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BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

- AUDIO FREQUENCY OSCILLATORS
- FABRICATED WOODEN AERIAL MAST
- THE LC CIRCUIT
- ANGLO-AMERICAN MEETING

NEW MEMBERS

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

British Isles (Licenced Amateurs)

G2QA *T. SIMKINS, M.B.E., "Zummervilla," Tetney Road, Humberston, Grimsby.
G2ZH H. S. EDWARDS, 72 Leopold Av., Handsworth Wood, Birmingham, 20.
G3IM *C. H. COX, 17 Links Road, Blackpool.
GM3PK J. W. DUNSIRE, 18 Allison St., Buckhaven, Fife.
G3QW J. A. BUDGE, 212 Summit Way, Bitterne Park, So'ton.
G3RD E. STEVENS, 9 Laurel Avenue, Twickenham, Mdx.
G3RW *D. E. DAVY, c/o Mrs. Cookson, Rufforth, York.
G3VM *F. W. FISHER, Keppel, Dereham Rd., New Costessey, Norwich.
G3US R. SHADLOCK, Cleveland View, Ackworth, Nr. Pontefract.
G4LH R. BURWELL, 4 Wymersley Road, Hull.
G4NG *V. RICHARDSON, 170 Orchard Way, Shirley, Croydon.
GI5JN *J. MILLIKEN, Fortfield, Upper Dunmurry, Belfast.
G5MF F. A. KING, 35 Oakmead Rd., Balham, London, S.W.12.
G5QY *H. HORNSBY, 105 Kenton Lane, Newcastle-on-Tyne, 3.
G6HL *I. E. HILL, Caen House, Caen St., Braunton, N. Devon.
G6IN *J. B. INGLIS, 7 Albyn Place, Edinburgh.
G8AO CAPT. E. CLARKE, M.B.E., 175 Marsden Rd., S. Shields.
G8RO *L. G. WILLARD, Egerton, Tangmere, Nr. Chichester.
G8UD *E. W. PRICE, 17 St. Gerards Rd., Blossomfield, Solihull, Nr. Birmingham.
2AAN J. H. CLARKE, 136 Andover Road, Newbury, Berks.
2ACG Y. ADALIAN, 9 Wood Street, Calne, Wilts.
2AJP H. BUXTON, 11 Walker St., Hadfield, Nr. Manchester.
2AOB G. JOBLING, 5 Meadowfield Terrace, Forest Hall, Newcastle-on-Tyne.
2AZS P. J. BAXANDALL, House 6, T.R.E., Malvern, Worcs.
2CAZ M. ELLIS, St. Anthony, Lower Heath Drive, Theydon Bois.
2CBG C. C. B. GUEST, 440 Glossop Road, Sheffield, 10.
2CIP J. MCLELLAND, 33 Hogarth Rd., Kirkdale, Liverpool, 4.
2CPJ H. R. EVANS, 41 Ringmer Rd., Moulsecoomb, Brighton.
2CPM W. V. W. MANSELL, Green Meadow, Kilgetty, Pems.
2CPX W. J. A. CARLTON, Sycamore Farm, Sycamore Road, Farnborough.
2CRY *F./O. H. T. SELF, R.A.F.
2FBV *P. R. DINHAM, 99 Durban Road, Patchway Estate, Bristol.
2FBH J. A. ANTHONY, 32 Bowring Park Av., Liverpool, 16.
2FQP L. J. AVORY, 25 Blenheim Road, Ramsey, Hunts.
2FQZ W. R. DAY, 73 St. Georges Road, Brighton, 7.
2FRL J. D. R. ETHERIDGE, 43 Lynford Avenue, Winchester.
2HBN T. A. SMITH, Vine Inn, Broadfield St., Boston, Lincs.
2HHJ T. CHAMBERS, 11a Evelyn Crescent, Southampton.
2HMI R. A. SHARP, Lodge Farm, Outwoods, Drive, Loughboro, Leics.

British Empire (Licenced Amateurs)

VE3PL/VE4OR L. S. RUSSELL.
VU2HU CAPT. R. COLLINS, R. Signals.
ZB1AA T. LOWREY, at Springfield House, Shotley Bridge, Co. Durham.
ZS4T/ZE2JC D. C. HUMAN, P.O. Box 113, Umtali, S. Rhodesia.

Foreign (Licenced Amateurs)

W1IOE S. HORBACH, U.S. Army.
W2GT MAJOR A. E. HOPPER, U.S. Army.
W2HGP V. S. ACUNTO, U.S. Army.
W2OA LT.-COL. C. A. PORTER, U.S. Army.
W2PF LT.-COL. D. TALLEY, U.S. Army.
W6RH LT. W. B. OVERSTREET, U.S. Army.
W6GMC M. SMITH, 438 Lola Av., Pasadena 8, Calif., U.S.A.
W7IDZ H. R. PATRICK, U.S. Army.
W7IXX A. M. FARIES, U.S. Army.
W8FFK SGT. R. V. COURTAD, U.S. Army.
W9PDU W./O. W. J. KIEWEL, U.S. Army.
W9IPO E. M. G. WEBB, U.S. Army.

British Receiving Stations (B.R.S.)

1174 *A. C. K. BAWDEN, 352 Green Street, Enfield.
5036 *E. A. MATTHEWS, 36 Olma Road, Dunstable.
8268 W. A. GARDNER, B.Sc., 24 Church St., Market Drayton, Shropshire.
8269 W. L. MARTIN, 10 Hill Rise, Birstall, Leics.
8270 H. R. RAYNER, Field Cott, Carrington Av., Hornsea, E. Yorks.
8271 G. AYLARD, 16 The Ridgeway, Southgate, London, N.14.
8272 R. A. GOULD, 21 Skeena Hill, Southfields, London, S.W.18.
8273 A. WARD, 122 Carnation Road, Swaythling, Southampton.
8274 R. BIRD, Carpe Diem, Doctors Lane, Chaldon, Caterham, Surrey.
8275 C. R. FILTNESS,
8276 P. H. HUNT, Green Shaw, Wentworth, Virginia Water, Sy.
8277 D. W. POULSTON, 15 High Nash, Coleford, Gloucester.
8278 N. S. CHEETHAM, 16 Elmsmere Rd., Didsbury, Manchester 20.
8279 W. G. R. CUNNINGHAM, 521 Mosspark Drive, Glasgow, S.W.2.
8280 R. C. HARTLEY, Chain Barm, Cleckheaton, Yorks.
8281 G. H. JONES, 5 Barnedale Av., Thingwall, Birkenhead, Cheshire.
8282 D. S. JONES, 36 Watering Cottages, Aldeburgh, Suffolk.
8283 B. I. CALLIN, 33 Caledonia Road, Batley Yorks.

A CORDIAL WELCOME IS EXTENDED TO THE

569

NEW MEMBERS WHOSE NAMES ARE LISTED

8284 R. F. BUCKERIDGE, 17 Browett Road, Coventry, Warwicks.
8285 L. H. KING, c/o 14 Clarence St., Bramley, Leeds, Yorks.
8286 L. SMITH, 2 Fordburg Road, London, N.16.
8287 T. G. BUCKINGHAM, 1 The Green, Sharnford, nr. Hinckley, Leics.
8288 F. A. SLACK, 81 Saltergate, Chesterfield, Derbyshire.
8289 J. A. DARWENT, 1 Terry Rd., Totley, Sheffield, Yorks.
8290 J. WHALEY, 6 West View Tce., Lympstone, nr. Exmouth.
8291 C. W. A. PAGE, 1 School Road, Oulton Broad, Lowestoft, Suffolk.
8292 W. C. WALLIS, 193 College Street, Long Eaton, Notts.
8293 A. W. WALMSEY, 110 Great Horton Rd., Bradford, Yorks.
8294 H.G.PALFREYMAN, 67 Fenton Rd., Acocks Green, Birm. 27.
8295 H. J. L. MONK, 60 Northfield Gardens, Watford, Herts.
8296 K. U. THOMPSON, Alderton, Woodbridge, Suffolk.
8297 A. H. R. COOK, Forge House, Sholden Bank, Mongeham, nr. Deal, Kent.
8298 D. H. BONHAM, 22 Michaelmas Road, Coventry, Warwicks.
8299 H. J. ROWLANDS, 59 Chilwell Road, Beeston, Notts.
8300 D. P. EVANS, 10 Hamilton Terrace, Pembroke, S. Wales.
8301 G. W. WEBSTER, 43 Hillend Road, Burnside, Rutherglen, Glasgow.
8302 R. T. COUGHTREY, 36 Smallberry Av., Isleworth, Middx.
8303 E. R. DREW, 162 Hill Road, Deal, Kent.
8304 A. F. TURNER, c/o 2 Weir Cottages, Arrochar, Dumbartonshire.
8305 D. PERRIMAN, 66 Stradling Av., Weston-super-Mare, Som.
8306 T. D. HOUGHTON, 15 Ruskin Av., Padiham, nr. Burnley, Lancs.
8307 A. CAULFIELD, 153 Phibsboro Road, Dublin, Eire.
8308 A. A. THOMAS, Derrymead, Merthyr Mawr, Bridgend, S. Wales.
8309 P. G. KAVANAGH, 11 Gressingham Rd., Allerton, L'pool 18.
8310 R. J. HAWKINS, 83 The Crescent, Tettenhall Wood, Wolverhampton.
8311 L. C. MILLER, 45 Acresfield Rd., Pendleton, Salford 6.
8312 B. JONES, 75 Park Road, Chesterfield, Derbyshire.
8313 R. CURLEY, 22 Woodland Rd., Northfield, Birmingham 31.
8314 E. S. SHELDON, 769 Ecclesall Rd., Sheffield 11, Yorks.
8315 J. W. MACVEY, Braemohr, Forestfield, Kelso, Scotland.
8316 G. E. STEVENS, 48 Cherhill, Calen, Wilts.
8317 G. U. INGLIS, c/o Murling Dene, Park Ley Rd., Woldingham, Surrey.
8318 J. G. TANDY, Strathmore, Stourbridge Rd., Hagley, Worcs.
8319 R. DEHN, 132 Willow Street, Bury, Lancs.
8320 J. W. STANDARD, 2 Hargreaves Place, Newton, Mont. N. Wales.
8321 L. L. KNOTT, Verandah Cottage, Easton, nr. Woodbridge, Suffolk.
8322 J. DAVIDSON, 2 Brington Road, Dundee, Scotland.
8323 G. W. GABB, 95 Trafalgar Rd., Moseley, Birmingham 13.
8324 E. G. KERSAW, Haincliffe, Ashton Road, Mytholmroyd, Yorks.
8325 J. BATEY, 72 Tyne Gardens, Washington, Co. Durham.

