SEPTEMBER 1968

Radio Communication

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

incorporating
RSGB
BULLETIN

KW SSB EQUIPMENT

is chosen
where reliability
is always first

KW 2000A
SSB TRANSCEIVER
180 watt PEP, 10-160 metres, complete AC psu, VOX, P.T.T.

KW VESPA Mark II
TRANSMITTER FOR ALL H.F. BANDS
220 watts PEP SSB, AM, CW.

KW 1000
LINEAR AMPLIFIER
1200 watts PEP with built-in psu and SWR indicator.

KW 201
AMATEUR BANDS COMMUNICATIONS RECEIVER
SSB CW, and AM; 10-160 metres.

KW ELECTRONICS LIMITED

Write for illustrated detailed specification on the above
and our list of KW Tested, 'Trade-in' equipment

K. W. ELECTRONICS LIMITED

1 HEATH STREET, DARTFORD, KENT

TELEPHONE: DARTFORD 25574 CABLES: KAYDUBLEW DARTFORD

Other KW Products: KW Antenna Switch (3 position), KW E-Z Antenna Match Unit, KW PEP Meter, KW Match SWR Indicator, KW Low-Pass Filters, KW Trap Dipoles, KW Balun, KW Dummy Load, KW Q Multipliers

RADIO COMMUNICATION

ASSISTANT EDITOR
Trevor R. Preece, G3TRP

EDITORIAL ASSISTANT
David A. Evans, G3OUF

CONTRIBUTING EDITOR
Pat Hawker, G3VA

DRAUGHTSMAN
Derek E. Cole

ADVERTISING MANAGER
Mrs P. D. Harvey

EDITORIAL OFFICE
RSGB Headquarters
28 Little Russell Street,
London, WC1
01-405 7373
01-405 2444

ADVERTISING OFFICE
Sawell and Sons Ltd.,
4 Ludgate Circus,
London EC4
FLE 4353

RADIO COMMUNICATION (INCORPORATING THE RSGB BULLETIN) IS PUBLISHED ON THE FIRST WEDNESDAY IN EACH MONTH BY THE RADIO SOCIETY OF GREAT BRITAIN AS ITS OFFICIAL JOURNAL AND SENT TO ALL MEMBERS

CLOSING DATES
(except where otherwise stated)

OCTOBER
6 SEPTEMBER

NOVEMBER
11 OCTOBER

INDIVIDUAL COPIES 4/-.

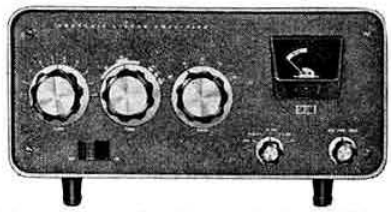
FRONT COVER: Members of the AERE Amateur Radio Club preparing for High Power Field Day. In the picture are (left to right) eleven-year-old Alex Sharpe, Contest Manager Tony Pratt, RSGB Regional Representative Cliff Sharpe, G2HIF (Alex's father) and the Club Chairman, Ted Wake, G5RP.

SEPTEMBER 1968
VOLUME 44 No. 9

HEATHKIT – The World's Largest

DEFERRED CREDIT TERMS BY ARRANGEMENT (OVER £10 U.K. ONLY)

SB-101 80 Through 10 Metre SSB Transceiver . . . 180 watts PEP SSB, 170 watts CW (the practical power level for fixed/mobile operation). Features USB/LSB on all bands, PTT & VOX. CW side-tone and more. Unmatched engineering and design.
Kit K/SB-101, 23 lbs., **£185 . 12 . 0.** P.P. 9/-.
Ready to use **A/SB-101, £225 . 12 . 0.** P.P. 9/-.



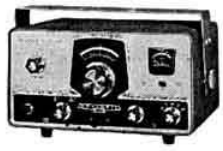
SB-200 KW SSB linear Amplifier . . . 1200 watts PEP input SSB, 1000 watts CW on 80 through 10 metres. Built-in antenna relay, SWR meter, and power supply. Can be driven by most popular SSB transmitters (100 watts nominal output).
Kit K/SB-200, 41 lbs., **£120 . 18 . 0.** P.P. 10/6.
Ready to use **A/SB-200, £145 . 18 . 0.** P.P. 10/6.

SB-610E Signal Monitor Scope . . operates with transmitters on 160 through 6 metres at power levels from 15 watts through 1 kw. Shows transmitted envelope. Operates with receiver IF's up to 6 Mc/s, showing received signal waveforms. Spots over-modulation, etc.
Kit K/SB-610E, 14 lbs. **£41 . 14 . 0.** P.P. 10/6.
Ready to use **A/SB-610E, £51 . 14 . 0.** P.P. 10/6.

SB-620 "SCANALYZER" Radio Spectrum Monitor and Analyzer. New narrow sweep widths with crystal filter for single channel analysis. 10 Kc/s., 50 Kc/s. Variable width to 500 Kc/s. Styled as SB series.
Kit K/SB-620, £64 . 14 . 0. P.P. 10/6.
Ready to use **A/SB-620, £77 . 4 . 0.** P.P. 10/6.

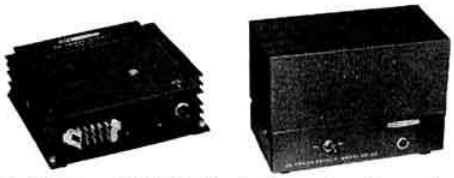
DX-100U Transmitter . . . 120 watts CW, 100 watts Phone. Built-in VFO and all power supplies. Band coverage: 160, 80, 40, 20, 15 and 10 metres.
Kit K/DX-100U, £95 . 0 . 0. P.P. 19/6.
Ready to use **A/DX-100U, £120 . 0 . 0.** P.P. 19/6.

MODELS
HW-12A (80m.)



HW-32A (20m.)

HW-12A and HW-32A Filter-Type SSB Transceivers . . . 100 watts PEP input TX. 1μV sensitivity RX. PC Board. Pre-aligned circuits. Power required: 800v. D.C. at 250 mA., 250v D.C. at 100 mA. —125v. D.C. at 5 mA., 12v A.C. or D.C. at 3·75A.
Kit, either model, **£60 . 3 . 0.** P.P. 10/6.
Ready to use **£74 . 13 . 0.** P.P. 10/6.
GH-12 Push Talk Microphone Ready to use **£4 . 3 . 0.**



HP-13 Mobile and HP-23 Fixed Power Supplies . . . For the "Single Banders" and SB-101. Provides all necessary operating voltages with excellent dynamic regulation.
Kit K/HP-13, 7 lbs., **£37 . 2 . 0.** P.P. 6/-.
Ready to use **A/HP-13E, £44 . 2 . 0.** P.P. 6/-.
Kit K/HP-23E, 19 lbs., **£30 . 18 . 0.** P.P. 9/-.
Ready to use **A/HP-23E, £36 . 8 . 0.** P.P. 9/-.

RG-1 High Sensitivity General Coverage Receiver . . . High performance at lowest cost. Covers 600 Kc/s. to 1·5 Mc/s., 1·7 Mc/s. to 32 Mc/s. Full specifications available.
Kit K/RG-1, 18 lbs., **£39 . 16 . 0.** P.P. 9/-.
Ready to use **A/RG-1, £53.** P.P. 9/-.
RA-1 Amateur Bands Receiver . . . Covers 10-160m. Half-lattice crystal filter at 1·6 Mc/s. Switched USB and LSB for SSB. Provision for fixed, portable or mobile users.
Kit K/RA-1 £39 . 16 . 0. P.P. 9/-.
Ready to use **A/RA-1, £53 . 0 . 0** P.P. 9/-.

***SEE HEATHKIT MODELS AT GLOUCESTER*-Bristol Rd. Tel: 29451. *LONDON*-233, Tottenham Ct. Rd., Tel: 01-636 7349**

Selection of Amateur Radio Equipment

LOWEST POSSIBLE INTEREST RATES TO ASSIST OWNERSHIP OF HEATHKIT MODELS

SB-301E Amateur Band Receiver . . . SSB, AM, CW and RTTY reception on 80 through 10 metres + 15 MHz WWV reception. Tunes 2 metres with SBA-300-4 plug-in converter.
Kit K/SB-301E, 23 lbs., (less speaker) **£140 . 12 . 0.** P.P. 9/-.
Ready to use **A/SB-301E, £170 . 12 . 0.** P.P. 9/-.

SB-401E Amateur Band SSB Transmitter . . . 180 watts PEP SSB, 170 watts CW on 80 through 10 metres. Operates "Transceive" with SB-301—requires SBA-404-1 crystal pack for independent operation.
Kit K/SB-401E, 34 lbs., **£157 . 10 . 0.** P.P. 10/6.
Ready to use **£192 . 10 . 0.** P.P. 10/6.
SBA-401-1 crystal pack, 1 lb., **£17 . 3 . 0.**

HW-30 2 Metre Transceiver . . . For fixed, portable, or mobile. Ideal for local and RAEN purposes. Input 5 watt. CC. Tunable regenerative RX. Size 9½"w, × 8"h. × 6" deep. (For 230v. operation if required)
Kit K/HW-30, 6½ lbs., **£26 . 8 . 0.** P.P. 6/-. Ready to use **A/HW-30, £36 . 8 . 0.** P.P. 6/-. **Kit GP-11** (Power Supply 6 or 12v. D.C.) **£10 13s.**
Ready to use **£13 13s.** P.P. 4/6.

SB-640 External LMO for SB-101 . . . Provides Linear Master Oscillator frequency control or either of two crystal controlled frequencies for a total of five frequency control options. Power supplied from SB-101 Trans.
Kit K/SB-640, 9 lbs., **£51 . 6 . 0.** P.P. 10/6. Ready to use **£56 . 6 . 0.** P.P. 10/6.

HD-10 All Solid-State Electronic Keyer . . . 15 to 60 w.p.m. with 10 to 20 w.p.m. slow speed option.
Kit K/HD-10, 6 lbs., **£23 . 12 . 0.** P.P. 7/6. Ready to use **£30 . 12 . 0.** P.P. 7/6.

GR-64E Short Wave Receiver . . . Covers 1 Mc to 30 Mc/s., plus 550 Kc/s. to 1620 Kc/s. AM band. Many special features for such a modest price. For 115, 230v, 50/60 c/s. A.C. mains operation.
Kit K/GR-64E, £22 . 9 . 0. P.P. 9/-. Ready to use **£29 . 9 . 0.** P.P. 9/-.

GC-1U "Mohican" General Coverage Receiver . . . 10 transistors, 5 diode circuit. Tunes 580-1550 Kc/s. and 1·69-30 Mc/s. in 5 bands. 6" × 4" speaker.
Kit K/GC-1U. £37.17.6. P.P. 10/6. Ready to use **£45.17.6.** P.P.10/6.

A complete line of test instruments for the Amateur Radio Station. The V-7A VFM and RF probe. The MM-1U Multimeter. The OS-2 Portable Oscilloscope and many more instruments are fully described in the latest Heathkit catalogue.

HEATHKIT®

DAYSTROM LTD., Dept. RB-9, GLOUCESTER

☐ Enclosed is £.....post paid U.K.

☐ Please send model(s).....

☐ Please send FREE Heathkit Catalogue.

NAME .....

ADDRESS .....

Prices and specifications subject to change without notice.

***BIRMINGHAM* - 17/18 St. Martin's Hse., Tel: 021-643 4386**

MEMBERS' ADS

CLOSING DATE FOR OCTOBER—11 SEPTEMBER *FORM ON PAGE 623*

FOR SALE

New mech. s.s.b. filter, 450 kHz £7. Heavy duty smoothing chokes and valves. 6V6 as new. Acos xtal. mic. £1. Wanted, overtone xtal. for 6·5 MHz. A. H. Parker, G3KH, 133 Station Road, Cropston, Leicester, LE7 7HH.

Last 20 yrs. of *Practical Mechanics* and *Radio Electronics*. Offers, will take *CQ* or *QST*, etc. or w.h.y. H. W. Hayne, 19 Calmore Gdns, Totton, Southampton, Hants.

Complete s.s.b. station, 80–10m. Tx heathkit HX20 with HP20 p.s.u., rx Hallicrafter SX111 with matching spkr., all manuals, Shure mic., 500 W auto. Operating desk. Deliver 150 mls. £155. J. A. Birley, G3PYN, 2 M.Q., Mundford, Thetford, Norfolk.

Labgear 3 bnd. quad kit in new condit., full instructions and all parts except bamboo spreaders £7 10s. plus carr. K. Wood, G3SME, Windrush, Hail Weston, Hunts.

Bulletins July 1935 to June 1946 bound six volumes, offers. H. Fenton, G8GG, 24 Cavendish Rd., St. Annes, Lytham St. Annes, Lancs.

14 in. scope. chassis, ideal basis for TV monitor £1. Stabilised p.s.u. 220V d.c. plus l.t.'s 15s. each. Modulation transformer, 100W £3 10s. Buyer collects. R. Wiltshire, 12 Leslie Rd., Winton. Bournemouth, Hants.

Tx 150 W plus. Rack units 6 ft. P.s.u., modulator wide band driver etc., £30 Hallicrafter SX28A £25. Wilcox Gay v.f.o. and manual 35s. Buyer collects. E. T. Manley, G2FU, 85 London Road, Kearsney, Dover.

Tx, a.m./c.w., 160-10m, 70 W, relay switching, p.t.t., xtal. cal. No. 10 freq. meter 250 Hz to 30 MHz, gd. condit. Wanted, 2 V sync. vibrator SSK9075A and xtals, 8782·5 and 10876·6, prefer HC6U type. R. Adair, GI3XGI, 16 Demesne Park, Holywood, Co. Down. Northern Ireland.

Lafayette KT320 rx, excellent condit. 550 kHz to 30 MHz, amateur bnds. elec. b/s., b.f.o., Q mult., a.v.c., m.v.c., a.n.l., S meter, £20. Buyer collects. Wanted cheap wkg. AR88 or Radiovision Commander and Joystick and gd. Joymatch. N. A. Mason, 60 St. Mary's Crescent, Ruddington, Notts.

Moving iron a.c., meter, 0-300 V, accurate, 15s. plus carr. 2s. Giant Lab. rheostat 200 W, 670Ω abt. 6 in. dia. with knob and all fixing screws 15s. post paid. I. Hazelton, 7 Dorset Road, Burnham-on-Crouch, Essex.

Exchange 1931–66 amateur magazines for any complete volumes of pre-war wireless periodicals, especially *Modern Wireless* Vol. 2 onwards, *Television-SW World* 1935–37, *Wireless Construction* magazine or weekly. or sell/buy. F. A. Herridge, G3IDG, 96 George Street Basingstoke, Hants.

