advised to attend the meetings at the Croydon Y.M.C.A., as Morse classes are now being held. BRS3003.

Weybridge.—Fourteen members attended the June meeting arranged by G6NK. A round table discussion was held and a wide variety of topics received attention.

General.—G3VB still in residence on "The Rock," reports on the reception of amateur signals. His list includes CN8, I2, HA, OK, HB and EA7. He has met ZS1CK.

G3MF reports from S.E.A.C. It appears that as well as W4EBZ he has G3WH and BRS8707 as neighbours. Hearty congrats to Robin Addie, G8LT, on his engagement.

It was with great regret that we learned that G5NF has been in hospital with spinal trouble since January. He would welcome letters from old friends; his address is C. Ward, Crooksbury Ward, County Hospital, Hale Road, Farnham, Surrey. G5WP.

DISTRICT 11 (North Wales)

Deputy D.R.: C. Spillane (BRS1060), "Woodside," Meliden Road, Prestatyn.

Rhyl.—As 2DAH who has left for service in Belgium was married during embarkation leave, we take this opportunity of offering him and his wife our congratulations. G2GZ will be pleased to meet any resident or visiting member in the area. His full address is L./Bdr. Shersby, L. H., 14294429, c/o Post Office, Wellington Road, Rhyl.

Prestatyn.—2HIY reports meeting BRS5800 at No. 2 Radio School and G8VA of Leicester at his station in Louth just prior to leaving District 17.

Caernarvon.—BRS9017 who is stationed near Chester, reports many activities including the construction of a multi-purpose meter, microphone warning system for his junior op. and a battery class B standby receiver. G3OY, his service associate, built an all-dry portable for use on frequent train journeys, from which he gets excellent results.

General.—W6RSZ is stationed at Prestwick. Any member who wishes to contact him should communicate with BRS1060. Members are invited to submit ideas for post-war district activities. Arrangements will be made to send them round the District for comment. BRS1060.

DISTRICT 13 (London South)

Acting D.R.: S. E. Langley (G3ST), 19 Elm Gardens, Mitcham Surrey.

The June meeting at the Y.M.C.A., Croydon, was as usual well attended. G4KY and BRS4324 have been busy fitting up new masts, and on inspection their efforts look decidedly useful. G4KY has taken cinematograph pictures of the arrival and erection of the masts, and these will in due course be added to the District 13 film. G3TA has arrived back from Italy on leave, and has already visited 3ST and 5PY. He will be attending our meetings until such times as he is posted again. A long and newsy airgraph has come from Capt. E. Ilott, R.E.M.E. (G2JK) who is still in Washington D.C., U.S.A. A letter is also to hand from Sgt. Hooper R.B., 247 A.M.E.S., R.A.F., S.E.A.A.F., who complains about the cost of radio components in India. He has, however, obtained sufficient parts to build the "Biscuit Tin Special," which brings in many stations. G3ST.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

D.R.: H. V. Wilkins (G6WN), 539 Oldfield Lane, Sudbury Hill, Greenford, Middlesex. Byron 3369.

Ex-Ft./Lt. Pope (G3HT) and Ft./Lt. Fletcher (2FUX) have accepted office on the P.W.P. committee to represent Service interests. The former is the first District 15 man to report home. At the next meeting a new District Treasurer will be appointed, G6RW having resigned. Eighteen members (including 3HT and 8FA) were present at the District meeting. 2FUX started a discussion on cathode followers and negative feedback for amplifiers.

Ashford.—Five were present at a meeting when 6RS continued his discussion on transmitters.

Harrow.—About a dozen members availed themselves of the benefits of the two meetings held last month.

Hayes.—Mr. Lilycrap of E.M.I. Service Ltd. kept the ten members interested in multivibraters and time base circuits as did Mr. Hayes of the Gramophone Company at a subsequent lecture on home recording when eighteen attended. Both the lecturers and the company are thanked for their co-operation in providing the demonstration. Mr. Ross, 10,123, is also thanked for his home recording exhibit and for providing the amplifier. The new BRS member who managed to get the gear along in spite of car trouble is also thanked.

High Wycombe.—Twelve members took advantage of the fine weather to turn up at the last meeting, including four from London. What about it locals? Mr. O'Young gave a very interesting lecture on frequency measurement and he is to be thanked. Our thanks also to Mrs. Lunnon for providing refreshments.

Edgware Short Wave Society are holding meetings every first Wednesday in the month at 8 p.m. at The Constitutional Hall, Edgware. The first was attended by twenty-two. The subscription is 2s. 6d. for the remainder of 1945.

R.A.F., West Drayton.—A very successful members' apparatus night was held during which Sgt. Worthington exhibited his oscilloscope and valve voltmeter. G6GS opened the meeting and he and the members are thanked for providing refreshments. Meetings are held here on the third Tuesday in the month at 7 p.m. and all interested are welcome. Just ask at the Guard Room.

General.—A District meeting is planned for Sunday, August 26, at the old N.F.D. site at Speen. Arrangements are also in hand for a District dinner.

We are sorry to hear that 2ADL is unwell and wish him a speedy recovery. Letters have reached the writer from 5JL, who

has been on leave and is now in North Holland, 8IP in the R.A.F. in Sutherland, 2BMY in India, 4966, 8054, 9087, 9129, 9556 and 9689.

G8IP has offered his services to newer members in assisting them with radio problems which can be answered by post. He is serving with the R.A.F. and his address is W./O. Barrett, R.A.F., Sango, Durness, Laing, Sutherland. We thank him for this kind offer.

As the D.R. will be on holiday at the end of July, reports should reach him by the 21st at the latest. G6WN.

DISTRICT 16 (South Eastern)

D.D.R.: W. A. Scarr, M.A. (G2*WS*), 8 *Beckenham Grove, Shortlands, Bromley, Kent. Scribe: E. H. Trowell* (2*HKU*), 27 *Unity Street, Sheerness, Isle of Sheppey, Kent.*

Congrats are extended to L.A.C. Cleggett, 2834, upon his marriage to Miss F. Hill (A.T.S.) who is on signal duties. He asks for news of G5XB. 9633 (W. Wickham) is engaged on VHF transmitter development and would like to hear from anyone interested in quality reproduction of records. P. W. Barnes, 2XB (Sevenoaks) seeks news of 5LB.

Sidcup.—L. Allen, 3MZ, is anxious to start some activity in the area and would like to hear from anyone interested. His address is 57 Burnt Oak Lane. 2DHV mentions that his wife (Assoc. member) is being demobbed from the A.T.S. and that A. K. Wall, 2YZ, is now living at 32 Onslow Drive.

Tunbridge Wells.—G5OQ who just returned after four years in South Africa, sends a very informative letter and mentions that 2DZT is preparing for VHF activity. 4IB hopes to be a Ft./Lt. by the time this appears. He is near 5KV now a W./O, in S.E.A.C. 6OB is a radio op. at Gibraltar. 2PQ is still turning out "Mortley" generators. 5OQ extends a welcome to new BRS members and would like to hear from them at 18 Wilman Road. 2DZT has built a nine-valve superhet for 5OQ. F. Barnard, 4FB, 34 Springwell Road, Tonbridge, would like to meet members and sends 73 to 3GW and 4BY.

Gillingham.—M.A.T.S. meetings are being held every Monday at the Foresters Hall, King Street (near S.R. Station). 2VB was a welcome visitor to 6NU recently. Condolences are offered to T. W. Hales, 4720, who has been invalided from the R.A.F. and also lost his little daughter in a street accident.

Sheppey.—Congrats to 2VA whose wife presented him with another daughter on June 17. 3GW whilst at a Norfolk rest camp built power packs and a modulator ready for the "Day." 7928 is now in Ceylon and looking for contacts.

Sussex.—2FQZ having returned after four years in the M.E.F. says that 2DQ1 is also on his way home. He has been erecting D./F. stations. 2CYW (ex G8HV) took part in the seaborne assault on Rangoon and during the occupation of the city met Colonel Thomson (R.A.M.C.), ZL2BG, of Rotorua, Auckland, who always "carried" his Hallicrafter with him. 2CYW asks for news of 6AB. What has happened to the rest of the Sussex group? 2HKU.

DISTRICT 17 (Mid East)

D.R.: A. C. Simons (*G5BD*), *Admiralty Road, Mablethorpe*, Lincs. *Phone* 69.

G3WB, 4315 and G3OS were at the Nottingham P.D.M. and had an enjoyable time. As 9100 is anxious to know the meaning of amateur abbreviations and the Q code, the D.R. will arrange a beginners meeting as soon as seasonal business allows. 8562 also thirsting for knowledge is a Star A.T.C. cadet and picks up a lot from various aerodrome visits. G5FY has rejoined and is looking forward to getting going once again. G4DV writing from Burma says he was very pleased to see the March announcement *re* licences. He will be more pleased with the June issue. G5LL has been on leave to the Isle of Capri. W2CVJ, with whom D.R. has kept up correspondence, is interested in the P.M.G. announcement *re* licences and says that over there they know nothing but he could be on the air within an hour. 4390 is now posted nearer home than usual and is able to do a little shack cleaning. G5BD.

DISTRICT 19 (Northern)

D.R.: R. J. Bradley (*G2FO*), 36 *Raby Road, Stockton-on-Tees.*

Catterick.—G2TA, 6T2 and BRS3762 have now become members of the Catterick Society. W4EXF, G8NO and the second op. to AC4YN are around the district but have not yet appeared at the meetings. GM8MQ is now known to be in Thirsk and not in India. 8PP is on his way to India to teach crystal grinding. The following talks have been given at recent meetings: BRS5254, "56 to 5,000 Mc/s. operation and types of equipment"; 2TA, "The Klystron and principles of wave guides"; BRS8768 is at present giving a series of talks on "Disc recording." The Catterick members wish to thank all concerned for the marvellous time they had at the District 19 Hamfest. BRS6943.

Middlesbrough.—The indoor photograph taken at the Hamfest was unfortunately a failure. The outside one is exceptionally good except for the fact that 2DMY who worked so hard to make the meeting a success and also arranged the visitors in their positions for the photo, seems to have got mixed up with a "Dellinger fade out" and vanished from the picture! Copies are now available from Mr. G. A. Kenyon, G3YK, 32 Emerson Avenue, Middlesbrough. Post card size 9d. and 8in. × 6in. 2s. 9d. post free. G2FO.

(It is regretted that the photograph reached H.Q. much too late for a block to be made for this issue.—ED.)

Northern Ireland

D.R.: J. N. Smith (*GI5QX*), 19 *Hawthornden Drive, Belmont, Belfast, N.I. Phone* 63323.

We extend a very cordial welcome home to Walter Caughey (2DZG) who has been a P.O.W. since the fall of Dunkirk.

Recent club visitors have included VE4AU and 2FIF of Daventry. Ft./Lt. Brookes (G5OI) has now left the District, and our good wishes go with him. GI5ZY would like to hear from GI3SX, who is requested to write, giving his bearings. GI5QX.

Scotland

Scottish Records Officer: J. Hunter (*GM6ZV*), 51 *Camphill Avenue, Glasgow, S.*1. *Langside* 237.

"*A*" *District.*

District Officer: D. R. Macadie (*GM6MD*), 154 *Kingsacre Road, Glasgow, S.*4. *Scribe: J. D. Gillies* (2*FZT*), 3 *Berridale Avenue, Glasgow, S.*4. *Merrylee* 4060.

Instead of a meeting a visit was arranged to the Electrical Laboratory of Stow College, on June 20. About 25 members and friends attended. The party found much to interest them as the equipment included signal generators and B.F. oscillators. Various applications of meters and a rather expensive method of testing a voltmeter by means of a variable speed A.C. motor were demonstrated. Mr. Tait and his assistants ably answered the many questions which were fired at them from all angles. The visitors took careful note of the lay-out methods used for wiring, instruments, etc., on an easily accessible "rack and panel" type of assembly, which could be utilised by the amateur. 2FZT.

"*B*" *District.*—Mr. A. G. Anderson, BRS5857, who has run meetings during the past year or so in Aberdeen, having obtained his B.Sc. degree has left at short notice for Bristol. As a result he was unable to contact all members as he had hoped. (Thanks O.M. and good wishes for the future.—6ZV.)

"*C*" *District.*

D.O.: Jas. Gouck (*GM3NH*), 4 *School Drive, Downfield, Dundee.*

The June meeting was intended to include the Annual General Meeting, but as only nine members were present, election of D.O. and committee was postponed until some future date when more members are present. Cpl. J. Kearns, R.A.F., was absent due to an unexpected trip to LA, but Cpl. Lewis managed to come alone. Some of these Service members deserve a big hand for the way they have supported meetings in spite of transport difficulties. A little Morse practise was indulged in and this will be a regular feature in the future as all newcomers are anxious to be ready when the time comes for the issue of new licences. GM3NH.

Victory P.D.M. in Nottingham

The East Midland P.D.M. held at Marsden's Cafe, Nottingham, on June 23, was attended by 74 members, representing all four counties. Particularly welcome were Lt. Mark Frost, BRS2692 (ex P.O.W.), Mr. H. W. Sadler, G2XS (No. 9 D.R.), and Lieut. Wigg, G5OW (Nottingham Police Radio). Headquarters was represented by the President (Mr. E. L. Gardiner, G6GR), Mr. H. A. M. Clark, G6OT (Hon. Secretary), and Mr. John Clarricoats, G6CL (General Secretary).

The meeting was opened by the Deputy D.R. (Mr. A. E. Clipstone, G8DZ) who introduced the President and invited him to occupy the chair. Mr. Gardiner expressed his pleasure at being present and surveyed the recent activities of the Society.

"*Clarry's* 70 *Minutes.*"—The address which followed by G6CL was one of the most masterly heard of recent times. Touching on the remarkable increase in membership and the strong financial position of the Society "Clarry" lead on to the topic of Post-War licencing which gained the undivided attention of all present. He explained how the Society had maintained close contact with the G.P.O., and referred to the assistance which has at all times been given by the Engineer-in-Chief and his assistants.

In paying tribute to the valuable work carried out by members during the war 6CL thought it was high time that the country as a whole became aware of the existence of the R.S.G.B., particularly when our activities had so recently been praised by such an eminent scientist as Sir Edward Appleton.

Regarding the future, "Clarry" stressed the importance of good operating procedure on the air as a means of relieving congestion, due to the proposed increase in power, and the undoubted influx of new licence holders. A request was made here for less crowding on the spot frequencies so popular in pre-war days. The General Secretary then announced that the collection of monies for the P.O.W. Fund had been suspended as sufficient funds now exist to provide for all future commitments.

He stated that 170 firms had been circularised with the list of post-war amateur requirements compiled by the Council, and that many had written to express their appreciation of the interest taken by the Society in ensuring that British manufacturers become aware of this market—estimated to be worth approximately £250,000 during the next three years. G6CL announced that the 1939 winners of Society awards will receive their tropies at forthcoming Society functions.

Mr. "Ham" Clark, G6OT, in a short address which held the attention of all present, outlined the trend of radio towards the V.H.F.'s, indicating that an advanced technique would have to be mastered by amateurs in the construction of V.H.F. gear. He suggested that the possible requirements would be a lathe and

a piece of copper tubing as opposed to yards of 16 s.w.g. and a soldering iron !

G6CL dealt with numerous questions after which the N.F.D. trophy won by District 4 in 1939 was handed by the President to G8DZ, who accepted it on behalf of the D.R. (Sq./Ldr. Ridgeway, G2RI).