* *Denotes Re-elected.*

8326 H. PEARCE, 1 Trevarnon Moors, Connor Downs, nr. Hayle, Cornwall.
8327 V. KERSHAW, 12 Glen Tce., Waterfoot, Rossendale, Lancs.
8328 L. F. LOCKYER, 19 Council Cottages, West Malling, Kent.
8329 R. J. RYLAND, 14 Kensington Road, Gosport, Hants.
8330 J. EDWARDS, 37 Lawn Road, Exmouth, S. Devon.
8331 S. J. PRESTON, 88 Bury Street, Ruislip, Middlesex.
8332 J. MERCER, 4 Glebe Crescent, Rugby, Warwicks.
8333 R. M. LAIRD, Euclid, Montrose Road, Forfar, Scotland.
8334 R. OUTWIN, 123 Cemetary Road, Doncaster, Yorks.
8335 W. PETHERAM, Cilfrew House, Cilfrew, Neath, S. Wales.
8336 A. B. THROSBY, Downlea, Witchampton, Wimborne, Dorset.
8337 F. A. BRIDGE, 87 Claremont Road, Wavertree, Liverpool.
8338 R. KERR, 55 Great King Street, Edinburgh, Scotland.
8339 R. N. MURRELL, Park Street, Gate Lodge, Windsor, Berks.
8340 R. W. SMITH, 45 Bushy Mead, Purbrook, Portsmouth, Hants.
8341 E. CLAYTON, Wakefield, Linkside South, Beacon Hill, Hindhead, Surrey.
8342 D. BLACKMORE, Foxley Manor, Holyport, Maidenhead, Berks.
8343 V. W. WOOD, 56 Frensham Road, Southsea, Hants.
8344 D. MARCH, 382 Stannington Road, Sheffield 6.
8345 A. L. MANN, Flat 3, 1 Knowsley Road, Southport, Lancs.
8346 J. MCLEAN, c/o 34 Roscoe Rd., Billingham, Co. Durham.
8347 D. A. MYHILL, Howick, Beechcroft Rd., Alverstoke, Hants.
8348 W. REYNOLDS, 26 Manor Road, Brampton, Chesterfield.
8349 G. A. BEARDON, 51 Hornsey Rise Gdns., Hornsey Rise, London, N.19.
8350 J. MCCLURG, 3 Ardmore Av., Ormeau Rd., Belfast, N. Ireland.
8351 S. C. BUNTING, 659 Oldpark Road, Belfast, N. Ireland.
8352 J. H. BRENTNALL, 21 Sutton Rd., Kirkby-in-Ashfield, Notts.
8353 T. H. TAGENT, 198 Winchmore Hill Road, London, N.21.
8354 G. T. CAINE, 83 Sherrards Way, Barnet, Herts.
8355 E. S. KING, 84 Hillside Gardens, Barnet, Herts.
8356 J. R. THURTELL, 2 Newbury Road, Ipswich, Suffolk.
8357 H. C. CHANNON, Tregony, Love Lane, Iver, Bucks.
8358 E. G. BRAYWOOD, Ashburn, Freda Avenue, Gedling, Notts.
8359 E. A. SHARPLES, 15 Leng Road, Newton Heath, Manchester 10.
8360 F. J. COX, 25 Market Square, Pottor, Bedfordshire.
8361 R. BROWN, c/o Ross, 3 Dick Terrace, Burntisland, Fife.
8362 G. SYMONDS, 64 Baysham Street, Hereford.
8363 S. B. GIBSON, 26 Mead Crescent, Birmingham 9.
8364 D. MEARS, 31 Manor Road, Leyton, London, E.10.
8365 S. D. BROWN, 3 Eden Mount, Stanwix, Carlisle, Cumb.
8366 J. LAWN, Blacksmiths, Swillington Common, Halton, Leeds.
8367 A. J. CROOKES, 13 Penygroes Road, Rhiwbina, Cardiff.
8368 J. D. W. DAVIDSON, 31 Highburh Dr., Burnside, Rutherglen, Glasgow.
8369 W. H. LONG, Norton Church Farm, Radley Green, nr. Blackmore, Essex.
8370 J. E. LAWSON, 40 Southwood Road, Cottingham, E. Yorks.
8371 C. R. HOSKISSON, Lynton, Hinckley Rd., Barwell, Leics.
8372 A. CALVERT, 59 Beech Road, Harrogate, Yorks.
8373 W. H. CROCKER, Waterloo Farm, Sealand Rd., Queensferry, Chester.
8374 T. W. PLUCKROSE, 96 Clarkes Av., Worcester Park, Sy.
8375 C. J. ORME, 3 Jubilee Villas, Old Stratford, Bletchley, Bucks.
8376 J. P. LAWTHER, 4 Barnfield Rd., Riverhead, Sevenoaks, Kent.
8377 T. POOLE, 75 Emily Street, West Bromwich, Staffs.
8378 C. VICKERS, 86 Blandford Rd., Harborne, Birmingham 17.
8379 R. J. DONALD, 111 Freshfield Road, Brighton, Sussex.
8380 C. W. HANKINS, 87 Dickens St., Peterborough, Northants.
8381 D. H. FEARN, 209 Derby St., Burton-on-Trent, Staffs.
8382 A. V. F. TOMLINSON, 13 Rowsley Rd., St. Annes-on-Sea, Lancs.
8383 G. JEPSON, 124 Spital Lane, Chesterfield, Derbyshire.
8384 K. H. MILES, 19 Padstow Road, Childwall, Liverpool 16.
8385 R. Y. MORRISON, Railway Tavern, Battersea Rise, Clapham Junction, London, S.W.11.
8386 S. STRONG, 78 Parsonage Barn Lane, Ringwood, Hants.
8387 T. D. CLAY, 7 Sandown Road, Wigston, nr. Leicester.
8388 MISS M. R. HOLDEN, 260 Grosvenor Road, Belfast.
8389 W. SLACK, 252 Peppard Road, Emmer Green, Reading, Berks.
8390 H. C. B. ADAMS, 13 Derwent Rd., Palmers Green, London, N.13.
8391 J. H. STANIER, 144 Middlemore Road, Northfield, Birmingham 31.
8392 J. WOAD, 4 Seniors Yard, Preston St., Batley, Yorks.
8393 O. D. KNIGHT, 16 Berners St., Highfields, Leicester.
8394 J. P. A. PRITCHARD, 19 Chapel Park Rd., St. Leonards-on-Sea.
8395 A. RUMBOLD, The Moorings, Flimwell, Hawkhurst, Kent.
8396 C. METTAM, 18 Hemper Lane, Greenhill, Sheffield 8.
8397 G. C. JONES, Cambrai, West Cliff Drive, Herne Bay, Kent.
8398 T. ALLAN, 67 Cadogan Street, Glasgow.
8399 G. D. DOBSON, The Dees, The Brant Road, Fulbeck, Grantham.
8400 R. H. J. MELLIS, 3 Madeline Road, Fishponds, Bristol.
8401 F. ROYDS, 14 Tweedale Street, Rochdale, Lancs.
8402 A. H. BOYD, 63 Levern Crescent, Barrhead, Renfrewshire.
8403 F. J. CAME, 148 Hill Lane, Southampton.
8404 R. J. TAME, The Post Office, Dorchester-on-Thames, Oxford.
8405 R. S. MARRIOTT, 16 Highway Rd., Maidenhead, Berks.
8406 J. E. SMITH, 26 George IV St., Hills Rd., Cambridge.
8407 W. T. CLEMENTS, 31 Sackville Rd., Hailsham, Sussex.
8408 J. W. S. FORTUNE, 32 Baldwyns Park, Bexley, Kent.
8409 J. H. RICHMOND, 63 Sydney Rd., Abbey Wood, London, S.E.8.
8410 P. S. CRITCHLOW, 106 Gospel Oak Road, Ocker Hill, Tipton, Staffs.
8411 C. A. HEATH, 13 Overton Crescent, Woodhouse Lane, Sale, Ches.
8412 R. W. WELCH, 46 Church Way, Whetstone, London, N.20.
8413 C. G. WELLS, 13 Springfield Road, Swindon, Wilts. (Transferred from Associate Grade.)
8414 T. JAQUES, 30 Saxton Avenue, Bessacarr, Doncaster.
8415 G. A. LANDRAGIN, Hedges, Red Rd., Boreham Wood, Herts.
8416 C. R. KENNEDY, 380 Bearwood Rd., Smethwick, Staffs.
8417 A. E. BARTON, 82 Hamsey Green Gdns., Warlingham, Sy.
8418 G. F. RUDD, Eccleshall, Berkeley Av., Chesham, Bucks.
8419 C. TAYLOR, 64 First Avenue, Chelmsford, Essex.
8420 D. K. DAVENPORT, 23 Muirhead Av., E, Liverpool 11.
8421 N. F. BOUNSALL, Green Shutters, Warren Rd., Worthing, Sussex.
8422 J. DRUMMOND, c/o McLeod, 1 Hallmead, Letchworth, Herts. (Transferred from Associate Grade.)
8423 H. W. HOUSTON, 34 Cecilia Rd., Dalston, London, E.8.
8424 T. GREENWOOD, 481 Revidge Road, Blackburn, Lancs.
8425 A. H. FORWAY, 23 Long Lane, Grays, Essex.
8426 P. D. A. ROBERTS, 66 Langland Bay Rd., Mumbles, nr. Swansea.
8427 K. E. TAYLOR, 39 Denton Rd., Edmonton, London, N.18.
8428 S. H. WARNES, 4 Willow Lane, Norwich, Norfolk.
8429 A. R. MORRISON, Cherlbury, Upper Manor Road, Godalming, Surrey.
8430 M. P. WAX, 52 Dartmouth Road, London, N.W.2.
8431 M. W. PARRY, 33 Carlton Road, Worksop, Notts.
8432 H. WALTON, 8 Borough Street, Salford 6, Lancs.
8433 A. R. JENKINS, Gilwen, Rugby Rd., Resolven, nr. Neath, Glam.
8434 W. G. TAYLOR, St. Augustines, Hillborough, Herne Bay, Kent.
8435 J. W. B. TANNAHILL, 1039 Colston Rd., Lambhill, Glasgow.
8436 J. G. M. DOWNS, 7 Hill St., Kingswood, Bristol, Glos.
8437 E. D. FARNSWORTH, 51 Birchwood Lane, Somercotes, Derbys.
8438 T. LAMPARD, 5 Council Houses, Long Cross, Felton, nr. Bristol.
8439 F. G. VINCENT, Seahaven, Coast Rd., Pevensey Bay, Sussex.
8440 C. F. MCGRANE, 14 Cedars Rd., Hampton Wick, Kingston-on-Thames.
8441 G. SWIFT, 44 Edgware Rd., Milton, Portsmouth, Hants.
8442 J. F. PALMER, c/o Mr. S. F. N. Palmer, "Eastleigh," Greenshaw Lane, Patrington, E. Yorks.
8443 T. F. AUSTIN, 6 Florence Rd., Kings Heath, Birmingham.
8444 F. A. LOVE, Leamington House, Stone Grove, Edgware, Middlesex.
8445 A. K. GREEN, 59 City Rd., Edgbaston, Birmingham, 16.
8446 IAN B. CHURCH, Broomhill, Spratton, Northampton.
8447 L. N. L. WRIGHT, 13 Fauvel Rd., Glossop, Derbys.
8448 G. J. WHITE, 69 Beresford Avenue Coventry, Warwicks.
8449 A. R. WALES, 25 Craigmillar Rd., Langside, Glasgow, S.2.
8450 R. N. FORBES, 56 Ludlow Rd., Offerton, Stockport, Ches.
8451 E. A. ROLES, 559 Becontree Av., Dagenham, Essex.
8452 G. T. BROWN, 2 Lansdowne Rd., Saltford, Devon.
8453 J. B. HARRIS, 25 Brockwell Lane, Chesterfield, Derbys.
8454 H. TOWNSEND, 33 Inhams Rd., Whittlesey, nr. Peterborough.
8455 D. SINCLAIR, 22 Meadowside, Wallasey, Ches.
8456 J. S. ALSOP, Bourne House, Bourne End Rd., Northwood, Middlesex.
8457 R. MAGGS, St. Audries, Roath Rd., Portishead, nr. Bristol.
8458 W. E. DONOGHUE, 10 Lonsdale Rd., Blackpool, S.S.
8459 T. H. BROMFIELD, 85 Old Park Ridings, Grange Park, London, N.21.
8460 J. SIMPSON, Midrest, Newtownards Rd., Bangor, Co. Down, N. Ireland.
8461 G. M. JONES, 58 Harpers Lane, Smithills, Bolton, Lancs.
8462 J. A. LADD, Serai, Radstock Rd., Midsomer Norton, nr. Bath.
8463 J. ROGERS, 50 Mersey Rd., Sale, Ches.
8464 P. N. PITT, 85 Bryanston Rd., Bitterne, Southampton.
8465 S. C. BAYLIS, 110 Shakespeare St., Stoke, Coventry.
8466 T. B. HOLMES, 795 Borough Rd., Birkenhead, Ches.
8467 D. J. HUSSEY, 2 Pattle, Beaminster, Dorset.
8468 A. M. BROWN, 141 New St., Stevenston, Ayrshire, Scotland.
8469 J. E. DOBBS, c/o 40 Waterloo Rd., Peterborough, Northants.
8470 K. R. ROBINSON, 560 Inglemire Lane, Hull, E. Yorks.
8471 S. G. CAMPBELL, 17 Delaware St., Belfast, N. Ireland.
8472 G. E. MANDERS, Buslingthorpe, Wickenby, Lincoln.
8473 D. S. BUSHNELL, 25 Railway Av., Whitstable, Kent.
8474 R. H. A. ROGERS, 126 Farm Lane, Fulham, London, S.W.6.
8475 J. K. MONEY, Buckstone Farm, Chobham, Surrey.

8476 H. R. LEVER, 13 Hollin Hill, Burnley, Lancs.
8477 C. B. HALL, 7 Garendon Rd., Shepshed, nr. Loughborough, Leics.
8478 D. E. MACKENZIE, 36 Harborne Park Rd., Harborne, Birmingham, 17.
8479 R. J. MUNDY, Kiln Farm, Mattingley, nr. Basingstoke, Hants.
8480 G. E. DAYUS, 126 Sandringham Rd., Perry Barr, Birmingham, 22B.
8481 S. HEYS, 9 Harper St., Barnoldswick, Colne, Lancs.
8482 J. W. NOBLE, 25 Thornhill Gardens, Sunderland, Co. Durham.
8483 W. F. WALL, 122 Ellerman Av., Twickenham, Middlesex.
8484 R. N. MITCHELL, 19 Rednal Hill Lane, Rubery, Birmingham.
8485 J. W. D. ANDREWS, Marymede, Bayshill Rd., Cheltenham.
8486 E. FITZAKERLEY, 116 Beech Rd., Armthorpe, Doncaster.
8487 W. R. SALTON, 106 Alderman Rd., Knightswood, Glasgow, W.4.
8488 MISS I. M. LINDSAY, Lauriston, Selkirk, Scotland.
8489 A. G. STAIN, Westwood, Station Rd., Arley, Coventry.
8490 R. J. LAUGHTON, 34, Gorse Rise, Grantham, Lincs.
8491 C. J. A. TORPEY, 74 Gardner Av., Liverpool, 20.
8492 F. W. BUDD, 29 Batsford Rd., Coventry, Warwicks.
8493 A. G. LEVER, 2 Park Villas, Blackshaw Rd., Tooting, London, S.W.17.
8494 W. H. BELLCHAMBERS, 51 Fisgard Rd., Gosport, Hants.
8495 A. BALDWIN, 8 Queen's Rd., Leytonstone, London, E.11.
8496 L. BRIGGS, 43 Lower Noon Sun, Thornsett, Birch Vale, nr. Stockport, Ches.
8497 H. G. TAYLOR, Witney St., Burford, Oxford.
8498 K. G. KEYSE, 73 Webb Lane, Hall Green, Birmingham, 28.
8499 S. H. DOUGLASS, 6 Oxford St., Blaenau Festiniog, Merionethshire, N.Wales.
8500 J. E. MINETT, 314 Sutton Rd., Southend-on-Sea, Essex.
8501 S. H. ROWLAND, 18 Love Lane, Burnham-on-Sea, Som.
8502 D. T. WILLIAMS, Rhydygan, Llansawel, Llandilo, Caerms.
8503 H. H. GENT, 10 Twyford Rd., West Harrow, Middlesex.
8504 P. H. CONSTANCE, 3 St. Mary's, Kingskerswell, Newton Abbott, Devon.
8505 R. M. TEW, 1 Constantine St., Plymouth, Devon.
8506 J. TOZER, Highfield, Porton, Salisbury, Wilts.
8507 D. AINSWORTH, 1 Rudyard Rd., Pendleton, Salford, 6.
8508 G. T. FOWLER, Maltmans Hill, Smarden, nr. Ashford, Kent.
8509 W. C. FRENCH, 1 Marine Drive, Dunstable, Beds.
8510 V. J. TONKS, 35 Salcombe Rd., Leyton, London, E.17.
8511 B. D. PORTCH, Spring Cottage, St. Lawrence, Ventnor, I.W.
8512 H. EGAN, 86 Branksome Drive, Nab Wood, Shipley, Yorks.
8513 C. N. FOSTER, 122 Hull Rd., York.
8514 A. INGHAM, 31 Farm Rd., Crossgates, Leeds, Yorks.
8515 E. W. SPENCER, 16 Hereford Rd., Southsea, Hants.
8516 T. H. HADDOW, 14 Corstorphine Park Gardens, Edinburgh 12.
8517 C. J. REYNOLDS, 105 Berkeley Rd., Bishopston, Bristol, 7.
8518 C. DRAKE, 13 Whitestone Lane, Fartown, Huddersfield, Yorks.
8519 L. C. WICKERS, 52 College Gardens, Chingford, London, E.4.
8520 D. F. HARPER, 35 Helena Rd., Norwich, Norfolk.
8521 G. M. JAMIESON, 10 Gordon Rd., Mannofield, Aberdeen.
8522 R. V. SPICER, 13 Harrison Rd., Fareham, Hants.
8523 D. H. CONRON, 15 Coleridge Av., Orrell Rd., Wigan, Lancs.
8524 F. STEWART, 120 Beatty Crescent, Kirkcaldy, Fife, Scotland.
8525 C. W. JORDAN, Chilgrove, Headley Rd., Woodley, Berks.
8526 F. GOULDSBROUGH, 133 Andover St., Sheffield, 3.
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Corrections to list published in August issue

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R.S.G.B. BULLETIN

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THE RESTORATION OF LIBRARIES

WE radio amateurs know full well the value of technical books. Few of us can afford a library as comprehensive as we should wish, but even our youngest member aspires to possess a few classical treatises which will enable him to extend his knowledge.

Notwithstanding paper restrictions, British and American publishers have, during the war years, offered us many first-class text-books, for which we have been more than grateful. But what of our colleagues in other lands, who for four long years have been denied all access to current literature and who have frequently had to stand as silent witnesses to the destruction of their national and public libraries and seats of learning? Can we do anything to help them? The answer is "yes" if we are prepared to answer an appeal, which we publish here, from Professor Sir Ernest Barker, Chairman of the Inter-Allied Book Centre Committee. This Committee has been set up under the auspices of the Conference of Allied Ministers of Education, to administer the organisation, and premises known as the Inter-Allied Book Centre, 3–5 Salisbury Court, London, E.C.4. The Centre, opened last month by the Rt. Hon. R. A. Butler, M.P. (Minister of Education and Chairman of the Conference of Allied Ministers of Education), is the focal point for the reception of all books, and it is to that address members, who answer the appeal, should send their gifts.

In order that Professor Barker and his colleagues shall know to which branch of the community they are indebted for certain technical books, it is recommended that every member who answers the appeal should state clearly in the accompanying letter, that he or she is a member of the Incorporated Radio Society of Great Britain. For record purposes a copy of the letter should also be sent to Headquarters.

J. C.

THE APPEAL.

"One of the tragedies resulting from the present war has been the destruction of many important libraries, both in this country and abroad. A great task before us is the replenishment, on as large a scale as possible, in each of the allied countries, of national, university, public and other libraries, which are open freely to serious readers, and whose books have been destroyed. Unless this is done the development of the arts and sciences will suffer a serious check. This need was early realised. Not only has much been done by various societies, such as the Library Association, but the British Government has also shown its practical sympathy by setting up machinery to withdraw from the book drives, primarily intended for paper salvage, all those books which would still be useful as books. *Already more than a million books, ranging over the whole field of knowledge, have been set aside from book drives. The collection includes books of every kind; but the proportion of* modern *technical, scientific, commercial and legal works is low. These are the books which a man keeps by him for purposes of his profession or calling—in brief, his working tools; and they are exactly the books needed for the replenishment of destroyed libraries.*

Fortunately few university, public and institutional libraries in Great Britain have suffered serious losses. In those libraries which have been more seriously damaged it is usually the books covering one or more specified subjects which have been destroyed, so that their need is not so much for a large number of books of a general character as for individual items in a special field.

The need of British libraries is clearly defined, so that, subject to such precautions as will enable British libraries to replace destroyed books, there should be a wide choice for allocation to libraries in allied countries. It is obviously desirable that as many of these libraries as possible should have a rich collection of the works of English standard authors, and in particular of the recent technical and scientific literature, publication of which has largely been stimulated by war-time research. Books in foreign languages as well as in English are also wanted.

*Many libraries, having lost their whole stock, will urgently need sets of the more important periodicals, particularly the back numbers of Journals and Transactions. We appeal, therefore, for complete sets where possible; but even the gift of odd issues may enable us to make up such sets. (Complete sets of the Society's Journal, from July, 1939, to date, are urgently required.—*ED.*).*

To obtain all this essential material we must depend largely on the generosity of universities; of scientific, literary and other learned bodies; and of their individual members. It is certain that those who themselves owe much to books will desire to help colleagues, especially in their own fields, by giving books which they can now be assured will be properly handled and, under expert guidance, be sent to the libraries where they will be most useful.

If anyone, who is unable to give books or periodicals, desires to support the general scheme, any money contributed will be used entirely for the purchase of books and periodicals urgently required; but so many books have been destroyed, or are in short supply, that the need is for books rather than money.

For the sake of economy in transport and labour it would be a great convenience if donors will first send to the Director lists of the books available. Carriage will be refunded, if so desired, on all books presented.

Books and periodicals in good physical condition, in all fields of knowledge, should be sent to the Inter-Allied Book Centre, where they will be acknowledged and dealt with by Mr. B. M. Headicar, the Director, and a qualified staff."

AUDIO FREQUENCY OSCILLATORS

By C. W. Cragg, (2HDU)

PART II

In this second article of the series, the writer mentions the Dynatron, and describes the Transitron and Beat Frequency Oscillators. Hints on the construction of a standard B.F.O. are also given, together with much other useful information.