2m Nuvistor converters (two for sale), both in gd. wkg. order. One with p.s.u., one without, send s.a.e. for details. P. Bentley, G3VUD, 3 Eddington Rd., Lytham St. Annes, Lancs.

National 190X g.c. and amateur bnd. rx in excellent condit., complete with matching spkr. Codar preselector and manual £55. M. Collins, 77 Townsend Rd., Tiddington, Stratford-on-Avon, Warks.

All copies of *Bulletin* from Dec. 1946 to June 1957 £5. Complete also *SWM* May 1947 to Apr. 1950 30s. Most subsequent numbers (to 1960) also available 12s. per doz. W. Miller, 13 Alder Rd., Glasgow S3.

P.s.u., 300 V £3. Rx, 20, 15 and 10m (no xtal. for 20m). Home brew, £20. Home brew f.e.t. f.m. rx. Numerous bits and pieces, buyer inspects and collects. W. B. Ringwood, G8ARY, 71 Wellfield Rd., Alrewas, Nr. Burton-on-Trent, Staffs.

CR100 rx wired with new set of valves, modified with S meter and manually variable n.l. In really f.b. condit. with manual and spare set of valves. S. J. Blaber, " Leylands ", Bolney, Haywards Heath, Sussex, Tel. Cowfold 367.

Hallicrafter HA4 transistor keyer with Vibroplex paddle £12. Heathkit RG1 rx gd. condit. £20. Heathkit QPM1, 465 kHz, Q mult., mint condit. £5. LM13 freq. meter 125 kHz to 20 MHz with p.s.u., recent calibration £10. E. Workman, G3RUD, 121 Norton Rd., Coleshill, Birmingham. Tel. Coleshill 2222.

Truvok tape deck Mk. 3 and amp. XK type K with spkr. £7 10s. Wkg. order, buyer collects. F. Croxson, 37 Canterbury Ave., Ilford, Essex. Lafayette HA350 rx inc. 160m. Used for 3 hrs. only. Give away price only £60. S. Jackson, G3CVG, 22 Brook Rd., Morecambe, Lancs.

McElroy RRD900/42 radio telegraph signal recorder, records c.w. and teletype on tape, 115 V a.c. i/p £4 10s. Carr. paid or swap for interesting but equally useless gear! Skybolt 16 × 15 binoculars, no case, £10 10s. M. J. Evans, GW3UCJ, 4 Gower Crescent, Baglan, Port Talbot, Glam.

Eddystone 888A £59. 640X £59 as new. Hallicrafters SX101A £75, amateur bands, s.s.b. (cost £225). Transceiver 2m, /M or /P, vibrator, a.m., c.w., QQV03-10, tunable £20. G6XM 2m converter, 28–30 MHz i.f. £7. S. Roberts, G3AQX, Cottage Farm, Wessington, Nr. Alfreton, Derby.

Eddystone S640 rx, excellent condit., new valves, realigned, no mods, ideal s.w.l., g.c. rx. Owner going amateur bnds. only £15 no offers, buyer collects. A. S. Anderson, G3VFM, 74 Oxendon Way, Binley, Coventry.

AP66862 Teleprinter terminal unit with home made p.s.u. (80/80 V) Sale £5 or exchange for high or low bnd. Pye Ranger. D. C. Chapman, G3NGK, 64 Heath Rd., Holtspur, Beaconsfield, Bucks.

Joystick antenna with new 4RF tuner (r.f. o/p meter) £5. RSGB Amateur Radio Handbook £1. IN2379 silicon rectifiers 100 mA, 4000 p.i.v., 6s. ea. (list £4 10s.) 4 for £1, new. G. Elliott, G3FMO, Oatlands, Southend Rd., Sandon, Nr. Chelmsford, Essex.

Labgear LG50 tx gd. condit.. £23 o.n.o. Complete 500 V d.c. mains p.s.u. £4 o.n.o. Parts to build 60 W a.m./c.w. tx, p.p. mod. transformer, all valves and chassis. Offers, all letters answered. M. L. Kinnersley-Taylor, Seaton Ryde, Tranwell Woods, Morpeth (2541), Northumberland.

CR100/7 with n.l. £12. vry gd. condit. Also partly constructed 40 W tx in steel cabinet, room wanted. W. Pearson, G3NSX 9 Long Lane, Limbrick, Nr. Chorley, Lancs.

Impending marriage forces sale of much beloved radio and hi-fi gear, CR150/4 rx, UA70/2 turntable and plinth, also Sunbeam Talbot 90 Mk. 3, s.a.e. list, all low prices. Martin C. Osment, G8AIP, 116 Parsonage Leys, Harlow, Essex.

Valves: ECL80, EB91, PCC84, Z749, 2001, D77, EF80, PCF80 (quantities available) 1s. each plus 6d. p. & p. on first valve plus 2d. on each additional valve. S. Butler, 50 Regent Drive, Fulwood, Preston, PR2 3JB. Tel. Preston 79237.

4CX250B soiled electrically OK 30s. each, swap a doz. plus an HRO with all coils and p.s.u. for an EC10. M. Perkins, G3PNI, 17 Durban Rd., Margate, Kent.

KW2000, d.c. p.s.u., home brew a.c. p.s.u., £150 o.n.o. P.s.u., 1750 V, silicon diodes with 813 and other lin. amp. parts £7 10s. Electronic keyer £12. RF24 with p.s.u., 4 MHz o/p £2. S. Whitehouse, G3OHN, 72 Rosemary Crescent, Woodsetton, Dudley, Worcs.

Three element 4m gamma matched beam, suitable /P use. Could deliver reasonable distance from N. E. Surrey. R. E. Piper, G3MEH, 13 Rydon's Lane, Coulsdon, Surrey.

RTTY, 7B, s. cover, base £25. P.s.u. 80/80 V £4. Auto-sender £5. Modulator 30 W. DL6EQ t.u. £5. Dulci 5 — 10 + 2 valve pre-amp. £12. Enclosure with spkr. £6. Autochange and Deram £3. Large Meccano set £5. Hornby '00' 3 rail, lots. S. L. Berry, G8ART, 159 Lancaster Rd., New Barnet, Herts.

MEMBERS' ADS members' ads MEMBERS' ADS members' ads MEMBERS' ADS

KW Valiant complete with transmit/receive rly. and info. £15. P.s.u. to suit Valiant £3. Sectional X aerial 5 ft 4 in., 7s. 6d., buyer collects, or will deliver within 20 mls. B. A. Harris, 14 Oxford Square, A.M.Q. RAF Locking, Weston-Super-Mare, Somerset.

Rx 1147B. Pathescope 9.5 mm movie camera, leather case, projector and case, roler blind screen in case, instruction books. Any offers. J. A. Bate, GW6WB, The Old Rectory, Marchwiel, Wrexham.

CR100 rx gd. condit., but rqs. alignment £15 buyer collects. S. Hopkins, 17 Mayfield Park, Fishponds, Bristol, BS16 3NH.

Linear Amp. ca. 1 kW, half power possible, with new final tubes, £40. C. Geng, G5ACX, 77 Kelvinbrook, West Molesey, Surrey. Tel. 01-979 6025 (after 1800 BST).

CRM1 RTTY tuning unit, less scope tube, offers. D. A. Evans, G3OUF, 80 Argyle Rd., Ealing, London, W.13.

Exchange Mosley RV4 4 bnd. g.p. ant. and most parts for a 2 813 lin. amp. inc. transformers, valves, cabinet, etc. for commercial quad or beam or good rotator with indicator. Flt. Lt. Ledger, G3UBL, 1 Conholt Rd., Andover, Hants.

DX100U tx 18 months old, factory checked, first class condit. £55 will deliver 100 mls. A. W. Rogers, G3SYZ, 143 Phillipers Garston, Watford, Herts.

Pye base station, 4m, tx, 20 W r.f. o/p, rx double conv., fitted with mute, both units self powered, housed in blue metal cabinet, as new condit. £25. S.a.e. for further details. P. E. Lindsley, G3UDV 47A St. Mary's Rd., Ealing, London. W.5.

Drake TR3 with matching RV3 remote v.f.o., spkr., 230 V p.s.u. type AC3 and unused spare valves, as new condit. £250. D. A. Barry, G3ONU, 67 Harcourt Rd., Bushey, Herts. Tel. 950 3091.

AR88 with circuit dia., gd. condit. plus spkr and cabinet £35. H. P. Jones, G3WPJ, 17 Bowood Rd. Taunton, Somerset.

Hallicrafter rx 130–210 MHz £11 o.n.o., wkg. but less S meter. Creed 3 teleprinter with p.s.u. (wkg on receive) £5 o.n.o. BC348 rx gd. wkg. order £12 o.n.o. Buyer collects. W. J. Eccleshall, 73 Piggots Way, Bishops Stortford, Herts.

Factory built Heathkit RA1 rx, 100 kHz cal. and spkr. Mint condit. £35 or exchange for mint EC10. M. T. Knights, G3TQY, Asher, Cross Road, Tadworth, Surrey.

Garrard LAB80 Mk. 2 transcription turntable with Deram cartridge and spare head. Perfect condit. Used only few hours, cost £35 accept £25 or swap for Garrard SP25 with cash adjustment. J. Binning, G3AJS, 293 Perry Street, Billericay, Essex.

Cossor ganging osc. 343 £5. 6 ft. rack rear side doors panels and chassis mostly uncut £5. 6 ft. rack £1. Stereo 10 W a.f. amp. £10. Sensible offers for G2DAF tx Mk. 2, 160–10m. N. H. Hyde, G3PJM, 91 Pelsall Lane, rushall, Walsall, Staffs. Tel. Walsall 21014.

LM14 with p.s.u., charts, handbook, new, offers or exchange w.h.y. D. H. Roe, G8AFG, 39 Station Rd., Drayton, Portsmouth, Hants.

HRO, 9 coils, resprayed cabinet, S meter, min. valve front-end, 6V6 o/p, p.s.u. £20 o.n.o. D. Fisken, G3WZD, 11 Thames Ave., High Halstow, Rochester, Kent. Tel HOO 397.

Swan 350 in prfct. condit. complete with xtal. cal. and Superior HB a.c. p.s.u., no mods., inspection invited, £190. A. W. Foster, G3GAH, 59 Orme Cres., Tytherington, Macclesfield, Cheshire.

Minimitter Converter, 1.5 MHz i.f., 80–10m., £7, p.s.u. £2. Cords with 3 p.v.c. insulated conductors, spade terminals, 54 in. long (ideal extension spkrs. etc.) 1s. each or 3 for 2s. 6d. (including p. and p.). Micro switches with 3 contacts 1 in. by ½ in. at 1s. 6d. each. J. K. Harvey, 22 Elm Grove, Bromsgrove, Worcs.

Heathkit Mohican and manual, little used, osc. rqs. attention £16 or swap for v.h.f. rx. G. A. Rigby, 12 Blenheim House, Whipcord Lane, Chester, Cheshire.

Relays 2 pole chngovr. 12–24 V, 700 Ω or 24–48 V, 6800 Ω, 5s. each or 5 for £1. Browns *F* headphones £2. Resistance meter 5–500 Ω 10s. All post free. M. Mann, G8ABR, 71 Queens Rd., Tewkesbury, Glos.

HRO MX rx, 9 g.c. coils in rack, spkr., phones and original p.s.u. £20 o.n.o. H. C. Pryse, 36 Hart Lane, Byfleet, Weybridge, Surrey.

Pye Ranger (Mobile) mdifyd 4m, b.f.o., a.n.l., trnstrsd front-end £10. AR88D manual 15s. Wanted mains p.s.u. for TW Communicator. J. Smyth, GI3AOB, "Strathleven," Toome Rd., Ballymena, Co. Antrim, N. Ireland.

Marconi valve voltmeter £3 10s. Monitor Type 25 a.c. p.s.u. £3. EMI scope type WM3. All reqr. a little attention. Wanted HRO MX manual, command tx. J. S. Liming, G3XNH, St. Leonard Fores Rd., East Horsley, Surrey.

Eddystone S640, £15. Igloo deluxe tent £20. Newnes Radio and TV servicing old models 30s. Woden UM3 mod. transformer 30s. W. G. Edwards-Hanham, G3FQC, Firecroft, 11 Lower Howsell Rd., Malvern Link, Worcs.

2m Labgear converter with built-in p.s.u., i.f. 10 MHz (built-in a.t.u.) Buyer collects or postage extra, Offers. T. Plumb, Banksfield, Haw Lane, Teadon, Nr. Leeds, Yorks.

Channel Master automatic rotator, used one week £15 o.n.o. W. K. Ginder, G3NAS, 222 Whetstone Lane, Aldridge, Staffs.

Heathkit RA1, clean, gd. condit., xtal. cal., matching spkr., QPM16 Q mult., (rqs attention) £30. M. J. Cooke, 76 Falcon Rd., West, Sproston, Norwich, Norfolk, NOR 73R.

New 12 V vibrators, two box tel., 32 ft. tubular steel telescopic aerial mast, R209 works well on a.m. and f.m. but rqs attention for c.w., spkrs and manual with set, Offers, Buyer collects. A Humphriss, 14 Fosseway Crescent, Tredington, Nr. Shipston-on-Stour. Warks.

Must clear shack. Rx's, tx's, mod., p.s.u.'s. convertors, preselectors, Q5er, HT11, a.t.u. relays, valves, hundreds of small components, must go in one lot. Club or dealer, £70. L. A. Wild, 1 Dig Dag Hill, Cheshunt, Herts. Tel. Waltham Cross 23452.

Top band tx with transistor supply £5 10s. Top band car radio converter £2. G3FIF whip base loading coil £2 10s. Modified Pye Reporter, mains operated, 4m. £6. F. D. Nurse, G3RBI, 10 Wenwell Close, Aston Clinton, Bucks.

Heathkit RG1, as new £30 o.n.o. Ancient Pilot radio with new valves, Long/Med/Short waves 35s. C. T. Hanley, G3VAC, 87 New Road, Chilworth, Guildford, Surrey. Tel Guildford 67613

KW2000A and a c. p.s.u. and Pye Reporter type mic., High Gain 14AVQ aerial, all at £200. AVO valve voltmeter CT38 gd. condit. £15. I. H. Crowther, GW3KLF, 8 Ffordd Pentre, Mold, Flints.

S.s.b. tx, 160–10m. complete with p.s.u. Transistorised to driver, Clevite filter, 6146, p.t.t., VOX, mic., cabinet £40. Twin beam scope 339 £8. C. T. Stagg, G3KPW, 62 Prospect Place, Grays, Essex.

Mobile, BC453 (Q'Fiver), Xtal. con. converter, BC454 (rqs. attention) £5. Vertical aerial (ZA11536) £3. Denco MTO1 25s. SCR522 30s. Xtals. FT243 type, 7 MHz (QTY 5) £1. Some SCR 522 spares, 832's etc. Offers plus postage. P. Gordon, GM3NXA, 2 Kintillo Road, Bridge of Earn, Perthshire, Scotland.