It would be unfair to conclude without paying tribute to the splendid tea arranged by the Notting-Hams. It was stupendous.

" CASEY."

The District 19 Victory Hamfest

THE first District 19 " get together " for nearly eight years was staged on Saturday, June 23, 1945. The event took place in the Board Room of the North Riding Infirmary, Middlesbrough, through the kind invitation of the Secretary-Superintendent (G3YK) who was responsible, with the assistance of Mrs. Kenyon, 2DMY and the D.R. for the arrangements.

Following the taking of a group photograph, G3YK (who was supported by the D.R., 2DMY and 5XT) opened the proceedings by welcoming the guest of honour, Group Capt. A. F. Johnson, C.B.E., D.F.C. (G3JN ex SU1AF), who had travelled specially from London, where he had only the day before been decorated by His Majesty the King. " Johnny " who was a very active member in Middlesbrough before the war was heartily congratulated on the honours conferred upon himself as well as the honour he incidentally brought to Amateur Radio.

After tea, members and visitors were conducted round the Infirmary's X-ray department by the honorary radiologist of the institution who also demonstrated a short-wave diathermy apparatus working with an input of 350 watts on 50 Mc/s., and a boy's heart-beats being registered on a cathode ray tube cardiagraph.

On returning to the Board Room the company proceeded to a general discussion during which such items as the return of transmitting gear, electrical and B.C.L. interference and post-war conditions were considered. G3JN also gave a short account of the difficulties encountered in maintaining radio communication in the Middle East and East Africa.

The proceedings were brought to a close by the D.R. who moved a vote of thanks to Mr. and Mrs. Kenyon and 2DMY for their efforts in organising such a successful gathering and for kindly providing cigarettes and liquid refreshments for all present.

At the conclusion of the proceedings some eighteen members availed themselves of Mrs. Kenyon's invitation to continue the discussion with further refreshments at her home.

Before closing this report of a highly enjoyable meeting the D.R. would like to express his thanks to those members, both at home and overseas who although unable to be present themselves wrote wishing us every success with our first District meeting for so many years.

The following were present :—G2FO, 3JN, 3TO, 3YK, 3LS, 3BS, 3TQ, 3UW, 3IV, 4KI, 5QU, 5XT, 8SN, 8IF, 8CL, 2HMK, 2FXA, 2AOB, 2HOJ, 2DMY, BRS10138, 8056, 7334, 4445, 6843, 8914, 10132, 9987, 5164, 6943, Messrs. Cornforth, Tufton, Harrison, Mr. L. Hall (G.P.O.) and Mrs. Kenyon.

G2FO.

Re-Union Meeting of Reseau Belge

A re-union of Reseau Belge members was held at the Cafe de l'Horloge, Port Namur, Brussels, on June 2, 1945. The meeting opened in true ham style, with much rag-chewing. Glasses could be heard clinking in the haze of smoke, and waiters were kept busy. Copies of THE BULLETIN and *QST*, kindly supplied by G6CL and by serving members with the B.L.A., were well in evidence and eagerly read from cover to cover. The gathering, which numbered nearly 50 persons, was finally called to order by Past President Paul de Neck, ON4UU, who addressed the meeting and extended greetings to all present,including a word of special welcome to the British contingent, at this, the first representative meeting of amateurs held in Belgium since the occupation. He spoke of the fine work done by Belgian amateurs in the Resistance movement and concluded by reading a congratulatory letter from G6CL in which he conveyed his greetings to all present.

The Secretary, ON4UF, then paid tribute to all members of R.B., who had fallen in the service of their country, and to those who had been sent to concentration camps. He gave a hearty welcome to Professor Max Cosyns, B9, of Brussels University, who has recently returned after two years spent in Dachau concentration camp, due to his activities with the underground movement. As Professor Cosyns smilingly remarked, " I made my QSO's too long." Professor Cosyns expects to return to Germany shortly for service with the occupation forces. 4UF said that amateurs in Belgium and all over the world have been of great service during the war and have made great sacrifices. In consequence they are worthy of a commanding place in radio matters during the peace. He discussed the problem of supplies and mentioned that manufacturers will have a large and ready made market, and spoke of the great progress that has been made in all branches of radio work. He concluded his speech by expressing his regret that the President of R.B., ON4AA, was unable to be present owing to his duties with the Canadian Army.

Formal procedure ended in the reading of the statement of accounts, after which, copies of the Amateur Radio Handbook were sold and application forms for R.S.G.B. membership handed round.

Those present were : G2RX, 6KS, 2DYZ, BRS8627, ON4AU, AQ, AV, CZ, EF, EY, FX, GB, HY, JB, JZ, JP, MA, NJ, NM, OB, OU, PA, PH, RD, RA, TA, UL, UF, UU, UX, VC, XL, CAM, LIM, TVS, Professor Cosyns, B9, and about a dozen self confessed " pirates " and receiving members.

The following asked that their 73's be conveyed : ON4PA to G6CL and G2YL, ON4UF to G6CL and G6LL, ON4BK to G8RW, and C. Buyse to Eric Rickett.

2DYZ.

KHAKI and BLUE

● F./O. D. R. Spearing, **G3JG,** and Ft./Lt. D. Evans, **G8VJ,** who are with 164 (S.) Wing, R.A.F., S.E.A.A.F., inform us that they have not attended amateur radio meetings at the R.A.F. station referred to in the March issue. They also state that Ft./Lt. (now Sq./Ldr.) Noel Simmons has not attended for the very good reason that he is 1,000 miles away.

We regret our error, which was presumably brought about as the result of mis-reading a letter from W./C. K. Jowers, **G5ZJ,** who, we understand, is on his way back to England.

● Ft./Sgt. K. W. King, **BRS8624,** whose address is S.E.A.A.F., India, would like to hear from members serving in the neighbourhood of Bombay, with a view to arranging meetings. His number is (505). Ft./Sgt. King is anxious to join the Experimental Section when it is revived.

● Cpl. T. Higgins, **G8JI,** now with 17 Area Signals, M.E.F., seeks news of G5ZR (Southport). 8JI reports that Ron Dabbs, G2RD, is in Italy.

● L.A.C. G. K. Adams, **2BOU,** writing from No. 17 Staging Post, R.A.F., M.E.F., asks that his greetings be conveyed to GW3CR, GW8SO, G3WD and all at GI6YM. He writes enthusiastically about the statement on post-war licence policy published in the March issue.

● Sigmn. P. Gammon, **G3VB,** reports that another successful meeting, attended by 16 members and friends, took place in Gibraltar on May 1. He can be contacted *via* SCU4, R. Signals.

● Ft./Sgt. J. S. Brown, **BRS6482** who is at the R.A.F. Station, Ramleh, Palestine, would like to hear from G4LV and G4PC, to whom he sends greetings.

● From Major Ken Ellis, **SU5KW,** we learn that Major Herbert, **G6RF,** is in No. 16 General Hospital, M.E.F., suffering from pneumonia and complications. We wish him a speedy recovery.

● Ft./Lt. R. W. Standley, **G8RW,** No. 15 Heavy Mobile Unit, R.A.F., B.L.A., informs us that a meeting of " R.A.F. Unit Berlin " personnel interested in the formation of a radio club was held in Brussels on June 18. Gp./Capt. Smeddle, D.F.C., has been invited to become President, Cpl. Boffin, G3HS, is acting as Treasurer and Ft./Lt. Standley is Secretary. The title " R.A.F. Unit/ Berlin Amateur Radio Society " has been agreed, and membership is to be open to the Berlin and attached units. Two rooms in the Headquarters Chateau have been made available to club members, one of which will be used as a workshop and the other as a meeting place.

We cannot pretend to explain why the " Berlin Unit " is stationed in Brussels, unless it is to confuse the Japs !

Fitting Parties—Attention !

It has been suggested that a record be compiled of amateurs, particularly ex-R.A.F. C.W.R. members, who have served on E.F.P.'s or F.P.'s.

If there is sufficient response it is proposed to publish a list in the R.S.G.B. BULLETIN when space permits.

Name and call sign should be forwarded to Ft./Sgt. S. Hall, G3BR, R.A.F., West Drayton, Mddx.

In the Service of their Country

We learn from Mr. R. J. Stellig, GW4CK, that Kess van Lent, **PAOXI,** and John Klinger, **PAOXL,** were put to death by the Germans after being charged with espionage work. They lived at Heemstede, Holland, and both were well-known members of the Haarlem group.

* * *

Information is also to hand, *via* Mr. E. A. Dedman, G2NH, that M. Pierre Blanchon, **F8WC,** of La Rochette par Fourneaux, Creuse, France, died in the notorious Belsen concentration camp in March. He was arrested at his home in March, 1944, for assisting the F.F.I. in a radio capacity. Mr. Dedman received the sad news from Michael Blanchon, 14 years old son of the late F8WC.

British amateurs offer their sympathies to the relatives of these brave men who died in the cause of Freedom.

AUGUST ISSUE

Due to the August Bank Holiday break and staff holidays, all copy for the August issue must be in the hands of the General Editor by the first post on Monday, July 30.

R.S.G.B. BULLETIN

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A CODE OF GOOD PRACTICE

IN preparation for an early start on post-war development, many industrial organisations and business undertakings are at present engaged, in co-operation with the British Standards Institution, in laying down codes of good practice for general guidance in their particular fields of interest. As the prospect of resumed activity on the amateur bands looms larger on the horizon, it seems to us that we might, with advantage, take stock of our own position and try to adopt some standards of conduct which will be for the common good and will make for our "self-preservation."

Undoubtedly there will be more activity than ever before, with mutual interference on a scale not previously experienced on the amateur frequencies unless we make a united effort to curb certain bad practices before they can become a menace. In short, it will be far easier to leave behind pre-war bad habits than to cure them after their resurrection.

The Council has given careful consideration to this matter and has appointed a Committee whose function will be to foster and encourage considerate operating and good clean signals on our bands.

Let us then take stock and see where our main shortcomings were to be found and what can be done towards their elimination.

Our first aim must surely be to reduce unnecessary transmissions to a minimum. The worst of them may be summarised as follows :—

1. Long "Test" calls.
2. Sending "doubles" when not requested.
3. Spurious emissions, "squeggers" and harmonics.
4. Modulation on telegraphy and over-modulation on telephony transmissions.
5. Inordinate chatter.
6. Use of DX bands for lengthy local contacts.
7. Use of unnecessarily high power.

Some general suggestions for the elimination of some, if not all, of the above are :—

1 & 2. The general adoption of "break-in" and "push-to-talk."

3 & 4. Use of efficient equipment and directional aerials.

5 & 6. Common sense and a sense of responsibility.

7. Power to be limited to the minimum required to maintain efficient contact.

It is anticipated that all licenced amateurs, in this country at any rate, will have access to all the approved amateur bands. It should, therefore, be the aim for everyone to have a low power transmitter, which is capable of rapid adjustment to several wavebands, and for the use of this transmitter for short-distance contacts to be a point of honour.

There can be no doubt that the general adoption of "break-in" and "push-to-talk" working would be to the benefit of us all and offers of articles dealing with the technical points involved are invited, for publication in this journal.

The increased use of well-designed variable-frequency oscillators will also help considerably towards the full utilisation of every spare kilocycle. In this connection the adoption of a uniform system of procedure will be advantageous. For example, "QSY up 5 kc/s" might become "QHI5" and "QSY down 20 kc/s" be "QLO20." Again, suggestions for a comprehensive list of essential procedure signals will be welcomed by the Editorial Staff.

In future, honest reporting must be the order of the day and flattery, which can be so misleading, must be strictly taboo !

In the past, only too often it has been the case that a transmitter has created unnecessary interference due to some fault being unknown to the operator because reports on his signals have not been sufficiently critical. This applies particularly to telephony transmissions. Our attitude must therefore be candour towards others and an expectation of candour in return. The deliberate transgressor must be dealt with in no uncertain manner. For their own sakes and the general well-being of everyone, his friends must get at the Black Sheep and make his misdeeds quite plain to him. We simple cannot afford to shield such people out of any misplaced sense of loyalty or friendship.

Some pessimistic folk fear that our bands in the post-war years will become intolerable and eventually unusable, but we strongly disagree, provided that members of this Society set a high example, co-operate to encourage good practices and discard those which are bad.

Naturally, complete success will be attained only if all active amateurs throughout the world come into line. Let us make it our business to see that British amateurs set the pace and by putting their own house in order, maintain their excellent pre-war reputation in the more exacting and therefore more interesting days to come.

A. O. M.—K. M. E.

IMPEDANCE MATCHING

By D. M. MacKay, B.Sc.* (BRS7027)

Introductory

ONE cannot go very far in the study of radio theory without meeting, in one form or another, the concept of impedance matching, usually as a thing to be desired and sought after, in the interests of efficiency, quality, or economy. It is the purpose of this article to explain, simply, why impedance matching is so desirable, and how it may be obtained in general, with particular reference to valves and aerials.

The basic idea of impedance matching is familiar to all cyclists who have used, or wished for, a three-speed gear. To get the most out of one's leg muscles, they should be offered a certain "optimum resistance" against which to thrust. If this is not done, speed or staying power is reduced. A variable gear helps by stepping up (or down) the load offered by the wheels so that the load offered by the pedals remains, as closely as possible, "matched" to the rider's capabilities.

Similar considerations apply in the transfer of electrical power. The problem arises from the fact that any source of electrical energy, whether it be a transmitter, a valve, or a humble dry-cell, has what is known as "internal impedance." That is to say, it acts as if it consisted of a source of E.M.F. in series with an impedance, which limits the current which can be drawn from the source.

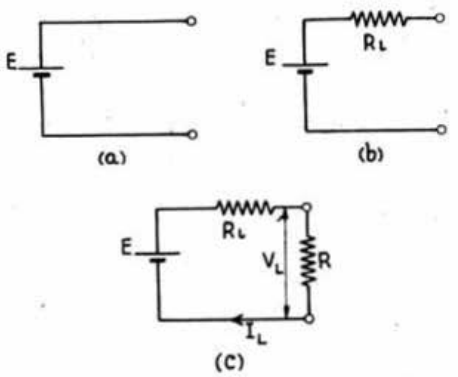

Fig. 1.

The internal resistance R_i of the cell determines the maximum power which can be developed in the external resistance R.

The Dry-Cell

The dry-cell is one of the simplest examples, and will serve as an illustration of the general principle. If its terminals are short-circuited, the current which flows is limited to a few amperes, indicating that the cell which we depict as in Fig. 1a, actually behaves like the arrangement shown in Fig. 1b, where R_i is the "internal resistance" of the cell. The potential difference (p.d.) across the terminals when no current is flowing, is known as the E.M.F. of the cell, which we may denote by E. When the cell supplies current, the p.d. across its terminals drops, the decrease being given by the product of the current and internal resistance.

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Now suppose that we wish to obtain in a load R, the maximum power which the cell can supply (Fig. 1c); *i.e.*, we wish to "match" the load to the cell. Let us call the p.d. across the load V_L, and the current I_L. Then the power, W_L, in the load is given by multiplying the *p.d. across it* by the *current through it*, or $W_L = V_L \times I_L$.

Now by Ohm's law, $V_L = R \times I_L$, and

$$I_L = \frac{E}{R + R_i}. \quad \text{So}$$

$$W_L = (R \times I_L) \times I_L = R \times I_L^2 = \frac{R \times E^2}{(R + R_i)^2} \quad \ldots \quad (1)$$

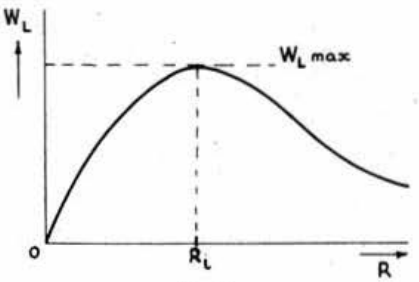

Fig. 2.