Negative Resistance Oscillators

MOST readers will be familiar with the Dynatron oscillator whose negative resistance characteristic is obtained by operating the screen of a tetrode at a higher potential than the anode, so that the valve is working on the negative slope of the anode-volts/anode-current curve. Oscillations start when the negative resistance is equal to the dynamic resistance of a tuned circuit, which is connected in series with the anode circuit. The Dynatron is, however, rather unstable in operation, partly because it depends upon secondary emission, but this defect can be overcome by using a pentode (instead of a tetrode) in the Transitron circuit.

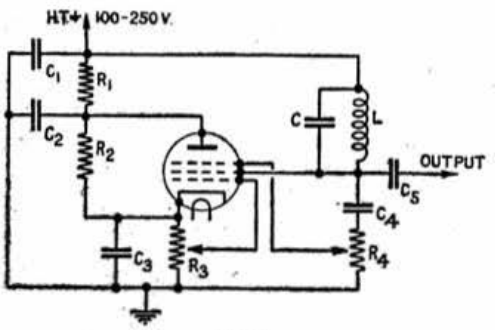


Fig. 12.
Transitron oscillator. C1, C2 8μF. C3 25 μF. C4 switched for each range (·001 at 1,000 c/s.). C5 0·1 μF. R1 10,000 ohms. R2 3,000 ohms. R3 500 ohms. (amplitude control). R4 1 megohm preset (oscillation control). Valve 6J7G. C and L tuned to frequency required.

Transitron Oscillator

The Transitron oscillator operates by virtue of a negative resistance effect between screen grid and suppressor grid (Fig. 12), the suppressor being negative with respect to the other electrodes so that it acts as a virtual cathode. The screen is made more positive than the anode, and is coupled to the suppressor grid at audio frequencies (*i.e. via* a condenser). In the non-oscillating condition, electrons leave the cathode, pass through the grid, and most of them also pass the screen grid. Here, however, they come under the influence of the negative suppressor grid and most of them return to the screen, only a few passing through to the anode. The screen current is consequently greater than the anode current and is derived almost entirely from electrons which have travelled from the suppressor grid. If, now, a small positive voltage is applied to the suppressor grid, more electrons will be able to pass through, and less will be returned to the screen. The screen current, therefore, decreases, and the screen voltage rises, this rise in voltage being passed on to the suppressor *via* the condenser, thus increasing the suppressor voltage still more. This further voltage increase on the suppressor again reduces the screen current. The effect is cumulative and continues until either the screen current is reduced almost to zero, or the suppressor is positive and starts to draw current. When the effect ceases, the suppressor condenser discharges, since no more pulses are arriving from the screen to maintain its charge. As this condenser begins to discharge through the suppressor resistance, the suppressor, becoming more negative, returns an increasing number of electrons to the screen, thus causing its current to rise. This rise causes the voltage-drop in the screen load circuit to increase, thus reducing the screen voltage. This reduction of voltage is passed to the suppressor *via* the condenser, causing it to go still more negative. This effect, which forms the other half cycle, will continue until either the screen current has risen to its maximum possible value, or the suppressor has been driven so far negative as to bias the valve to cut-off.

The Transitron may be made to operate at frequencies ranging from a few cycles per second up to about 100 megacycles per second. At audio frequencies the resistance and condenser connected to the suppressor should have a time-constant equal to the frequency of operation, although any given set of values will hold over a band of frequencies. For instance, at a frequency of 1,000 c/s. a resistance of 100,000 ohms and a capacity of ·01 μF would be suitable. The tuned circuit need not possess a very high value of Q in order to obtain oscillations, but this factor will assist in maintaining a good wave-form.

The tuned circuit in the Transitron may be replaced by the resistance-capacity tuning network of Fig. 8 as shown in Fig. 13. To tune this oscillator, the condensers may be ganged, and the two resistances switched as before for the various frequencies. One difficulty arises in this connection, namely, that the screen voltage will alter if the associated resistance is changed, with the result that the circuit may cease to function. The most satisfactory way to overcome this difficulty is to switch in a fixed condenser, of capacity equal to that of the tuning condensers and in parallel with the latter, for the lower frequencies. This will limit the amount of frequency variation possible on the lower range, but it is an advantage to have the lower frequencies more spread out over the dial so that frequency errors are equalised over the ranges used. If the frequency is linear with dial rotation the percentage errors in reading will be much greater as the lower frequencies are approached.

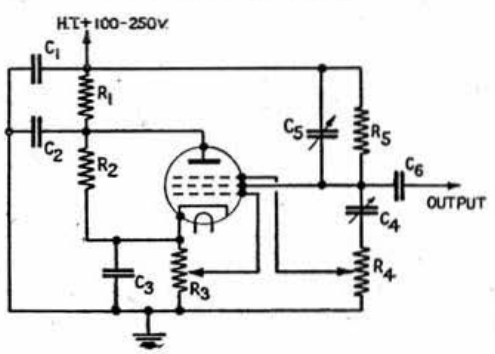


Fig. 13.
R/C Tuned Transitron. C1, C2, C3, C5, R1, R2, R3, R4, as in Fig. 12. Valve 6J7G.

One advantage of the Transitron is that the output may be very conveniently controlled merely by altering the grid potential. This varies the electron-flow from the cathode, and reduces the current of each electrode by the same proportion, resulting in practically no frequency change. The resistance from grid to earth should be kept as low as possible. By feeding a small voltage to the control grid from another source, the Transitron may be synchronised. To obtain the best waveform, the voltage fed back from screen to suppressor should be made as low as possible consistent with stable operation (*i.e.* the oscillator should be just oscillating). A preset control is used to achieve this condition. In the resistance-tuned version, the two tuning resistances and condensers need not be equal in values.

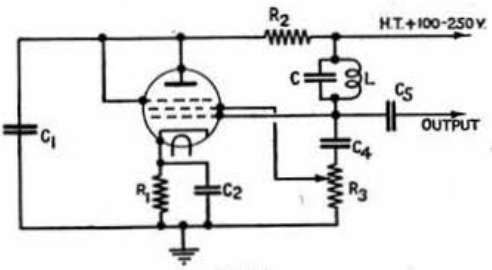


Fig. 14.
Modified Transitron. C1, C2, C4, C5, as in Fig. 12. R3 1 megohm preset (oscillation control). R1 500 ohms. R2 100,000 ohms.

A modification of the Transitron is shown in Fig. 14. Here a valve which has its suppressor internally connected to cathode may be used or, alternatively, it may be tied to the anode. The negative resistance effect is obtained between control grid and screen grid. The operation of the circuit is the same as for the normal Transitron, except that the grids are all moved down one place. The H.T. supply should be kept as low as possible because the grid draws current. A valve such as the 6F6 is suitable.

The Beat Frequency Oscillator

As it appears in most communication superhets, the principle of the beat-frequency oscillator is well known. If two radio frequencies are mixed together, two new frequencies are produced, one equal to the sum, the other to the difference between the original frequencies. When the radio frequencies are close together the difference frequency will be audible, and if one of the original frequencies is altered, the resultant beat will also be changed. To cover the audio range a variation of about 15 kc /s. is needed on the R.F. (*i.e.* to produce beats from zero to 15 kc /s). This amount of variation can be obtained easily on the radio frequency employed, but cannot be produced at A.F. owing to the large capacity change which would be needed. Even if a large enough condenser were available the L./C. ratio of the tuned circuit would be so poor on the lower frequencies that it is doubtful if oscillations would be obtained.

The first requirement in designing a B.F.O. is to set up two R.F. oscillators. These should be as stable as possible because any small frequency drift will show up very much more on the A.F. beat than on the R.F. For instance, suppose the oscillators are working on 100 kc /s.—a frequency often used—and one of them drifts 100 c /s., this variation is only 0·1 per cent. The beat will, however, also change by 100 c /s., and if this were previously 400 c /s. it will go to 500 c /s. or 300 c /s. according to the direction in which the R.F. oscillator has drifted. It will be appreciated that this is a very considerable change (25 per cent.). Had both oscillators drifted in the same direction and by the same amount the change would not have caused any alteration in the output frequency. The radio frequency oscillators should, therefore, be as alike as possible so that any small amount of drift will cancel out.

The same considerations asnormally apply to the stabilisation of R.F. oscillators also apply here. Mechanical construction should be rigid and identical for the two oscillators, except that one will employ a tuning condenser whilst the other will be preset. Negative temperature co-efficient condensers may be used in parallel with the main tuning capacities so that temperature has only a small effect on the frequency. If possible, the supply voltages should be stabilised.

Between each R.F. oscillator and the mixer it is usual to insert a well-screened buffer amplifier as this helps to prevent interaction. On low-beat frequencies there is a tendency for the oscillators to " pull " into the same frequency, but this effect is reduced by the buffers, which also ensure that the load on each oscillator is constant. If the buffers are tuned this will help to prevent harmonics of the oscillators from reaching the mixer and so assist in reducing distortion in the output. Any normal type of mixer can be used, but it will help to keep the output constant with changing frequency if the variable oscillator is fed into the oscillator grid, while the fixed oscillator is used to feed the signal grid. This is due to the fact that variations of the tuned oscillator output may occur as its frequency is altered, and because of its lower slope, changes on the oscillator grid affect the mixer output less than similar signal grid changes.

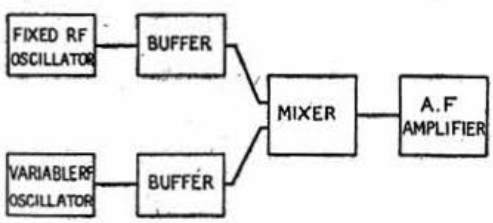


Fig. 15.
Block Diagram of Beat-frequency Oscillator.

In the anode circuit of the mixer there will be the two R.F. frequencies, the sum of these frequencies (about 200 kc /s.) and the audio beat, but as the A.F. signal only is required the R.F. must be filtered off. This is achieved by means of an R.C. filter as shown in the circuit of Fig. 16. The filter is followed by an A.F. amplifier of low distortion and good frequency response. The distortion from a B.F.O. can be made as low as one half of 1 per cent. above 100 c /s., but the waveform usually falls badly at the lower frequencies. The tuning condenser should be of good quality in order to avoid drift or frequency fluctuations, and should preferably be of a type which causes the scale to open out considerably towards the low frequency end. Such a design will tend to reduce errors in scale reading, as described in the Transitron section. It is usual to employ a small trimmer on the variable oscillator so that if for any reason the frequency of one oscillator or the other changes by a small amount the calibrated scale can be lined up again by setting the zero frequency mark to coincide with zero output from the amplifier, which means that the two R.F. oscillators are on the same frequency. Alternatively, if the apparatus is operated from an A.C. supply, the 50 c /s. mark on the dial can be set at the correct frequency by feeding in a small amount of mains voltage and tuning the trimmer until the resulting beats in the 50 c /s. out-

put, as seen on an output meter, are as slow as possible. This will give a more accurate setting than the zero setting, so long as the mains are at 50 c /s. As the mains deviation is not likely to be more than about 2 per cent. this will be accurate enough for most amateur purposes.

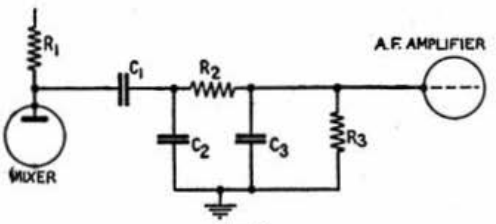


Fig. 16.
R.F. Filter in Mixer Output. R1 mixer load. R2 50,000 ohms. or R.F. choke. R3 100,000 ohms. C1 0·01 μF. C2, C3 0·0003 μF.

Of the four main types of oscillators described, the inductive feed-back type is generally the easiest to adjust properly. At very low frequencies, however, the resistance-tuned circuits are more suitable because at these frequencies only a very poor *Q* can be obtained in the tuned circuits of the L. /C. oscillators.

Volume Compression

If it is desired to maintain constant output when an oscillator is tuned over a range of frequencies, volume compression may be used on the amplifier. This should result in the minimum of distortion, so that it is better if the A.F. is applied to a " straight " grid of the controlled valve, while the D.C. is applied to a grid with variable-mu characteristics. This D.C. is obtained by rectifying some of the A.C. signal and is used to control the gain of the amplifier. If the signal is taken from a stage before that which is to be controlled, the controlling effect will be better, since the gain of the controlled valve will not affect the amount of signal reaching the diode rectifier. A suitable circuit is shown in Fig. 17. The amplitude control will have to follow this stage and in any case this should be as late as possible in the amplifier. This ensures that distortion on low outputs is not increased by residual hum (most of which is normally introduced in early stages) since the hum is decreased with the signal when the amplitude control is in a late stage.

(To be concluded)

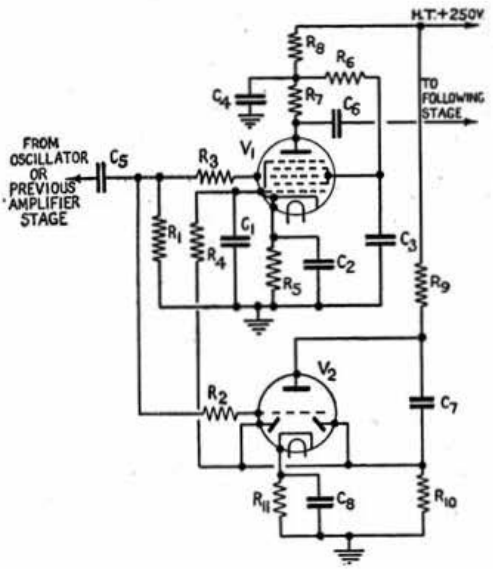


Fig. 17.
Volume Compression Circuit. V1 6L7. V2 6Q7. R1, R4, R10 0·5 megohm. R2, R3, R11 5,000 ohms. R5 1,000 ohms. R6, R7, R9 100,000 ohms. R8 20,000 ohms. C1, C5, C6, C7 0·1 μF. C2, C8 25 μF. C3, C4 8 μF.

Book Review

ELECTRICITY AND ITS APPLICATION TO CIVILIAN AND MILITARY LIFE. By Charles A. Rindle. Published by George Allen & Unwin, Ltd., Museum Street, London, W.C.1. Price 25s. 466 pp., 396 illustrations.

This is an outstanding book for two reasons. First it provides a complete self-teaching course in the fundamentals of electricity, and second it takes on the appearance of an ultra-modern novel with a technical theme. Seldom has the subject of electricity been treated in such a topical, yet highly informative vein. For example we find in the chapter dealing with the various uses of the heating effects of an electric current, a delightfully clear description of the principles employed at the outbreak of the present war to defeat the Magnetic Mine. There are several illustrations of the equipment used, including one of a Wellington bomber fitted with an enormous de-gaussing coil. Military uses of electricity are referred to in numerous sections of the text, which is illustrated by many up-to-date photographs.

It is quite impossible in the limited space here available to refer even briefly to the wide range of subjects covered, but mention must be made of the Quiz which appears at the end of each chapter. Gems of compression, they demand from the student just that little extra mental effort needed to maintain his interest at a high level. As with the ordinary text, each Quiz has a topical Service flavour. One example will serve to illustrate the ingenuity of the author.

" A military agent in occupied territory places a pocket compass on the ground and finds that the needle is unsteady, the N-pole occasionally swinging abruptly towards the East where it remains for a short time. A few feet away from this point the erratic behaviour of the compass is not observed. Explain this occurrence fully." It is of no avail to turn to the end of the book for an answer to this or any other Quiz teaser. The reader must worry it out for himself!

Another feature that will appeal is the use of heavy type for formulæ and fundamental laws.

The author, who is an experienced teacher in electrical engineering, explains in his preface that the book is " organised around the (U.S.) War Department's outline *Fundamentals of Electricity*, and that " a central theme unifies the book—the control of atoms."

Having dipped liberally into the fount of knowledge provided by this most unorthodox author, we feel justified in observing that a treat lies in store for those who are fortunate enough to purchase a copy of the first printing. J.C.

Book Received

We have received from Eitel-McCullough Inc., an interesting booklet called " Electronic Telesis." This is an illustrated account in simple language of the application of electronic valves and other devices for purposes other than ordinary communication. Subjects such as the blind landing of aircraft, radio heating, facsimile transmission, television and frequency modulation are followed by the story of the development of Eimac tubes since 1934. Copies are available gratis from Eitel-McCullough Inc., San Bruno, California, U.S.A.

Addendum

In Part I of Mr. Cragg's article, published last month an omission occurred in the preparation of Fig. 9. In the tuning network shown dotted two resistances were not designated. These should have been marked " R " to indicate that whatever their value, the other resistance (marked " R/2 ") is one half that value.

OUR FRONT COVER

OUR front cover shows a typical Mullard all-glass valve with the metal " can " removed, so that the all-glass construction can be clearly seen. This new technique overcomes many of the problems of maintaining efficient valve operation at high radio frequencies.

A FABRICATED WOODEN AERIAL MAST

By E. Beckwith (BRS3430).*

IN the early part of 1942, after various moves about the country during the preceding year, a settled home was again made and the writer cast around for some means of erecting an aerial at least as high as that used before. Enquiries were made locally, with the object of obtaining steel or wooden poles of some sort or other, but all to no result. Material of all sorts was in short supply.