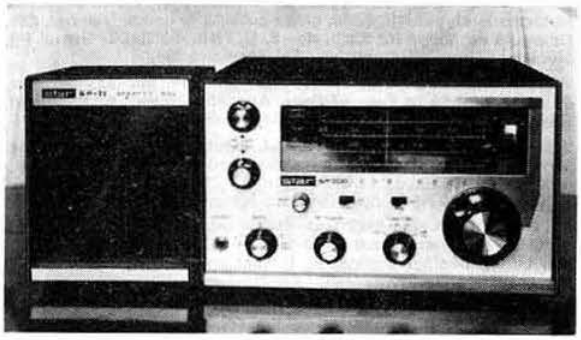
KW2000A with a.l.c. and a.c. p.s.u., HB Q mult. £175 o.n.o. C. Trusson, South Marston Manor, Swindon, Wilts. Tel (Daytime) Swindon 6251 ex. 54.

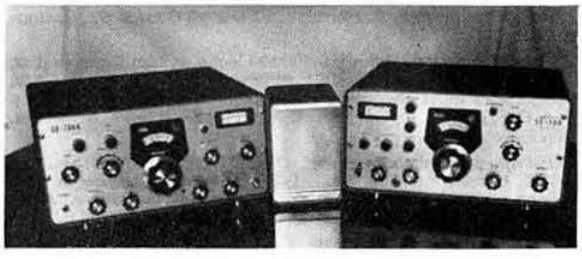
Four public address horn driver spkr. units £2 each. Two meta horns rectangular £3 each. Nikkormat hard leather camera case. unused £3. Nikkor reloadable cassette unused 30s. (all prices o.n.o.), D. Wilson, G8APS, 177 Dower Road, Four Oaks, Sutton Coldfield, Warks.

Command tx, 3–4 MHz, £2. Transformer 1000–0–1000 at 250 mA £2. V.h.f. tx Type 127, Lecher line tuning 10s. CV2799, QQV03–10 new, unused 35s. Rotary transformer 12 V to 300 V at 200 mA 7s. 6d. Carr. extra, G. R. Steele, GM3SIY, 28 Erskine Hill, Polmont, Stirlingshire. Tel OFA 43 2025.

Sideband, new mech. filter, 450 kHz, listed £10 sell at £7. Large ceramic 4 pole bandswitch, suit aerial tuner. PA turret studio xtal. mic. £2. Smoothing chokes. Wanted 6.5 MHz overtone xtal. A Parker, G3KH, 133 Station Rd., Cropston, Leicester.

SOMMERKAMP * * STAR * INOUE *





I promised you some more pretty pictures and here they are—Star ST-700, £135; Star SR-700, £115; Star SR-200, £40; Inoue IC-700R, £85; the matching Tx and p.s.u. also available at £80 and £30 respectively—or as a package deal £180 the lot.

Hansen SWR bridge, £3 10s.; Katsumi electronic keyer, £7 15s.; Monitor, £7 15s.; TE-18 G.D.O. £11 10s.; Tech VTVM, £16; Speech compressor, £7 15s.; Converters 21 or 28 mc/s, £9 10s. These and other choice bits and bats will be on Stand 18 at the RSGB show.

Sommerkamp—certainly, but as I sell the stuff as fast as I can get it, there's not much point using up advertising space.

Secondhand stuff—lots of it, and all A1, just give me a yell if you want something.

Send a large S.A.E. for lists.

NEW, NEW, NEW——

For the benefit of you chaps down South, we are opening up a small branch in the Brighton area where you can go along and play with the latest gear. Alan Whitford, G3MME, will preside—his outstretched hand ready to pluck the wallet from your nerveless fingers, his beady little eyes glittering like P holes in the snow. Brighton, they tell me, is the land of the Wide Boys—I am studying spivery at night classes. No longer do I sell you a beat up s/hand falling-to-pieces rig at £100 but I can do you a nice rig at 1½ less 10 and I should be ruined already.

Anyway, by the time you read this we should be fixed up, so if you want to twiddle knobs and things give me a yell and I'll tell you where to go. (That doesn't sound very nice!)

Service—

still up to the eyes but we can cope if necessary.

DON'T FORGET—MAKE A DATE FOR STAND ONE-EIGHT AND DON'T BE LATE, 'COS THE SHOW WILL BE GREAT.

And that, Gentlemen, shows you the depths of depravity to which Bill Lowe will sink.

73,

THE BANDIT

J. B. LOWE

50-52 WELLINGTON STREET, MATLOCK, DERBYS.

Telephone: MATLOCK 2817 (or 2430 after 6 p.m.)

MEMBERS' ADS members' ads MEMBERS' ADS members' ads MEMBERS' ADS

2C39A 20s. ea. Also, 6SN7, 6SK7, EF50, OM6, EF36, ECC81, EF80, 12AT7, 6060, EF91, PL81, PY80, PY81, PCC84, ECL80, PY32, 10P13, 7AU7, PCL84. Any six 10s. Wanted, unmodified PCR3, state details, G. A. Jeapes, 165 Cambridge Rd., Great Shelford, Cambridge.

160m mobile tx (10 W) p.s.u., ant. base, rx convertor, £15. Tiger TE200 tx. idles at 150 W £45. RX208 in original crate £4, CR100 £15. R. V. Tunstill, G3OET, 21 Chaucer Rd., Chelmsford, Essex.

CR100, gd. condit. £13 10s. o.n.o., buyer collects, 100 W mod. transformer, new, £3. J. Whiltshire, 12 Leslie Rd., Winton, Bournemouth

Transistor u.h.f. tuner, modified for 70 cm TV, plugs into aerial socket of a domestic TV, 39s. Valve unit ditto., 12s. 6d. Mohican £19. Marconi sig. gen. 16–150 MHz 25s. s.a.e. for details. Wanted Heathkit scope. T. S. Glazier, G8ABQ, 8 Ombersley Road, Worcester.

G.d.o., 7–210 MHz, 7 ranges, built-in a.c. p.s.u. and d.c. meter amp., Accurate calibration, separate probe unit, first £7 10s. secures, p.and p. 15s. RCA 3 in. oscilloscope £4 10s., p. and p. £1 or collect either item. R. C. Hills, G3HRH, 73 Warren Way, Digswell, Welwyn, Herts. Tel. Welwyn 4769.

Rx. 1147B 180–220 MHz unodified with r.f./i.f. acorn valves, circuit, £2 10s. BC453 200–550 kHz, Q 5er, 12K8 missing £2 10s. Minimitter Low pass filter 75 Ω design impedance, cut off freq. 36 MHz, 30s. M. J. Darkin, G3KTH, 4 Ashdrive, Catshill, Bromsgrove, Worcs.

TW Topmobile rx with transistorised voltage regulator for 12 V operation if required. Minimitter mobile tx, 15 W, 160/80/40 with control unit. Offers. Wanted Geloso G222TR, 2m and 4m commercial convertors. W. H. Fletcher, G3WXT, Holmdale, Martin, Lincoln.

Canadian No. 52 rx, 1.75–16 MHz, Pi a.t.u., mains p.s.u., geared slow-motion drive (very useful on 20m) £12 D. J. Benham, 77 Baldock Rd., Letchworth, Herts. Tel. Letchworth 6392.

Two, Zenith variac transformers 0–270 V at 8 A., 2 KVA, weight 30 lbs. £5 10s. each, buyer collects or carr. extra, s.a.e. please. J. H. Lepper, GM3JHL, 42 Inch Crescent, Bathgate, West Lothian, Scotland.

Pen recorder, new, offers. Wanted KW2000 and a.c. p.s.u., s.a.e. to A. E. Peake, GW3SRG, 70 Higher Lane, Mumbles, Swansea.

RSGB Bulletin, 20 copies mainly 60-61. *SWM* 65 copies mainly 57-61. 30s. the lot, inland carr. paid. C. D. Lewis, G3NHL, The Willows, Nuns Meadow, Gosfield, Halstead, Essex.

Manual for BC221 freq. meter, offers A. H. Peperell, G3TOP, 55 Broom Hill, Cookham, Berks.

Fisher 30 W mono. amp., 417A low noise triodes for v.h.f., International xtal. 100 kHz cal. with p.s.u., precision d.c. millivolt meter, 2m. tx/rx transistorised in box. Wanted coils and parts for HRO. K. H. Kanalz, G5AGX, 6 Marzena Court, Whitton Dene, Hounslow, Middx. Tel. 01 894-6880.

HC-6/U xtals. (50) 3rd overtone 50·9-51·4 MHz, Fundamentals 3·3 6·6, 16·5 MHz, 5s. ea., £5 the lot. Command rx 6-9 MHz usual mods perfect £3. R209/2 rx 1-20 MHz, phones 12 V, £7. R. Johnston, GI3HCG, 6 Beechdene Drive, Lisburn, Co. Antrim. Tel. Lisburn 2473.

Panda tx PR120V full wkg. order, spare valves, delivery up to 50 mls. £27 10s. A. Brown, G2WQ, 10 Glebelands Rd., Prestwich, Manchester.

R.f. sig. gen. 100 kHz to 30 MHz £3. Valve tester and Multimeter part of test set I-56-D with instructions £5 o.n.o. General Radio audio power meter, multi impedance £3 o.n.o. Unused QQV06-40A. 30s. P. J. Kerry, G8AUZ, 47 Cottenham Road, London, E.17.

Collins 32V1 150 W c.w./120 W phone tx, fine condit. with autotrani., manual and 2 spare 4D32. P.a. valves, buyer tests and collects or deliver 50 mls. £42 10s. H. J. Caldwell, G8US, 3 Milton Ave., Bath, Somerset.

AR88 tuning gears 18 tooth ¼ in. bore, 9s. 6d ea. Handbook, top-band rig in case. £12. C. G. James, G3VVB, 63 Halkincroft, Langley, Slough, Bucks. Tel. Slough 28014.

Sig. gen. type 52A in transit case £7 10s. carr. paid. Howard Bantam Rotavator with plough, tines, grass cutter and hedge trimmer, £55. Or would exchange for s.s.b. rig. E. S. Fish, GM2HCZ, Gravel Pit, Moniaive, Thornhill, Dumfries. Tel. Moniaive 345.

W1191A wavemeter with 1 MHz xtal., h.t. unit, but less acc., £2. *Bulletins* Jan. 59 to Dec. 67 (less Apr. 60) Offers. A. Longfield, G3PVV, 17 Highfield Villas, Langold, Worksop, Notts.

Eddystone 888A, immaculate condit. mech. and elec., recent test showed equipment well up to makers spec., reason for sale, going transceive £75 o.n.o. Lt. P. D. Smith, G3PNM, HQ Mess Royal Signals, Blandford Camp, Blandford Forum, Dorset.

Hallicrafters SX100, matching spkr., gd. condit. Valves 5763, 6CH6, KT88. Transformer 450-0-450. Handbooks Fiat 600, Peugeot 203, Offers postage please. R. L. Edinton, G3AGF, 8 Springfield, Kenworth, Nr. Derby.

HQ180 as new with auto-transformer and handbook, £100. HRO table model, p.s.u., 8 coils, full set b.s. coils inc. 21 MHz, handbook, gd. condit. £25. P. H. Askew, 96 Main St., Sedbergh, Yorkshire. Tel Sedbergh 236.

Commercial 18 W o/p v.h.f. base stn. tx and rx (close to 2m. bnd.) QQV03-20A p.a., mains operation, both £15. Dummy loads, 50 and 75 Ω Electrosil H39 with pryrex base, 30s. ea. T. R. Preece, G3TRP, 28 Stoneyfield Rd., Old Coulsdon, Surrey, CR3 2HG. Tel. 71 52138.

BC348 with built-in p.s.u. and S meter, £15 inc. tatty separate spkr. Garrard transcription player with stereo-mono head, £10. Numerous smaller items, s.a.e. for list. J. Hum, Houghton on the Hill, Leicester.

Top Bnd. tx with transistor p.s.u., £5 10s. Top bnd. car radio converter, £2. Base loading coil, £2. Modified mains Pye Reporter 4m, £6. F. Nurse, G3RBI, 10 Wenwell Close, Aston Clinton, Bucks.

888A, S meter, spkr., mounts, £65. LG300 FR valved, no p.s.u., £15. Minimitter Mercury, complete, needs attention, £15 buyer collects. N. Hales, G2DTO, 4 Westbrook Road, Thornton Heath, Surrey. CR4 8PS,

DX40U VF1U professionally built, £30. K.W. Valient tx and p.s.u. 160-10m. £25. HRO p.s.u. g.c. and b.s. coils, new capacitors PR30 £10. Delivery arranged s.a.e. details. F. J. Sweeney, 58 Grosvenor Rd., Epsom Downs, Surrey.

Mohican GC1U gd. wkg. order, manual, sep. S Meter, 100 kHz xtal. cal., mains p.s.u., £17. Pye Reporter, part modifd. 2m, manual, £2. Set of 4 xtals. for 150 kHz filter with carrier xtal., £3. T. Holbert, GM3DXJ, 19 Thomson Dve, Currie, Midlothian.

Hallicrafters SX62A, £100. SX110, £40. HA230, £17. EC10, £35. All in new condit. Eddystone 840C used only 10 hrs., as brand new, £45 or exchange for mint HA350. S. N. Andrews, 34 Rawcliffe Lane, Clifton, York.

Heathkit GC1U Mohican factory built few weeks ago, mint, £28. B44 Mk2 fully converted for 4m (transceiver) built-in vib., tunable rx, 4 xtals, £8. Both items plus carr. K. A. Ballance, G3KNB, 8 Oak Ave, Walton-on-the-Hill, Staffs.

Will exchange 1931-66 amateur magazines for any complete volumes of pre-war wireless periodicals, *Bulletins* August 1929, January 1930, July 1933 or RSGB Annual Log Book 1928 and supplements, or sell/buy. F. A. Herridge, G3IDG, 96 George St., Basingstoke, Hants.

GEC Miniscope, transistor panels, 600 V p.s.u., 80m Command rx, valves odd, xtals, set filter xtals, RF27 unit, bound volumes *SWM*, components must clear, very cheap, some free, call and inspect. S. J. Coe, G3FCT, 8 Priory Rd., Davington, Faversham, Kent. Tel. Fav. 2902.

NCX3 with xtal. cal., p.s.u., mike., £100. BC221Q, charts, p.s.u., £15. NC105, transformer rqs. attn., £15. Defunct homebrew tx with Geloso 4/104 v.f.o., £10. Carr. extra. Free junk for callers. A. H. Bridgman, G3BAA, 393 Redmires Rd., Sheffield S10 4LE. Tel. OSH2 32955.