Variation in power output (W_L) with load resistance (R) in Fig. 1(c).

We can see at once that if R is zero, or infinitely large, W_L will be zero, and no power will be developed. It may readily be shown by mathematics† that the expression for W_L is a maximum for given values of E and R_i when we make $R = R_i$. Consequently, a graph showing variation of W_L against R will start at zero where $R = O$, rise to a maximum where $R = R_i$, and fall away to zero as R increases beyond that value (Fig. 2). The load is matched when its resistance is made equal to the internal resistance of the cell, and the power then obtained is the maximum which the cell can deliver to an external circuit. Unfortunately, under these conditions an exactly equal amount of power is wasted in heating the internal resistance of the cell.

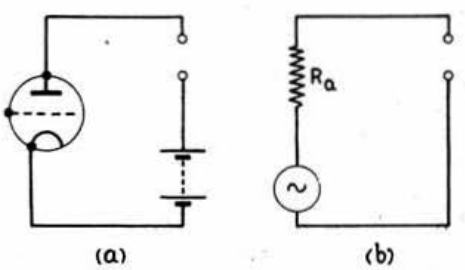

Fig. 3.

(a) Anode circuit of valve; (b) The A.C. equivalent.

† Differentiating with respect to R,

$$\frac{dW_L}{dR} = \frac{E^2}{(R + R_i)^3}\Big[(R + R_i) - 2R\Big].$$

When W_L is maximum, $\frac{dW_L}{dR} = O$.

$\therefore R + R_i - 2R = O$, or $R = R_i$.

The theory worked out for a dry-cell holds good in general for both A.C. and D.C., and we shall now consider some of the more important applications.

Power Valves

In considering the matching of a power valve to its load, it is necessary to distinguish carefully between the A.C. and D.C. properties of its anode circuit. With a certain D.C. anode voltage and bias, the valve will pass a certain value of direct current, and by dividing anode voltage by anode current we could find the *D.C.* resistance of the valve. This is of little practical interest. With a suitable grid bias, however, a small A.C. voltage applied to the grid will cause the valve to pass an anode current which may be regarded as comprising a steady direct current with an alternating component added, or superimposed.

To this A.C. component the valve offers quite a different resistance, known as its *A.C.* or (loosely) *anode* impedance. This is usually given by the makers, or may be found from the valve's characteristic curves [1, 2], and it is this impedance (generally denoted by *Ra* for convenience), to which the load must be matched if we wish to extract the maximum A.C. power. It acts in the same way as the internal resistance of a cell in limiting the A.C. power available (see Fig. 3), and in normal (" Class A ") amplifiers [3], maximum power is developed, as before, when the load has an equal resistance.

There is another point to be considered, however, when matching an output valve to a load. A certain amount of distortion of waveform takes place in the process of amplification, and is dependent partly on the value of the anode load. The use of the *load line* in determining the optimum load has been dealt with recently in these pages [2, 4, 5], and will not be further discussed in detail but it should be noted that, particularly in the case of pentodes, the optimum load is not necessarily that which gives maximum power output for a given input, if distortion is to be kept within tolerable limits.

It may be helpful to compare the action of a valve in this respect with that of a motor-car engine, which has an " optimum load " in which it can develop the greatest amount of power. An engine with too light or too heavy a load is capable of doing less work, in the same kind of way as a valve with too high or too low a load resistance.

The Transformer

We can carry the analogy a step further. In the motor-car, optimum loading is ensured by the use of a gearbox. Fortunately, for alternating current, we have an analogue of the gearbox in the transformer.

It is well known that a transformer with n times as many turns on the secondary as on the primary, will, if fed with A.C., have a secondary voltage n times that of the primary. Consider such a transformer, with a resistance R_L across the secondary (Fig. 4a). Call the primary voltage V_P, primary current I_P, secondary voltage V_S, and secondary current I_S. The *power* in the load (at any instant), which we may call W_L, will be $V_S \times I_S$, or, since $I_S = V_S/R_L$, $W_L = V_S^2/R_L$. Now $V_S = n \times V_P$;

therefore $$W_L = \frac{n^2 \times V_P^2}{R_L} \quad .. \quad .. \quad .. \quad (2)$$

If we assume that this power is equal to the power going into the primary (*i.e.*, that we have a perfect transformer), then from equation (2),

$$\frac{n^2 \times V_P^2}{R_L} = V_P \times I_P \quad .. \quad .. \quad .. \quad (3)$$

Now the primary circuit would obviously draw the same current at the same voltage if it were replaced by a resistance R_P, such that $R_P = V_P/I_P$ (Ohm's law), or $I_P = V_P/R_P$ (Fig. 4b).

Substituting this value of I_P in equation (3), we have

$$\left(\frac{1}{R_P}\right) \times V_P^2 = \left(\frac{n^2}{R_L}\right) \times V_P^2 \quad .. \quad .. \quad (4)$$

Evidently $1/R_P = n^2/R_L$, or

$$R_P = \left(\frac{1}{n^2}\right) \times R_L \quad .. \quad .. \quad .. \quad .. \quad (5)$$

We have discovered that a " perfect " transformer of ratio 1 : n, loaded by a resistance R_L across its secondary, behaves like a resistance $\frac{1}{n^2} \times R_L$, or, to put it otherwise, a resistance R_L is " transformed " in the ratio $1 : n^2$.

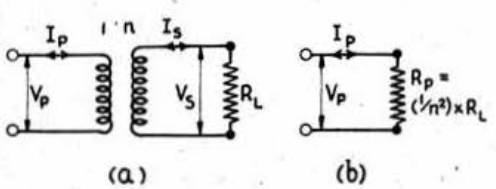

Fig. 4.

A loaded transformer (a) behaves to A.C. as a resistance Rp (b).

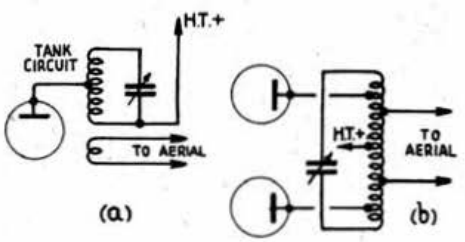

Fig. 5.

Tank circuit coupling: (a) Single valve, with loop coupling to aerial; (b) Push-pull stage using tank coil as auto-transformer for both aerial feeders and anodes.

Equation (5) may be rearranged to give

$$n = \sqrt{R_L/R_P} \quad .. \quad .. \quad .. \quad .. \quad (6)$$

As far as matching is concerned, this tells us that if we wish to match, say, a valve whose optimum load is R_P, to a load R_L, we can do so by using a transformer whose turns-ratio is the *square root* of the ratio of R_L to R_P.

In passing it might be mentioned that *reactances* are transformed according to the same law: *i.e.*, an inductance is transformed to $1/n^2$ of its value (like a resistance), but a capacity to n^2 times its value.

An auto-transformer, in which primary and secondary are parts of the same continuous winding, behaves in the same way as an ordinary transformer, and can be used for impedance matching when the conductive linking of input and output circuits is not objectionable.

To sum up, a transformer acts as an electrical gearbox, in which the turns in the windings correspond to the teeth on a gearwheel, the current (rate of flow of electricity) corresponds to the rate of rotation, and the electromotive force corresponds to the torque (turning force). Like the gearbox, it enables us to offer to a source the impedance into which it works best, irrespective of the load we wish to use, provided we choose the correct ratio.

To avoid misunderstanding, it might be as well to touch briefly on the subject of valve loading, with a

resistance or transformer, in a *voltage* amplifying stage, as the requirements here are quite different.[6] In a voltage amplifier, normally, very little power is required from the output. The requirement is to obtain maximum output voltage, at very low current, so that, from the analogy of the dry cell, we evidently require an anode load large compared with the A.C. impedance (R_a) of the valve. If it is a resistance, its value is limited by the drop in D.C. anode voltage which it produces. If a transformer is used, H.T. voltage drop is avoided, and voltage step-up may be obtained in the secondary, but the turns ratio cannot be made very high in practice, because distortion and transformer losses then become serious.

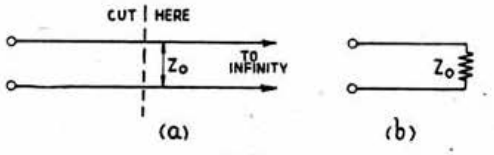

Fig. 6.

Terminating a length of transmission line with its characteristic impedance Z_0.

Aerials

It is well known that an aerial which is free to radiate, can absorb power from a transmitter without either storing or returning it. In this way it behaves like a resistance, and in fact this characteristic property can be measured in ohms, and is known as its *radiation resistance*. It is quite distinct from its *D.C.* resistance as a length of wire, which we can neglect as it is of trivial importance. The radiation resistance may be regarded as the " load " which the surrounding space offers to the radiant energy, in the same way as the air offers a load to the diaphragm of a loudspeaker ; for a half-wave dipole, it has a value of about 80 ohms at the centre.

Evidently it will be necessary, when designing a transmitter, to consider the correct matching of the output stage to the radiation resistance of the aerial, so as to secure maximum transfer of power. Usually the output stage has one or more valves feeding energy into a tuned " tank " circuit, from which it is transferred to the aerial (Fig. 5). The tank circuit has a certain " dynamic " impedance, and this must be matched to the output valve. This can be done most easily by using the tank coil as an autotransformer, and connecting the valve anode to a tapping point on it, in order to get the required step-up ratio. The aerial will also require to be connected to a tapping point or to a small secondary coil, such that its impedance can be matched to the tank circuit. In practice this is done by making the tapping points or the secondary " loop " adjustable, and setting them in the position in which maximum current flows in the aerial.

Transmission Lines

When the aerial has to be fed from a distant transmitter, connection is generally made *via* concentric or parallel conductors known as *transmission lines* or feeders. These have many special properties, of which only a few will be dealt with briefly here. An infinite length of transmission line can be shown to behave like a resistance, known as its *characteristic impedance* or *surge impedance*, of a value which can be calculated from the line dimensions. R.F. energy fed into the near end of such a line will be continually absorbed, and travel outwards along the line with a velocity nearly that of radio waves in space. If the line is cut at some point (see Fig. 6), its behaviour as a load can remain unaltered, if we " terminate " the cut end with a resistance equal to its characteristic impedance. This is so because the resistance will now be able to absorb exactly the power which previously was absorbed by the right-hand portion of the line, so that the source will, so to speak, be unaware of any change in the load offered to it. If any other value of resistance is used as a termination, some energy will be reflected, and wasteful standing waves will be set up in the line. They can be compared to the vibrations set up in a violin string, and may give rise to high voltages and currents, causing unwanted radiation and resistive losses.

Evidently, it is important to match the aerial to the transmission line so that it presents a load equal to the line impedance. This may be done using a conventional transformer, as before, but for short-wave work a simpler method may be employed, using a *quarter-wave transformer*.

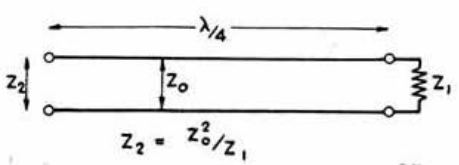

Fig. 7.

The quarter-wave transformer.

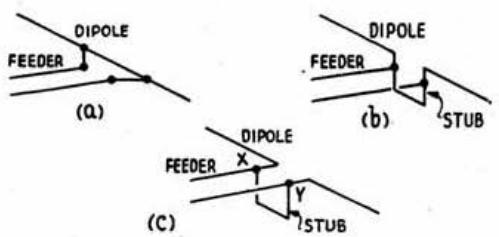

Fig. 8.

Tap matching and stub matching.

The Quarter-Wave Transformer

A transmission line which is a quarter of a wavelength long at a certain frequency, has some peculiar properties. If one end is terminated by an impedance Z_1, the impedance of the other end, Z_2, will have a value such that $Z_1 \times Z_2 = Z_0^2$, where Z_0 is the characteristic impedance of the line (Fig. 7). If, then, an impedance ratio of n is required (*i.e.*, if $Z_2 = n \times Z_1$), then $Z_0 = \sqrt{Z_1 \times Z_2} = Z_1 \times \sqrt{n}$. Such an arrangement makes an efficient matching transformer, if the Z_0 required is such as to make the dimensions reasonable. If not, the required ratio may be obtained by using a number of matching sections in series.

The action of the quarter-wave transformer may be explained briefly as being due to partial reflection. If the terminating impedance differs from Z_0, some energy will be reflected, and will return to the input end either in phase, or exactly out of phase with the input voltage. Consequently, the voltage across the input end will be either greater or less than the voltage across the load, and in the same way the input current will be correspondingly less or greater than the load current. On dividing the voltage by the current, we see at once that the effect of the reflected energy, in or out of phase, is to raise or lower the input impedance

of the quarter-wave section, according as the load is less or greater than its characteristic impedance Z_0. At one end, energy is present at high voltage and low current; at the other, the same energy is present at low voltage and high current—the same result as we should have obtained by using a conventional transformer, or more correctly, an auto-transformer.

Tap Matching

The impedance between any two points on an aerial varies with their separation. Consequently, it is often possible to match a feeder to an aerial by connecting it to two tappings on the aerial, such that the impedance between them matches the line (Fig. 8a). The tapped portion of the aerial may take the form of a "stub" folded back at right angles to the remainder (Fig. 8b). This may be either open- or short-circuited at the free end, the position of the tapping points varying accordingly.

One practical form of stub matching arrangement may be derived from Fig. 8b by "pulling out" the feeder as in Fig. 8c. Matching is carried out by attaching a stub of suitable length to points X, Y, on the feeder, such that standing waves are reduced to a minimum. The calculation of length and position is difficult, but can be simplified by the use of charts which have been prepared for the purpose.[7] Alternatively, the use of trial-and-error methods is quite possible, with patience. A short-circuited stub is preferable where possible, as the free end is at earth potential and can be rigidly fixed. An open-circuited stub may be necessary if the length of a suitable shorted stub is impracticably small. It requires greater care in insulation, as its free ends carry high R.F. voltages. Consequently, it is more difficult to build in a rigid form.

In feeder matching, a *standing-wave detector* is of great value. It may take the form of a neon lamp, or other device for indicating R.F. voltage or current, which can be moved along the feeder. Variations of current or voltage along the feeder indicate standing waves, and matching should be adjusted until these disappear. Matching is not, of course, complete until the transmitter also has been matched to the feeder.

A short- or open-circuited stub behaves at R.F. as if it were a capacity or an inductance, of a value dependent on its dimensions. Hence we may regard the length of line between stub and aerial in Fig. 8c as a "tuned feeder" (see below), tuned to resonance by the reactance of the stub across X–Y. The points X, Y, are chosen so that the impedance of this tuned system matches that of the feeder line.

Tuned Feeders

Tuned Feeders, in which standing waves are allowed to be set up, are often used over short distances. Essentially, a tuned feeder is a continuation of the aerial itself, "folded up" to reduce unwanted radiation, and as its name implies, it is tuned, by means of series or parallel reactances, to resonate at the frequency required. Provided that fairly close spacing of feeder wires is used, radiation losses are not serious. The popular "Zeppelin" aerial employs one form of tuned feeder (Fig. 9).