It was then decided to try something of a different nature, partly to fill the existing need and also to provide some practical results with a view to post-war development. Accordingly, a height of 36 ft. having been decided upon, a design was prepared for a fabricated wooden mast, triangular in plan, and 21 in. at its greatest width, tapering at each end to 3 in. In view of the material available for construction, this width does not occur at the exact centre, but at 20 ft. from the ground.

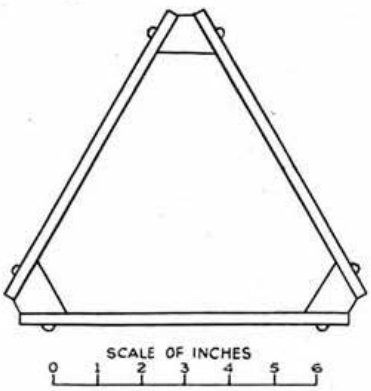


Fig. 1.
Section through mast 5 feet from ground.

Three pieces of yellow deal floor-board $\frac{7}{8}$ in. thick and of a total length of 20 ft. were at hand, and were earmarked for the upright members of the lower part of the mast. The remainder of the raw material consisted of a number of roofing battens as used by builders, 13 ft. long and $1\frac{3}{8}$ in. × $\frac{3}{4}$ in. section, together with about two bundles of plasterers' laths varying in length from 2 ft. to 3 ft., 1 in. wide and $\frac{1}{4}$ in. thick, about 25 ft. of $1\frac{1}{4}$ in. × 16 SWG hoop-iron, 17 ft. of 1 in. × $\frac{1}{8}$ in. mild steel flat, four gross of 1 in. R.H. black japanned screws, three dozen 2 in. × $\frac{1}{4}$ in. R.H. screws and nuts and a gross of $\frac{3}{4}$ in. × No. 8 wood screws.

Construction

The three deal boards which were to form the lower uprights were sawn into strips, the edges of which were carefully planed and bevelled to an angle of 60 degrees, the finished width being $1\frac{3}{8}$ in. (Fig. 1). These strips were next joined together in three lengths of 20 ft. each, by screwing a 9-in. piece of hoop-iron over each butt joint, each piece of iron having six holes punched through to take the $\frac{3}{4}$ in. × 8 screws. Care was taken in this joining-up process to see that joints in adjacent uprights were as widely separated as possible so as to avoid weakness at any point.

A pair of uprights were then joined at one end by a 21-in. length of lath, and at the other end by a 3-in. piece. Seventeen other cross members of lath were then screwed on in the same manner, the spacing between these ranging from 22 in. to 9 in. at the small end. The diagonal braces, also of lath, followed next, and with one side complete, the third upright was added, commencing with the end members, next the intermediate cross pieces, and finally the diagonals, these being carefully checked to see that none was screwed too tightly, as this would distort the shape. The resulting structure is amazingly light and strong.

For the upper part, 16 ft. in length, a similar procedure was followed, the three uprights in this case being planed and joined up from 13-ft. lengths of $1\frac{3}{8}$ in. × $\frac{3}{4}$ in. batten. To link together the 20-ft. and 16-ft. sections to form the complete mast, three pieces of 1 in. × $\frac{1}{8}$ in. steel 3 ft. long were used. These were bolted on the inside of the wooden uprights, having first been bent to the required amount, six bolts through each, three above the join and three below. Additional diagonal braces were then screwed across the two centre sections to counteract any possible tendency to " spreading " at this point (Fig. 2).

The pulley for the halyard was mounted direct to the top of the mast, so that the halyard runs down through the centre of the mast, and finally, the whole mast was given a thorough soaking with a mixture of equal parts of Cuprinol and Solignum green. This mixture gives a pleasing green finish which harmonises well with trees in the background, and after two years' exposure shows no sign of deterioration.

To support the other end of the aerial a similar mast 26 ft. high and 16 in. girth was built. This stands on a steel bracket on the wall of the house 10 ft. above the ground to bring the overall height the same. Both masts were erected by the writer and his wife without any other assistance, the lightness of this form of construction making the job fairly simple. The 36-ft. mast stands on a wooden base sunk into the ground, and is held at the centre by four guys, each consisting of two 15 SWG galvanised steel wires, a single wire runs to the top to take the aerial pull. The 26-ft. mast has three wires to its centre and one to the top. They have now been standing for two years with

The mast in position.

* 49, Loughborough Road, Quorn, Leics.

no attention beyond an occasional adjustment of the guys, and have been the object of much favourable comment both from amateurs and members of the public generally.

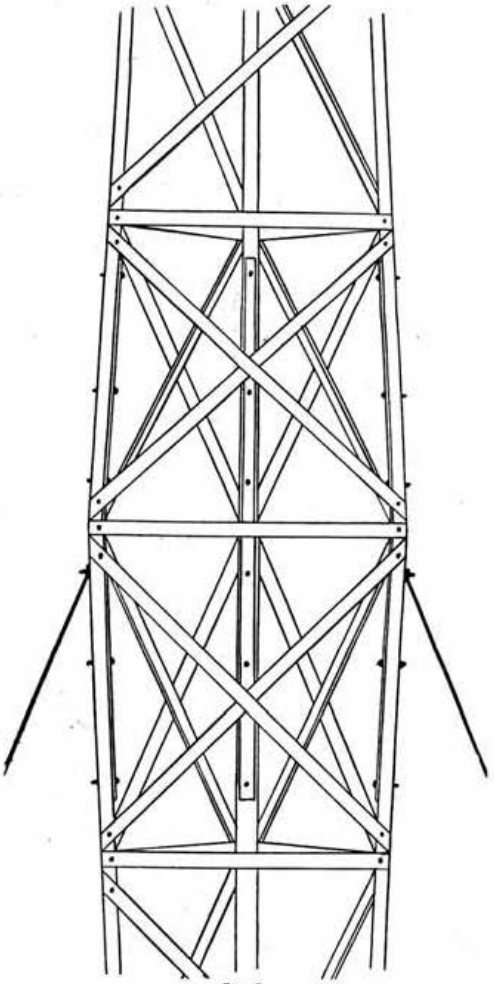


Fig. 2.
Centre part of mast showing method of joining upper and lower sections and additional diagonal braces.

Finally, the writer, bearing in mind the experience gained in building and erecting these masts, would have no hesitation in attempting much taller ones for his post-war station, the strength and lightness of the type being thought well worth the extra trouble involved.

Remote Control of Model Aircraft

Mr. Douglas G. Bagg, **VP4TO**, of Trinidad, writes to say that several useful articles dealing with the remote control of model aircraft have appeared in past issues of *QST*. He quotes the following dates for the information of Cpl. Profaze, BRS6942 and others interested in the subject: September and October, 1938, March and August, 1940.

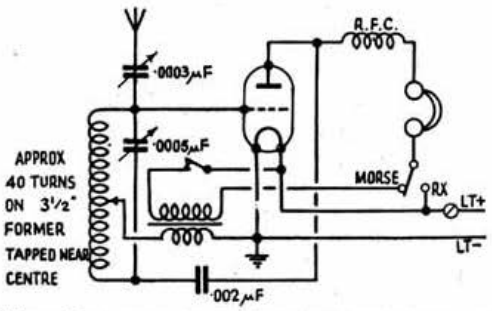
The General Editor would be pleased to hear from any member who has carried out original work in connection with remote control gear, and who would be willing to prepare an article or articles for publication.

Without H.T.

By R. J. BALDWIN, G3WZ.

REMEMBERING that flash-lamp bulbs have been known to work as diode detectors with "silver" paper anodes externally connected, and soft bright emitter valves have been operated satisfactorily from a high tension supply of 10 volts and less, an attempt was made to produce a Morse Practice oscillator which would function *sans* H.T.!

The accompanying sketch shows the resultant broadcast set-cum-Morse practice oscillator obtained after some preliminary experiments. Strangely enough it works and the anode bend detector gives surprisingly good results. Users, when they find Morse practice becoming tedious, have only to stop keying and listen to a little broadcasting!



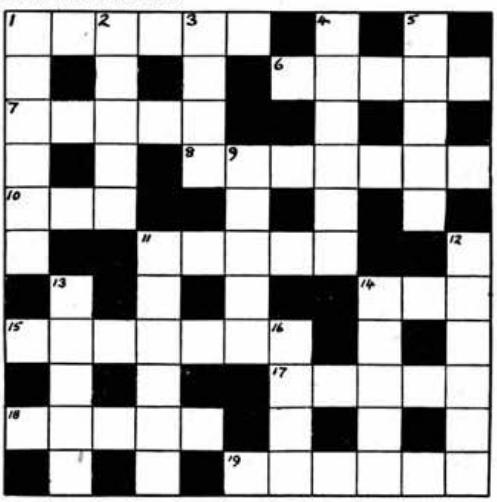
It is not always easy to persuade a battery triode to oscillate at R.F. without the aid of H.T., but experiments with the choke and position of the tap will—or should—produce the desired effect. Incidentally, the damping effect of the aerial is used to control reaction, but a filament rheostat or variable blocking condenser will do the job equally well. The change-over switch could be eliminated by utilising the back contact of the key, but it would be necessary to detune the "receiver" in order to avoid listening to a "broadcast programme" spacer.

It would be interesting to discover to what frequency such a circuit could be coaxed to operate.

An Airgraph Crossword

By Cpl. P. Nicoll, G5ZN

The accompanying Crossword was sent by Airgraph from India. Page 1 contained the Crossword proper, Page 2 the Clues, Page 3 the Solution. Cpl. Nicoll, whose home is in Burnley, is now serving in India with the R.A.F.



ACROSS
1. A good time-base is ——.
6. All receivers have them.
7. Can do damage.
8. A unit often used.
10. Voltage. Power Magnetic intensity.
11. Sometimes a controlling factor.
14. Used for large output.
15. 6C5, 6J5, 6F5, etc.
17. Not wanted in Super-het.
18. Pirate.
19. Useful instruments.

DOWN
1. Beware of these!
2. Compass needle always points ——.
3. New valves are often ——.
4. This type of station is useful in war-time.
5. Bleeders do this.
9. Battery maker.
11. The electron thinks it attractive.
12. Found on racks.
13. Five.
14. Electrons fly to it.
16. A.C. shown graphically.

Solution next month.

★ *IS YOUR SUBSCRIPTION DUE?*
PROMPT PAYMENT ASSISTS HEADQUARTERS

THE LC CIRCUIT: FREQUENCY COVERAGE

By R. H. HAMMANS (G2IG).

A GOOD deal of mystery seems to surround the factors which govern the tuning range of an LC circuit. It is hoped to show in this article that if approached in the right way, the problem of designing a tuned circuit to cover a predetermined frequency range becomes almost mental arithmetic.

It should be appreciated, however, at the outset that the inductance does not enter the problem until other factors have been settled. Start then with any variable condenser of known maximum capacity. Then for any given frequency range, the fixed capacity across the circuit when the variable is at minimum, is unalterably determined. If stray capacities are too small they must be augmented by a trimmer, or if strays are too great they must be reduced.

A simple formula for calculating the value of minimum capacity required to give a coverage ratio T (max. frequency divided by min. frequency) is given below :—

$$\text{C min.} = \frac{\text{C variable}}{T^2 - 1}$$

(Derivation of this formula is given in the appendix.)

Example :—Suppose a variable condenser of ·0003 μf is required to tune a circuit from 6 Mc /s. to 12 Mc /s.

$$T = \frac{12}{6} = 2 \quad T^2 = 4 \quad \text{C min.} = \frac{\cdot 0003}{4 - 1} = \cdot 0001$$

This value, ·0001, must remain across the circuit when the variable condenser is " all out " ; in other words, the stray capacities together with trimmer *must* equal ·0001 μf. It should be observed that the same result would be obtained if 12 to 24 Mc /s., or 5 to 10 Mc /s., or 100 kc /s. to 200 kc /s., had been the wanted coverage. It is also clear that since L does not appear in the formula, the coverage ratio is independent of the value of inductance.

Suppose that the value of variable condenser in the example had been 75 μμf, then C min. would be $\frac{75}{3} = 25$ μμf. That is to say, strays and trimmer must equal 25 μμf. Here a difficulty arises, because in most circuits strays due to valve electrode capacities, coil self capacity, variable condenser minimum, wiring, etc., will exceed 25 μμf. The result is that less than the required 2 to 1 coverage will be obtained. If, by very careful design, strays could be kept below 25 μμf, all would be well, but otherwise a larger variable is the only solution.

Once this all important value of C min. has been determined, the value of inductance may be calculated from the formula :—

$$L = \frac{10^6}{\omega^2 C}$$

Where $\omega = 2\pi \times$ max. frequency (Mc /s.), C = C min. as calculated above (μμf), L = Inductance (μH), or as a more rapid alternative, one of the well-known LC charts may be used.

For an example, let us return to the previous case in which C min. was 100 μμf and 12 Mc /s. was the maximum frequency.

$$L = \frac{10^6}{40 \times 12 \times 12 \times 100} = 1 \cdot 75 \text{ μh (approx.)}$$

(40 is taken as a rough figure for $2\pi^2$)

The value of inductance so calculated serves as a guide to the winding and construction of the coil. One of the many formulæ may be used, but fortunately no high degree of accuracy is wanted since final adjustments may be made by the following process.

Adjustment of Inductance

So far, there are two obstacles to further progress. First, although the precise required value of C min. is known, it includes all the strays which cannot be estimated very accurately. Second, the coil when wound will only approximate to the calculated value. Consequently if accurate results are needed, and no laboratory measuring apparatus is available, final adjustments must be made, the only standard necessary being one of frequency. The method is as follows :—

(1) Set up the coil in the circuit in which it is to be used, or as an absorption wavemeter, according to which system gives most ready indication of frequency.

(2) Connect across it a trimming condenser of such a value that, together with strays, the wanted C min. may be reached somewhere within its travel.

(3) Connect the variable condenser across the coil and set it to minimum capacity.

(4) Adjust the trimmer until the circuit is tuned to the high frequency end of the coverage range.

(5) Turn the variable condenser to maximum capacity, and check the frequency to which the circuit is tuned.

The frequency obtained under (5) should be fairly close to the low frequency end of the required band. If the answer should be lower than the desired limit, it shows the coverage to be too great and C min. must be too small, but if the trimmer is increased in capacity, the high frequency limit will become lower. This proves the inductance to be too large, and a turn or part of a turn should be removed, repeating the process until correct coverage is secured. Summarising, it should be remembered that too large a coverage means the inductance is too large and *vice versa*.

In conclusion, it is interesting to note that a very close estimate of stray capacity is possible as a result of such a test. If an air dielectric trimmer is used, and it has semi-circular vanes, the amount of its capacity in circuit may be judged quite closely. Subtracting this from the calculated value of C min. leaves the total of strays, including the minimum capacity of the variable condenser.

Below is a table showing approximate capacities for various normal components which introduce strays.

R.F. Pentode input capacity	8 to 12 μμf.
R.F. Pentode output capacity	12 to 20 μμf.
Variable condenser minimum capacity	5 μμf to 1/20th of max. whichever is the greater.
Coil self capacity	2 to 10 μμf according to size and construction.
Wiring and valve holder ..	5 μμf.
Total	32 to 62 μμf.

(*Continued on page* 80.)

RECORD ATTENDANCE AT SECOND ANGLO-AMERICAN MEETING

ALL war-time attendance records, for amateur radio meetings in Great Britain, went by the board on Saturday, October 28, when more than 120 fully-licenced British and American amateurs met at the Mostyn (American Red Cross) Club, 32–50 Edgware Road, London, W.1. The additional advance publicity given to the meeting, coupled with the fact that it took place during the afternoon, were factors in favour of an improved attendance compared with that of the previous meeting, held a month earlier.

The meeting was opened at 2.30 p.m. by Lt.-Col. David Talley, W2PF, who extended a cordial welcome to the British amateurs present. A roll call was then taken of all American amateurs which, for the second time, showed that all nine Districts were represented.

At the invitation of Col. Talley, Ft./Lt. John Clarricoats, G6CL (General Secretary of the R.S.G.B.), was invited to act as Chairman of the meeting. After thanking Col. Talley and his colleagues for the honour which they had extended to him, he called upon the British amateurs present to identify themselves by call sign and home town.

Mr. Leslie McMichael, G2FG (Co-Founder of the Society in 1913), then addressed the meeting. In the course of a brief but much appreciated speech, Mr. McMichael extended greetings, in the name of all British amateurs, to the amateurs of the United States. He also spoke of the early days of the Society and of his personal association with the original Trans-Atlantic tests.

The Chairman then called upon that other great pioneer of British Amateur Radio, Mr. Gerald Marcuse, G2NM, for a few words. "Gerry," as he is affectionately known to all "old timers," related several personal and amusing anecdotes concerning his early associations with the A.R.R.L., R.S.G.B. and the I.A.R.U. He spoke of his warm friendship with the late Mr. Hiram Percy Maxim (first President of the A.R.R.L.) and of his meetings with Mr. Kenneth B. Warner (Secretary of the League) during the time the Trans-Atlantic tests were making world history.