ANNOUNCING A GREAT NEW TRIO SYSTEM

PS-500AC

POWER SUPPLY AND SPEAKER

● Utilizes a silicon voltage rectifier to supply the high 900 V requirements of the TS-500 transceiver ● B supply lines requiring 300 V and less are taken from the centre of the capacitor stack and voltage dropping resistors are used in series to form the 200 V and 150 V supplies ● A half wave silicon rectifier circuit is used to obtain block bias voltage of 120 V ● Two 12.6 V 3 amp. secondary windings supply heater voltages for the transceiver valves ● The primary windings are connected for operation from 230 V line sources ● The power supply jack incorporates speaker line terminals, as well as the power transformer primary connections so that AC power switching is made from the transceiver ● Incorporates specially designed 6½ in. communications speaker—frequency range 150—5000Hz. ● Size 7½ × 8⅝ × 11⅞ in.

TS-500 SSB TRANSCEIVER

● Precision, double gear tuning mechanism and linear tuning condenser provides 1kHz direct reading divisions on all bands ● Besides SSB, AM (A3H) and CW communication is provided ● Operates with a max. input of 200 W PEP on SSB and CW ● Undistorted output more than 1 W ● Covers all amateur bands from 3.5 to 29.7 MHz with a 7 band tuning system in both transmitting and receiving modes ● Double conversion type superheterodyne receiver ● Solid state VFO circuitry assures high stability performance ● Receiver sensitivity 1μV S/N 10 dB (14 MHz), Selectivity 2.7 kHz (—6dB) 5.0 kHz (—55 dB) ● Xmitter audio freq. 300-3000 Hz (—6 dB) ● Uses 17 valves, 3 transistors and 15 diodes ● New Trio developed crystal sideband filter provides superior shape factor and clear, crisp SSB quality ● Highly effective AGC circuit prevents fading, permits easy reading of signals ● Built-in crystal calibrator circuit works with 500 kHz, 1 or 3.5 MHz crystals ● RIT circuit for fine receiver tuning ● Built-in circuits include VOX, PTT, ALC, RIT, CAL, RF-HV METER, connections for ext. VFO and ALC ● Used with a remote VFO a special switching circuit permits, in effect, the operation of two transmitter/receivers ● Power supply from sep. PS-500AC unit ● Size 13 × 8⅝ × 11⅞ in.

VFO-5

VARIABLE FREQUENCY OSCILLATOR

● Equipped with the same high precision double gear dial mechanism and linear variable frequency capacitor as the TS-500, enabling direct reading of frequencies at 1 kHz intervals ● Oscillator frequency range covers all the amateur bands, as the TS-500 ● Built-in crystal oscillator section assures crystal controlled transmitting/receiving ● Unlike ordinary VFO units, this VFO permits four different functions through the utilization of a "criss-cross" function switching scheme ● Outstanding frequency stability due to cool operating all transistor circuitry, adoption of a Vaccar oscillator circuit and temperature compensation features ● Rugged LC box and solid construction throughout make this unit practically impervious to mechanical shocks ● All power requirements are taken from the transceiver through a single connecting cable ● Uses 4 transistors and 2 diodes ● Size 7⅞ × 8⅛ × 6 in.

COMBINED PRICE £203.0.0

PRICE £28.0.0

Illustrated Technical Information Leaflet on Request.

SOLE UNITED KINGDOM AGENTS AND DISTRIBUTORS

B.H.MORRIS & CO.(Radio) LTD

84-88 NELSON STREET, TOWER HAMLETS, LONDON, E.1. Tel.: 01-790 4824

Please send me full illustrated literature on all TRIO Communications Equipment

NAME _____

ADDRESS _____

_____ RC/1

My nearest TRIO stockist is:

MEMBERS' ADS members' ads MEMBERS' ADS members' ads MEMBERS' ADS

Codar AT5 tx less p.s.u., £9 10s. Carr. extra. S. J. Down, G3USE, 59 The Crescent, Caddington, Luton, Beds.

Eddystone EC10 mint, mains p.s.u. and LR phones, £30. T. Halstead, G2AL, 9A Rosebery Rd., Boscombe, Bournmouth, Hants. Tel. Bournmouth 46851.

AR88D £25 also PR120V £20, buyer collects. E. T. Ward, G3JWC, 21 Rangemore St., Burton on Trent, Staffs.

Woden UM2, other transformers, clearing components, surplus Bulletins from 1938, PW etc., s.a.e. list. A. D. Besford, 49 Blake Rd., Gt. Yarmouth, Norfolk. Tel. Gt. Yarmouth 2677.

Clearing out shack, spares at give away prices, valves acorns to 813s, transformers, chokes, p.s.u., AR88, SB10, v.t.v.m., s.s.b. spares, all letters answered. R. Wilkinson, Kingsborough Lodge, Chequers Rd., Minster, Sheerness, Kent. Tel. Minster (Sheppy) 2157.

Components for high power equipment, mains and mod. transformers, variable and high voltage fixed capacitors, meters, Eimac valves etc., back issues of *SWM* and *CQ*, enquiries with s.a.e. S. R. Kharbanda, G2PU, Ivett Lodge, 39 London Rd., Harston, Cambridge. Tel. Harston 454.

Codar AT5 and mains p.s.u., £18. Eddystone 640 rx unmodified, £10. Class D wavemeter 6 V a.c., wkg., £3. B3 xtal. mike., £2. R.f. field indicator 1-250 MHz, £2. D. L. Griffiths, GW3XHG, 33 Coburn St., Cathays, Cardiff. Tel. Cardiff 40860.

AR88LF in vry. gd. condit. with manual, £30 o.n.o. Will deliver 50 mls., evening or Sunday viewing. G. Todd, 52 Trevor Cres., St. James, Northampton.

Panda Cub late model gd. condit. will deliver up to 50 mls., £24. A. E. Beardsley, G3XKT, 14 York Ave., Sandiacre, Notts. NG10 5HB, Tel. Sandiacre 2554.

Collins " narrow " F455 mech. filter, swap Collins F455J21 mech. filter 2·1 kHz wide 6dB down, s.f. 1 : 1·5. N. K. Booth, G3SYC, 49 Park Ave., Normanton, Yorkshire.

KW Valiant with screen mod., £20 o.n.o. Top Band mobile tx 6 × 6 × 9 in., £7 10s. Command rx 3-6 MHz, £4, consider exchange for equipment ex-pirate Codar tx, v.f.o. needs re-cal. No front panel. N. Ashman, G3NSI, 33 Nesbit Rd., Co. Durham.

Codar PR30 offers, J. E. Temple, G3AXI, 4 Coquetdale Place, Bedlington, Northumberland.

Eddystone rx S750 with S meter and mains filter gd. condit., unmarked, £40 o.n.o., prefer buyer collects or carr. extra, can be seen any evening after 6 p.m. J. R. Easton, GM3VXR, 70 Leven St., Motherwell, Lanarkshire, Scotland.

Mk1 vertical aerial 32 ft. whip etc., £3 10s. KW trap dipole, £4, prices inc. carr. H. Tonks, 11 St. Edwards Rd., Bournbrook, Birmingham 29.

Standard 19 in. equipment rack, £4 19s. 6d. TF144G, £19 10s. TF517, £10 10s. 4X150A, 15s. 500 W isolating transformer, £7 10s. AR88D, S meter. BC453 spkr., spare valves, £38 10s. o.n.o. Philco rx 22 valves 100 kHz to 18 MHz, £4 10s. o.n.o. D. Byrne, G3KPO, Jersey House, Eye, Peterborough. Tel. Eye 351.

Creed 85R keyboard typing reperforator mint, £25. Heterodyne freq. meter 20-280 MHz similar BC221, £25. Spares for Creed 7B, 85R, s.a.e. for list. RA1 rx with manual, £28. Carr. extra, all items o.n.o. I. S. Partridge, G3PRR, 104 Grange Drive, Stratton St. Margaret, Swindon. Tel. SSM 2222.

Moving coil meters, flush mounting, 3·25 in. dia., 0-200 μA,0-500 mA, 11s. 6d. ea. Valve check meter for Eddystone 358X rx 12s. 6d. National type N dial 4 in. with vernier, offers, s.a.e. with enquiries, H. Beadle, G8UO, 12 Cartmel Rd., Keighley, Yorks.

G.P.O. lattice mast sections 12 ft. 6 in. lengths, triangular section, £3 15s. ea. Four 50 ft., £12, buyer collects. C. Howard, G8BBY, Toll House, Watling St., Watford, Rugby, Warwickshire.

HA350, 160-10m 115/230 V, xtal cal., spkr., handbook, mint condit. original packing, will deliver up to 100 mls., gone transceive, £65 o.n.o. B. E. Dean, G3OIX, Starbeck Swimming Bath, Spar Lane, Harrogate, Yorks.

HRO rx 230 V p.s.u., band spread coils gd. condit., £15. Figured Oak reflex cabinet sand filled with Goodmans 8 in. 15 Ω spkr., vry. gd. condit., buyer collects, £10. C. Collins, G8SC, Calumet, New Rd., Ridgewood, Uckfield, Sussex.

Lafayette KT320 new condit., gd. wkg., £20 o.n.o. AVO sig. gen. gd. wkg., £3. Have other odds and ends, meters etc. W. H. Dyer, 60 Gilbourne Rd., Plumstead Common, London, S.E.18.

LG300 r.f. unit, working plus 1000 V transformer if rqd., first reasonable offer secures, regret buyer collects. Kokusai mech. filter MF455-15K unused complete with literature, £7 post paid. J. A. Crux, G3JAG, 16 Wiltshire Close, Bedworth, Nuneaton, Warwicks.

Eddystone 504 rx, £18, AVO (electronic), £15, Decca stereo amp. 4 W ea. channel, £5, AVO 8 Mk2 brand new, £18. Valves/components state wants, sell or exchange 70cm/2m gear. P. W. Barnet, G8BIZ, 85 Harwood Hill, Welwyn Garden City, Herts.

Mini-ten beam, £5, prop pitch motor, £4, CH33 6 ele. beam, 35s., TS184A 70cm cavity, £4, RT34-APS13, £5, Type 846 r.f. e.h.t. generator, 35s., 58 set, £2, buyer collects or post extra. B. Robertson, 12 Hazel Close, Mildenhall, Suffolk.

Heathkit RA1 amateur band rx, very. gd. condit., £25, Joslin, 13 Talbot Rd., Skegness. Tel. 4185.

Brand new 6 in. Xpelair, £7. Murphy B585 v.h.f. a.m. transistor needs atten., £2. TU7B and R1155, 50s. ea., Wayne Kerr CT53 freq. meter 8-290 MHz, perfect, £17. Cadenza ribbon mike, with case, as new, £7. please add carr. F. J. Crisp, Carnmenellis House, Carnmenellis Redruth, Cornwall. Tel. Stithians 501.

All parts to build a 60 W a.m./c.w. tx (mod. p.p. 6L6). Also a 500 V mains p.s.u. Offers. 19 set main 4-gang tuning condenser. Required urgently cheap HRO, all letters answered. M. L. Kinnersley-Taylor, G3WTA, Seaton Ryde, Tranwell Woods, Morpeth, Northumberland. Tel. Morpeth 2541.

Image orthicon camera control unit ex BBC field equipment, Offers. G3FIF 80m. loading coil, £1 10s. R. F. Furness, G3RUI, 17 Hillingford Ave., Great Barr, Birmingham.

LR2 freq. meter (160 kHz to 60 MHz) and sig. gen., brand new, £65. Audio osc. TS332C/U 20 Hz to 200 kHz, £40. Alfa multimeter brand new, £3. Also have scopes, meggers, micro-wave equipment. C. Goldman, Apt 6, 36 West Heath Rd., Hampstead, London, N.W.3. Tel. 01 453-2663.

19 set Mk3 in gd. wkg. order with a.c. p.s.u. (for rx only) resprayed case, b.f.o. needs slight attention, £7 10s., also 11 in. TV in gd. wkg. condit., cabinet fair, £2 10s., buyer collects or arrange collection for both, will sell separately. A. M. Laird, The Tower, Patna Rd., Kirkmichael, Ayrshire.

2m transistor converter, homebrew AF186 r.f., AF178 mixer, i.f. 4-6 MHz or can change if xtal. available, £5. S. Williamson, G3WGU, 3 Beaufort Ave., Bispham, Blackpool. Tel. Blackpool 53126.

Labgear LG50 tx, recent, new mains transformer, p.a., and other valves. Mods now T9 note. C. Brown, GW3OIM, Cartreff, 125 London Rd., Holyhead, Anglesey.

Hvy. duty smoothing chokes, few 6V6 valves cheap, studio xtal. mike, £2. Large 4 gang ceramic bandswitch suitable antenna tuner or turret in p.a. Wanted xtal. 6·5 MHz. A. Parker, 133 Station Rd., Cropstow, Leicester, LE7 7HH.

2m and 70cm tx's, converters, p.s.u. and modulator in 19 in. aluminium rack, tape recorders, G2DAF rx, 20 W amp., pre-amp., many chassis and spares, exchange Hammond electronic organ. Offers G. Parris, G3XFW, 2 Ashford Grove, Yeovil, Somerset.

Miniature TV camera, new U.S.A. Vanguard Model 501 transistorized, complete Vidicon and lens, £75 or exchange 2m. tx/rx. P. Landor, G3AME, Old Bank Chambers, Station Rd., Horley, Surrey.

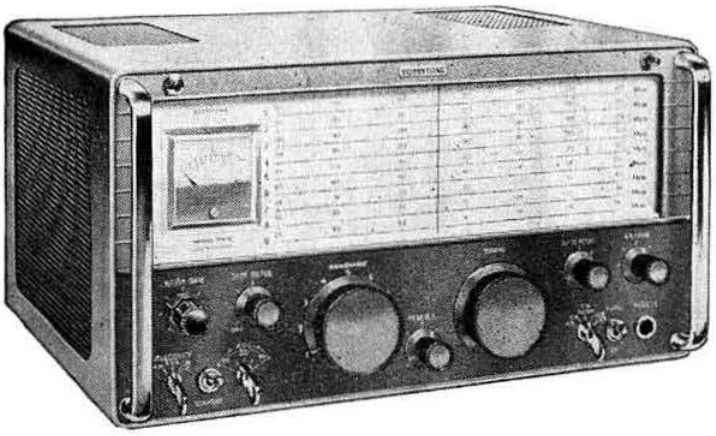
Continued on page 621

Eddystone

BRITISH MADE

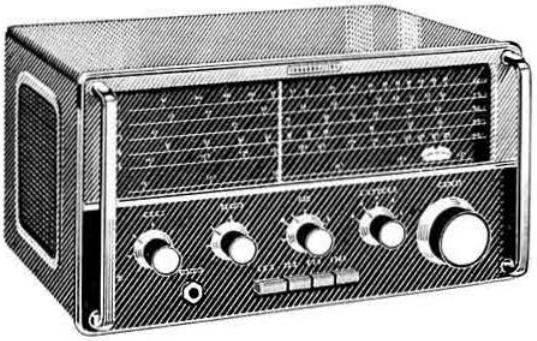
Amateur communications receivers

EA12



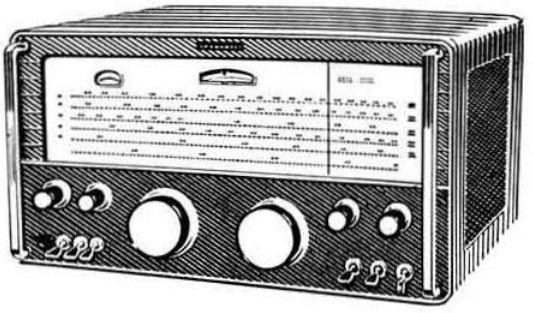
An amateur bands double-conversion superheterodyne receiver, for a.m, c.w, and s.s.b reception. For all amateur channels between 1.8 MHz and 30 MHz in nine 600 kHz bands with 28 MHz to 30 MHz in four bands.