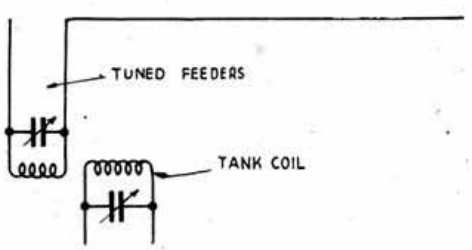

Fig. 9.
The "Zeppelin" aerial, employing a tuned feeder.

The Single-Wire Feeder

It is possible to match an aerial to a *Single-wire feeder*, without producing standing waves in it. A half-wave aerial, represented by PQ in Fig. 10, has at any point T along its length, an impedance to earth which varies with the position of T, and is a pure

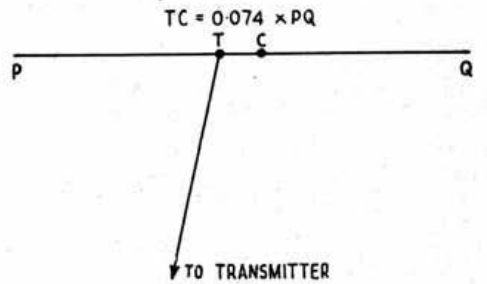

Fig. 10.
The single-wire feeder.

resistance. Consequently if a feeder with the appropriate value of characteristic impedance Z_0 is connected between T and earth, matching is achieved, and no standing waves will be set up in the feeder. A single vertical wire used as a feeder usually has a characteristic impedance of about 500 ohms, so that if T is chosen to have an impedance to earth of this value, standing waves will occur only in the horizontal portion of the aerial, where they are wanted; although some energy will radiate from the feeder, the greater portion will be sent out from the aerial itself. An approximate rule for the distance of T from C (the centre of the aerial) is $TC = 0{\cdot}074 \times PQ$.

This account has perforce been somewhat sketchy in parts, but it is hoped that the occasional sacrifice of rigour to brevity will be forgiven.

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DISTRICT NOTES

As from this issue District Notes will be published in the form of a *Supplement* sent to members only.

To ensure that future issues are published on the 14th of each month, it is essential that the advertised closing date for copy be strictly adhered to. Notes received after closing date cannot in future be accepted.

RELAYS IN STATION LAYOUT

By P. W. J. GAMMON (G3VB).

PART I

THE return of transmitting facilities will undoubtedly bring with it numerous changes in operating standards on our bands. For example, many amateurs will have received training in commercial or Service operating and will no longer be content with pre-war conditions, while a great increase in the use of "break-in" operation, both 'phone and C.W., is to be expected. This will assist in the solution of the QRM problem, as also will a wider use of variable frequency oscillators for controlling transmitters.

Furthermore, although standardised rack and panel construction was coming into increasing use prior to the war, many stations, the writer's particularly, did not benefit fully from it due to lack of forethought in rack layout and cabling. In working out rack layout schemes, due thought must be given to the need for complete flexibility, coupled with the absence of stray wires between panels or racks.

With these thoughts in mind, and considering the 1·7 Mc/s. to 28 Mc/s. bands—assuming optimistically that these will be restored—this series of articles has been prepared. No attempt has been made to design specific apparatus, but typical arrangements will be indicated which, even if not closely adhered to, can provide a starting point.

Operating Facilities

All ordinary operating facilities should be available from the operator's position. These are as follows: Send/Receive/Break-in ('Phone or C.W.); 'Phone/C.W.; Band Change; Frequency Variation (up to, say, 30 kc/s. either side of normally used frequency). In order to obtain all these facilities from the one position use can be made of relays in addition to the usual panel switches on each piece of equipment. To provide the variable frequency facility, a gang tuned V.F.O. and doublers can be used, with individual power amplifiers for each band, drive being taken from one of the doublers at the required frequency. Obtaining complete band coverage would be possible by flattening the P.A. tuned circuits, but it is doubtful whether the consequent reduction of efficiency would be justified. Under ordinary conditions a change of frequency would only take place to avoid interference, and would seldom be more than a few kilocycles to one side of the usual operating frequency. If the change exceeded this amount it would be necessary to retune the P.A.'s and aerial couplers.

Telephony operation would entail the use of a common audio amplifier giving some 20 watts output to a 500 ohm line. Feed to the various P.A.'s would then be taken *via* attenuators if required, to modulation or modulator input transformers. An additional modulator, associated with the P.A. would be needed if higher audio power was required, and it could be driven from the 500 ohm line.

Mains failure protection and provision for automatic or clock contact operation could also be provided if desired. Protection against mains failure would

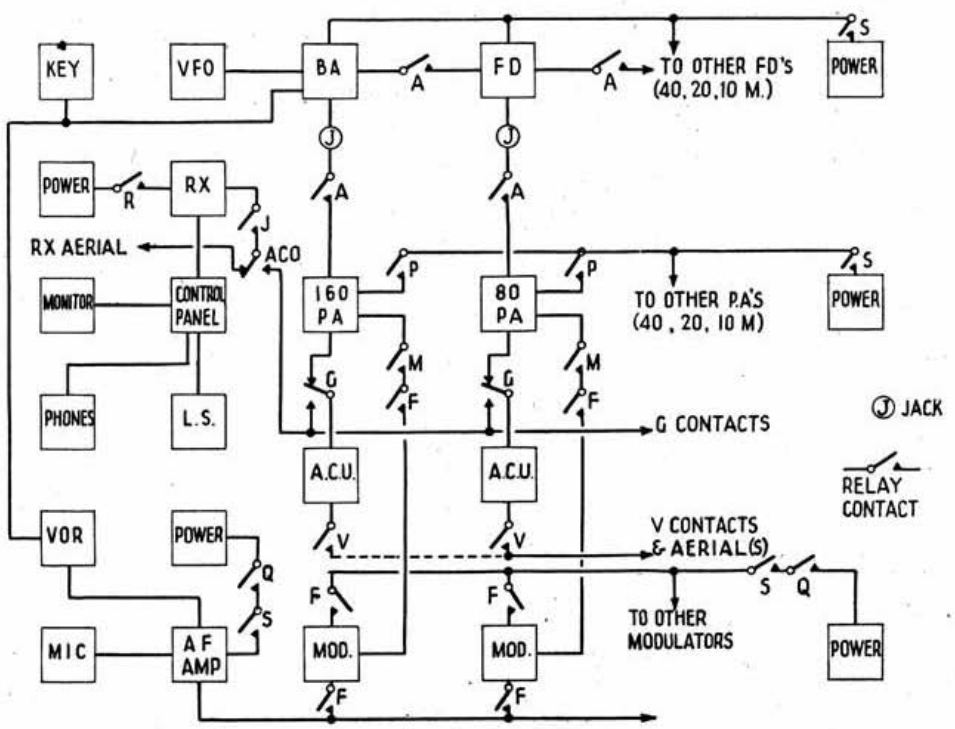


Fig. 1.
Block Schematic of a relay-controlled amateur station.

involve the use of a magnetically operated contactor in the main A.C. feed, held operated over its own contacts. Mains failure would release the contactor and resetting by hand would be necessary. The addition of a battery-operated coil on the contactor could be used to provide clock or push-to-start operation.

Layout

Considering the foregoing it will be seen that the layout would be slightly unconventional by pre-war standards since both the R.F. driver and audio amplifier would be associated with the receiving position. The complete station can be conveniently divided into three sections : (*a*) Operator's Position (*b*) Transmitter Rack, and (*c*) Aerial Couplers. Should the shack prove suitable (*b*) and (*c*) could be combined, the only proviso being that the feeder leads be near to the aerial coupling rack to avoid long lengths of feeder inside the shack. The positioning of the various items of equipment then appears as follows :—

Operator's Position.—Receiver and power supply, V.F.O. and doublers (gang tuned), keying unit, control panel, voice-operated relay, audio amplifier, monitor *etc.*

Transmitter Rack.—All power-supplies other than receiver including supply for relay operation, R.F. power amplifiers with associated modulators or modulation transformers.

Aerial Couplers.—Units to couple any available aerial to the P.A. for the band on which it is required to use them.

Link coupling would be used as a convenient means of transferring R.F. from rack to rack. To avoid cumbersome high current leads and consequent voltage drop, each panel requires its own heater transformer. Standard relay racks would be used throughout, the operator's position consisting of, say, three bays approximately 5 ft. high with bench and drawers attached.

To provide flexibility, and to allow panels to be changed or renewed without disturbing long cabling between panels or racks, a standard chassis connector should be used. In the writer's case it has been tentatively arranged to use one or two octal sockets and plugs according to the requirements of the particular chassis. Each connector should be cabled permanently to a tag-block on a grouping panel common to the rack. Each panel and chassis is thus represented by a tag block on the grouping panel. Power connections and inter-panel wiring can then all be accomplished by means of short connections between blocks. These are easily altered to suit different types of panel when experimental work is being carried out. R.F., of course, could not be taken on these tags and each link line should go *via* terminals with bridging strips, which are easily disconnected for patching, if desired.

With the band change facility, aerials from one only to a maximum of one per band could be used. Under normal send/receive conditions the transmitting aerial would also be used for reception. Under break-in conditions a separate receiving aerial would be switched in.

Block Schematic

A block schematic diagram of the entire station should be prepared. Fig. 1 shows one working on the foregoing lines. A description of its operation follows.

A low powered variable frequency oscillator (V.F.O.) powered by a stabilised supply, delivers R.F. on the 1·7–2 Mc/s. band. This drives a buffer amplifier (B.A.) to give several watts of R.F. drive on this band. This drive can be taken from a panel jack, or by fixed link to a power amplifier (160 P.A.) for the band. Alternatively it can drive a series of frequency doublers (F.D.) from any of which drive for a particular band can be taken to the power amplifier for that band. R.F. is fed from the power amplifiers to the aerial through a coupling unit (A.C.U.).

For telephony operation the audio amplifier (A.F. Amp.) is brought into use, feeding the modulation transformer or modulator (Mod.) on the required band. Keying is effected in the buffer stage, allowing the V.F.O. to run continuously for greater stability. The key, auto-send and voice-operated relay contacts are all in shunt. When using 'phone break-in, the voice-operated relay (V.O.R.) draws audio from the amplifier for its operation.

AUGUST ISSUE

Due to the August Bank Holiday break and staff holidays, all copy for the August issue must be in the hands of the General Editor by the first post on **Monday, July 30.**

Relays

For all A.F., A.C., or D.C. switching these can be the ordinary telephone type relay. For R.F. low capacity contacts are needed.

Referring to Fig. 1, relay operation is as follows :—

" A " Relays are operated by the band-switch according to the band selected. " A " contacts break the drive from the following doubler and feed R.F. out to the P.A. link line. R.F. can also be drawn from the panel jacks " J ", the relay being mechanically coupled to the jack springs. " A.C.O." Relay is operated by the break-in switch. It provides a separate receiving aerial for break-in conditions. " F " relay is operated by the band switch. A.F. is applied to the modulator or transformer of the band selected, and H.T. + is applied to the modulator.

" G " Relay changes over the transmitting aerial to the receiver link on the " receiver " position.

" J " Relay protects the receiver input from high R.F. voltages by earthing the aerial terminals when transmitting.

" M " Relay, operated by the 'phone switch, prepares for the operation of " F," and removes a short circuit from the secondary of the modulation transformer.

" P " Relay, operated by the band switch, applies H.T. to the P.A. on the band selected.

" Q " Relay, operated by 'phone switch, prepares the circuit for modulator and audio amplifier H.T., later applied by " S " contact in series.

" R " Relay applies H.T. to the receiver in " Receive " or " Break-in " position.

" S " Relay applies H.T. to the units of the transmitter selected by the band and 'phone switches.

" V " Relay, operated by the band switch, connects the feeder to the coupling unit for the band selected. It also prepares a circuit for the operation of the associated " G " Relay.

In Parts II examples of typical chassis units will be given, indicating specific relay arrangements.

(*To be continued*)

Activity in Switzerland

Dr. Rudolf Stuber, **HB9T,** reports that limited activity, in the form of organised traffic tests, is taking place in Switzerland. The first of these tests took place on May 13 from 0900 to 1100 G.M.T. on 7 Mc/s. and the second on June 24 from 0500 to 0700 G.M.T. on 3·5 Mc/s. and from 0900 to 1100 G.M.T. on 7 Mc/s. Participating stations are not permitted to give their exact location, but they can be recognised by their call signs (HB7FA to HB7FZ). All are well known pre-war Swiss amateurs. HB calls other than those quoted should be treated as " pirate."

AN EFFICIENT U.H.F. OSCILLATOR

By G. Michael King (G3MY) *

THE basis of this oscillator is a length of "Trough Type" concentric line which not only tunes the cathode circuit of the oscillator, but also forms a very rigid foundation for the whole unit. The actual frequency-determining part of the circuit consists of a normal half wave line connected to the grid and plate circuit of the oscillator valve, an H.Y. 615.

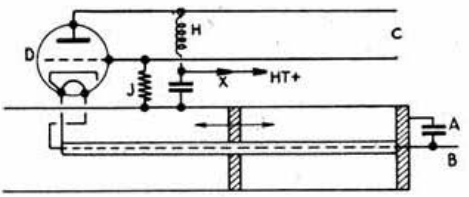


Fig. 1.
Semi-theoretical diagram of the 600 Mc/s. oscillator.
A ... ·0001 μF. Mica.
B ... Insulated heater wire.
C ... ¼ Wave Oscillatory circuit.
D ... H.Y.615.
H ... V.H.F. Choke (self-supporting).
J ... 20,000 Ohm gridleak.
X ... ·006 μF. Mica required when the oscillator is used as a Super-regenerative Detector.

Theoretical Circuit

As can be seen from Fig. 1 the grid and plate caps of the valve are connected to the half-wave line, which for 600 Mc/s. consists of two 7½ in. lengths of ¼ in. silver-plated copper tubing spaced ½ in. centre to centre and supported by means of a polystyrene cradle (Figs. 2 and 3). The grid and plate connections are tapped on to the rods at the point of lowest R.F. voltage which in this particular case happens to be about 1in. from the top caps of the valve. The plate connection is made by a self-supporting choke comprising 20 turns of 22 gauge wire ¼ in. diameter. The grid connection is affected by means of a 20,000 ohm 1 watt carbon resistance.

In the cathode circuit, the cathode is strapped to one side of the heater and this connection is taken directly to the open end of the inner conductor of the concentric line. The other side of the heater is fed *via* an insulated wire which is threaded through the inner conductor of the concentric line. The low (R.F.) potential end of this insulated conductor is bipassed to the outside shell of the cathode trough by means of a ·0001 μF mica condenser which under no circumstances should be omitted.

Tuning of the cathode is achieved by means of a copper block which can be slid to and fro along the concentric line, thereby altering its effective length.

The cathode circuit should be adjusted until maximum output is obtained. If the oscillator is being used as a super-regenerative detector, the position which gives smoothest regeneration should be chosen.

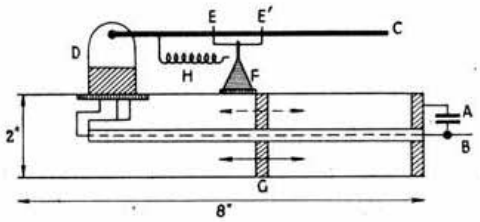


Fig. 2.
ketch of side view of the 600 Mc/s. oscillator. Notation as in Fig. 1.