The attendance at the meeting of Mr. McMichael and Mr. Marcuse was appreciated by all present, as was the presence of Mr. J. A. J. Cooper, ex-G5TR, first Honorary Editor of the old *T. & R. Bulletin* and a tower of strength to the Society in the early 1920's.

The R.S.G.B. was officially represented by Mr. E. L. Gardiner, G6GR (President), supported by Mr. A. D. Gay, G6NF (Immediate Past President), Mr. H. A. M. Clark, G6OT (Hon. Secretary), Mr. A. O. Milne, G2MI (Hon. Editor), and Messrs. Charman, G6CJ, Hoare, G2DP, and Russell, G5WP (Members of Council).

Following the speeches by Messrs. McMichael and Marcuse, Mr. Arthur Milne, G2MI, gave an interesting account of amateur conditions as they applied to the British amateur bands prior to the war. His talk was augmented by a series of recordings of actual amateur contacts made by Mr. C. G. Allen, G8IG. The voices of several well-known DX personalities were heard in QSO including those of Miss Dorothy Hall, W2IXY, and Mr. Bryan Groom, GM6RG. Mr. E. G. Allard, received the thanks of the meeting for loaning and operating the speech equipment.

After a brief interval, during which a number of press photographs were taken, Col. Talley and Mr. Dan Linsey, W2PL, opened a discussion on post-war amateur radio. Numerous useful points were raised and duly noted, but due to lack of time it was not possible to formulate any set plans. The Chairman when summing up the results of the discussion expressed the hope that an opportunity might be provided by the R.S.G.B. to arrange an "Open Forum" to which British and American amateurs could be invited. It was, he assured the meeting, the desire of the R.S.G.B. to work in the closest possible co-operation with the A.R.R.L. especially in the preparation of the Amateur case, for presentation to the first post-war International Conference.

Mr. E. L. Gardiner voiced the thanks of the Society to those responsible for arranging the meeting and extended a cordial invitation to all American amateurs in London on December 30 to attend the Annual General Meeting of the Society. He expressed the hope that those who are not yet members would apply for election.

A sincere vote of thanks to the Mostyn (American Red Cross) Club was proposed by Chaplain (Major) J. D. Andrew, W4EFG, and carried with acclamation. The Manager (Mr. "Bill" Cruise) in his reply expressed his pleasure at being able to render assistance in the matter of accommodation and refreshments.

Roll Call

The following signed the register :

W1CPV, DJC, KMH, 2HZQ, KED, KES, MVR, NC, GT, OGL, OKB, PF, PL, 3CBY, JBD, QS, 4EFG, 5IHK, KSU, 6JWL, OCA, OIT, 7FND, GZI, 8FFK, JXV, KFZ, OQC, RCY, SKY, 9EAZ, FVQ, JQW, KSX, MFD, SYX, VGT.

G2AX, DP, FG, GO, HP, IG, KH, MI, MR, NH, NM, TJ, UA, UV, YL, 3BQ, BR, LD, MZ, OJ, RH, RQ, SH, ST, SU, UH, YY, 4CL, FB, GH, HI, LS, OL, OO, 5CM, JU, LC, LI, PY, QF, SR, VQ, WP, XH, YA, 6CJ, CL, GL, GR, LJ, OT, PR, QC, SC, WN, ZR, 8BW, DG, DI, IG, KZ, LQ, NT, NV, QV, RN, SC, TL, GW5TC, GM3LO, 8FM, 2ADL, CBB, DAT, DHF, DHV, FDF, FUX, HKU, VE3DG, 3RO.

It had been hoped to hold a third Anglo-American meeting on Saturday, November 25, 1944, at the Mostyn Club, but due to circumstances outside the control of the previous organisers this will not now be possible. It is expected that a number of U.S. amateurs will support the R.S.G.B. Annual General Meeting on December 30.

Photograph

It is regretted that the Group photograph taken during the meeting is not satisfactory for reproduction, only the first few rows being recognisable.

Congrats

● To Mr. H. Bevan Swift, **G2TI**, Honorary Member, Past President, Past Chairman, Past Honorary Secretary, Past Honorary Editor, and doyen of the old T. & R. section, who celebrated his 70th birthday last month. May he long be spared to share with us his wide knowledge of Society affairs.

● To Mr. Robert D. Tucker, **G5LU**, on the occasion of his marriage on November 18, 1944, to Miss Joan Gladys Chance of Watford, Herts.

● To L.A.C. G. W. Peacock, **BRS6368**, and his wife on the safe arrival of a daughter—Judith Ann, born on September 14. Mrs. Peacock met her husband whilst serving as a Radar Operator in the W.A.A.F. They were married in October, 1943.

● To Sgt. R. J. Beckley, R.A.F., **BRS7144** whose wife recently presented him with a daughter—Pamela Jillian.

● To Mr. J. C. Graham, **GM3TR**, of Kirkwall, Orkneys, whose wife presented him with a son—Eric—on October 5, 1944.

● To Eric Trebilcock, known to pre-war DX'ers as **BERS195**, on the arrival of Robert Winston, junior operator elect.

● To Sgt. J. W. Russell, **G2ZR**, now the proud father of a son. ZR, who is in India has ham company in the person of 2FGB. He sends greetings to all old friends in District 7.

● To Capt. D. Westwood, **G8WF**, of Barnsley, whose wife presented him with a son—Michael Phillip—on August 29, 1944.

KHAKI and BLUE

● By " V Mail " comes news of Capt. Eric Ilott, **G2JK**, now a member of the British Army Staff in Washington, D.C. Although he had only been in the " land of the kilowatt " for one month up to the time he wrote his letter, he had already made contact with many old friends of the air including W3FPQ, who promptly offered to escort him to a meeting of the Washington Radio Club. He says " the meeting was held in the dark, out in the open in a beautiful park called Rock Creek. They had a huge blazing fire going and we were all provided with frankfurters to roast. It was a jolly party and reminiscent of N.F.D." Later he attended meetings of the I.R.E. where he had the pleasure of meeting Major Armstrong, originator of modern F.M. and Dr. Everett of text book fame. He has also visited the only F.M. station operating in Washington, and has heard the transmission both as it is monitored, and as it is received 12 miles away. He sums up his impressions with the words " it sounds pretty good." He suggests that the G's should get going on F.M. as quickly as possible.

We hope to publish a topical story from Capt. Ilott in a later issue.

● Welcome home to Sq./Ldr. " Tony " Chapman, **G2IC**, of Folkestone, after three years' service in India and elsewhere. Prior to the war he played a prominent part in Society activities in Kent.

● Warrant Officer J. Suires, **2DBF**, who receives congrats on his recent promotion, reports meeting Fl./Sgt. Reyner, G6FZ. He sends greetings to 2DQC and to W. O. Baker, Sgts. Coleman, Williams and Thorogood, and seeks news of J. Cannon, BRS5799. His home address is " Crendon," Lock Lane, Maidenhead.

● Lt. Ron Reed, **G2RX**, now with B.L.A., has visited Rennes, Cherbourg, Paris, Laval, Le Mans, Rouen, Amiens, Brussels and Antwerp, but surprisingly enough he has yet to meet a " ham." He is in the Intelligence Corps, which may account for this lamentable state of affairs ! Ron sends greetings to G5QF, 6OT, 8PI and all other old friends.

● Lt. W. Clegg, **G8RF**, serving with the R.E.M.E. in Italy, reports meeting a " well-known rebel " who he is seeking to convince that R.S.G.B. membership is not merely a means of getting a 25 watt licence ! He has also met 2ADS—a Sergeant on the stores side of Signals.

● Friends of AQMS. Jack Hargreaves, R.E.M.E., **G5VO**, will be interested to learn that he is now in Belgium with B.L.A. Having examined a good deal of captured German radio-gear he comments, " it is probably more solid than our own, yet some of the short-wave sets are really superb in their fitting out. The Germans are very fond of fitting everything so that an entire unit can be changed easily. Apart from that, any section of a unit is quite easily replaceable. All resistors and condensers are mounted on panels, and if one goes down the whole panel is replaced." He is using a one-valve short-wave receiver which fits into his kitbag. The set employs a type 1D8 American multiple valve.

● From Egypt comes news of Lt.-Col. E. Y. Nepean, **G5YN**, who reports meeting, among others, Col. Bailey, known to Northerners as G2QB. Col. Nepean invites members serving in Egypt with R. Signals to contact him at 3 G.H.Q. Signals. He sends greetings to all old friends and looks forward to meeting them over the air at an early date.

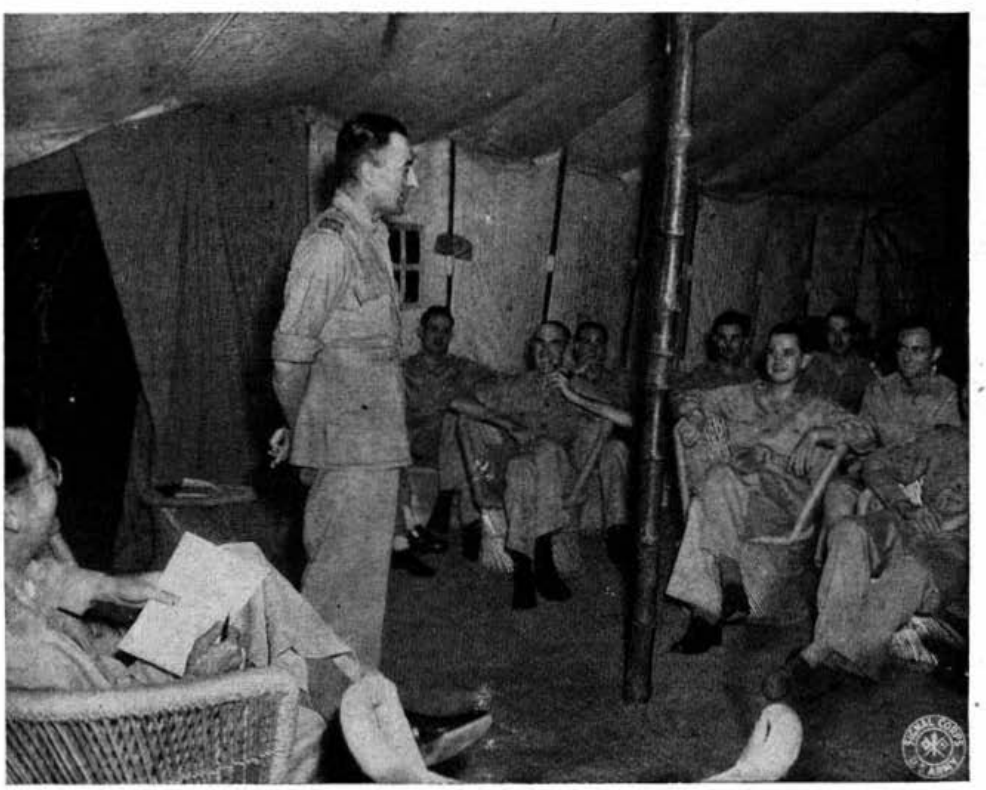
● P.O. Radio Mech. R. C. E. Beardow, **G3FT**, now in Freetown, Sierra Leone, sends greetings to Bill Hamer, G3WT and all old friends of the Romford and District Amateur Radio Society.

● Mr. J. C. Graham, **GM3TR**, will be pleased to extend hospitality to any member serving in the Orkney Isles. His address is " Mossfell," Pipersquay, Kirkwall. Telephone, Kirkwall 470.

● Cpl. E. C. Cooper, **2HNW**, writing from No. 89 Squadron, R.A.F., reports meeting G8VX, BRS3890, 4148, VE3AQQ, 3AYA and 5ACE. He seeks news of G4FV and sends greetings to G8HB, 2BFC, 2HFC and 2FTP. His home address is Meadowside, Cranston Road, East Grinstead, Sussex.

● Sgt. K. Rainbird (R. Sigs.) serving with the Nigeria R. Signals in Lagos, would like to hear from Mr. F. Waistell or any of the other operators of the old Meerut Radio Club station. Present members serving in Meerut may be interested to hear that the Club was started in 1935 by VU2ED and 2EU in the Cavalry Signals Barracks off the Garmuktesar Road. Sgt. Rainbird wishes to contact members serving with the West African Forces.

● F./Sgt. M. F. Owen, **BRS4353** would like to hear from those who served with him in No. 12, E.F.P., during 1939–40. His home address is 101 Shaftesbury Road, Reading.



FRANK SHOOTS A LINE.

Sq./Ldr. Frank Adams, G2YN, addressing the fourth joint British American Radio Amateur (Duration Dxers) Club in Delhi, India, on July 3, 1944. Seated left foreground is Col. Brooke Sawyer, W6CV, of Redlands, California.

(Photo by U.S. Army Signal Corps.)

Letters to the Editor

Specification Standards for Communication Receivers

DEAR SIR,—It was pointed out in the June, 1944, issue of the R.S.G.B. BULLETIN, that there is a growing necessity for some form of specification standard from which a comparison between different types of communications receivers can be made. It is not my intention to set minimum standards for such apparatus, but rather to pass on my views as to how I think a specification should be presented in the descriptive literature of a receiver. Any values given are merely suggestions. It would, however, give me great satisfaction to learn that I have provided food for constructive thought.

Apart from the usual information regarding frequency range, I.F., valve complement, power supplies, visual tuning indicator, etc., which are nearly always referred to in, even small, advertisements, the following factors determine the *usefulness* of a receiver:

(1) Sensitivity at rated output.
(2) Signal-to-noise ratio.
(3) Image rejection ratio.
(4) Adjacent channel rejection ratio.
(5) Maximum band width for telephony reception.
(6) Maximum signal level before output distortion exceeds a certain limit, for telephony.
(7) Details of A.V.C. action, and quiescence delay (if any).
(8) Detuning due to A.V.C.
(9) Detuning due to warming up.
(10) Detuning due to supply fluctuations.
(11) A.N.L. characteristics (if any).
(12) Kilocycles per degree of tuning control.
(13) Tuning control backlash.
(14) Arrangement of B.F.O. controls.

Considering each factor in turn: (1) For purposes of standardisation, 25 milli-watts should be set as the standard output, this being near the minimum necessary for intelligible operation with headphones. The rated sensitivity should be given as the number of micro-volts input, at the aerial terminal of a standard input impedance of, say, 400 ohms, required to produce this output, with the B.F.O. at optimum setting. It should be stated for both ends of each frequency band covered.

(2) The signal-to-noise ratio should be referred to this level, and should exceed 3/2. Where it does not, the R.F. input voltage required to obtain this minimum acceptable figure should be given as the rated sensitivity of the set, and the fact stated under (1). The signal-to-noise ratio should be given for both ends of each band.

(3) The image rejection ratio should be stated in – decibels, referred to the audio output of the set, with due precautions against blocking in the 1st R.F. stage, taken during the test. It should also be given for both ends of each band.

(4) Adjacent channel rejection-ratio should be stated for both maximum and minimum settings of a continuously variable selectivity control, or for each position in the case of a selectivity switch. It should be referred to the output of the set and stated as " plus or minus . . . c/s. for (say) – 30 db."

(5) The maximum band width for telephony reception should be stated as " plus or minus . . . kc/s. for (say) – 3 db."

(6) The maximum signal level before distortion exceeds a certain level on telephony, should be referred to an R.F. voltage, 50 per cent. modulated at 400 c/s., this corresponding more closely to amateur usage than the 30 per cent. modulation customary in laboratory work. The distortion should be measured with both A.V.C. and A.N.L. " on " and should not exceed 15 per cent.

(7) The A.V.C. details given should be: (*a*) the minimum R.F. input at which A.V.C. voltage appears (delay); (*b*) R.F. inputs between which output does not vary more than 3 db (optimum A.V.C. range); and (*c*) quiescence delay (if any).

(8) The detuning introduced by A.V.C. should be given in kc/s. per micro-volt input, and the affected stages should be stated.

(9) The detuning, due to warming up should be given in kc/s per time unit, and for the first hour the successive time intervals for 1 kc/s. drift, with A.V.C. " off," should be given, and the affected stages stated.

(10) Detuning, due to supply fluctuations, should be given in kc/s per cent. fluctuation, and the affected stages stated.

(11) The A.N.L. details should state whether it is adjustable, and up to what noise/signal level it is effective without introducing more than, say, 10 per cent. distortion.

(12) The number of kilocycles per degree of tuning-dial rotation should be stated, and, for the amateur bands, should not exceed 1 kilocycle per degree of the control knob.

(13) The amount of mechanical backlash should be given as the number of degrees difference in reading when tuning to the same signal by clockwise and counter-clockwise rotation. It should not exceed 10 kc/s. on the highest band covered.

(14) The B.F.O. control details should state whether both frequency and amplitude controls are provided, or only one, or neither. The R.F. input at which optimum B.F.O. injection is obtained, should also be stated.