Primary features. Crystal-controlled 1st oscillator, 2nd oscillator with continuously variable selectivity to 50 Hz, muting switched or by external relay, twin noise limiters, for a.m/c.w, and s.s.b, short-term drift better than 20 Hz and less than 100 Hz in any one hour, 'S' meter calibrated in nine levels of 6 dB and dB levels beyond 'S9', two a.g.c time constants, deep slot filter, independent r.f, i.f, and audio gain controls with outputs for f.s.k and panoramic adaptor.



EC10 communications receiver

The fully transistorized EC10 communications receiver, supreme in its class, covers both medium-wave broadcasting and all shortwave service to 30 MHz. Incorporating the famous Eddystone tuning drive, with logging scale and auxiliary vernier, shortwave reception is particularly simple. Battery-operated or from optional a.c mains unit.



940 H.F communications receiver

An outstanding 13-valve receiver with two r.f and two i.f stages, silicon diode noise limiter circuit and high quality push-pull output. Built to a professional specification, facilities include provision for c.w, a.m, and s.s.b reception over the range of 480 kHz to 30 MHz in five bands. Suitable for 110/125 V and 200/250 V. 40-60 Hz a.c mains.

Comprehensive information from your Eddystone distributor or: Eddystone Radio Limited, Eddystone Works, Alvechurch Road, Birmingham 31. Telephone: 021-475 2231. Telex: 33708

A MARCONI COMPANY

LTD/ED551

RADIO SOCIETY OF GREAT BRITAIN

FOUNDED 1913, INCORPORATED 1926

MEMBER SOCIETY INTERNATIONAL
AMATEUR RADIO UNION

PATRON: H.R.H. THE PRINCE PHILIP, DUKE OF EDINBURGH, KG

COUNCIL 1968

PRESIDENT	J. C. GRAHAM, G3TR
EXECUTIVE VICE-PRESIDENT	J. W. Swinnerton, TD, B.Sc.(Econ), G2YS
IMMEDIATE PAST PRESIDENT	A. D. Patterson, B.A.Sc., GI3KYP
HONORARY TREASURER	N. Caws, FCA, G3BVG

ORDINARY ELECTED MEMBERS

B. Armstrong, G3EDD
J. Etherington, G5UG
E. G. Ingram, GM6IZ
L. E. Newnham, G6NZ
R. F. Stevens, G2BVN
G. M. C. Stone, C.Eng., MIEE, MIERE, G3FZL
E. W. Yeomanson, G3IIR

MEMBERS ELECTED BY ZONES

R. J. Hughes, G3GVV
A. F. Hunter, GM3LTW
H. E. McNally, GI3SXG
F. K. Parker, G3FUR
J. R. Petty, G4JW
D. M. Thomas, GW3RWX
G. Twist, LLM, G3LWH

SECRETARY	C. P. Pope, BRS29906
GENERAL MANAGER	A. E. Dowdeswell, G4AR

REGIONAL REPRESENTATIVES

Region 1.—North Western.	B. O'Brien, G2AMV, 1 Waterpark Road, Prenton, Birkenhead, Cheshire.
Region 2.—North Eastern.	K. Sketheway, BRS20185, 51 Baret Road, Walkergate, Newcastle upon Tyne.
Region 3.—West Midlands	R. W. Fisher, G3PWJ, 63 Swan Crescent, Langley, Oldbury, Warley, Warwickshire.
Region 4.—East Midlands.	F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
Region 5.—Eastern.	S. J. Granfield, G5BQ, St. Lukes, 47 Warren Road, Cambridge.
Region 6.—South Central.	L. W. Lewis, G8ML, 34 Clevelands Avenue, Cheltenham, Gloucestershire.
Region 7.—London.	P. A. Thorogood. G4KD, 35 Gibbs Green, Edgware, Middlesex.
Region 8.—South Eastern.	D. N. T. Williams, G3MDO, Seletar, New House Lane, Thanington, Canterbury. Kent.
Region 9.—South Western.	J. Thorne, G3PQE, Jessamine House, Chapel Allerton, Axbridge, Somerset.
Region 10.—South Wales.	C. H. Parsons, GW8NP, 90 Maesycoed Road, Heath, Cardiff, Glam.
Region 11.—North Wales.	M. Williams, GW3LCQ, " Dwyros," 12 Penrhos Avenue West, Llandudno Junction, Caerns.
Region 12.—North-East Scotland.	J. MacIntosh, FCCS, MIERE, FAIA, GM3IAA, Broom Park, Cradlehall, Inverness.
Region 13.—South-East Scotland.	G. P. Millar, GM3UM, 8 Plewlands Gardens, Edinburgh 10.
Region 14.—West Scotland.	N. G. Cox, GM3MUY, 191 Maxwell Avenue, Westerton, Bearsden, Glasgow.
Region 15.—Northern Ireland.	J. Thompson, GI3ILV, " Albany," Newry Road, Armagh, N. Ireland.
Region 16.—East Anglia.	W. J. Green, G3FBA, Meadway, Links Avenue, Brundall, Norwich, Norfolk, NOR 86Z
Region 17.—Southern.	L. Southwell, G3JLS, 15 Hollybank Road, Hythe, Southampton, Hants.

CERTIFICATES MANAGER	C. R. Emary, G5GH, c/o RSGB HQ.
INTRUDER WATCH ORGANIZER	C. J. Thomas, GW3PSM, 59 Maendy Way, West Pontenwydd, Cwmbran, Monmouthshire.
PUBLIC RELATIONS OFFICER	Mrs Sylvia Margolis, 95 Collinwood Gardens, Clayhall, Ilford, Essex.
QSL BUREAU MANAGER	A. O. Milne, G2MI, 29 Kechill Gardens, Bromley, Kent.
RECORDED LECTURE LIBRARY CURATOR	A. O. Milne, G2MI, 29 Kechill Gardens, Bromley, Kent.
SLOW MORSE PRACTICE TRANSMISSIONS ORGANIZER	M. A. C. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.
V.H.F. MANAGER	G. M. C. Stone, G3FZL, 11 Liphook Crescent, Forest Hill, London, SE23

QTC

OUR 70cm BANDS
ICELAND GETS 4M
ECLIPSE SURVEY

The 70cm Band

The GPO have advised the Society of changes which will shortly be made in the existing band of 427 to 450 MHz. A new service has come into operation on this band and the amateur frequency allocation has been re-arranged to take account of this. On the effective date (which has yet to be notified) the frequency limits will be 425 to 429 MHz and 432 to 450 MHz.

Members will be aware that by the terms of footnote 319 to Article 5 of the Geneva Radio Regulations, 1959, in the UK, the 70cm band is allocated on a primary basis to the radiolocation service and on a secondary basis to the amateur service.

Iceland Licensed for 70 MHz

TF3EA (Reykjavik, Iceland) has recently received a licence to operate on the 70 MHz amateur band. The licence states that transmissions are to be made on the spot frequency of 70·250 MHz with a maximum p.a. input power of 25 watts. TF3EA is already receiving on the band and hopes to transmit very soon. The South Coast V.H.F. Group (who supplied the information) are normally in contact with TF3EA daily at 18.00 GMT on 14·260 MHz. It appears that the month of September is about the best for sporadic-*E* from the UK to Iceland, and that openings are likely to occur at any time of day. Several propagation modes are suitable for contacting Iceland and these will be discussed in next month's "Four Metres and Down."

Region 1 IARU Contest, 7-8 September

Several groups in past years have entered both the Region 1 IARU contest and V.H.F. National Field Day. Those groups wishing to enter both contests this year are advised to (carefully) note the differences between the rules of the two contests. All those entering the Region 1 contest should forward two copies of their log to the V.H.F. Contests Committee at RSGB HQ and are reminded that scores are calculated on a points per km basis.

GB2GC Group Moves On

Members of the GB2GC Expedition Group will be operating 20 miles from the Swiss border, signing FOKP, from 2 to 8 September. Frequencies to be used will be 144·115 MHz (A1-A3) and 145.41 MHz (A3j). The field is now clear for new call-signs at the top of the V.H.F. NFD results tables.

Solar Eclipse Monitoring

The University of Virginia is conducting a survey of radio propagation conditions before, during and after the eclipse of the sun on 22 September 1968. Monitoring reports on received signals are required and Members are invited to take part in this valuable research project. Suggestions for monitoring and report forms can be obtained from RSGB Headquarters. A postcard giving your name and address and marked "Eclipse survey" is sufficient.

LED

Light Electro Developments Ltd., better known as LED, have recently moved to a new address, 116 Fore Hamlet, Ipswich, Suffolk. John Bays, G3KFX, who many amateurs knew as Managing Director of this company and developer of the Anglian transceiver, has emigrated to Australia and although retains his interest in the company he is spearheading the formation of an Electronics Division of Australian Consolidated Industries of Sydney NSW. He has obtained a VK2 call, and is operational from his office using an Anglian 1000. The Managing Director of LED is now D. O. Boddley, G3KUM.

Transistorized Converter for 70 MHz

In his article published in the May issue, W. H. Allen, G2UJ, specified the use of TIXM10 transistors, manufactured by Texas Instruments Ltd. As these devices are germanium, Texas Instruments are "phasing them out," resulting in their being excluded from the Texas catalogue. By special arrangement it is still possible to purchase them, however, and they can be ordered direct from the TI Supplies Division, 12 Wellcroft Road, Slough, Bucks, at a price of 7s. 4d. each, plus 1s. 6d. postage and packing.

RSGB Dinner Club

The next meeting of the Dinner Club will take place at the Kingsley Hotel, Bloomsbury Way, WC1 on Friday, 25 October at 7.30 for 8 p.m. As always, this is a completely informal function to which overseas visitors are particularly welcome.

With the intention of enabling members and visitors to plan ahead for the meetings it has been decided to fix future meetings on the third Friday of every third month commencing on 25 October. The succeeding meeting will therefore take place on 17 January, 1969.

On Thursday, 25 July, the President, John Graham, G3TR and the Regional Representative for South Wales, Cyril Parsons, GW8NP, with their wives were honoured by Her Majesty the Queen by being invited to a Garden Party at Buckingham Palace. The President and Mrs Graham were further honoured by being presented to His Royal Highness, the Prince Philip, Duke of Edinburgh, who is the Patron of the Radio Society of Great Britain. Prince Philip enquired about the progress and well being of the Society, showing a keen interest in its work. He was particularly interested in our new Headquarters Building.

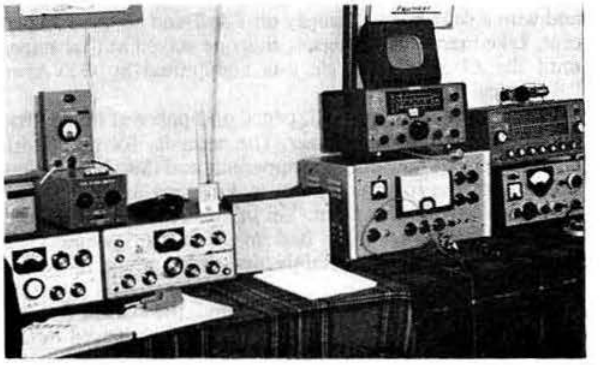
John Graham and his wife can be seen in the left-hand photograph, and Mr and Mrs Parsons on the right.

The Aberdeen Amateur Radio Society recently took part in the Aberdeen Festival where on the final day they staged an exhibition open to the General Public. Over 8000 people saw an excellent display of Amateur Radio which created considerable interest and should prove most beneficial to the hobby.

Club members and friends worked extremely hard to make this display as interesting and attractive as possible and the compliments received more than justified their efforts. Items on display included home-built transmitters and test gear, modern s.s.b. equipment and a new transceiver. The Club Sommerkamp equipment was operated under the call GB3AF using a " Hustler " Vertical aerial.

The Photograph shows some of the members' own gear with the station on the left.

(Photo by A. Abel)



New Texas FET

Texas Instruments Ltd. have announced a new n-channel epitaxial planar FET labelled the TIS88. This has a 4dB noise figure at 400 MHz with a 1 kHz bandwidth and it is mounted in a SILECT plastic moulding similar to the commonly-used 2N3819. It can be obtained through WEL Components Ltd., 5 Loverock Road, Reading, Berks., who have quoted a price of 6s. 7d. per unit in quantities of 100.

Radio Amateurs' Examination—3 December, 1968

The Society will be providing a centre at the College of Preceptors, Bloomsbury Square, London, WC1 for this examination. Applications to sit the examination must be sent to the General Manager, RSGB, accompanied by the entry fee of 35s. for members of the Society and 45s. for non-members. The number of places available is restricted to 90 ("First come—first served").

The closing date for entries is 31 October 1968.