Construction

The construction of this oscillator should present little trouble, the only difficult part being the cathode trough which is made from copper. The outside conductor of the trough which is 8 in. long and 2 in. deep, is made from 16 gauge copper. One end of the trough is closed by a 2 × 2 in. piece of ¼ in. thick copper bar which can be obtained from any ironmonger's store for next to nothing. The inner conductor of the trough is made from ⅝ in. diameter thin-walled copper tubing. This inner conductor is firmly brazed into a ⅝ in. hole in the centre of the end-plate, which closes off one end of the trough.

Results

This oscillator was designed for use as the local oscillator of a U.H.F. Superhet which made use of a diode mixer. In peace-time, however, the same circuit could very well be used as a low power transmitter, which would probably give a good account of itself if used in conjunction with a high gain aerial such as the square corner type of beam which can easily be constructed for use on these frequencies. The tuning of the cathode circuit is not extremely critical and in actual operation it is possible to change the operating frequency by as much as 50 Mc/s. before any noticeable falling off of output occurs. For fixed

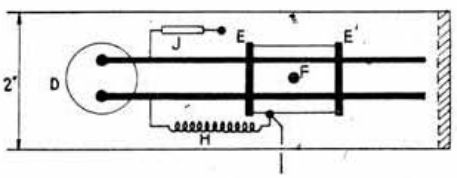


Fig. 3.
Top view of the 600 Mc/s. Oscillator.
EE' ... Polystyrene cradle.
F ... Ceramic standoff insulator.
G ... Copper shorting bar for Cathode Trough.
Other notation as for Fig. 1.

frequency work, minor changes of frequency can be brought about by means of short lengths of threaded copper rod screwed into the free ends of the parallel rod grid-plate circuit. For use as a super-regenerative detector the grid leak should be increased to 5 Megohms or more, and the U.H.F. choke should be bipassed at the H.T. side by a ·006 μF mica condenser if good quenching is to be obtained. When operating near the frequency limit of the oscillator, it will be necessary to make use of a separate quench oscillator operating on about 100 kc/s.

As originally described the oscillator works with 250 volts on the plate and draws 15 to 18 mA. plate current. The maximum frequency which can be obtained is in the region of 650 Mc/s. as measured with a Lecher wire system. When this circuit is being used as part of a super-regenerative receiver, tuning can be most easily brought about by connecting a small tuning condenser directly across the grid and plate caps of the valve. This condenser should have a capacity of about ·000005 μF and can very well be of the type used for neutralising beam tetrodes and similar low-capacity valves. The small disc type of neutralising condenser is ideal for the job.

* 51 Springfield Road, Sheffield 7.

A FRESHMAN'S GUIDE TO AMATEUR RADIO

By A. O. Milne (G2MI) *

INTRODUCTION

WE "old-timers" talk a great deal these days about the prospect of "getting back on the air," but how many of us realise that there are probably thousands of members of this Society, also looking forward to the day when licences will be issued again; members who have joined our ranks since September, 1939, many of whom have never *heard* an amateur signal, who know only Service procedure and Service equipment—yes, and Service jargon.

It may be that to something approaching 50 per cent. of our present membership, pre-war amateur radio, its traditions and usages are a closed book.

With this in view, it has been decided to publish in The Bulletin a short series of articles designed to introduce the Freshman to amateur radio, answer his questions and generally help him along on his way.

Breaking-in to the Game

Before the war each newly licenced radio amateur had usually passed through a number of stages of development, gradually growing in experience as he made his way from stage to stage. His interest might have been of a purely technical nature or he might have been attracted by the romance of the possibility of talking to people all over the world, or more usually by a combination of the two. In all probability it was aroused in the first place, either by hearing amateur signals on an all-wave receiver or by knowing some transmitting licencee personally. Once bitten by the "Radio Bug" the case even at this early stage was usually already hopeless and our embryo Ham would henceforth spend much time and midnight oil listening on the amateur bands and in building more suitable equipment for this purpose, learning the Morse code and in sending reception reports to the stations whose signals he heard.

In due time he would probably apply to the G.P.O. for a transmitting licence, usually being granted an Artificial Aerial permit, known to all as an "AA" or "Three letter call." This permitted the holder to operate sending apparatus provided that radiation therefrom did not stray beyond the confines of the room in which it was installed. The licencee was allocated a call-sign, consisting of three letters, preceded by the figure 2. Thus 2ABC (note—*not* G2ABC), as a means of identification should the owner's efforts to confine his signals within the prescribed limits prove unsuccessful.

The Full Licence

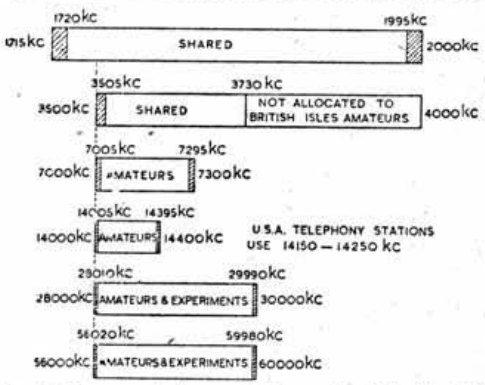
In due course, and provided he could put up a sufficiently convincing story to the Post Office he would blossom out to full maturity with a 10-watt radiating licence and a "full call."

This was a figure and two letters, prefixed by the letter G, thereby proclaiming to all the world that this was a British transmission. Up to the outbreak of war, call signs had been issued in the series G2, 3, 4, 5, 6 and 8, thus G2MI, G6CL, G8IG, etc. Allocations up to G4QZ had been reached when licences were determined in September, 1939; the order of issue having been 2, 5, 6, 8, 3, 4. Don't ask us why!

Armed with this passport to the air, our Radio Amateur proceeded to follow his particular line of interest to his heart's content.

This then is a reasonably true-to-life story of the average pre-war amateur's rise to fame or notoriety, as the case might be.

Applications for a full radiating permit were accepted only from persons over the age of 16 years; those under the age of 21 required the sponsorship of a parent or guardian, in whose name the licence was granted until the applicant reached the age of 21.



The amateur frequency bands as at 3rd September, 1939. The shaded portion at each end indicate the tolerances specified by the G.P.O. to allow for possible crystal variations.

The Morse Test

If the application was successful, it was necessary for the applicant to pass a test in sending and receiving the Morse code at a speed of 12 words per minute before a licence could be granted. For this examination, which was usually held at the local head Post Office, a fee of 5s. was charged.

The purpose of this test was not to further embarass the already somewhat harassed applicant, nor was it to ensure that he could understand what other Amateurs were saying. It was a requirement made by law to make certain that should a Government W./T. station request an amateur station to cease transmitting, the request should not go unheeded. A word of timely advice here to those who have passed at 18's or more in the Services. Are you sure you can *send* the Morse code as well as you can receive it?

Frequency Control

The only other overriding condition to which the applicant had to conform was the possession of a quartz crystal which had been calibrated and certified either by a reliable crystal manufacturer or by the Society's Calibration Manager.

This condition was imposed to meet the requirements of the International Radiotelegraphic Convention, to ensure that amateur stations kept to their allotted bands. The crystal had to be cut to a frequency having harmonices within all the bands for which the owner was licenced.

These bands, as they are called, were sections of the frequency spectrum roughly in harmonic relationship and situated as follows:—

1720 kc/s.	—	1995 kc/s.	
3505	—	3730	
7005	—	7295	
14005	—	14395	
28010	—	29990	
56020	—	59980	

* 29, Kechill Gardens, Hayes, Bromley, Kent.

As a general rule, a new licencee was allowed to use the 7 Mc/s. and 14 Mc/s. amateur bands and sometimes also the 1·7 Mc/s. band. Later, by special application, permission would be granted for operation on the other bands and in special circumstances extra power was authorised.

The British amateur did not enjoy the use of the full internationally allocated bands because a guard band or tolerance was fixed at each end, to minimise the possibility of signals being radiated outside the licenced limits. Use of the 3·5 Mc/s. band was subject to special restrictions due to the fact that it was shared with the Armed Services; the British amateur having the use of about one-half of the International band, which extended from 3,500 to 4,000 kc/s.

* * *

As this series of articles is mainly directed to the Newcomer, it will materially assist our efforts if members in this category will tell us what they want to know about Amateur Radio. It is proposed to deal with such points as the various bands and how they were used. What we talked about. Ham jargon. International contacts, etc., etc. In short, to

Tell you all about the air,
What we did and why and where!

Will you therefore please send your queries *direct to the writer* at his home address *not to Headquarters*. All questions of general interest will be dealt with in these columns. Others will be answered by post on receipt of a stamped and addressed envelope.

(To be continued.)

LIKE OLD TIMES AT BARNET

HAPPY memories of past pleasures, combined with lively anticipation of good things to come, bridged the gap of the past six years at the District 12 Dinner and Dance, held at the Salisbury Hotel, Barnet, Herts, on Saturday, June 30. This, the first large-scale social event held in the Society since the close of the European War provided the opportunity of a most enjoyable get-together of North London and visiting Amateurs and their ladies. No less than 101 sat down to dinner, and it was gratifying to see that most of the British Isles Districts were represented.

The appearance of many "old-timers," whose presence has been greatly missed in recent years, gave the gathering almost a pre-war atmosphere, and long-awaited "contacts" were made amid the good-fellowship which flourishes wherever "hams" assemble.

In the excitement of meeting old friends, dinner got away to a somewhat belated start, but let no one doubt that full justice was done to the excellent fare provided.

The Loyal Toast was followed by "District 12," proposed by the President, Mr. E. L. Gardiner, G6GR, who expressed his pleasure at seeing so many ladies present, especially as it had not been unknown in the past, for a "ham," on getting married, never to be heard of again! His reminiscences of early days struck a nostalgic chord in many hearts

A Record of Progress

The reply on behalf of the District was made by Mr. H. A. M. Clark, G6OT, who referred with regret to the unavoidable absence through illness of the D.R., Mr. Seymour Buckingham, G5QF, one of our oldest D.R.'s (in service, not in years!) who had done so much to make this gathering possible. He hoped that he would soon be with us once more.

Turning to District matters, G6OT, on behalf of 5QF, related how regular monthly meetings had been kept going during the past six years in spite of the absence of so many members in the Forces. These meetings had perforce been held mainly at members' homes and a debt of hospitality was owed to their temporary hosts. One institution, however, which had been maintained was the traditional Cuffley summer gathering at G6LL, and at almost all meetings the welcome presence of Forces' visitors was noted, including, on occasion, some of our Allied friends.

G6OT then referred to the active group at St. Albans, piloted by the T.R., Mr. Cliff Adams, BRS3412, also unfortunately prevented by illness from attending. He sent his best wishes for a successful evening. St. Albans had held bi-monthly meetings throughout the war, and much appreciated the D.R.'s interest, especially his visit to them a few days before entering hospital.

District 12, which was one of the largest, now had 515 members, and presented a pretty problem in administration; it was noteworthy that suggestions put forward by some of the newer members were almost identical with the pre-war plans for the District, but their successful fruition would depend on the availability of more T.R.'s and the return of Service members.

In the days to come, members were looking forward to hearing the stories, both personal and technical, of those who had been actively engaged in the war, and it was essential that the new advances, when published, should be fully exploited in the interests of efficiency and progress.

In concluding, G6OT mentioned that the duties of Acting D.R. and District Scribe had been undertaken for the present by Messrs. P. R. ("Bill") Solder, G5FA, and C. R. Stevens, 2DHF, respectively. Best thanks were due to Mr. Sidney Howard, G8TY, who had taken over the Dinner arrangements at short notice, and to Mr. Pickard, of Webb's Radio, who had presented many useful pieces of apparatus as prizes.

Finally, he welcomed the presence of Mrs. Buckingham, and spoke with appreciation of her unfailing help to her husband and the District.

The "Acorn" Stage

Mr. Leslie McMichael, G2FG, Founder Member, in proposing the toast of "The Radio Society of Great Britain," recalled the early days of the Society, when, as the London Wireless Club, it commenced life in Hampstead, under the Presidency of Mr. F. Hope-Jones. He said that he would like to put on record the help accorded to the young Society by Mr. A. W. Gamage, Senior, who put at its disposal, for literally no rent, two rooms, which he furnished for its use, and which later housed the Society's property during the 1914–18 War.

Many illustrious Presidents followed, and while a history of the Society up to the early 1920's was preserved in the archives, it was of paramount importance that a new history, right up-to-date should be prepared. The contributions of amateurs to science and civilisation must never be forgotten, and the achievements of such men as Cecil Goyder, for example, should be recorded for posterity. It would be found that almost every distinguished radio engineer had once been an amateur, and glowing tributes had been paid to the amateurs' pioneering work by such men as Sir Ernest Fisk, and, more recently, by Sir Edward Appleton.

The growth of the Society during the war had now made available a very large body of potential research workers, and Mr. McMichael thought they might well

find opportunities for further great achievements in the fields of microwaves, etc.

The Society's Contribution to the War Effort

Mr. John Clarricoats, G6CL, General Secretary, in responding to the toast, said that while he would have to be brief, he felt that the time had come when the Radio Amateur should claim some of the credit due for his contributions to Victory. Security had allowed little mention up to the present, but as soon as circumstances permitted, an astounding story would be told.

He recalled that prior to the war, the Society had been largely instrumental in the formation, first of the R.N.W.A.R., and later of the R.A.F.C.W.R. Some forty members of the Civilian Wireless Reserve went to France on 1st September, 1939—the " Early Birds " —while two radio amateurs, Jack Hamilton, G5JH, and Ken Abbott, G3JY, were among the first casualties, being lost with H.M.S. *Courageous*.

The Society during the war became one of the chief sources of technical experts for all kinds of radio work of the highest importance and secrecy, as well as a recruiting ground for ready-trained Radio mechanics and civilian technicians. There were now more than 5,000 members in the Services, while the majority of the remainder had been contributing in their various ways to the prosecution of the war.

He was pleased to see present Major J. Drudge-Coates, VU2FO, and Lt. M. Quartermaine, G3FZ, recently returned from Japanese and German prison camps, as well as Mr. Lambourn Edwards, G8TL, whose efforts had been so much appreciated by all P.O.W.'s. Nearly £1,000 had been distributed through Mr. Edwards in the form of Red Cross parcels.

The Present and Future

G6CL then referred to the fact that within 48 hours of VE day, Council was in touch with the Post Office regarding the restoration of licences, and so high was the esteem in which the Society was held in Service and Post Office circles, that licences would undoubtedly be granted the moment security permitted. He continued by mentioning that the BULLETIN was now twenty years old and had never missed publication throughout the war, despite all enemy QRM. The history of the Society was already in hand, and would be published as soon as circumstances permitted. Brief reference was made to the future, when N.F.D. and ham-fests return, and 6CL hoped that, with the aid of air transport these could help to forge a new link in international co-operation. He concluded by congratulating Mr. McMichael on his 32-year-old " baby," and expressing the hope that G2FG would be present at its Golden Jubilee.

A Tribute to Service Members

The toast of Members of Active Service was proposed by Mr. H. V. Wilkins, G6WN, District 15 Representative. Looking at the wonderful gathering in District 12, he said that we must not forget any one of those who had helped to make this meeting possible, especially remembering those now fighting what was once splendid DX, under adverse conditions, in the Far East. He, also, was very glad to see the repatriated P.O.W.'s present.

Replying, Lt.-Col. K. Morton-Evans, O.B.E., GW5KJ, said that when the Service members got back on the air as amateurs, he hoped that they would set an example by putting out irreproachable signals.