Specifications of this type would help the amateur a great deal towards being able to obtain just what he requires; particularly it would be a help to those who do not live in or near a big city where they can inspect a large number of types, but have to buy " a pig in a poke " by examining specifications published by manufacturers.

Finally, I should also like to make the following suggestion. It is practically universal usage to use one switch to bring in the B.F.O. and cut the A.V.C. system in communications receivers. Why not substitute an A.V.C. network with a time-constant of, say, 1½ seconds in the B.F.O. " on " position of this switch, and use the rectified output of this to control the amplitude of the B.F.O.? Has it ever been tried? If so, what were the results? If not; why not?

Yours faithfully,
J. BAER (F.R.S.93).
R.A.F., M.E.F.

Into the Unknown

DEAR SIR,—It has been the privilege of the amateur experimenter in past years to conquer fresh fields. Our predecessors were squeezed out of the frequencies which they helped to develop and given higher frequencies to " play " with.

To-day we feel that our national usefulness belies further restriction of our activities, but at the same time many of us must now be considering where post-war pioneer development will be most needed. Let us consider therefore, wavelengths below 1 cm. Is it to be assumed that the textbooks of 20 years hence will dismiss such wavelengths as " of no practical application to scientific development "?

Let us even consider frequencies in the region of light and above (approx. 375,000 Mc/s.). Surely an immense field of experiment exists there for amateurs. It is conceivable that the first scientific approach to an understanding of the after-life will come when vibrations above the speed of light are capable of investigation.

This is no critical period in the life of Amateur Radio. In the years to come the Movement will become greater and stronger in proportion to its contribution to progress. Therefore, I suggest (probably unnecessarily) that the Council should consider and encourage a vastly expanded Research and Experimental Section which will foster an early migration to the micro-waves in post-war years.

Yours faithfully,
G. F. KEEN (2BIL),
(F./O. R.A.F.V.R.).

Post-War Licence Conditions

DEAR SIR,—The letter from Mr. Bryant (G3SB) in response to your August editorial has set forth very clear and concise conditions for post-war licences. However, I would suggest certain amendments to several of his nine points for the reasons given below.

Point 2. *Power.*—Suggest that power be limited to 25 watts for the first year and increased to a limit of 100 watts by specific application thereafter. The reason being, that there is little difference between apparatus capable of 10 watts and that capable of 25 watts. The amount of interference caused by improper handling of 10 or 25 watts causes the same amount of local disturbance. The limit of 100 watts would require sufficient extra stages of R.F. and A.F. amplification to warrant the construction of additional apparatus, whereas 50 watts may not.

Point 3. *Telephony.*—This type of signal to be restricted to 160, 80 and 5 metre bands. The congestion of all bands which produced signals other than those of local origin was sufficiently bad in pre-war days and is likely to become far worse post-war. Alternatively, telephony to be restricted to certain portions of each band, subject to complete international compliance.

Point 6. *Permission to use more than one operator.*—This may lead to serious abuse and I consider it too dangerous to provide any liberty capable of being " stretched."

Point 8. *Proof of activity to be required annually.*—Is this a little too much enthusiasm? There are occasions when such things as business activities, family responsibilities and possibly military service demand a cessation of active transmission for long periods. I know several leading amateurs in the scientific, medical and military professions who have been obliged to abandon transmission for prolonged periods. Would it be equitable to withdraw licences from such amateurs because they were unable to transmit for a whole year?

Regarding a technical examination in addition to the morse test. I find the same difficulty as Mr. Bryant. Nevertheless it was apparent to me that for several years prior to 1939 there became two separate camps, those interested in experimenting and those interested in communication alone. It is with regret that a few in the later category gave the impression that their sole interest was in hearing their own voices. Thus there is some necessity for both a technical examination and restricted telephony.

Yours faithfully,
G. A. SWINNERTON (G6AS, G2GX)
(Lieutenant, R.E.).

DEAR SIR,—I have been interested in recent correspondence in THE BULLETIN on "Post-War Licensing Conditions," and I would like to add the following observations :—

(1) The replacement of crystal control by *stable* master oscillator control seems to me to be most desirable. I would go even further and suggest the adoption of a system of "netting" such as is common in the Services. This process involves zero-beating the M.O. of the transmitter to the carrier of the incoming signal so that two or more stations in communication with one another use a common frequency. The saving in channels and the consequent reduction in interference will be obvious. The objection that a test call may well result in chaos if thirty-five stations all reply on the same frequency is not really as strong as it appears. Experience suggests that the competent operator should find little difficulty, under average conditions, in picking out the station he wants. His task will be even easier if he indicates in his test call the county or zone from which he asks for replies.

(2) Interference would be further reduced if we could cut down the unnecessary chatter which was, unfortunately, so common in pre-war days. I do not decry the "rag-chew" when it is a *bona fide* discussion of conditions, a comparison of results or even a greeting between new friends—but were they all? In this connection I would suggest that some responsible body—and who better than the R.S.G.B. ?—might consider the publication of a standard system of calling, answering and reporting which would cover the routine business of establishing communication. The vast influx of new operators after the war will bring with them widely differing ideas on "procedure," from the old "ham" methods to the latest Inter-Service amendments. Useless time on the air, the cause of so much interference, would surely be cut considerably if we agreed to conform to a simple standard routine. We should still have plenty of scope for individuality in the text of our messages.

I should be glad to read comments on these suggestions.

Yours faithfully,
R. POSTILL (G8NO),
(Lt.-Col., R. Sigs.)

The Case for Low Power

DEAR SIR,—I feel I must express my disagreement with the general trend of letters in the October issue in which pleas are made for higher power after the war.

Why all this fuss about higher power ? Surely it is not intended that amateur stations should become free-lance communication stations.

I worked for over two years on D.C. mains with a maximum input of 8 watts and I do not remember having much trouble in making contacts. I had my share of 14 Mc/s. DX and did plenty of "rag chewing" on 7 Mc/s. One thing is certain : it did not take ong to find out if the aerial was operating correctly.

I think I got as much out of my 8 watts into a carefully cut aerial as a good many got out of their 50 watt stations working into a piece of wet string !

Surely the results of the R.S.G.B. QRP contests proved that really low power can make contacts and the higher power of 10 watts gives plenty of scope for experiment.

If one of the objects of amateur radio is to further our knowledge of radiation and operating technique then the low power transmitter is the equipment to work on.

Let the input remain at 10 watts for the first two years with the option of 25 watts afterwards. High power to be granted to those, very few, who have genuine reasons for wanting it.

I believe that, in the past, requests for high power were the results of (*a*) not being able to do much on low power owing to lack of experience or technical knowledge, (*b*) a certain amount of jealousy among the QSL card fiends, and (*c*) the very human failing of wanting to have something bigger than the man next door.

If input is to be the prime factor in a transmitter why not give everyone a kilowatt and do away with the aerial ?

Joking aside, if high power permits are ever issued freely, amateur radio will soon become a rich man's hobby. I certainly could not afford a 2,000 volt quarter amp power pack.

Yours faithfully,
F. BEWLEY (G8HX).

Medium Wave U.S. Broadcast Stations

DEAR SIR,—It may interest members to know that North American medium-wave broadcast stations have been coming through earlier than ever this year, in spite of the sunspot minimum.

I have been hearing these stations fairly consistently from October 9 to the time of writing (October 29). They have been audible as early as 23.00 G.M.T. on certain nights, and seem to reach peak strength between 01.00 and 03.00 hours G.M.T.

I have found the following to be the most consistent :

WCAU, Philadelphia	1200 kc/s.
WNAC, Boston	1250 ,,
WCOP, Washington D.C.	1500 ,,
WMEX, Boston	1510 ,,
WLAC, Nashville, Tenn.	1510 ,,
WKDW, Buffalo	1520 ,,

WLAC, Nashville, cannot be heard until WMEX closed down.

The outstanding station is WMEX, Boston, and surprisingly enough his power is only 5 kW. (confirmed by announcements from the station). He reaches a peak strength of S.7 on the S. meter and usually runs between S.5 and 6.

The best British Empire station from the other side of the Atlantic is VONF, St. Johns, Newfoundland, on 640 kc/s. He can usually be heard fairly well, even if North American stations are inaudible.

It seems a pity that the old 1·7 Mc/s. midnight oil burners, helplessly have to watch this spell of good low frequency conditions pass quietly by.

One more item of news :

I received a letter recently from an R.A.F. man (unknown to me) informing me that he had met ON4AD of Ghent, who had asked him to pass on the word that he is safe now, after suffering great hardships during the German occupation. ON4AD will be remembered by many members for his fine 3.5 Mc/s. phone signal. ON4AD also passes on the word that he has become the proud father of two children, Erik 2½ years, and Diane 1 year, during the German occupation.

I expect to receive more information on how the ON4's have fared, during the German occupation, when the postal service to Belgium is restored.

Sincerely yours,
FRANK H. WATTS (G5BM).

Suggestions for a Post-war Standard Frequency System for Great Britain

DEAR SIR,—I should like to submit an idea for consideration in the planning of post-war Society activities.

The fixed frequency transmissions of WWV and (pre-war) of the N.P.L. are fairly well known. The idea is to run a similar service, on an extended scale, *by amateurs for amateurs.*

Briefly, a chain of stations to be set up, covering the British Isles, radiating signals, at pre-arranged times, on spot frequencies, with a constant radiated power. Accuracy to WWV standard would not be necessary, although doubtless not beyond the skill of post-war amateurs. The stations would be keyed automatically, for identification purposes and alternate periods of modulated C.W. and pure C.W. transmission would suit all needs.

The benefits derivable, to both licensed and BRS members, would be numerous. Examples which come readily to mind are :

1. Assessing state of band.
2. Marking band edges (and/or C.W./telephony edges).
3. Determination of improvement or otherwise resulting from alterations to receivers, pre-selectors, aerial matching, etc.
4. Provision of signals for lining-up and calibrating receivers, frequency meters, etc.
5. Determination of aerial characteristics (*e.g.* back to forward ratio), particularly with beam arrays.
6. Selection of portable sites (particularly on V.H.F.).

It is suggested that such signals should be radiated inside all amateur bands. On very high frequencies, the value of the system would be enhanced and the fact that signals were being radiated at definite times would greatly encourage and assist many amateurs, BRS in particular. Probably, much useful information on V.H.F. propagation would be forthcoming.

Careful planning would be necessary and many difficulties present themselves but it is suggested that the idea deserves careful consideration in view of its utility to all amateurs.

Yours truly,
J. N. WALKER (G5JU).

The President, Council and Headquarters Staff send Christmas Greetings and Best Wishes for the New Year to all Members serving abroad.

A safe and speedy return to you all.

BRITISH ISLES NOTES AND NEWS

DISTRICT 2 (North Eastern)

D.R.: C. A. Sharp (G6KU), 50 Moore Avenue, Wibsey, Bradford. Bfd. 10772. Scribe: H. Beadle (G8UO), 13 Chandos Street, Keighley.

Bradford.—A meeting will be held at the home of Mr. D. Clift, BRS6807, 50 Rooley Crescent, Odsal, Bradford, on November 26, at 3.30 p.m. All members are welcome. 6KU is busy rebuilding power supplies. 4GJ was recently on leave and sends 73 to all his friends. 2SU is now interested in a microscope. 3HA is back in N. Africa after a pleasant visit to Malta.

Halifax and Sowerby Bridge.—No reports are to hand, has activity ceased ?

Leeds.—Congrats. to 4MC (R.A.F.) who is now a sergeant. He is still on the move and expects to go abroad again shortly. 5893 now has his communications receiver working. One or two members are experimenting with C.R.O.'s and are obtaining all kinds of pictures, most of which are " not in the book."

Morley.—The meeting at 6PL's on September 10 was attended by 5YV, 6PL, 6QO, 2HHV, 6709 and Messrs. Somerscales, Green and Sykes, who heard a talk on Radio Servicing given by Mr. J. Spivey, 2HHV. The next meeting will be held at the home of Mr. Bennett, Zion Street, Batley, when an Avo Valve Tester will be demonstrated. 5YV now has his Oscilloscope working satisfactorily, thanks to 6BX. 'YV is hoping to have his receiving gear returned by the G.P.O. 6709 is having trouble with his Oscilloscope. Letters have been received from 2FQH and 6655, who seem to be interested in their Service occupations.

Sheffield.—A meeting was recently held in the city and although the attendance was small the enthusiasm was exceedingly great. A further meeting has been arranged for Wednesday, November 29, at the " Dog and Partridge," Trippet Lane, at 7.30 p.m. Will every member in the area make an effort to attend ? We offer congrats to Mr. and Mrs. W. T. Quibell, on the birth of a daughter, Jean, on August 9.

General.—4412 is now in Belgium and having a " wizard " time. 5GJ is in Gibraltar. 2VO is in PA and says he can see into D from the local church steeple. 4142 (R. Sigs.) was greatly impressed by the German radar gear. He wishes to purchase pre-war BULLS containing details of low power transmitters and will pay face value for same.

The Scribe has misplaced the letter budget rota and wishes all those whose names were on it to write in to him.

G8UO.

DISTRICT 3 (West Midlands)

D.R.: V. M. Desmond (G5VM), "The Chestnuts," Hanley Castle, Worcester. Scribe: E. J. Wilson, 48 Westbourne Road, Olton, Birmingham.

Birmingham.—A meeting of M.A.R.S. was held at the Chamber of Commerce, New Street, on Tuesday, October 17, when a most interesting demonstration of the Cathode Ray Oscilloscope was given by Messrs. Shaylor and Watson. 2FDR.

Rugby.—Sixteen members and visitors attended a meeting on Sunday, October 15. A suggestion was adopted that a letter be sent to H.Q. expressing the desires and hopes of members regarding the allocation of post-war frequencies together with opinions regarding licence qualifications. G8FM.

DISTRICT 4 (East Midlands)

Deputy D.R.: Albert E. Clipstone (G8DZ), 14 Epperstone Road, West Bridgford, Notts.

Derby.—A new lease of life has begun in this area and at the October meeting G2OU, 5YY, BRS4071, 6775 and 7328 heard the first of a series of talks on the Cathode Ray Oscilloscope. The second of the series on Time Bases will be given on December 3 at G3OZ, 2 Franklin Drive, Boulton Lane, Alvaston, at 3 p.m.

We welcome G6XM, late of Farnborough, who is in the R.E.M.E. 2CVV has been posted to " Buzz Bomb Alley." We wish him luck. G8SI writes from Scarborough that he is now the proud father of a " Junior Op." G5YY is building a modulated oscillator, details of which will be given at a later meeting.

The T.R. would like all local members at home and abroad to write to him regularly. His address is 43 Kenilworth Avenue, Derby. G2OU.

Nottingham.—The October meeting which was a great success was attended by 21 members. The highlights of the evening were first the showing of District 4 N.F.D. and 56 Mc/s. field day films by our old friend John Curnow, G6CW, and, second, a talk on radio conditions in the U.S.A. by W8TBD who is stationed in this area. Mrs. 8DZ managed to provide 21 cups of the American national beverage—coffee—and biscuits for those present. Later G8DZ showed members his workshop and explained the various items of test equipment.

The next meeting will be held at 2AOO, 78 Henry Road, West Bridgford, at 6.30 p.m. on November 26, when G6CW will give a talk on aerials and radiation.

Members who are to visit the works mentioned last month will be notified of the time and place by post. G8DZ.

DISTRICT 5 (Western)

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

Bristol.—The October meeting produced a somewhat better attendance. Discussion centred around the problem of discovering how many members are in the Bristol area at the present time. It was agreed that H.Q. be approached, the T.R. to send in a list of names for revision. We were pleased to welcome several visitors at this meeting, including 4DC and 5518. Others who attended were G3YT, 6RB, 2BYU, 2FBV, 2AIA, 2CUI, 3065 and 7961. At the next meeting to be held on December 10, it is hoped to arrange a lecture on the Cathode Ray tube. G6RB.

DISTRICT 6 (South Western)

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

Taunton.—G4BN, 5AK, 5LM, 6LY, 2DRW and others met at the Y.M.C.A. on September 10 to hear a talk on U.H.F. by one of our Allies. News has been received of G3KX, 3NB, 5BW, 5TN and 6LQ.

Exeter.—The next meeting will be held at 2.30 p.m. on November 25, at the Y.M.C.A. Arrangements will be as usual.

BRS6171 would like to hear from anyone who logged the reception of W3JAK's signals in the early days of the war.

G5SY.

CLOSING DATE FOR DECEMBER ISSUE IS NOVEMBER 30th. REPORTS SHOULD BE POSTED TO REACH D.R.'s AND SCRIBES BY NOVEMBER 25.

DISTRICT 7 (Southern)

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

Bournemouth.—Ten members attended the meeting on October 28, at which Mr. Sills, a repatriated P.O.W., gave a most interesting talk on his Service radio experiences. Next meeting November 25, 3 p.m., at 45 Parkwood Road. BRS2947 reports fit and happy from the M.E. (*via* 2HNO.)