Amateur Licences

The number of amateur licences in force at the end of June were:

Amateur (Sound) A	12,837
Amateur (Sound) B	985
Amateur (Sound Mobile) A	2,503
Amateur (Sound Mobile) B	83
Amateur Television	184
The number of model control licences current is	14,126

Silent Keys

We record with sorrow the passing of:

A. G. Pruden, G2CZN, of Chesham, Bucks.

F. St. Clair Olton, ex-VP6FO, of St. Michael, Bucks.

R. B. Cave, BRS26425, of Peverell, Plymouth, Devon.

J. A. Hopkins, BRS29658, of Fishponds, Bristol.

Loop Aerials

By "SPENNY," G6NA*

READERS acquainted with the writer will know of his fascination for small aerials, and so will not be surprised at the strong interest with which the now widely known *Electronics* article of last August [1] was read. This happened while making one of many regular long train journeys, and after re-reading, a paper exercise was worked out there and then. Using the formula given in the article, for a typical amateur case the radiation resistance came out to quite a reasonable value; so the hypothetical design was continued, based on the use of 200 lb/mile hard drawn copper (10 s.w.g.) for the loop. It must be admitted that this material happened to be the only one for which an accurate figure for resistance at 2 MHz was known at the time! While I was still in the train, the imaginary aerial was almost up—and with a calculated efficiency on Top-Band of some 50 per cent. Like many such schemes, this one stayed at that stage, until the *Electronics* article was highlighted by G3VA in " Technical Topics."[2]

Enthusiasm again aroused, pencil and paper at home produced quite a different answer. The necessity for that " girt big tubing" was now only too apparent, and the whole design smacked of the reasons for not making any attempt in the past to go beyond this point. Yet in the article the US Army Limited War Laboratory had made it work—and with claimed results which certainly demanded more thorough investigation.

Electronics was borrowed again, and the reason for the more practical value of radiation resistance achieved in the train was soon discovered. The calculations made at home were based on " Terman," whereas in the formula given in the article[3] the area of the loop was squared twice. Question, which is right?

Cutting a long story short, the standard text books were found to be right. The sources of information given at the end will prove invaluable to those who really want to know why, but may be safely ignored if the reader just wants an aerial. For him, the following design methods can be used to produce good aerials without further ado.

Radiation Resistance

As is well known, the radiation resistance of an aerial is all-important as the current flowing through it, when squared and multiplied by it, determines the amount of power which is actually radiated. Any other resistance characteristics just consume radio frequency power to warm up the conductors, the atmosphere or the shack. Not only does knowledge of the value of this resistance enable us to compute the efficiency, and to design any required coupling or matching network, but it gives us a picture of the general behaviour of the aerial. As has been pointed out in this Journal many times, the radiation resistance needs to be as high as possible, as it is easy then to supply current without the necessity for heavy current feeders; and the aerial has wide-band characteristics so that operation on any frequency within a given amateur band can be undertaken without re-tuning. Unfortunately, small aerials usually spell low radiation resistances and loops are no exception.

So, first things first, the radiation resistance of a loop is

$$R_{rad}=31{,}171\left(N\frac{A}{\lambda^2}\right)^2 \text{ ohms}$$

where N is the number of turns of the loop, A is the area of the loop in square metres, and λ is the operating wavelength in metres. This is a general formula. However, for those who like short cuts,

$$R_{rad} = 197 l\lambda^4 \text{ ohms}$$

when the loop is circular and small. $l\lambda$ is the length of the circumference in terms of wavelength, e.g., when the circumference is a quarter wavelength long $l\lambda$ will be 0·25. This formula introduces an error of 2 per cent when the circumference is one-third of a wavelength long, but the error becomes less as the loop is smaller. Note that the effect of the circumference is proportional to the fourth power of its length.

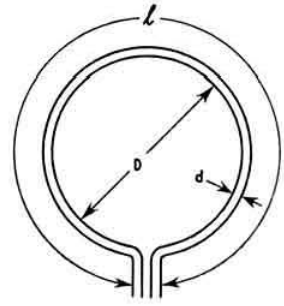


Fig. 1

When the loop is large we may again use an approximation,

$$R_{rad} = 592\ l\lambda \text{ ohms}$$

which is applicable when $l\lambda$ is greater than five wavelengths.

Effective Height

Effective height is generally defined as the ratio of the e.m.f. delivered by the loop when it is in an electromagnetic field to the strength of the field.

$$\text{Effective height} = \frac{\text{loop e.m.f.}}{\text{field strength}} = \frac{2\pi Af}{c}$$

where the e.m.f. is in volts, the field strength in volts per metre, A is the area of the loop in square metres, f the frequency in Hz and c the velocity of light. Useful in determining the gain required by receivers.

Resistive losses

The resistive losses which are of immediate concern are those of the loop and its associated coupling unit. Losses due to absorbing bodies in the neighbourhood of the aerial will be roughly the same for any aerial system. Owing to the low value of radiation resistance, high currents are necessary to

* 23 Northport Drive, Wareham, Dorset

enable even medium powers to be radiated, so that the copper loss must be kept to a low value in order to achieve efficient operation; low in comparison with R_{rad} that is.

The following materials come to mind, and their resistance per ft. is given for 1·8 MHz operation.

¼ in. diam. copper tube 4 milliohms per foot.
½ in. diam. water pipe (copper) 2·4 milliohms per foot.
¾ in. diam. water pipe (copper) 1·5 milliohms per foot.
1 in. diam. water pipe (copper) 1·3 milliohms per foot.
0·4 in. diam. coaxial cable 2·2 milliohms per foot.
200 lb. copper wire 10 milliohms per foot.

Aluminium conductors of the same section will be 1·7 times greater in resistance.

Operation at 3·5 MHz will raise the resistance by about 40 per cent, except in the case of the coaxial cable which will have only a small increase. The whole of the cable is used, the inner and outer conductors being connected together at their ends.

Inductance

It is necessary to know the inductance of the loop before one can work out the values of the coupling network components. Using the notation of Fig. 1 as before, the inductance

$$L = 0{\cdot}00508\, l(2{\cdot}303 \log_{10}\frac{4l}{d} - F) \text{ microhenries.}$$

when l is the length of the perimeter and d is the conductor diameter, both in inches. F is a factor depending on the shape of the loop, having the following values for regular shapes.

Shape	Factor
Circle	2·451
Octagon	2·561
Hexagon	2·636
Pentagon	2·712
Square	2·853
Equilateral Triangle	3·197

The Coupling Network

As the impedance of such a small loop is so low, a coupling network is required which will present a nominal 50 or 75 ohms to the transmitter output. Any of the normal methods may be used but just as the copper loss of such a low impedance device as a loop is of some consequence, so will be that of the coupling unit, especially when transformer coils are used. Fortunately, unlike a short vertical or dipole aerial, the loop has an inductive reactance so that tuning and coupling may be done by the use of capacitance only as indicated in [1]. The losses in a suitable capacitance are generally much lower than in a practicable inductance. The November BULLETIN [2] gave the circuit values for a "universal" coupling circuit covering a wide frequency band. For amateur work, a simpler version is suggested. The circuit is shown in Fig. 2.

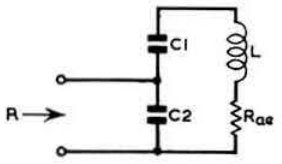


Fig. 2. A coupling network for the loop

The design of the unit seldom needs to be carried to extreme accuracy, mainly because variable capacitors will have to be employed anyway in order to tune to frequencies over the whole of the waveband in question. Referring to Fig. 2, the value of the two capacitors is

$$C1 = \frac{1}{4\pi^2 f^2 L\left(1 - \sqrt{\frac{R_{ae}}{R}}\right)}$$

and

$$C2 = \frac{1}{4\pi^2 f^2 L}\sqrt{\frac{R}{R_{ae}}}$$

where f is the frequency of operation, R is the supply or transmitter output impedance, and R_{ae} is the total resistance of the aerial, the sum of R_{rad} and the copper and other losses.

For the more practically minded souls, these expressions may be ignored and a shorter method used. Assume C1 to tune the loop to resonance; a reasonable assumption as C2 will be very much larger and so have little effect. C1 may be found from a nomograph or from

$$C1 = \frac{25300}{Lf^2}\text{pF}$$

where L is the inductance of the loop in microhenries and f is the operating frequency in MHz.

Short cuts for Top Band and 3·5 MHz are

$$C = \frac{7839}{L}\text{pF} \qquad \text{on Top Band}$$

and

$$C = \frac{2068}{L}\text{pF} \qquad \text{on 3·5 MHz}$$

where L is in microhenries. The constant does not bear a four to one relationship because the two bands are not exactly an octave apart. The values obtained by using them are exact for the low-frequency edge of each band.

The ratio of the two capacitors to each other is

$$\frac{C2}{C1} = \left(\sqrt{\frac{R}{R_{ae}}} - 1\right)$$

from which expression C2 can be quickly evaluated. Values obtained in this way will usually be quite accurate enough, unless it appears that a standard value capacitor is going to be only just right.

A word about capacitors for this network. Attention is drawn to the value of the current which may flow through them; 10 watts of Top-Band output will mean 10A for a 100 milliohm resistance, a similar current flowing when 100 watts is applied to a 1 ohm resistance—typical values for the two bands considered.

Brass variable capacitors, and fixed capacitors of ample rating are most desirable. The losses introduced by small aluminium variable types are quite noticeable. Fixed value capacitors are best chosen from clamped mica types having high current ratings. Fortunately both brass variable and clamped mica fixed value types are still available from ex-Government supply stores. One or two retailers advertise new components.

Switches for changing fixed values also need consideration, those from the TU5-9 series of tuning units being admirable for the job.

According to the original article, a balanced circuit is not necessary unless high powers are to be used. From experience gained from QRP operation this statement seems quite true, and the writer would recommend a balanced circuit for

powers greater than 20 watts. When using the unbalanced circuit, it should be so arranged that the bottom or "earthy" side of the loop is connected to C2, thus avoiding to some extent the shunt losses arising from close proximity to earthed objects.

Conclusions

From the foregoing it will be realized that by employing a loop instead of a small vertical aerial one trades copper losses for earth losses, and in the case of higher powers losses due to corona discharges as well.

The coupling network can be made more efficient by using capacitors instead of inductors.

But the real advantage of the loop is freedom from dependence on a connection to earth. Earth resistances of even two ohms are not easy to achieve, especially in frosty weather. This is why the ground-plane aerial has become popular, but is not practicable for the average amateur on the 1·8 and 3·5 MHz bands.

Consider the parameters which determine the radiation resistance and therefore the success of a design.

For a given space and conductor, a one turn loop of paralleled conductors is better than the same number of conductors used in a multiturn loop.

Keep the area of the loop as large as possible, but avoid ungainly and irregular shapes as the perimeter-to-area ratio then becomes unfavourable. The best shape is a circle, and the reciprocal of the factor F used for determining the inductance will indicate the extent of the fall in radiation resistance which will occur when other regular shapes are used.

Practice

Having reached these conclusions, the urge to " have a go " proved irresistible, and the following aerial was erected. What the writer calls " half-inch " coaxial cable was used; for the very good reason that it was available and much more tractable than half-inch copper pipe. A more specific description of the cable is 0·4 in. overall diameter with an outer conductor consisting of 142 strands of 0·0072 in. copper wire, and an inner conductor of 0·052 in. diameter. The inner and outer conductors are soldered together at the ends.

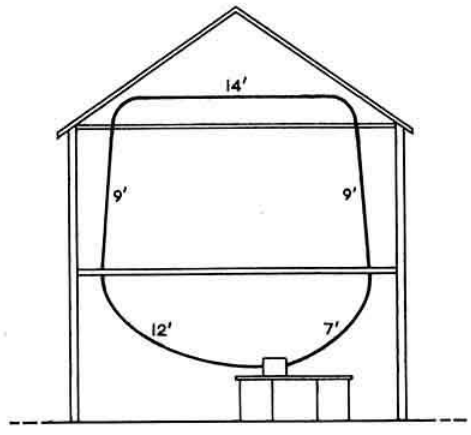


Fig. 3. The test loop as fitted in a convenient barn!

The loop was put up, half in the hay loft, and half in the stable underneath, Fig. 3 showing the arrangement. The bottom of the loop was at bench height 33 in. above the ground. The plane of the loop was approximately vertical with a 10°–190° bearing.

Possessing an area of 16·5 m², R_{rad} works out to be 14 milliohms. The radio frequency resistance is 107 milliohms, so that if the coupling unit introduces no loss the efficiency will be some 11½ per cent. Not as good as the first calculations in the train suggested—but still a useful efficiency for 1·8 MHz! The inductance was worked out to be 19 microhenries.

A coupling unit was constructed to enable a transmitter consisting of two 2N3053 transistors as c.o.-p.a. to be used.

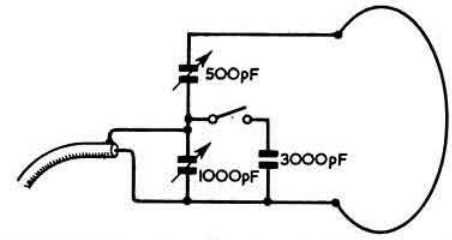


Fig. 4. Coupling circuitry associated with the loop of Fig. 3

As the writer wanted to be quite sure that no earth connection via the mains supply played any part, the receiver was likewise a self-contained transistor one. Thus the whole station could be moved from the normal operating position in the kitchen, which is situated on the other side of a yard, and coupled to the loop instead of a 40 ft. near vertical wire supported by a sycamore. This " control " aerial was worked against the normal station ground, the water pipe system, which has been proved over the years to be the best obtainable at the site.

In the light of the figures, and remembering the one watt transistor, the loop was connected with considerably diminishing enthusiasm.

Putting the matching capacitors to roughly the calculated values, and switching on the receiver, doubts were dispelled as signals were immediately heard. Resonating the loop, and the band was really " there." So the loop was then properly coupled, and operation commenced.

The very first CQ from QTH Taplow, Bucks, brought an answer from G6QN at Wimbledon. And then testing started in earnest. Our thanks are due to G3GGO and the other stalwarts who stood patiently by while a quick change was performed in order to obtain a comparison. In almost every case a 2 S-point advantage over the wire was reported, representing a good 10dB gain. One of the early QSOs was a half-hour ragchew with G3GWI in York during the height of the evening QRM. All of this on Top Band. On 3·5 MHz things should be better, but of course the control aerial is much better too, so that the comparison is not so marked.

No marked directional properties at all were found, although looked for.

As the writer sees it, this form of the loop may be of considerable interest to those contest operators with little space; a length of cable thrown over the roof for the weekend

Continued on page 581

A Simple Audio Oscillator and Pulse Generator

By J. F. C. JOHNSON, C.Eng., MIERE., AMIREE(Aust), MNZIE, ZL2AMJ*.

EVERY oscilloscope owner requires a source of sinusoidal signal, without which the scope is very restricted in its application. If the source can provide squarewaves so much the better, especially if these can be adjusted in length to give variable " mark-to-space " ratio.

This audio oscillator started out as a straightforward sinewave source and just " grew " until it finally met the following specification:

Sinewave:

Frequency coverage:	15 Hz to 130 kHz in four ranges.
Distortion:	Less than 0·3 per cent (at 1000 Hz).
Output amplitude:	5 volts peak-to-peak.
Output level:	Varies less than 1dB over entire frequency range.
Output impedance:	1000 ohms max.