F./Lt. W. H. Allen, G2UJ, spoke about the value of N.F.D. experience to the " Early Birds," and to the success of a foreign mission he had just concluded being due to the help of a " ham " abroad.

Major Drudge-Coates, VU2FO, referred to his status as a serving soldier abroad in peace-time, and said that the efforts of the Society on behalf of its members, was known and appreciated by those overseas.

Presentation of B.E.R.U. Trophy

At this point the President welcomed the opportunity of being able to present the B.E.R.U. Junior Trophy, stored underground for the last six years, to Major Drudge-Coates, the 1939 winner.

The Ladies

The toast of " The Ladies " was then proposed by Capt. Jimmy Matthews, G6LL, who pointed out how valuable and unselfish was the help of the ladies in a hobby which entailed so much listening, and especially during the war, when it was forged into a weapon against the Huns.

Mrs. Buckingham returned thanks on behalf of the ladies, saying how willingly their co-operation was given.

Visiting Amateurs Acclaimed

The last toast, " Visiting Amateurs," was proposed by Mr. F. (" Dud ") Charman, G6CJ, who said that he had travelled a good deal, and had found that an amateur " ticket " was as good as, if not better than, a British passport in any part of the world.

Lt. Fred. Anderson, U.S. Signal Corps, W9TDV, in replying, paid tribute to British radio achievements, as exemplified in the apparatus he had handled in the course of duty, and looked forward to even stronger bonds between amateurs in the U.S.A. and Britain in the future.

Apologies were received from Sir Ian and Lady Fraser, Lt.-Col. J. D. Andrew, W4EFG, Mr. and Mrs. E. Ostermeyer, Mr. and Mrs. A. E. Watts, and Mr. and Mrs. S. K. Lewer, who were unable to be present.

On with the Dance

Following dinner, the remainder of the evening was devoted to dancing, during the course of which numerous pretexts were made for the distribution of a variety of prizes, including items of radio gear, and also acceptable gifts for the ladies.

In the intervals of dancing, many old acquaintances were renewed amid much enjoyable " rag-chewing," and altogether the evening was one which will live long in the memories of those fortunate enough to be present. BRS3386 and 2DHF.

JCKW

Major Ken Ellis, **SU5KW**, AW3, G.H.Q., M.E. Forces, informs us that station JCKW has commenced broadcasting on 7220kc/s., using an input of 7·5 kW. JCKW replaces the old Cairo Forces station. The station is situated on a hill 3,000 ft. above sea-level near Jerusalem. Sgt. Tim Heffernan, **G8HW**, is in charge. The Cairo Forces short-wave programme is now being radiated on 7192·5 kc/s.

" Detached Contact Circuit Drawings and How to Read Them "

An error occurred at the end of the article appearing under this title in the June issue. The reference to BS504 should read BS530.

It should perhaps be mentioned that this specification is at present undergoing revision and will be re-issued in due course. Whilst it is thought that any change in the symbols dealt with in THE BULLETIN article is unlikely, there is every reason to expect that some of those concerned with other branches of telecommunications will be revised.

OUR FRONT COVER

OUR front cover illustration shows a Resistance and Capacity Measuring Bridge, one of the range of test instruments made by the Mullard Company.

The bridge is a robust A.C. driven unit which can be used for the measurement of resistances between 0.1 ohm and 10 megohms, or capacities between 10$\mu\mu$F and 10μF using internal standards. It is very simple to operate—balance is indicated by the opening of the sensitive tuning indicator, and the value of the unknown component can be read directly from the scale. Alternatively it can compare two similar impedances, or the internal balance indicator may be used to detect signals of 1 millivolt and upwards.

Letters to the Editor

Appreciations

DEAR SIR,—Just a few lines to express my appreciation of all that the Society is doing with regard to post-war licences and, indeed, the welfare of the amateur generally. The information published in recent issues of THE BULLETIN has been of extreme interest and, I must say, the provisional terms and conditions for amateur work in the future far exceed my highest hopes. They seem, to me, to be both well-balanced and progressive and a model of " good sense."

It is very reassuring to those temporarily out of touch with things to know that affairs are being looked after with such enthusiasm and effectiveness. The R.S.G.B. is doing a grand job. Thank you and good luck in your further efforts.

Yours faithfully,
W. J. MCCLUNE (2BGM),
Lt., R.N.V.R.

[*Lt. McClune's letter is one of many received in recent weeks expressing appreciation to the Council for its work in connection with the re-issue of licences.—Ed.*]

The Kreigies Return Thanks

DEAR SIR,—You will recall, the last time I wrote, that my address was Marlag und Milag Nord, Germany. I am pleased to say that those evil days are over as I returned a week or two ago to this country.

My health is pretty good fortunately except of course it still feels unbelievable to be out of it. I should like to express my deepest thanks to all members who have helped in any way their fellows who were incarcerated. There are still alas many more in Japanese hands. I enclose a cheque to help the fund along for these chaps.

Yours faithfully,
G. W. HINDLE (BRS3692).

DEAR SIR,—I do want to thank you once again for all you did on my behalf while I was behind the wire. The cigarettes and tobacco were greatly appreciated I can assure you. Fortunately I find I am little the worse for wear and have slipped back into civilisation with considerable ease ; in fact I feel very fit at the moment, which is a good thing though it somewhat jeopardises the chance of getting an extension of leave on medical grounds !

Yours sincerely,
STEPHEN HEATH.

DEAR SIR,—I would like to thank you for all the help you have given to us while we were in what one may say " unfortunate circumstances." The parcels of cigarettes, etc., meant more to us than it is possible to imagine.

I have had quite a lot of experience in building " paper, wire and wood " sets which we always managed to keep going during our prolonged stay with our late hosts.

Yours sincerely,
A. R. RICHARDSON (2CXT).

DEAR SIR,—What a pleasure to be able to write you again, uncensored. Your cigarette parcels, books and games, not forgetting a kit bag and attaché case, were most welcome and when " smokes " were low your " bumper " parcels were a heaven-sent blessing. Words fail to express my appreciation to you, the Society and above all, Mr. Edwards (G8TL) whose untiring work on behalf of P.O.W.'s is a shining example of the ham spirit. Please convey to all responsible my warmest appreciation of their gifts, which did very much to lighten the darkness of captivity.

Yours sincerely,
WALTER E. CAUGHEY (2DZG).
Signalman, Royal Signals.

[*Unfortunately Sigm. Caughey developed frost-bite last February, which has made necessary an operation on his foot. We wish him a speedy recovery to full health and strength.—Ed.*]

More About a Standard Receiver

DEAR SIR,—With reference to the letters published in the June issue I should like to express my appreciation of the views expressed therein. It would seem, however, that Mr. G. W. Gabb, BRS8323 has got himself " out of phase," so to speak, and is not looking at the problem from the point of the transmitting amateur.

How could a reliable report of real accuracy be given from a receiver using curtain rod type I.F. ? What about frequency stability and selectivity ?

For the sake of argument, suppose there are three receivers situated in such a position that they each receives exactly the same signal input from a transmitter working at a fixed power input :

Receiver A.—An 11 valve commercial superhet complete and the last word in design.

Receiver B.—A 4 valve home built superhet constructed to the owner's pet ideas.

Receiver C.—An 0-v-1 battery driven home built job.

Actual input to each aerial 2 microvolts.

Could the transmitting station get *exactly* the same signal strength report from each receiving station ? I say theoretically " yes," but practically " no."

If, therefore, a set of average size could be decided upon as a standard, a good step forward would have been made towards accurate signal reporting.

A kit set was suggested because :

1. The real amateur likes to build his own equipment.
2. A manufacturer can work to much closer tolerances with the aid of his special test equipment.
3. With similar components in each receiver a uniform sensitivity would be more easily obtained.

Whatever the final design of the receiver comes out at, it must be within the reach of the man with a not-too-deep a pocket, not forgetting that the beginners of to-day are the engineers of tomorrow.

My respects once again to your correspondents BRS9772, 5872, 8273 and 8323.

Yours faithfully,
A. J. WARD (G3WD).

DEAR SIR,—With reference to the discussion on a manufacturer's kit for a communication receiver, I feel I must write and back up your correspondent who opposes the suggestion.

Surely the main object of amateur radio is to develop and construct gear for experimental purposes.

To design and successfully build a receiver provides a great deal of satisfaction, but to design the coils and I.F.'s and match and wind same, surely gives the final kick that makes one feel that something has been achieved. I feel sure I am speaking for the majority of real amateurs.

I figure that any person with an alert mind could build up a kit set, yet he could not be considered a radio engineer.

In the past twelve months, in spite of lack of spare time due to Service duties, etc., I have built two superhets (home-made coils etc.) and three T.R.F. receivers, all very successful, and like most other Service radio men I have many plans for the days when I get my " bowler hat," which I hope is not too distant.

Yours sincerely,
R. J. BAKER (BRS1875),
Sgt. R.A.F.

DEAR SIR,—I would like to point out several aspects on the standard receiver which BRS8323 seems to have overlooked in his letter published in the June issue.

Firstly, may I point out that the very fact that a person has been accepted by the R.S.G.B., as a member, should be sufficient proof of that person's education and ability. Having built several receivers successfully, I resent the implication that I am incapable of building a 7 valve set, simply because I advocate a standard receiver. The science of radio communication does not start and finish with the receiver, and a standard receiver may be desirable by many, for the following reasons.

1. Experimental work may take the form of investigation into aerial systems, transmitters, oscilloscopes or television. This being the case, a reliable receiver is necessary, yet to build it might steal precious time and components from the specialised interest.

2. Besides being an experimenter, the struggling enthusiast is possibly a keen SWL, and to him, a good-quality receiver is essential. The time he saves by the purchase of a standard receiver, and also the expense, will benefit him in other directions.

3. To build a receiver, one needs the tools and the facilities. Most of us possess both, but I am sure there are many who are less fortunate, due to war conditions and setbacks. I defy any man to build a first-class receiver with inferior tools and hampered facilities, a receiver that is, comparable with a manufactured one.

4. Home-made sets need good calibration, and unless calibrating apparatus is at hand, this presents much consternation to the builder. Nothing is more annoying than to pick up a station, only to find you are unable to determine (accurately) its frequency. Many amateurs, newly launched in the radio world, do not possess all the necessary equipment. Even if they are capable of building it, time, expense and facilities must limit their efforts. To say in as many words as BRS8323 does that because a person wished to use a manufactured receiver, he lacks enthusiasm and ability to construct a receiver is both nonsense and untruthful. I am sure that many an " old stager " uses a manufactured communication receiver, and *I* would not like to question *his* ability to build a receiver.

As for the remarks on lack of enthusiasm, I challenge BRS8323 to make those same remarks to an audience of BRS members or licensed amateurs. Maybe BRS8323 is in a position to use Service workshops and " junk " as he is in the Forces. If that is so, I do not doubt constructing receivers is both cheap and enjoyable to him. This I mean as an observation, not an insinuation, for being a Serviceman myself, employed in the Signals Branch, I know from experience that many an amateur has the opportunity to use Service workshops and salvaged components during the course of construction.

For civilians, at retail prices, reliable components *are* expensive, especially if it is remembered that to some enthusiasts, the price of a speaker, for instance, means " short rations " for several weeks. While such small sacrifices are perhaps expected, it is logical and desirable that the enthusiast should get the best return for his investment.

Yours faithfully,
A. WARD (BRS8273).

DEAR SIR,—I quite agree with BRS8323 (Mr. Gabb's) letter in the June issue, regarding a standard receiver.

If we reach the stage whereby our receivers, etc., are built from a kit of parts, then all initiative and incentive is lacking and we would not be able to call ourselves " amateurs " in the true sense of the word.

Yours faithfully,
I. F. HEYBYRNE (BRS3538),
Sgt. R.A.F.

Commercial v Service Morse Standards

DEAR SIR,—I, too, was much interested in BRS5653's letter on good Morse, but was very surprised at the answer given by BRS9261 in the June issue and feel that I must take up the cudgels on behalf of the Service.

The great difference between Commercial and Service Morse is caused by the fact that the vast majority (probably 90 per cent.) of Merchant ship operators use " bug-keys " whereas in the Royal Navy this type of key is not allowed. Morse made on a " bug-key " is a type all its own and requires great practice both in sending and receiving before proficiency is obtained.

Naval operators spend very little time on commercial waves and I contend that it is not so much the Morse that is at fault in slowing down communication but the fact that the operator has to concentrate on using correct procedure, a procedure seldom used and containing many unfamiliar abbreviations. The Morse standard in the Navy is extremely high, operators being obliged to pass stiff tests in speed and style before being classed as proficient. In peace-time a telegraphist could not be classed fully-trained until he had completed a probationary period of three years. I would like to add that I can " make " Morse on an ordinary Post Office type key at 30–35 w.p.m. that will compare with any—even tape transmitted Morse.

I read with regret BRS9261's reference to British Shore stations, especially Gibraltar. I worked the 600 metres wave there for nearly 12 months in 1936–37, during the Spanish war, and have since met many commercial ops in the Merchant Service who were full of praise for its handling of T.R.

Yours faithfully,
D. H. COBB (BRS8875),
C.P.O. Tel., Royal Navy.

DEAR SIR,—I was interested to read the letters from BRS5653 and 9261 on " Good Morse." The latter makes a very foolish statement when he decries the efficient working of British Naval operators, in favour of our own commercial people.

In peace-time, as in war-time, the standard of operating in the Royal Navy was the highest of any in the world. I wish to point out to Mr. Roberts that his experience of working with the coast stations at " Gib." Aden and the Falklands on " five ton " is nothing to go by. The very junior boys are put on this wave to gain experience. If he would really like to hear some operating, I invite him to listen in on a " Fleet wave " or an " auxiliary wave," when the Fleet is conducting a W./T. exercise.

Another point he might do well to bear in mind is the fact that Naval operators, besides being just operators, are also skilled coders, technical men, and carry in their heads a W./T. organisation that is world-wide, and extremely complicated ; not as the Radio Officers of Merchant ships, who simply have to know how much to charge for a radio telegram.

Remember that the R.N. operator gets a reference sheet if he makes one short out of place in peace-time, and does far more practical operating.

Therefore, for really good operating, I will challenge anyone to beat the Royal Navy.

Yours faithfully,
P. HODGKINSON (BRS8981)
L./Tel., R.N.

The Post-War Amateur Market

DEAR SIR,—There are one or two points in Mr. Cosky's letter published in the June issue with which many members will not agree. His remarks about American radio equipment having mainly a novelty appeal are not in accordance with my own recollections. It is only necessary to think back some 12 years to the days when the *only* low loss short wave components to be obtained in this country were American, with the exception of the few products of one or two pioneer British firms who had the courage to produce what the amateur required. Mr. Cosky has surely forgotten that no British firm was producing communication receivers for the amateur market before 1937, and that British made transmitting valves of modern design at a reasonable price were not available until 1937 or 1938. The American manufacturers had at least five years start over the great majority of British concerns.

Mention of valves and prices in the last paragraph raises the main point about the use of American valves by British amateurs. When British manufacturers attempt to charge twice the price for exactly the same article they cannot blame anyone for buying foreign products. In 1939 it was possible to buy an American 6L6G for as little as 3s. 6d. These tubes were admittedly " seconds," but were good enough to stand up to all kinds of maltreatment. First grade American 6L6G's were 8s. 6d. Yet British makers were trying to sell their own versions of the same valve for nearly twice the price ! As for the yarn about British valves being ever so much better, that will not stand scrutiny either. It is true the older types of British valves were designed with higher slopes than the corresponding types of American valves, but to attempt to put over the idea that a British-made 6L6G is infinitely superior to a first-grade American make (to the extent of costing twice as much) is just silly. As for British amateurs slavishly copying American literature, I have yet to see an amateur-built transmitter which was a slavish copy of any published circuit. *Quot homines, tot sententiæ* is an old and true motto which could be translated as : " As many kinds of transmitter as there are amateurs."