Croydon.—The October combined meeting of Districts 7 and 13 was like pre-doodle days with an attendance of 22, which included G2DP, 2HP, 2UA, 2VB, 3FK, 3ST, 4NI, 5BT, 8TN, 1545, 3003, 4324, 4434, 4641, 6653, 6894, 8417 and four visitors. The inquest on 6894's (not 6814 as erroneously recorded in the October issue) receiver resulted in a verdict against the I.F. section. Plenty of advice was proffered, so 6894's troubles should soon be at an end. 4641 donated two books to be Dutch auctioned for the P.O.W. Fund, which benefited to the extent of £1 15s. 0d.

We were all pleased to see 8TN again looking very fit. Welcome also to 3SU (Petworth), whom we hope to see frequently. 2FWA has purchased a double beam 'scope. 4641 gave an interesting account of some of the places he visited whilst in the Navy. (*via* G2DP.)

Coulsdon.—Owing to a recent fly-bomb incident 4324 has come over from District 13 and is now living with 1545. 2AYM, serving with the R.A.F. in the B.N.A.F., would appreciate hearing from 5XH and 5XW. 2AYM's address may be had from the T.R. Seasonal greetings are extended to all local members serving overseas. (*via* BRS3003.)

EXETER MEETING

Some of those who attended the September meeting at the Y.M.C.A. in that town.

Southampton.—Attendance was good at the September meeting held at Mount Pleasant School when a general discussion took place on U.H.F. aerials and receivers. As it is not possible to give details of the next meeting in this issue, inquiries should be made from the T.R., G8QW, 17 Calmore Gardens, Totton. (*via* G8QW.)

Guildford.—A pleasant surprise has been experienced by one or two local members who report meeting Bill Gilhespy, G6GS, recently back from the Middle East. Welcome Bill!

The next local meeting will be held at The Cinema Cafe, Woodbridge Road, Guildford, at 3 p.m., on Sunday, December 3, when a lecture will be given by Mr. A. L. Beedle, G6OW. He has chosen as its title "A to Z of Amateur Radio." It is essential that those who propose coming should inform G5RS, 20 Hedgeway, Guildford (Phone 2286), beforehand. G5WP.

Forthcoming Events

Nov. 19	District 12, 3 p.m., at 2DHF, 22 Bramford Court, High Street, Southgate, N.14.
Nov. 19	District 3 (Rugby section), 3 p.m., at the Percival Guildhouse. Talk on home-made test gear.
Nov. 25	District 4 (Leicester Section), 2.30 p.m., at 15 Abbeymeade Road. Display of R.S.G.B. and other films.
Nov. 25	District 6, 2.30 p.m., in the Y.M.C.A., 4 Colleton Crescent, Exeter.
Nov. 26	District 4, 6.30 p.m., at 2AOO, 78 Henry Road, West Bridgford, Notts. Talk on Aerials by G6CW.
Nov. 26	Scotland "A" District, 3 p.m., in the Royal Technical College, George Street, Glasgow. Enter by Montrose Street.
Dec. 2	District 15, 3 p.m., at The Excelsior Hotel, 1 Ladbroke Gardens, Ladbroke Grove, Notting Hill, W.11.
Dec. 3	District 4, 3 p.m., at G3OZ, 2 Franklin Drive, Boulton Lane, Alvaston, Derby. Talk on Time Bases.
Dec. 10	District 5, 3 p.m., at 17 Colston Avenue, Centre, Bristol. Lecture "The Cathode Ray Tube."
Dec. 19	Midland Amateur Radio Society. 6.30 p.m., at Chamber of Commerce, New Street, Birmingham. Demonstration of high fidelity sound reproduction by G5BJ.

DISTRICT 11 (North Wales)

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

GW4CK whilst on leave recently was accompanied by W8SCW. Their only contact was with GW3CF. G2GZ reports V.H.F. receiver experiments with BRS8152 and 8256. G8JM back home after a long spell in Malta is now at Malvern. G3ZY in the M.E. asks for contacts with members in the Llanberis area. (QRA from 1060.) 2DTQ has left the district and is now in Chippenham. 5770 (India) reports well. 4023 (M.E.) is now fit after a spell in hospital. 5520 from somewhere in the Pacific area reports a meeting with VE4AEH, a Marine operator at a recent port of call. 2DAH (R. Sigs.) is in Worthing, where he hopes to effect a few contacts. Major Higson, GW2PH, has again been posted overseas, this time to the C.M. area. BRS1060.

DISTRICT 12 (London North and Herts)

D.R.: S. Buckingham (G5QF), 41 Brunswick Park Road, New Southgate, N.11. Enterprise 3112.

North London.—Although only eight members supported the October meeting held at the home of Capt. Phillips (PXL), a lively discussion took place on frequency control. It was agreed that as the topic offered such a wide scope it would be followed up again at the next meeting. On that occasion materials used for maintaining stability will be considered. The meeting will be held at the home of 2DHF, 22 Bramford Court, High Street, Southgate, N.14, on Sunday, November 19, at 3 p.m.

Mr. A. H. Bruce, G5BB, who served abroad for some time during the early stages of the war, has recently been discharged from the R.A.F. on medical grounds. We wish him a speedy recovery.

St. Albans.—The meeting held at BRS3412 on October 1, was attended by G5QF, 8FJ, 2BVH, 2HAB, 4477, 7097, 7238 and Associate member R. Lindridge. 2BVH of the Marconi Co., earned the thanks and admiration of all present for a most interesting talk about the Oscilloscope, after which he demonstrated how to use the instrument, explaining the various types of wave form, etc. He also handed round for inspection a number of books on the subject. A small mains operated receiver designed to fit into a square gas mask carrier, was produced by the same member.

Thanks are due to the parents of BRS3412 and his lady, for an enjoyable tea. G5QF.

DISTRICT 13 (London South)

A.R. (South Eastern and Central), S. E. Langley (G3ST), 19, Elm Gardens, Mitcham, Surrey (Temporary Address).

G2DP, 2HP, 2JB, 2UA, 2VB, 3ST, 2DRT, BRS1545, 3003, 4324, 4603, 6894 and R. Ulrich were present at the special meeting held at the home of G2VB, 35 Grangecliffe Gardens, South Norwood. A junk sale plus the usual collection realised 30s. for the P.O.W. fund. G2VB also presented a mystery box, which was raffled for the above fund. We thank Mr. and Mrs. 2VB for the opportunity of holding this meeting at their house, and for the refreshments provided.

The "Ann" Cup will in future be open for competition to all members of Districts 13 and 7 for the best piece of radio apparatus constructed during the year. A meeting of judges will be held at the home of BRS4324, 3 Englewood Road, Clapham South, at 3 p.m., Sunday, December 17. G2JB sends 73 to all old friends; he has received an airgraph from G6HM, who is fit and well in India. Capt. E. C. Ilott, G2JK, R.E.M.E., now in America (see "Khaki and Blue."—Ed.) will be pleased to deliver personally messages to those W.'s you have worked. He contacted W3FTQ the first day he arrived. (His address with 3ST.) G3ST.

DISTRICT 14 (Eastern)

Scribe: L. J. Fuller (G6LB), 14 High Street, Walton-on-Naze, Essex.

Chelmsford.—The October meeting held at G6ZC was attended by G6ZC, BRS3757, 7131, 3555, 2725, 5822, 5242, Messrs. Mead, Lawson and East, the last named being a welcome new member. In order to improve the standard of meetings, it was decided to obtain the use of a room where lectures can be given, and practical work carried out. Thanks are due to Mrs. 'ZC for the tea kindly provided.

As it is hoped to hold a Social evening in Chelmsford after Christmas, all members who would support such a function (to which ladies will be welcomed) are asked to contact the T.R., BRS5242, at once.

The Scribe, who was pleased to meet G5RV recently, while on short leave, noted with interest that even if keys are silent, RV's trigger finger has not lost its cunning. G8PB also paid a welcome visit to G6LB while in Chelmsford. "Tiny" gets smaller than ever, and the post-war mast question should not present him with any problems. He will be able to hold his sky-wire up in the air and orient it any way he pleases!

Our old friend, G2YI, now in Reading, is anxious to contact G3MV of Brentwood. Members in that area please note.

Mr. Hunt writes from Chingford to inform local members that he is going overseas. He wishes to contact G8JM, whom he last heard of in Gibraltar.

Walton-on-Naze.—The Scribe would like to hear from members in the locality with a view to arranging a meeting in Colchester or Clacton. G6LB.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

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

The October meeting was the best supported for many months. Those present included G2TJ, 5LN, 6WN, 8KZ, ex-VE3DG, 2ADL, 4542, 5027, 5301, 6275, Mr. Gardiner (Associate) and Mr. Collier, a prospective new member. High Wycombe was represented by the acting T.R. BRS4781 and 5666.

2ADL presented suggestions for the District Post-War planning. These are to be discussed again at a West London section meeting and will be put before the next District meeting. (See Forthcoming Events.)

It is understood that G8KZ, of North Kensington, and Mr. Freer, 4781, of High Wycombe, have been nominated to serve on Council and solicit your votes.

Mr. Hindes, BRS6275, has accepted office as Acting T.R. for West London. The D.R. welcomes this offer and thanks him in anticipation for what he proposes doing to get the section going again.

From overseas comes news of Captain Brotherton, 2BDV, of the Middlesex Regiment, who has already met some locals somewhere in Europe. 2BQC who enjoyed his stay in the District is also on the Continent again. 4AR is still abroad and carries on correspondence with G3YM (who is back with the C.M.F.), and 8KW. The former and AR have already designed their new transmitters but cannot come to any agreement over the P.A. valve. 2BMY has had malaria but is fit again. G6WN.

DISTRICT 17 (Mid East)

D.R.: A. C. Simons (G5BD), Admiralty Road, Mablethorpe. (Tel.: 69.)

G3OS who has found a suitable room for a meeting in Gainsboro, has been visited by G3JO. 3WB is busy on B.C. receivers. 5710 is somewhere in the Paris area. 2BQC is in Belgium and still waiting for a meeting with G2UK. His five years association with G8TB remains unbroken. He asks for news of 2BUV. 2LX after five years in the R.A.F. is starting up instrument repairing in Lincoln. Congrats to G6LI who is now commissioned. 7117 is enjoying the sights of South Africa. 5LL has little to say from Italy but is looking forward to getting home. 2DRT is getting some practice on his NC.81.X. His full call was granted the day the G.P.O. collected his gear! 8562 and 8710 full of

optimism have already had QSL's printed. 2FT is experimenting with toy size receivers. 5BD has treated himself to kit of parts for a 7in. oscilloscope. A report from 4315 (Sleaford), who is teaching electronics, brings news of an old friend, G6TV, who has just returned from Holland. 4315's co-instructor at an Army school in the District is 8701. G5BD.

DISTRICT 18 (East Yorkshire)

District Scribe: S. Davidson (G6SO), 10 Sidney Street, Scarborough.

Scarborough.—Mr. Allen Edwards, BRS1420, reports visits by Capt. George, 2DBO, of Caerleon (Mon.). 1420 is on the lookout for a Leica camera. Jack Cooper, G6CP (R.A.F.), now stationed in Southern England, is known to have spent a short leave in the town recently. 2DDA (R.A.F.) stationed in Scotland and now an L.A.C. paid his usual visit to 6SO during his recent leave. News is to hand from George Hobson an old member of the Scarboro' Short-Wave Society who is doing war work in Liverpool. He sends 73 to all old friends. We welcome to the district Ft./Sgt. W. R. Philpot (R.A.A.F.), VK3EZ. G6SO.

DISTRICT 19 (Northern)

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

G6VG of South Shields has just returned from the Middle East and is now enjoying himself reading through three and a half years accumulation of BULLS. He sends 73 to all Tyneside members including 5WZ and 6PB, who are still in Egypt.

A very welcome letter was received recently from Harry Hornsby, G5QY, who returned to this country last March after a long spell of service with the R.A.F. in Egypt. He is now stationed in Scotland, but at the time of writing was in hospital recovering from an operation for the removal of his right eye. He sends 73 to all old friends. All members who know him will join with us in wishing him a speedy recovery. G2FO.

Scotland

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

It is pleasing to be able to report that all the main centres of activity in Scotland with the exception of Edinburgh are now holding regular meetings, and it is hoped that support will be given to all such meetings. What about it, Edinburgh members, will someone volunteer to try and organise meetings in that district? Offers will be welcomed by GM6ZV.

"*A*" *District.*—At the October meeting GM3AR delivered an interesting lecture on receivers. A junk sale was also held.

"*B*" *District.*—On October 11 a meeting was held at BRS5857 when GM6VO, GM6IZ, BRS5637, 6857, 6107 and 8070 attended. Good support is now being received at regular meetings, details of which can be had from BRS5857 (A. G. Anderson, 87 Braemar Place, Aberdeen).

"*C*" *District.*—At the August meeting the D.O., Mr. T. Reay, tendered his resignation due to pressure of business. We thank him for all his work during the past five years. Mr. Jas. Gouck, GM3NH, of 4 School Drive, Downfield, Dundee, has been elected as his successor, and we wish him the best luck. At the October meeting Mr. R. M. Laird gave a very interesting talk on H.F. oscillators with practical demonstrations. GM6ZV.

Northern Ireland

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

Belfast.—Members of R.S.N.I. will be glad to learn that affiliation to R.S.G.B. has been accomplished and that regular meetings of their society will be held at an early date.

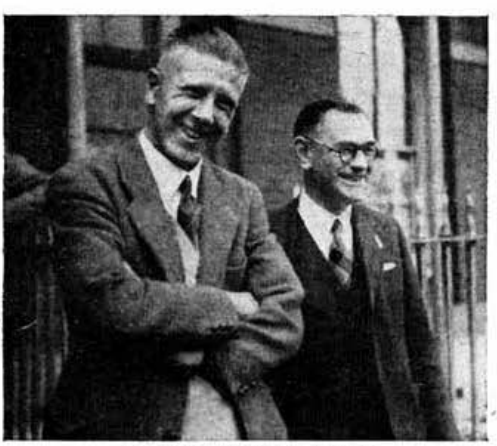
The A.G.M. of the Y.M.C.A. Radio Club was held on October 4, a report of which appears below. The D.R. was pleased to see upwards of 30 R.S.G.B. members present.

Recent visitors to the club have included BRS4692, 6181, 8127, 8351, 7637 and GI3CM.

Our good wishes accompany Mr. W. G. Dickson (7936) who has left to take up important work in the Midlands. GI5HU, during a recent visit to England, called on the Sheffield T.R. and also attended the A.G.M. of M.A.R.S. He desires to express sincere thanks for the hospitality extended to him by G3PR, but regrets missing G3BS.

Congrats are extended to Mr. Jim Lowden, GI8ML, on his marriage and a cordial welcome is extended to new members N. Phillips (BRS8688) and J. W. Kennedy (BRS8691).

(*via* GI5HU.) GI5QX.



SMILES IN THE SOUTH-WEST

Herb Bartlett, G5QA (T.R. for Exeter) with Walter Sydenham, G5SY (South Western D.R.).

City of Belfast Y.M.C.A. Radio Club

The tenth Annual General Meeting of the Club was held on October 4 last at Wellington Place, Belfast, when the following were elected to office:—

President: J. H. Ireland. *Vice-Presidents:* J. N. Smith (GI5QX), Rev. W. E. Davey, J. S. Phillips ("Rectifier"). *Chairman:* T. Linton (BRS3883). *Vice-Chairman:* F. Reavey (BRS4351). *Hon. Secretary:* F. A. Robb (GI6TK). *Hon. Treasurer:* J. W. Douglas. *Assistant Hon. Secretary:* R. S. Holden (GI5HU). *Hon. Auditors:* Messrs. Jensen (2DGU) and Fisher (2FOC). *Committee:* Messrs. Holden (GI5HU), Johnson (BRS7937), Milliken (GI5JN), Black (GI3IA) and Turner (BRS4111). *Hon. Librarians:* Messrs. McClurg (BRS8350) and Beatty (BRS7922).

The new President is General Secretary of the Belfast Y.M.C.A., whilst one of the Vice-Presidents (Mr. J. N. Smith) is the R.S.G.B. Representative in Northern Ireland.

It was reported to the well-attended meeting that the financial position of the Club is strong, and that a good programme had been planned for the winter. Morse classes are held on Monday and Thursday evenings at 8 p.m., and a practical radio class on alternative Friday evenings at 7.30 p.m. Club night is on Wednesdays at 8 p.m.

The Hon. Secretary reported that more than 50 per cent. of the present membership are also members of R.S.G.B., and that during the past year 51 visiting amateurs had been entertained at the Club.

Before the meeting ended several packets of R.S.G.B. note-paper were balloted for and the proceeds, amounting to £1, were sent *via* GI5QX to the R.S.G.B. Prisoners of War Fund.