Squarewave:

Frequency coverage:	Same as for sinewave.
Output amplitude:	5 volts peak.
Output level:	No change over complete frequency range.
Output impedance:	1000 ohms max.
Mark-to-space:	Continuously adjustable from less than one-to-ten to more than ten-to-one.
Polarity:	Choice of either positive-going pulses or negative-going pulses (from earth).
Power requirements:	External battery (17 to 26 volts d.c.) or 230 volts a.c. mains (internal regulated power supply).

* 15 Byron Street, Upper Hutt, New Zealand

The prototype is built in an aluminium box 7½ in. wide, 4 in. high and 2 in. deep. It weighs 3 lb. The sinewave oscillator with the squarewave circuitry is built on a piece of printed circuit board 6½ in. by 1¾ in. (see Fig. 3), and the regulated power supply is built on a separate board 2 in. by 1¼ in. (see Fig. 5).

Fig. 1 is the circuit diagram. TR1, 2 and 3 form a Wien-bridge oscillator, originally described in a Mullard publication many years ago, though using germanium transistors

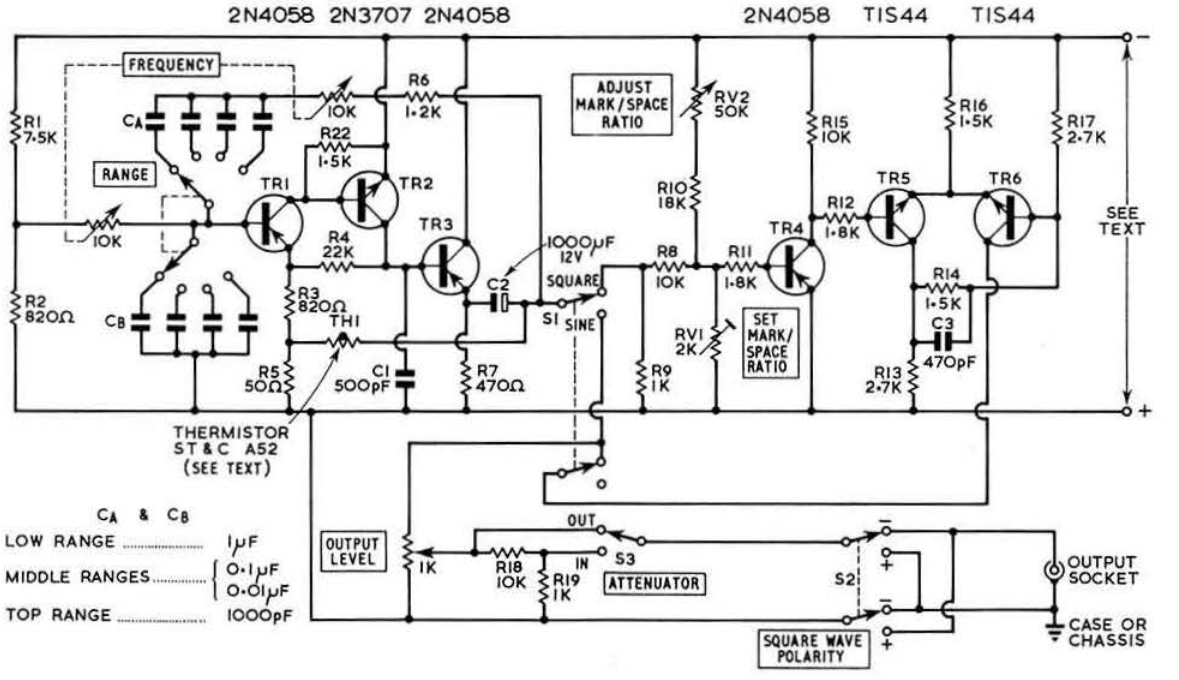


Fig. 1. The circuit diagram of the instrument. TR1, 2 and 3 form a Wien-bridge oscillator and TR5 and TR6 a Schmitt trigger. TR4 is the keying stage that permits variable mark-to-space adjustment to the output squarewaves. Note that the circuit is tied to earth at one spot only—the output socket. This is to enable the provision of squarewave polarity reversal. All transistors shown are Texas Instruments types.

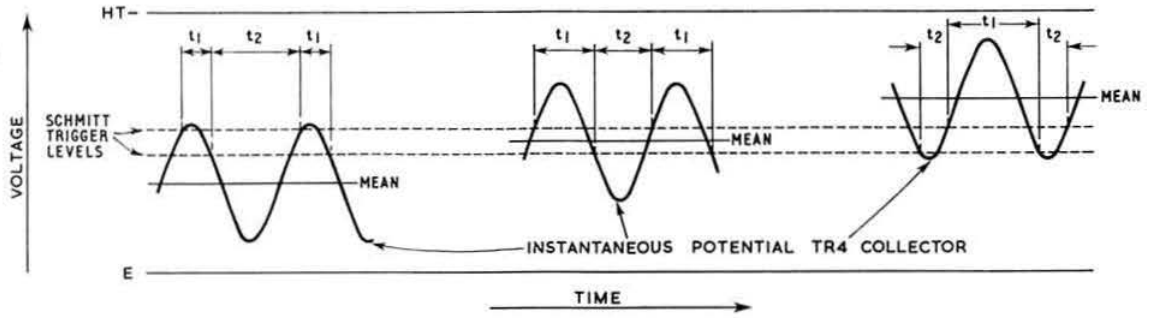


Fig. 2. The instantaneous voltage at TR4 collector plotted against time. By adjusting the mean level above or below the Schmitt trigger levels the output mark: space ratio (t_1 to t_2) can be lengthened or shortened.

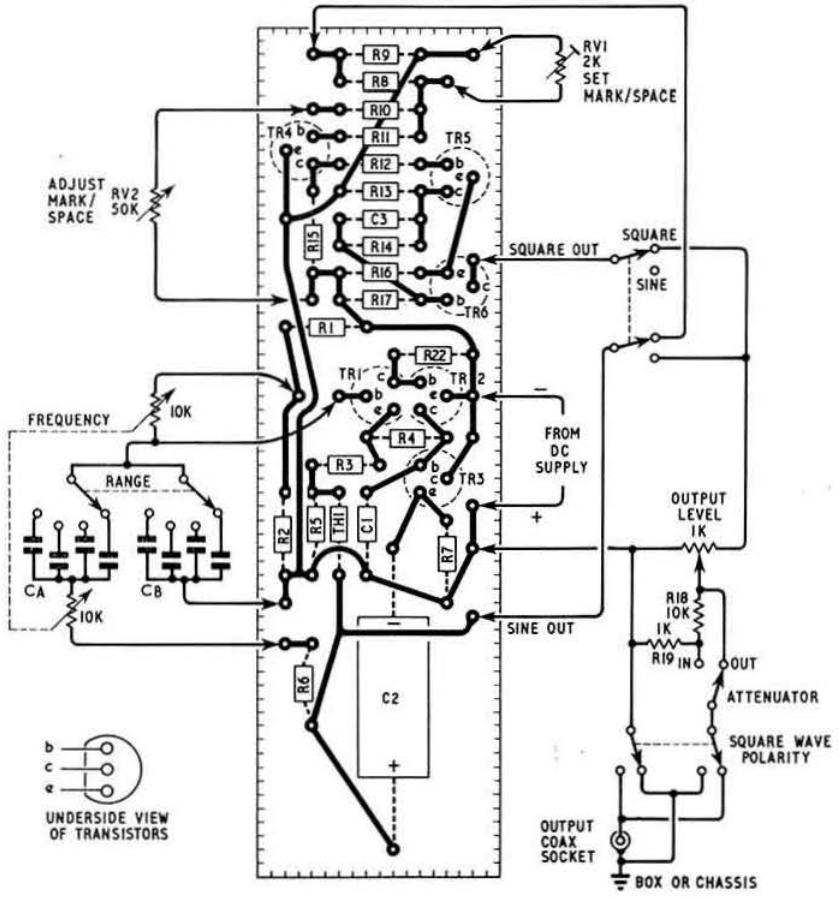


Fig. 3. The print-board layout for the audio oscillator and squarewave generator (underside view).

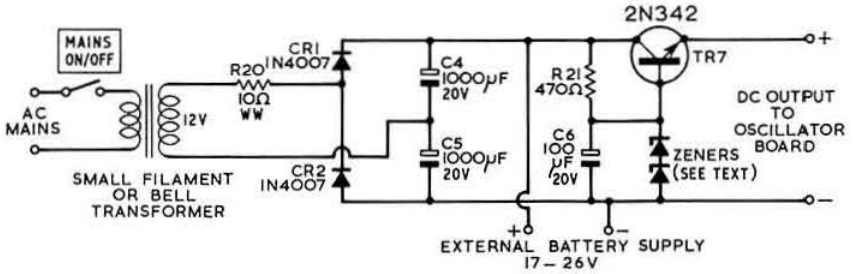


Fig. 4. The circuit of the regulated power supply. The zener diodes are selected to provide the correct voltage for the least distorted sinusoidal output from the oscillator.

with different component values. Amplitude stabilization is obtained with the thermistor, manufactured by Standard Telephones and Cables Ltd. and bearing the type number A52.

Output is taken via S1 (in the sine position) to the coaxial output socket. When S1 is in the " square " position, the oscillator feeds TR4 which in turn keys TR5 and TR6—a Schmitt trigger. Output from TR6 feeds the coaxial output socket, via the polarity reversal switch S2 which gives choice of positive or negative-going squarewaves. S2 obviously plays no part in the " sinewave " output.

Fig. 2 shows how the adjustment of the mean voltage appearing at TR4 collector brings about a change in the mark: space ratio. The change in mean level is brought about by adjustment of RV1 and RV2, RV1 being preset while RV2 is brought out to the front panel.

Note that only one point on the complete circuit is earthed—at the output socket. This is to allow correct operation of S2, the squarewave polarity switch. If, therefore, 50 Hz hum in the output is a problem, reverse the connections to the mains transformer primary. This will place the " neutral " end of the primary in proximity to the secondary and eliminate the problem.

The h.t. supply voltage necessary will have to be found by experiment. All units built have been found to have a 1 to 2 volt h.t. range over which a non-distorted sinewave output is obtained. In one case this was about 14 volts h.t. and in others about 18 volts, which means that the two zeners shown can only be selected after the oscillator is constructed.

Many other transistor types can be substituted—the ones shown are the ones used in the prototype—but there is no reason why other types will not perform as well. It is vital to note that the thermistor should be covered with a piece of opaque sleeving—it is sensitive to ambient light changes.

RV1 is adjusted so that the Schmitt circuit fails to trigger at each end of the range of RV2. The output at each end of RV2 is then a permanent " mark " condition or a permanent " space " condition at the output socket. At intermediate settings of RV2, the output is a variable mark-space at the oscillator frequency.

The 500 pF capacitor from the base of TR3 to earth was found to be necessary to suppress high frequency instability and may not be required with other transistor types.

The original unit has given good service for a considerable time and is now " indispensable."

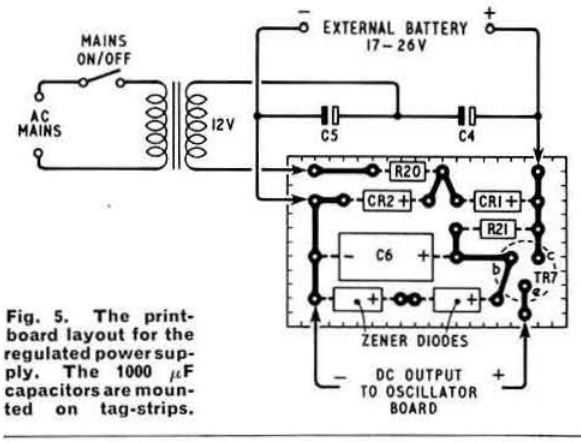


Fig. 5. The printboard layout for the regulated power supply. The 1000 μF capacitors are mounted on tag-strips.

Loop Aerials *continued from page 578*

would probably pass unnoticed, and would enable signals comparable to those from the hillsides to be emitted.

Permanent Construction

If a permanent aerial is to be erected the following points should be watched. Avoid joints, but if they are necessary, brazing or welding is the way to make them. Soft solder will cause trouble in a short time. Thin walled copper tube of as large a diameter as possible is the best material. Mount the coupling unit at the operating position, or arrange remote operation of it, as Q's of over a hundred are to be expected on Top Band (the aerial described has a Q of 160).

More Information

The following sources contain relevant information, starting with Maxwell's equations and Poynting vectors to arrive at basic formulae.

Electro-Magnetic Waves and Radiating Systems, Jordan 1950.

Antennas, Kraus (W8JK). Particularly p. 166 onwards.

Engineering Handbook, Terman.

Services Textbook of Radio Vol. 5.

References

[1] K. H. Patterson, " Down-to-earth Army Antenna," *Electronics*, 21 August, 1967.

[2] J. P. Hawker, " Technical Topics " RSGB Bulletin, November, 1967.

[3] Reference (1) gives the radiation resistance of a loop as $3{\cdot}12 \times 10^4 (NA^2/\lambda^2)^2$, where N is number of turns; A is area enclosed; and λ is wavelength. This differs from $31{,}171\ (NA/\lambda^2)$ by the factor A^2!

TECHNICAL TOPICS

By PAT HAWKER, G3VA

LAST month, John Allaway, G3FKM, in " Month on the Air," put into words what many of us have been wondering for some time—where have all the Gs gone? With British licence statistics at an all-time high, one can often tune the h.f. bands (I can vouch for 14 MHz c.w.) and begin to imagine that some secret edict must have been issued by the PMG closing down almost all stations in this tight little island. Soon, our overseas friends will be mounting DXpeditions to London!

There is no easy way of quantitising this decline in activity. Back in the 'thirties the Society used to hold regular band-occupancy checks, recording all British calls heard over a weekend—and I seem to recollect that this usually resulted in about half of all licensed stations being logged. There can be little doubt that similar checks today would yield a far, far lower percentage.

G3FKM suggests that British amateurs have quitted h.f. for v.h.f. and Top Band. Yet one has only to read " Four Metres and Down " to find repeated appeals for more activity—and 1·8 MHz can often seem pretty empty of amateurs.

It may be, of course, that large numbers are busy building new gear, or swatting up on theory, or even reading *TT* (preferably, if you will excuse the commercial, in the new collected edition *Amateur Radio Techniques* covering ten years of *TT* in 160 large pages and 350-plus diagrams!).

G3FKM believes that many stations stay off because of TVI—some may suspect it could be just TV. Then, undoubtedly, many amateurs today retain their licences during long periods when they have no intention of using them, simply because of the difficulty of renewing a call, once it has been given up. With licences going up to £3 a year, it might be opportune for the Society to press for some new arrangement by which licences could be put into temporary cold storage, but renewed without having to retake examinations. It used to be said of " lapsed " amateurs that " they always come back," after those years when work or family considerations interrupt the hobby; but this, I fear, is no longer true, largely because of the difficulty in renewing a licence.