A sidelight on the unnecessarily high prices of valves is the well-known fact that the Government is paying less than *one-fifth* of the official retail price for the same types of valve the general public has to pay 10s. a time for. It is not very long since reference was made in Parliament to Lease-Lend valves being imported at 9d. each and sold retail at 10s. or more.

In conclusion, whilst British amateurs should, and will, support manufacturers who give them a fair deal, they cannot be condemned for refusing to pay grossly inflated prices. The average amateur has only a small amount of cash to spare for his hobby and he naturally spends it where he can get the most value for money.

Yours sincerely,
A. G. DUNN (G3PL).

Book Review

THE SHORT WAVE LISTENER'S HANDBOOK. Compiled by N. Stevens and C. Overland. Published by The British Short Wave League, 53 Madeley Road, London, W.5. 2s. 6d., postage extra.

If you want to know your way about the short waves, this little book will help to put you on the right path. It contains tabulated information on the broadcasting and radio-telegraph stations of the world operating in the short-wave range. There are 16 pages of station names with their frequencies and six pages of standard communication codes, including the various reporting systems used by amateurs before the war. The serviceable frequencies for various geographical areas of the world and for various times throughout the year are also given.

A brief technical section is included with the apparent intention of helping the listener to make minor alterations or repairs to his receiver.

It is regretted that in a book written especially for the beginner there should appear so much inconsistency in the use of symbols. For instance, *mfd*, *µfd* and *µF* are all used in various places to signify *microfarad*. We recognise that there is no universal agreement as to whether " per second " is necessary when specifying a frequency, but every writer ought to make up his mind which convention he is going to adopt. In this book we find frequencies stated in *kc/s.*, *kcs.*, *Kc/s.* and in plain *kilocycles*.

It is a pity, too, that no distinction is drawn between " spitch " and " radio-telephony." Donald Duck might emulate one but not the other.

S. K. L.

News From Guernsey

Mr. Thomas de Putron, **G8MF**, 7 Commercial Arcade, Guernsey, reports fit and well although we are sorry to learn that he suffered imprisonment from the hands of the Nazis for suspected transmitting activities. His Super Skyrider was confiscated but he was able to recover it during the last days of the occupation. He has contacted G2YH, who is with the British Army in Guernsey.

The Post-War Amateur Market

Mr. L. Philpott, G4BI, Rectory Cottage, Walton le Wolds, Loughborough, Leics., who is interested in a small sheet metal working concern, would be glad to hear from any member willing to give him ideas regarding the types of chassis or cabinet required by amateurs. Mr. Philpott is anxious to make his contribution to the needs of the post-war radio amateur.

Silent Keys

It is with very deep regret that we record the death in Germany from heart failure of Warrant Officer George Donald Barry, BRS3745, of Liverpool. W./O. Barry was taken prisoner nearly four years ago after an operational flight over Germany and was apparently in good health when he made his escape during a forced march earlier in the year.

W./O. Barry had been married for only one month when he was reported missing.

On behalf of all members, especially those who have themselves returned home safely from Germany, we offer sympathies and condolences to his mother, wife and other relatives.

J.C.

It is also with deep regret that we record the passing of :—
Pierre Blanchon, **F8wC**, of Creuse, France.
Arne Eikrem, **LA7A**. Killed in action in Norway.
L.A.C. W. J. Inman, R.A.F., **BRS5541**, of Birmingham. Died on active service.
John Klingen, **PAOXL**, of Heemstede, Holland.
Kees van Lent, **PAOXI**, of Heemstede, Holland.
George McCulloch, **VP5GM**, of Kingston, Jamaica.

Book Review

RADIO RECEIVERS AND TRANSMITTERS. By S. W. Amos and F. W. Kellaway. Published by Chapman & Hall. Price 21s.

During the past few years a number of books have been published on the general principles of radio engineering. Some good, some bad. When we received for review a new book bearing the above title and priced at one guinea, we anticipated a "meaty" treatise on the design of transmitters and receivers. Let us confess here and now that we were soon disillusioned. This book contains 280 pages in all, of which the first 104 deal with general electro-technology, including standard A.C. theory, and a chapter on aerials and wave propagation. The next 131 pages deal with the theory of valve circuits and their application to receivers, *whilst a total of 29 pages, 10 per cent. of the whole book, is left to cover the field of transmitters.* The last few pages consist of some mathematical appendices.

In their preface the authors say that the book is intended to provide a bridge joining pure science and applied radio for serious students who are presumed not to be beginners. It is our feeling however, that with so much waiting to be said on the technical design of receivers and transmitters, it is a pity to find yet another book which attempts to cover the whole field from A.C. theory to frequency-modulated transmitters.

A good feature of the book is that the theory in the earlier chapters is illustrated by reference to practical components found in receivers, but the assumption seems to have been made that the only existing receivers are those designed to cover the broadcast channels. For example, on p. 22 in a chapter on Inductance, the authors say that "a coil in parallel with a *standard* tuning condenser needs an inductance of about 157 μH in order that the circuit shall tune to the medium waveband." No reference to the size of a *standard* condenser has yet been made. In several places notably on p. 82 "short-wave" reception is considered to be covered completely by "13 to 50 metres." There is hardly a reference in the book to the reception of frequencies other than those of the short, medium and long wave broadcast bands.

Turning now to the theoretical chapters in greater detail, there are several points which leave us a trifle unhappy. For example, on p. 50 we are told that a low power-factor condenser of ·0001 μF will present a resistance of *several megohms* to a constant potential. We should consider such a condenser to be a very poor one if it had a D.C. leakage resistance of only a few megohms. We wonder too, how many budding radio engineers, presumably surrounded by power packs and dry batteries, would turn to an *electrophorus* to apply a charge to a conductor! (p. 38). We have also failed to see, with regard to curve (*b*) referred to on p. 31, how the D.C. resistance of a single wire can be the same as that of two similar wires in parallel.

There seems to be no clear distinction in chapter IV between the *resonant* and the *natural* frequencies of a resonant circuit and surely the word "continuous" in line 13 of p. 69 should read "alternating." In the chapter on aerials there is a paragraph on short wave aerials in which resistance seems to be confused with reactance and why, in all references to reflectors, is it necessary to earth them? Again, with reference to frame aerials, we have the astonishing statement that they "give maximum results from a particular transmitter when the plane of the frame is at right angles to the line joining the aerial to the transmitter"!

Unfortunately we cannot agree any more readily with some of the authors' statements in the chapters on valve circuits. Having carefully explained why a suppressor grid is inserted in a pentode we learn on p. 121 that a pentode will become inseparative if the screen voltage exceeds that on the anode by more than 20 volts.

On p. 174 there is an orthodox tapped anode coil neutralising circuit which we are told is brought into balance by adjustment of the anode tuning condenser. It is further stated that in such a circuit the balance must be inevitably frequency-dependent. In point of fact if the coupling between the two halves of the coil is tight the balance conditions are independent of frequency. Indeed some readers may remember a commercial short-wave receiver of some 15 years ago in which the neutralising condenser needed no re-adjustment at all over the whole tuning range.

Practical receiver circuits, particularly to broadcast sets, are discussed fairly fully including a detailed description of that of one commercial type, *but the subject of communication receivers is dismissed in exactly one page* where we learn that the purpose of a quartz crystal in such sets is to provide a deep crevasse in the I.F. response curve. The almost universal use of a crystal to produce a sharp peak is not even mentioned.

The shortness of the chapter dealing with transmitters has already received comment, but two points deserve mention. One is the statement on p. 236 re spark transmitters that "transmitters such as these only produce current in the receiving aerial when the transmitter key is pressed," which seems to us rather obvious. Readers of this journal may be interested to know that amateur transmitters receive *one paragraph* to themselves in which it is stated that at frequencies *lower* than 500 kc/s. it is possible to dispense with a crystal oscillator and "still keep the allotted frequency within the specified limits." One wonders if the authors know that permission to amateurs to use the 1,000 metre band (the only band they ever used below 500 kc/s.) was withdrawn over 22 years ago! H.A.M.C.

Subscriptions to "CQ"

The Society is now in a position to accept subscriptions to "CQ" (a new monthly publication of Radio Magazines, Inc., New York) at the rate of 17s. 6d. per annum, payable in advance. Orders will be passed to the publishers for execution, and delivery can be expected approximately three months from date of order. Subscribers who change their address during the currency of a subscription should notify the publishers.

Congrats

● To Capt. E. P. Appleby, **G8ZD,** on his marriage to Section Officer Elspeth Gordon, W.A.A.F.

● To Mr. W. Adams, **G8JF,** and his wife, of Wallington, Surrey, on the safe arrival of a son—Rodney Michael—on May 19, 1945.

● To Sgt. J. Binning, **BRS3893,** of Forest Gate, London, and his wife on the birth of a son—Raymond Kenneth—on May 12, 1945.

● To "Ex-Batchelor" Cpl. T. Higgins, **G8JI,** and his wife on the safe arrival of a daughter—Vivianne Margery.

● To Cpl. E. Powell, **GW3QB,** who was married on June 23, 1945, to Miss Joan Elliott. They are now living at 141 Wortley Road, High Green, near Sheffield.

● To Council Member, Lt.-Col. K. Morton Evans, Royal Signals, **GW5KJ,** who has been appointed an Officer of the Order of the British Empire.

● To Mr. J. Roberts, **BRS7313,** of Whalley Range, Manchester, on his recent marriage to Miss Joan Cresson.

● To Mr. Cyril Turner, **G8NL,** and his wife on the birth of a daughter—Lesley Patricia—on May 17, 1945.

● To Mr. Bruce Edwards, **2AZM,** of Sidcup, Kent, whose wife presented him with a second child, a son, on June 29, 1945.

● To Dr. T. A. Appleby, **G3RZ,** who was married on June 30, 1945.

● To F./O. Jim Davies, **G2OA,** of Liverpool, who has been mentioned in despatches presumably for the grand job of work he has been doing in connection with the installation of mobile radio equipment. Jim also receives congratulations upon becoming father of a son and heir. Unfortunately he is at present in hospital with a duodenal ulcer. We wish him a speedy recovery.

HEADQUARTERS CALLING

May Council Meeting

*Resume of the Minutes of a Meeting of the Council of the Inc. Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.*1, *on Monday, May* 14, 1945, *at* 6 *p.m.*

Present.—Messrs. E. L. Gardiner (President), S. K. Lewer, H. A. M. Clark, A. J. H. Watson, A. O. Milne, A. E. Watts, F. Charman, D. N. Corfield, F. G. Hoare, E. H. Laister, S. E. Langley, W. E. Russell and J. Clarricoats (General Secretary).

Apologies for absence were received from Messrs. A. D. Gay and Lt.-Col. K. Morton Evans.

1. It was reported that the B.B.C. are unable to accept the suggestion made by the Society that they should endeavour to maintain the present Droitwich frequency of 200 kc/s. The B.B.C. had explained that although its transmissions are maintained at a high degree of accuracy, it does not set out to provide a standard frequency service. In view of the value of the present 200 kc/s. transmission for calibration purposes, it was agreed to institute further inquiries.

2. The B.B.C. also informed the Society that they are unable to adopt the suggestion put forward at the previous meeting that frequencies and call signs should be announced at intervals in their General Overseas Service.

3. It was unanimously resolved to elect 161 Corporate Members (128 proposed by Corporate Members, 33 supported by references) 16 Associates, 2 Junior Associates and 6 Foreign Members. Applications for Life Membership received from Messrs. M. R. Campbell, VK3MR, and H. Jones, G5ZT, were approved as were two applications for transfer to Corporate membership.

4. After examination it was unanimously resolved to accept and adopt the Monthly Balance Sheet and Statement of Account.

5. It was unanimously resolved to transfer a further £1,000 to the Post-War Development Fund, and to invest this sum, together with the £1,000 voted at the meeting held on March 19, 1945, in 1¾ per cent. Exchequer Bonds 1950 Series "A." It was reported that short-term 2½ per cent. National War Bonds are no longer "on tap."

6. It was reported that stocks of Society publications held at Caustons had been reduced to: Handbooks, 9,138 paper covers, 500 cloth. Supplements, 6,059 paper covers 108 cloth.

7. It was reported that 140 copies of a list of components, valves, etc., which it is thought will find a ready sale among amateurs, had been distributed to the radio trade and press.

8. It was reported that a letter had been addressed to the Radio Industry Council requesting that representatives of the Society be invited to meet representatives of the R.I.C. to discuss matters relating to the disposal of surplus Government radio apparatus.

9. It was reported that no reply had been received from the B.B.C. regarding the suggestions that a representative of the Society be invited to deliver a talk over the Forces network.

10. Mr. E. Wilson (Hon. Secretary, Midland Amateur Radio Society) wrote to acknowledge the letter sent after the previous meeting and agreed to close the discussion on combined membership which had prompted the correspondence.

11. It was reported that several applications for membership had been received from Belgium and French amateurs. It was agreed to accept such applications on the understanding that their subscriptions will be forwarded as soon as currency regulations permit. M. Larcher (President, R.E.F.) had already given an undertaking to forward subscriptions from French amateurs.

12. It was reported that to date 12 members and non-members who had received parcels from the R.S.G.B. P.O.W. Fund, were now back in the United Kingdom. All had expressed their gratitude to the Society. Mr. C. H. L. Edwards (Hon. Administrator) wrote to suggest that the Fund should contribute towards the cost of specialised treatment if any returned member should need such assistance. Mr. Edwards did not consider that any call would be made on the Fund in this connection, but he requested permission to exercise discretion if the necessity should arise. Council agreed to his suggestion.

13. It was reported that a further lengthy letter addressed to the President had been received from Mr. H. H. Phillips, GW4KQ, dealing with a variety of matters. Mr. Gardiner stated that he intended to write to Mr. Phillips as soon as he had had an opportunity of studying the letter in detail.

14. The Society's Advertising Manager (Mr. H. Freeman) wrote to suggest that as from the July, 1945, issue of THE BULLETIN the following rates and terms for Exchange and Mart Section advertisements should become effective:

Trade Advertisements.
50 words maximum, 6d. a word. Minimum charge 9s.
Members Private Advertisements.
100 words maximum, 2d. a word. Minimum charge 3s.

Mr. Freeman also suggested that advertisements should not be accepted from non-members other than bona-fide members of the radio trade.

In putting forward his suggestions Mr. Freeman explained that owing to the limited space available for display advertisements, radio traders have recently shown considerable interest in reaching the membership through the Exchange and Mart Section. As a result, their advertisements have tended to crowd out members' private advertisements. He considered this control was necessary until such time as more paper becomes available. After discussion it was agreed to accept Mr. Freeman's suggestions.

16. It was reported that arrangements had been made for the return to Headquarters of all Society trophies which had been held by Harrods since September, 1939. It was agreed to present the trophies to 1939/40 winners, as opportunity occurred. The trophies would be held for one year as from July 1, 1945.

17. After specimen technical examination papers and proposed syllabuses had been examined, it was agreed to submit them to the G.P.O. for their preliminary comments.