The Committee extends a warm welcome to any amateur who visits Belfast in the course of his duties or business. The address of the Hon. Secretary is 60 Victoria Avenue, Sydenham, Belfast, to whom all Club communications should be sent.

R.A.F. Association

Croydon, most fly-bombed borough in England, and the home of more holders of decorations for gallantry in the air than any other town in the British Isles, has yet another link with the war in the air, which calls for the support of all who have served, or are serving, in the Air Services. We refer to the Royal Air Force Association, and in particular to the Croydon Branch which, with a membership of 600 ranks as the second largest branch in Great Britain.

Under the leadership of the civic heads and with the support of such eminent personalities as Air Chief Marshal Sir Arthur Tedder and Air Vice Marshal Sir C. A. H. Longcroft, the Branch appeals for the sum of £5,000 to provide a clubroom for members of the Association.

South London and North Surrey members who have served, or are now serving, in one of the Air Services, are cordially invited to apply for membership of the Association (the entrance fee is 2s. 6d. and the subscription 5s. per annum) and to join forces with the Croydon Branch in bringing to fruition this clubroom which, when completed, will become a lasting memorial to those gallant Sons of the Air who have made the Great Sacrifice.

The Chairman of the Appeal Committee is Mr. F. E. Boulton, 20 Sumner Road, Croydon, and the Hon. Secretary is Mr. T. W. K. Cook, 5 Temple Avenue, Shirley.

The R.A.F. Association is open to all officers and men and women, past and present, who have been gazetted for a total period of not less than three months for duty in, seconded to, transferred to, or enlisted in the Royal Naval Air Service, Royal Flying Corps, Royal Air Force, Women's Royal Air Force, Auxiliary Air Force, Royal Air Force Volunteer Reserve, Special Reserve, Dominion Air Forces, Colonial Air Forces, Princess Mary's R.A.F. Nursing Service, Women's Auxiliary Air Force.

The address of the Association Secretary is 105A Gloucester Road, London, S.W.7.

A VK Invitation

A cordial invitation is extended to members serving in New South Wales to attend monthly meetings of the Wireless Institute of Australia (N.S.W. Division), held in the Y.M.C.A. Building, Pitt Street, Sydney, on the third Thursday evening in every month.

Mr. Jim Corbin, VK2YC (R.S.G.B.–B.E.R.U. Representative for New South Wales) also invites members to contact him at 78 Maloney Street, Eastlakes, Maloney (MU 1092 and MU 1879).

HEADQUARTERS CALLING

September Council Meeting

Resume of the Minutes of a Meeting of the Council, held at 6 p.m. on Monday, 25th September, 1944, at New Ruskin House, Little Russell Street, London, W.C.1.

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

Apologies were received from Messrs. H. A. M. Clark and A. D. Gay.

(1) It was reported that the suspension of the despatch of parcels to prisoners of war in Germany continues.

(2) It was unanimously resolved to elect 176 Corporate Members (137 proposed, 39 supported by references), 12 Associates and 3 Junior Associates.

(3) The monthly Statement of Account was presented and adopted.

(4) The Secretary reported the position of the reprints of the Handbook and Supplement.

(5) It was unanimously resolved to transfer a further sum of £500 to the Post-War Development Fund, and to loan this sum to the Government free of interest on the same terms and conditions as previous loans.

(6) It was unanimously resolved that the sum of £1,000 be transferred from the Accumulated Fund as at 1st October, 1943, and placed to the credit of the Post-War Development Fund, and that the sum of £1,000 on loan to the Treasury, at present regarded as a Current Asset, be transferred to Fixed Assets.

(7) Council continued its review of matters relating to post-war licence conditions. Every aspect of the subject had been covered in a tabulated list to be critically examined by each member of Council in preparation for final discussion.

(8) It was reported that representatives of the Society had recently attended a meeting with the G.P.O. to discuss post-war licencing matters.

(9) It was reported that a draft memorandum outlining the functions and activities of the Society had been prepared.

(10) Messrs. S. E. Langley, G3ST, and E. H. Laister, BRS3386, were nominated to serve on the 1945 Council, in place of G./Capt. G. R. Scott Farnie, GW5FI, who will complete 3 years' service on December 31, 1944, and W./C. J. H. C. Hunter, G2ZQ, who is on active service in India.

(11) A letter was read from the Board of Trade stating that when the question of the disposal of surplus radio equipment is discussed with the industry, the Society's request that facilities should be afforded to members to acquire such equipment will be borne in mind. The Board also intimated that a copy of the Society's letter of enquiry had been forwarded to the Ministry of Aircraft Production, who will be responsible for the disposal of certain classes of radio gear.

(12) Letters of thanks were read from members who had been awarded honoraria for their contributions to the Society's Journal.

(13) It was unanimously resolved to grant affiliation to the Radio Society of Northern Ireland. The application was supported by Mr. J. N. Smith, GI5QX (Representative for Northern Ireland).

(14) Mr. Stacey reported that no reply had yet been received to a letter which he had addressed to the Ashton-under-Lyne Amateur Radio Society, who had complained that their notes were omitted from a recent issue of THE BULLETIN. It was agreed to write to the Ashton Society informing them that as arrangements have now been made to publish the closing date for District notes in each issue of the Bulletin, the Council trusts that no further difficulties will arise in that connection.

(15) The Secretary stated that a letter had been received from the Deputy D.R. for South Wales, in which he had mentioned that at a recent Cardiff meeting (attended by eight members), views had been expressed regarding post-war Provincial Representation. It was agreed to await a further letter from Mr. Phillips. The Secretary's interim reply was read and approved.

(16) It was agreed to hold the Annual General Meeting on December 30, 1944.

(17) It was agreed to defer until the October meeting a decision regarding ordinary monthly meetings at the I.E.E.

(18) Mr. Watts asked for it to be recorded that it is his wish that at some later date his collection of bound volumes of the Society's Journal shall be donated to the Society.

The meeting closed at 9.15 p.m.

Board of Trade Licences

On several occasions recently, the General Secretary has been asked by new members to support their application to the Board of Trade for a licence to establish a radio business. The Society cannot, under any circumstances, accede to such requests.

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

DONATIONS.—The General Secretary acknowledges with thanks on behalf of Council, receipt of donations from: District 17 (per G5BD), £1; District 4 (per G8DZ), £2 10s. 0d.; District 11 (per 1060), 16s.; District 1 (per G6CX), 12s.; H. A. M. Clark, G6OT, 5s.; District 12 (per G5QF), 12s.; N. Coxall, 8827, 7s. 6d.; R. H. Farmery, 7186, 14s. 6d.; W. N. Craig, GM6JJ, 5s.; W. D. Gilmour, G2VB, 5s.; Belfast Y.M.C.A. Radio Club (per GI5QX), £1; K. Fraser, GM4FK, 10s.; H. Arnfield, G3LX, £1 5s. 0d.; E. H. Hopkins, G2XN, 5s.; T. R. Nisbet, GM3SW, £1 1s. 0d.; C. B. Seaman, 2603, 5s.; R. A. Bent, 5s.; H. G. Brown, 4s. 6d.; J. Dickson, G2HV, 5s.; C. L. Ward, G5NF, 5s.; A. J. Mitchell, 2DLX, 5s.; A. H. Payne, 7165, 3s. 9d.; A. Cuff, 4599, 2s. 6d.; District 7 and 13 Meeting, £1 15s. 0d.; V. T. Dickins, 2134, £3; F. W. Fletcher, 2FUX, £1; R. A. Rees, 4891, 2s. **Total receipts to date, £1,378 0s. 6d. Expenditure to date, £867 12s. 0d. Balance in hand as at 30th October, 1944: European Fund £140 8s. 6d. Far East Fund £370 0s. 0d.**

NICE GESTURE.—Sgt. T. R. Nisbet, GM3SW, was the recipient of an honorarium for an article published in the last volume of THE BULLETIN. In a letter from India to his brother requesting him to donate the award to the R.S.G.B. P.O.W. Fund, he wrote, "please explain that it is a gesture in memory of those who were not so lucky as I was in the evacuation of the Far East in 1941–2." Thanks GM3SW for the gesture, it is most warmly appreciated.

Changes of Address

Members who change their permanent address are asked to note that at least one month must elapse before the change can become effective for BULLETIN despatch purposes.

The Society cannot, under existing conditions, send the BULLETIN direct to a Service address. Members on Active Service should arrange for re-direction from their home address. Provided re-direction is effected promptly, no additional postage is required.

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.) ..	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 Los Angeles)	12s. 0d.
"Radio" (Monthly publication of Radio Ltd.) per annum	21s. 0d.

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*.

THE LC CIRCUIT—(*continued from page 71*)

The table quotes input and output capacities for the valve; this assumes the coil to be an intervalve coupling impedance. Less strays are likely in other circumstances, and the above figures are on the high side for carefully designed and constructed circuits.

APPENDIX

Let L.F. limit of tuning range be f_1
„ H.F. „ „ „ „ „ f_2

Then Ratio $\frac{f_2}{f_1}$ is coverage ratio T.

$$f_2 = \frac{1}{2\pi \sqrt{L\,C\,min.}} \text{ and}$$

$$f_1 = \frac{1}{2\pi \sqrt{L\,(C\,min. + C\,var.)}}$$

$$\therefore \frac{f_2}{f_1} = T = \frac{2\pi \sqrt{L\,(C\,min. + C\,var.)}}{2\pi \sqrt{L\,C\,min.}}$$

$$\therefore T = \frac{\sqrt{C\,min. + C\,var.}}{\sqrt{C\,min.}}$$

$$T^2 = \frac{C\,min + C\,var.}{C\,min.}$$

$$\therefore C\,min \times T^2 = C\,min + C\,var.$$

$$\therefore C\,min\,(T^2 - 1) = C\,variable.$$

$$\therefore C\,min = \frac{C\,variable}{T^2 - 1}$$

EXCHANGE & MART - ADVERTISEMENT RATES

MEMBERS' private advertisements 2d. per word, minimum 3s. TRADE advertisements 4d. per word, minimum 6s. Box Numbers: 6 words, plus 1s. 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 30th of the month for following month's issue.

ALL KINDS OF PRINT.—Send your enquiries to G6MN, Castlemount, Worksop.

BAYLISS Transformer, 500–0–500 volts, 60 mA. 4 v. 3–4A. 4 v, 2A., all c.t. Exchange for 500–0–500 volts 250 mA. 5 v, 3A. 6·3 v. 3–4A c.t., or sell.—Box 465, PARRS, 121 Kingsway, London, W.C.2.

"BUG Key" wanted.—State price and condition. — BOERSMA, 162 Sussex Gardens, London, W.2.

COMMUNICATION Receivers thoroughly overhauled and tested. Write for quotation.—MILES, G2NK, 59 Amherst Drive, St. Mary Cray, Kent.

CONSTRUCTORS Data Sheets. If you are in need of constructional details and blueprints of tested and guaranteed designs, here are some of the L. Ormond Sparks data sheets now available: A Super S.W. 2-valver; the "L.O. Two," a double pentode line-up for DX work (battery); a two-valve amplifier (battery); 3½ watt A.C. amplifier; A.C. trickle charger transverse current microphone. All 2s. 6d. each, plus S.A.E. electric guitar units. Three designs of high-efficiency units, complete details and prints, 5s.—Send S.A.E. for list "T.R.," L. ORMOND SPARKS, (R.), 9 Phoebeth Road, Brockley, London, S.E.4.

DECCA 6-valve A/W, S/Het Chassis, valves, speaker, 50s. Phillips A.C. eliminator, 5H.Ts., 20s. 20Hy chokes, 40 ma., 3s. 6d. 30 ma., 2s. 6d. 2-gang, ·0005, 5s. 8 mf., 250 v., 4s.—2BCP, 3 Clarence Road, Hastings.

FOR SALE.—Useful collection of 50 Wire-end Resistors, all different. Nominal values from 10 ohms to 9 megohms, ½ to 1 watt types, 20s. post free.—Box O17, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1.

FOR SALE.—Two R.C.A. Acorn Pentodes, 956, 50s. each. One acorn triode, 955, 45s. All unused.—Box 455, PARRS, 121 Kingsway, London, W.C.2.

FOR SALE.—Good quality S-W Receivers, components and electrical gear; s.a.e.—Box 456, PARRS, 121 Kingsway, London, W.C.2.

FOR SALE.—Brand new unused Webb's 63" rack with castors, £2 5s. 0d. carriage paid. Also (all perfect) 40 copies *Electronic Engineering* (up to November, 1944); 25 copies *The Gramophone* (up to November, 1944); 22 copies *Practical Mechanics*; 30 copies *Practical Wireless* (up to December, 1944). Offers!—MEYRICK, 222 Sherrard Road, Manor Park, London, E.12.

HALLICRAFTER S27 Receiver for sale, in good condition. Frequency range 27·8 to 143 Mc/s. What offers?—Box 445, PARRS, 121 Kingsway, London, W.C.2.

McELROY "Bug" Key wanted.—Price and details to G3QD, 95 High Road, Beeston, Notts.

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

NATIONAL NC81X, as new. Speaker to match, £35.—2HDV, 44 Earle Road, Bramhall, Cheshire.

POST OFFICE type Resistance Bridge by Silvertown, ·05 ohms to 100 ohms, no galvo. Would sell or exchange for multi-range meter.—PEARCE, 91 St. Augustines Avenue, Wembley, Middx.

SALE.—Partly constructed 22-range Meter 750 microamps f.s.d., includes Westinghouse rectifier. Offers? — GREENWOOD, "Glencairn," Illingworth, Halifax.

SALE.—RCA 954, 955, 956, 30s. each. Few British and American valves, *i.e.*, 6K7, 6SJ7, 8s. 6d.; 6L6, 10s. 6d.; 5Y3, 7s. 6d. Few electrolytics, 8 mfd., 450, 7s.; 8 mfd., 750, 8s. 6d.; 8–8 mfd., 450, 8s. 6d. Phillips A.C. type 274A, £6 10s. 0d. Few sundries, stamp for particulars.—Box 468, PARRS, 121 Kingsway, London, W.C.2.

VALVES wanted urgently.—W31 (Osram) or VP1321 (Mazda); new 3Q5GT, 7-pin Pen 20, PT625, PM25, or 615PT.—Particulars to ARMSTRONG, North Hall, Basingstoke, Hants.

WANTED.—Class B Input Transformer, 6A6 plates to two 6A6 grids; details.—SAINTY, 23 Albert Road, Witham, Essex.

WANTED.—Gram-motor, Turntable and Pick-up, 200/240 volts.—BRS8006, PERRY, The Field, Old Church Road, Nailsea, Somerset.

WANTED.—Rola G12 or similar type speaker.—B.M.-NBWP, London, W.C.1.

WANTED.—National Velvet Vernier, dial type "N" or similar with vernier scale, reading to ·1.—BRS5319, 41 Innerbridge Street, Guardbridge, Fife, Scotland.

WANTED.—Avodapter complete with Avo couplers. Good price paid.—W. MACDONALD, Brae Gardens, Dingwall, Ross-shire.

WANTED urgently.—American Metal Valves, type 6SA7, 6C5, 6J5. List price paid.—TAPSON, 1 Squirrel Lane, Booker, High Wycombe, Bucks.

WANTED.—Test Meter (A.C. and D.C.), Avo, Taylor, Wearite or other good make; also U.H.F.Rx. Both guaranteed good condition.—Write G8CP, Newhaven Rectory, Sussex.

WANTED.—Frequency Checking Instruments. Commercial built preferred, must be accurate and reliable job. Hallicrafters 12 in. PM12C speaker complete in matching cabinet to SX17. Sale: Brand new Avo 40, offers. Philco Allwave battery receiver, as new, £10.—Box 452, PARRS, 121 Kingsway, London, W.C.2.

WANTED.—Hallicrafter SX24, SX28, SX25, S20R, SX23, or other good communications receiver. For sale: Cossor model 3332 oscilloscope, perfect.—JOYCE, Thorntree House, Newhall, Burton-on-Trent.

WANTED.—First edition R.S.G.B. *The Amateur Radio Handbook*, in good condition.—FT./LT. CLARK, 2BIB.

WANTED.—P.M. Rola G12 Speaker, impedance 2·6 ohms; also 6-volt Mallory vibropack delivering 280 volts or more at 80 mills. Must be bargains.—Box 458, PARRS, 121 Kingsway, London, W.C.2.

WANTED.—Bug Key, must be in new condition. State price wanted.—RODGER, Guthrie Road, Letham, Angus, Scotland.

WANTED.—Pair Midget Headphones suitable for pocket receiver, at least 4,000 ohms.—"Ypres," Fosters Road, Tintagel, Cornwall.

XMAS Bargains!—Get them now. Valves, meters, components, smoothing condensers, resistors, etc., etc. All going dirt-cheap. No "junk."—Box 449, PARRS, 121 Kingsway, London, W.C.2.

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.

See OCTOBER Issue

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"The Morse Code Qualification."

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"Morse Code Training."

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