It was also agreed to submit to the G.P.O. for their comments a proposed international definition for "amateur experimental station."

The meeting closed at 10.15 p.m.

General Secretary on Vacation

The General Secretary will be on vacation from Wednesday, August 8, until Monday, August 27. During this period members are kindly requested to reduce to a minimum correspondence of a general nature.

R.S.G.B. Prisoners of War Fund

The Council has decided that as from July 15, 1945, no further appeals need be made to the membership on behalf of the R.S.G.B. Prisoners of War Fund.

It is felt that the credit balance in hand (amounting to approximately £700) is more than sufficient to ensure that the needs of every member known to be held prisoner by the Japanese are fully provided for. Unfortunately it is not yet possible to send parcels to prisoners of war in the Far East, but the ban may eventually be lifted.

Although no further appeals will be made publically, private donations may, of course, be forwarded to Headquarters as hitherto.

DONATIONS.—The General Secretary acknowledges with thanks, on behalf of Council, the receipt of donations from: District 4, Nottingham, £1; M. Campbell, VK3MR, 12s. 6d.; E. T. Casey, 2FMN, 14s.; Catterick Meeting, per 5724, £1; H. G. Cunningham, ZB1A, 15s. 6d.; Liverpool Meeting, per 2FGB, 13s.; G. M. Hindle, 3692, £5 5s.; F. T. Smith, G6FK, 5s.

Total receipts to date £1,627 5s. 5d. Total expenditure to date £921 0s. 9d.; Balance in hand as at 29th June, 1945: European fund £336 4s. 8d. Far East fund £370.

American Publications

The Society is in a position to accept orders for the following publications which are ordered individually from America:

"QST" (Official monthly publication of The American Radio Relay League). By subscription, per annum	17s. 6d.
"The Radio Amateur's Handbook" (A.R.R.L.) 1945 Edition	10s. 6d.
"The Radio Amateur's Handbook"—Special Defence Edition (A.R.R.L.)	8s. 6d.
"The Antenna Handbook" (A.R.R.L.)	4s. 0d.
"A Course in Radio Fundamentals" (A.R.R.L.)	3s. 6d.
"The Radio Handbook" (Editors and Engineers) 1943 Edition	12s. 0d.
"Radio" (Monthly publication of Radio Magazines Inc.). By subscription, per annum	21s. 0d.
"CQ" (Monthly publication of Radio Magazines Inc.) by subscription, per annum	17s. 6d.

Orders must be accompanied by a remittance made payable to the Society and rates and prices are subject to alteration without previous notice. Delivery can be expected in about 12 weeks from date of order. Service Addresses must not be used. Single copies of text books only may be ordered.

Members who change their address during the currency of a subscription to *QST* or *Radio* should advise the publishers *direct*.

EXCHANGE AND MART SECTION

MEMBERS' private advertisements 2d. per word, minimum charge 3s. Maximum words accepted, 100. TRADE advertisements 6d. per word, minimum charge 9s. Maximum words accepted, 50. An additional charge of 1s. 6d. is made for use of Box Numbers. TERMS : Cash with order. All copy and payments to be sent direct to Advertisement Managers, Parrs Advertising Ltd., 121 Kingsway, London, W.C.2, by the 25th of the month for following month's issue.

ALL KINDS OF PRINT, especially QSL Cards.—Send your inquiries to G6MN, Castlemount, Worksop.

ABUNDANT supplies available for amateurs. All new goods. Electrolytics, resistors, condensers, coils, I.F.'s, speakers 2 in. to 12 in. Filament, mains, O/P transformers, 1 mA meters, Yaxley switches, Mullard bridges and oscilloscopes, 10,000 English and American tubes, including many hard to get. State your wants. S.A.E., I ship C.O.D.—BRS7370, BERNARDS RADIO CO., 67 High Street, Chatham. Phone 2927.

BE SURE and write for our mail order list " T.R." Steel racks, chassis, condensers, coils, chokes, etc. Complete trimmer tool kit, box spanners, screw drivers (12 tools and 2 extension handles) in carrying wallet, 30s. 2½d. stamp for list " T.R."—WAVEBAND RADIO LTD., 63 Jermyn Street, London, S.W.1.

BERRY'S (SHORT-WAVE) LTD. have vacancies for Class " A " ex-Servicemen experienced in (*a*) Communication receivers, (*b*) Transmitters, (*c*) Transmitting valves.—Full details of experience and past positions to BERRY'S, 25 High Holborn, London, W.C.1.

BRS 5689 again with good gear ! Ferranti transformers : 1-AF3, 10s. ; 3 – AF5's, 15s. each ; 1–AF5 (C5), 25s. ; OP1, 15s. ; OPM11C, 15s., and other transformers. Chokes, all heavy duty and screened. Pye 32H, 120 mAs, 15s. Varley swinging choke 14–28H, 140 mAs, 20s. Ultra 30H 150 mA, 20s. 3 Hydra block type non-elec., 4 μF 500v condensers, 5s. each. 40 asst'd aluminium screening cans, round and square for valves, coils, etc., 1s. each. State wants. 35 asst'd service sheets, Pye, Ekco, Cossor, etc., 1s. each.—BRS5689, 24 Rossie Island Road, Montrose, Angus.

COMMUNICATION Receiver required. Must have crystal gate and be in working order.—Write particulars to ZB1A, CUNNINGHAM, 232 Leigh Road, Chandlers Ford, Hants.

EXCHANGE.—Midwest 18 valve de Luxe receiver in modern R.G. cabinet, 6 wave-bands, high fidelity p.p. output, 20 watts output ; 4½ to 3000 metres ; perfect condition, first-class performance, for Hallicrafters SX17, SX18 or other good communication receiver.—G3ZW, 357 Chorley Old Rd., Bolton, Lancs.

E.D.C. CONVERTER with sound proof cabinet and filter, 220 D.C. in 220 A.C. out, 180 watts, perfect, £10. Unused Tungsram rectifiers, PV4200 and RV200/600, 12s. 6d. each Woden autotransformer, 230/115v 60w, unused, 17s. 6d. Cosmos mains transformer, 4/4/350v, £1. Filament transformer, 6·3v, 3a, unused, 12s. 6d.—GRAY, Four Winds, Devenish Road, Sunningdale, Berks.

FERRANTI M/C with selector switch, F.S.D. 5 mA. range 0–7·5v., 01150 v., 0–15 mA., 45s. Ferranti M/C centre zero 15 mA F.S.D., no scale, 10s. Ferranti AF3, 3s. AF5, 6s. 6d. OPMI, 6s. 6d. " Bulletins " 1934–39, 5 vols., 30s., also 1941 onwards. " Wireless Worlds " 1938–44 complete, 1931–37 almost ; reasonable offers, whole or part. American Radio magazines 1935–40, 50, 25s. New Jacks, various combinations, 7s. 6d. doz. New valves : Pen 45DD, 12A7, 12SA7. New S/W components ; condensers, coils, chassis, etc.—Particulars S.A.E. to : BRS4440, 36 Grange Avenue, Thornbury, Bradford, Yorks.

FOR SALE.—Useful collection of 50 wire-end resistors all different. Nominal values from 10 ohms to 9 megohms, ½ and 1 watt sizes. 20s. post free.—Box 0102, R.S.G.B., New Ruskin House.

FOR SALE.—Hallicrafters 11 tube, SX23 receiver. R.F. stage, crystal gate with six position selectivity, BFO, automatic noise limiter, S meter, pre-selected bandspread on ham bands, 31 Mc/s. to 550 kc/s. continuous coverage. Has been kept in immaculate condition and looks as new. Also 10 in. Bakers triple cone speaker in metal cabinet and Varley matching transformer for the receiver; also auto transformer for power line, and the original instruction booklet. Offers to Box 615, PARRS, 121 Kingsway, London, W.C.2.

G2AK has the following surplus :— Hammarlund Super-Pro 16-valve complete with pack and speaker, 540 kc. to 20 Mc., £85. Hallicrafter S 11, 11-valve RX pp 6L6's output, 545 kc. to 38 Mc. (5 bands), £35. W.B. extension L.S., 20s. Mullard basic oscilloscope, £10 10s. W2AMJ uhf convertor with 6J8 1852 and 80 tubes, 5 Mc. i.f., £10. Decca Portrola portable, A.C./D.C. radiogram, 3 band ; offers. HRO coils, set of 3 : 50–100 kc., 100–200 kc., 180–430 kc., unused, cost £18 10s., £12 the lot.—YOUNG, 42 Stanford Avenue, G6. Barr, Birmingham, 22A. Phone ; Great Barr 1537.

HALLICRAFTER'S 25 valve dual diversity receiver, complete with valves and meters, but less speaker. Unused since 1939. Offers or exchange.—BURKE, 15 Oram St., Chesham, Bury, Lancs.

HAMS !—Watch those bypass condensers—use Mica ! ·002, 1s. 6d., ·01, 2s. Oil filled, see last month's advert. Aluminium chassis and panels made up to order. Eddystone and other short-wave components. List 1d.—GORDON J. STUCK, 72 North Street, Sudbury, Suffolk.

METERS.—5 mA M/C 2½ in. square, 30s. Assorted 100 resistors, £1. Valves : 6K7G, 6Q7G, 6K8G, 6J5, 6G5, D63, 76, X65, EF6, EF39, U14, 5U4G, 7s. 6d. each.—Box 633, PARRS, 121 Kingsway, London, W.C.2.

MONOMARK service.—Permanent London address. Letters redirected. Confidential. 5s. p.a. Royal patronage. Key tag 9d.—Write BM/MONO7A, W.C.1.

PARTRIDGE Mullard 28 watt Amplifier Kit. Mains trans 400–0–400, 4v 1a, 4v 6a, 4v 3a. Tapped output trans, primary 428s. Driver trans sec separate windings. Chokes, 1 each 75H and 13H. Mic trans 250/350, 400/600 ohms. Mod trans primary 428s. (Sec, 10,000 ohms.) One pair matched Pen 428. Mullard drawing ; £14. New, unused ; no separation.—HOUCHIN, G3GZ, 90 Shaggy Calf Lane, Slough.

QST. Collection of 50 back issues (1939–44) for sale. Price £2.—Box 0101, R.S.G.B., New Ruskin House.

SALE.—Ferranti multi-range milliameter 0–7·5–30–150, 50s. Transformer 1,000v. ½A, 6·3v, 2v, 50s.—BRS3789, 24A Watcombe Road, Bournemouth.

SALE.—Short-wave Magazine, Vol. 14, less Nos. 1 and 2 ; Vols. 15 to 18 complete ; offers for lot. I want Bulletins, October, 1943, and October, 1944.—2FZT, 3 Barridale Avenue, Glasgow, S.4.

SALE.—7 in. C.R. Tube (magnetic) holder, focusing and deflector coils, new, £3.—BRS9777, 25 Tenth Avenue, Northville, Bristol 7.

SALE.—National NC81X Receiver, 10–160 metres, amateur bands, new condition, £25.—R. H. PARKINSON, 35 Sunny Grove, Chaddesden, Derby.

SALE.—10 valve Superhet with preselector, speaker, no cabinet, £25 or near offer.—BRS6878, 11 Hillingdon Avenue, Ashford, Middx.

SALE.—National HRO Receiver and Coils including medium wave broadcast coils, A.C. power pack and complete set of unused spare valves, also D.C. model Avometer and G2NI all-mains 6-valve pre-amplifier. What offers ?—Box 623, PARRS, 121 Kingsway, London, W.C.2.

TELE-RADIO (1943) LTD. for new components at list prices. Weston meter 0–250 micro amps, centre zero, £3 5s. C.R. tubes, wirewound precision resistors, Keston mains trans, chokes and output trans. Instrument wave-change switches, 2-gang condensers with s.m. drive, 16s. 9d. Vitavox and Celestion speakers. Specialist in short-wave work.—TELE-RADIO (1943) LTD., 177A Edgware Road, London, W.2. Phone : Pad 6116.

UNUSED Transformers.—230/250 Pri. 500v 250mA twice, 4v 3 amp twice, £4. 1000v, 750v at 250 mA, 90s. 500v 500 mA, £4. Fil trans 2·5v, 10 amp, 5v 3 amp, offers. 250 mA S.W.G. choke, £1. New crystal holder, 10s. 8 μF, 750v wkg condenser, 15s. Boxed Ken-Rad 6L6G, 16s. each. Mullard EL35, 16s. each. Browns " A " phones, 30s.—BENTLEY, 57 Briarsland Avenue, Sale, Cheshire.

USEFUL BOOKS.—Systematic Radio Servicing including catalogue of radio service aids, 1s. 7d. Handbook on American Midgets, 2s. 7d. Valve Comparative Tables (Equivalent Charts). 1s. 7d.—V. E. S. (B.), Radio House, Ruislip.

WANTED.—Trophy 6 or 8 or similar American receiver. State price and condition.—2BMI, c/o 11 Uxbridge Road, Slough, Bucks.

WANTED.—Hallicrafters SX28a Receiver and Speaker ; or Comet Pro and Speakers ; or National HRO and Speaker. Also wanted, a DB20 preselector. Will part exchange Hallicrafters SX23 receiver and speaker ; both in excellent condition, for any of the above receivers. Cash adjustment if necessary.—Full details to Box 614, PARRS, 121 Kingsway, London, W.C.2.

WANTED.—Sky Buddy or similar type communication receiver. State price and condition.—CLAPHAM, BRS9260, 184 Monks Road, Lincoln.

WANTED.—One each 3Q5GT and 117L7GT, urgent.—NEALE, 18 Vainor Road, Sheffield, 6.

WANTED.—Avominor D.C. or Universal.—Price and condition to BRS8070, 109 Fortess Road, Tufnell Park, London, N.W.5.

WANTED.—A.C. Communication Receiver, Hallicrafter or similar make.—Full details, price, etc., to W. H. HODGSON, G3BW, 53 Hill Top Road, Arrowthwaite, Whitehaven, Cumb.

WANTED.—6-in. B.T.H., R.K., any voltage, cone-coil not required.—FT./SGT. YATES, G3LB, R.A.F., Beaulieu, Hants.

WANTED.—Loan or purchase " Radiocraft," January, 1945. Member in army.—BRS8254, BM/NBTP, London, W.C.1.

WANTED.—Radio Designers Handbook by Langford Smith, Radio and Telecommunications Engineers Design Handbook by Blakey. Any of Ridos or Gherhardi books on Radio Servicing. —Details to LAWDEN, 345 Stockford Road, South Yardley, Birmingham.

WANTED.—National HRO, 101X or 81X receiver in good condition.—Details, cost, etc., to Box 630, PARRS, 121 Kingsway, London, W.C.2.

WANTED urgently.—Good quality all-wave signal generator, mains. State make, year and price.—JOHNSON, 37 Bulk Road, Lancaster.

WANTED.—Hallicrafters SX17 or SX24 type matching speaker in cabinet, as new. 50 per cent. above list price offered. Hallicrafters model HT-7 frequency standard. Three coppered brass speaker frets to cover 9½ in. holes.—Details, prices, to 14 Common Road, Evesham.

£2 5s. OFFERED for latest edition " Modern Radio Servicing " by Ghirardi.—BRS5846, Hollingbury Gardens, Worthing.

PATENTS AND TRADE MARKS

KING'S Patent Agency Ltd.(B. T. King, G5TA, Mem.R.S.G.B., Reg. Pat. Agent), 146a Queen Victoria Street, London, E.C.4. Handbook and Advice on Patents and Trade Marks free. Phone : City 6161. 50 years' refs.

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