Certainly, the current level of British activity on h.f. compares unfavourably with that of most European countries—especially Germany and to the East. If this is really a matter of TVI then it is time we all did something more about it; if it is rather that large numbers no longer find amateur radio as interesting as when they struggled to acquire their licences, then we should be looking into why (for, technically, there is still much useful development work to be done); if it is because many modestly equipped stations feel it to be an unequal struggle to compete against the " four-element, 80-ft up " types, or because they feel that communications technology has become too complex for the non-profes-

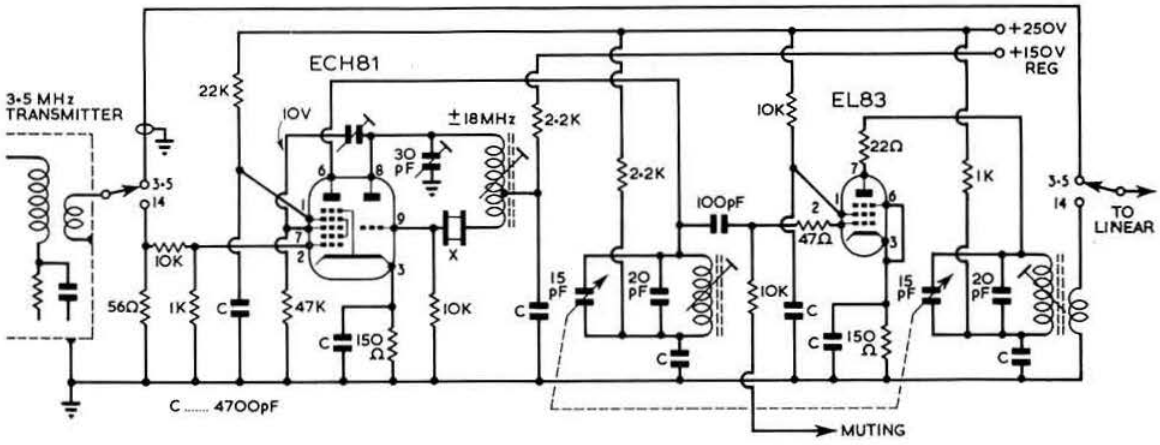


Fig. 1. PAOVER's 14 MHz transverter.

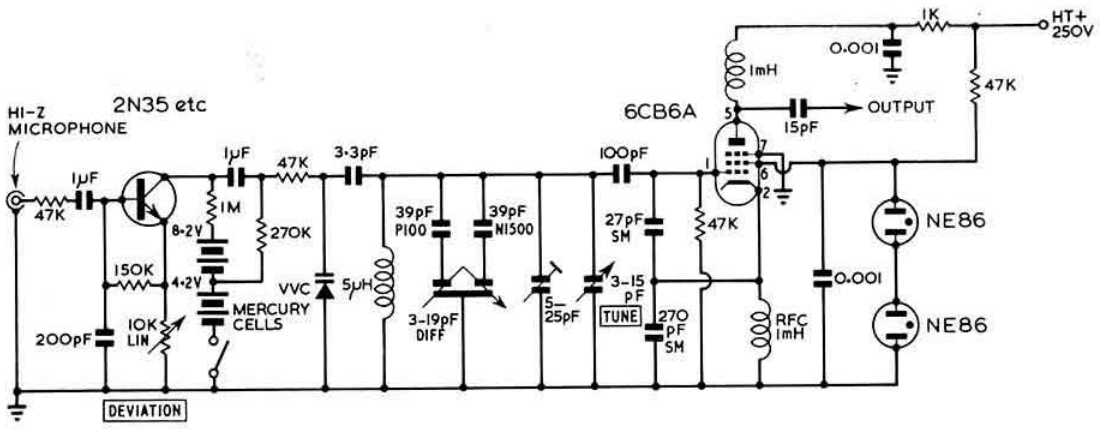


Fig. 2. WB2CPG's n.b.f.m. v.f.o. providing output on 8 MHz.

sionals, then we must find ways of encouraging the use of simple, as well as of advanced equipment.

Is it perhaps, the endless number of " contests " or the many, often pointless, new certificates announced each month? At one time such awards were a real encouragement in providing a genuine yardstick of achievement, but now too often appear as just fund-raising wallpaper. There would seem to be need of an urgent enquiry into what is happening to the level of British activity, and how it now compares with 10, 20 and 30 years ago. All sorts of " technical " questions would have to be answered—how active is " active "? Is there some critical period when many amateurs give up? What has been the real effect on the hobby of s.s.b.? Why are there now more model-control licences than amateur licences? Do the Societies and publishers do all they might to keep alive interest in the hobby? And of the 14,000-plus UK licensees, just how many have been on the air or active in constructional work in the past three months?

Traditionally, September was the month when the summer absentees came flooding back on to the bands—will this happen this year? By mid-August there are signs of more UK-activity than for several months, so perhaps it is just a temporary lull.

S.S.B. Transverter for 14, 21 or 28 MHz

Recent issues of *Radio Communication* have described several simple transverters for providing s.s.b. drive on 144 MHz. A similar technique can, of course, be used to obtain output on 14, 21 or 28 MHz from a 3·5 MHz s.s.b. exciter. A simple two-valve unit of this category was described recently by PA0VER in *Electron* (July, 1968) using ECH81 frequency changer and EL83 output: see Fig. 1. Typically a 5950 kHz crystal in the Squier third overtone oscillator (tap on coil about $\frac{1}{4}$ of total winding) provides a 17,850 kHz output to heterodyne the 3·5 to 3·85 MHz signal to 14·35 to 14·0 MHz (note inversion of band tuning).

About 0·5 V signal should be applied to the signal grid of the ECH81 compared with about 10 V to the injection grid. Care must be taken to ensure that the EL83 cannot take off as a TPTG oscillator, with short leads to the parasitic suppressors. The 75-ohm output is obtained from a winding about one-tenth the number of turns in the main tank circuit coil. It should be possible to obtain about 20 V in 75 ohms (roughly 5 watts) drive on 14 MHz.

Incidentally in the same issue of *Electron* we noted a 10-watt modulator using only two valves (ECC805, ECLL800) —we were about to include it in *TT* when we suddenly realized that it was the same circuit as that given in May, 1965, deriving from DL1HM. A reminder, however, that this is a useful approach.

More on N.B.F.M.

Even in these days of s.s.b., the continuing value of n.b.f.m. techniques for amateur operation has been pointed out on a number of occasions, and the attractive ease with which f.m. can be obtained by using variable voltage capacitance diodes (or even with conventional semiconductor diodes) has already been emphasised.

In *73* (March, 1968), WB2CPG gives the subject another good going over—stressing that this approach makes possible the construction of a complete n.b.f.m. modulator for a c.w. transmitter of any rating for around £2, as well as being a considerable help in eliminating TVI when operating with an aerial in the middle of a forest of TV aerials. Back in August, 1962, we drew attention to a design by PA0LOD using an OA201 diode across an 8 MHz crystal oscillator

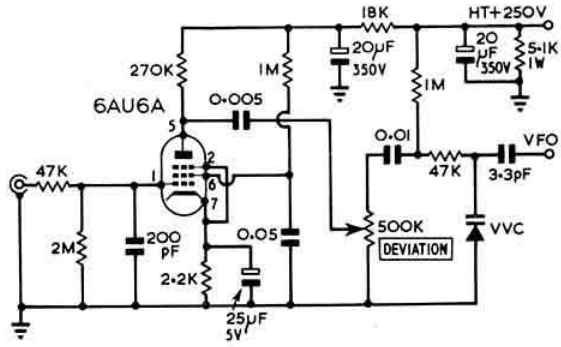


Fig. 3. Valve version of the n.b.f.m. unit.

for 144 MHz operation. WB2CPG gives details of a comparable system for use with an 8–9 MHz v.f.o. intended to be multiplied up to 50 MHz, in which the a.f. requirement is reduced by using genuine VVC diodes such as the Pacific Semiconductor VO15E or the 6·8SC20: see Fig. 2. This arrangement could probably be used in the UK for 70 MHz.

WB2CPG uses a single n.p.n. transistor for a.f. amplification, but also provides an alternative arrangement for those who prefer to use a valve: Fig. 3. His v.f.o. incorporates the differential capacitor system of adjustable temperature compensation that was described in *TT* (April, 1963). He seems satisfied with slope detection of the n.b.f.m. signals but readers may like to be reminded of the G8ACC four-diode phase discriminator (*TT*, May 1967) which, like all the back-issue *TT* references given here, will also be found in *ART*.

The swing of the VVC is effectively reduced by the 3·3 pF series capacitor since the frequency deviation will be multiplied up for v.h.f. operation. He suggests that the correct deviation for this application is about 2000 Hz at the *output* frequency for a top a.f. of about 3000 Hz, that is a deviation ratio of about 0·7. For 50 MHz this means that the actual swing of the v.f.o. capacitance is less than 1 pF. He points out that the bias voltage for the VVC must be set high enough to prevent the sum of all voltages (d.c., peak r.f., and peak a.f.) from driving the VVC into its conducting region.

Electronic Tuning Diodes

Mention of variable voltage capacitance diodes reminds me that these components may well in the future replace the majority of tuning capacitors. This forecast has been made now for some years, but for various reasons progress has not been as fast as at one time seemed likely. But in recent months, many more designs—even including medium wave broadcast receivers—have been turning up in the journals using this technique. Some progress has been made on the Continent and in the United States in consumer applications such as v.h.f./f.m. tuners and television tuners (for a long time diodes have been used in this way to provide automatic frequency control).

One of the amateur-equipment designers who always seems well up in the lead in getting new ideas into practical equipments is Ulrich Rohde, DJ2LRX and in *DL-QTC* (October, 1967) he described an efficient 144 MHz convertor using two TIS34 FET r.f. stages, TIS34 mixer and BSX20/BF173 bipolar crystal oscillator/multiplier chain. In this converter he uses three BA141 tuning diodes in the r.f. and mixer circuits. Then again, in the Dutch *Radio Electronica* (August 1968) a v.h.f./f.m. tuner is shown using BF246 junction FETs, with all tuning, including oscillator, by means of four BB104 diodes, each of which is a dual-diode unit providing the preferred arrangement for diode tuning outlined in *TT* (July, 1967).

It thus really looks as though the use of VVCs is likely to progress rapidly in the near future in consumer and amateur applications, and they also turn up again in the next item.

New Narrow-band Military Transceiver

My remarks (*TT*, July) on the advantages of narrow-band reception for c.w.—and the growing belief that such an approach could result in reliable long-distance working at low power—had an interesting sequel. For John Donne, G3NWZ and a string of Far East calls, invited me along to see a brand new British Army lightweight H.F. transceiver, the UK/PRC-316, just going into full-scale production at Bush Murphy Electronics. This equipment (see my more detailed description in *Electronics Weekly* of 7 August) provides 4 watts output on up to 45 channels between 2 and 7 MHz, with a total station weight, including battery, wire dipole aerials, and handset of under 9 lb (or rather less than half the weight limit for the old low-power Field Days).

One of the interesting points about this new equipment—originally designed as the A16 by the Signals Research and Development Establishment—is that the fixed frequency telegraph channels have a bandwidth of 300 Hz, appreciably less than what would have been possible a few years ago. This may not sound very narrow-band compared with the RCA and Avco units which I described before, but it should be remembered that the military expect to use this unit in all temperatures and to subject it to some pretty harsh treatment, and yet be sure that the signals always come up spot in the channel without any b.f.o. or clarifier tuning whatsoever. The approach thus implies considerable confidence in the stability of the non-ovened crystals, and it is anticipated that the equipment will provide reliable working over distances of hundreds of miles from a 12-volt dry battery or rechargeable battery, or by plugging it across a vehicle battery.

One of the ideas which appealed to me was that although there are 9 main frequencies for the transceiver, spaced through 2 to 7 MHz, on each of these are five " off-sets " spaced at 1.25 kHz apart, and thus ideal for dodging QRM as well as providing extra channels. This is achieved by changing the injection frequency to the 2nd mixer (the transmitter exciter is common with the receiver in this respect). The set also has an a.m. capability in which the wideband aperiodic amplifier is operated in a linear mode, and the receiver bandwidth then becomes 6 kHz, though this is intended for much shorter ranges than on c.w. Altogether a distinct advance on such earlier compact equipments as the old B2.

Some useful ideas for improving equipment reliability could also be gathered from the Bush Murphy production areas. " Cordwood " construction of sub-modules (that is small resistors and capacitors held between plastic end-plates); the replacement wherever possible of electromechanical with electronic devices (diode switching, variable capaci-

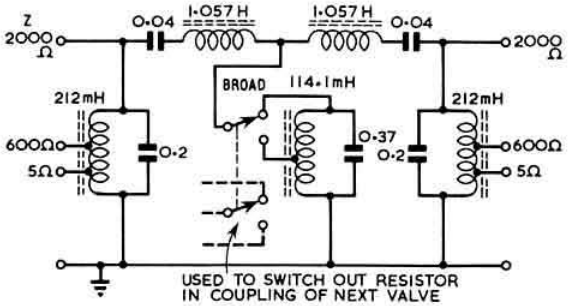


Fig. 4. DJ2IP dual bandwidth a.f. filter, representative of modern a.f. filter design.

tance tuning diodes, etc.); almost complete elimination of any plugs and sockets, even for crystals which are soldered in; use of a tough plated plastics container to reduce weight and the clean air assembly all add up to a realization of what military quality assurance programmes imply these days.

Unlike the UK/PRC-316, amateur h.f. portable stations need some form of free-tuning, but it might well be that some of these techniques could be adopted by arranging that the variation of the offset channels could be by v.x.o., thus in effect giving a high-stability heterodyne-type exciter for both receiver and transmitter, and allowing the receiver bandwidth to be cut down still further.

A.F. Filter

Really narrow-band reception depends on using either a series of cascaded single-crystal filters (and this approach can be very effective), or an a.f. filter having good shape characteristics. Many of us tend to equate an a.f. filter with the old FL8 type filter and leave it at that; very few high quality a.f. filters have appeared in UK publications. However this subject has always seemed to attract considerable attention in West Germany, and many a.f. filter articles have appeared over the years in *DL-QTC*.

Two fairly recent articles have been by DL7AV (December, 1967) and DJ2IP (October, 1967) both using quite complex filter arrangements giving good shape factors, with the '2IP filter having a switched broad and narrow position: see Fig. 4. These filters use compact ferrite pot-cores, and results depend to a considerable extent on the Q's achieved and on the quality of the components generally, so that it really needs a full constructional description to allow duplication. This might be a good opportunity for someone with a good knowledge of filter technique and the construction of high-Q inductors to come up with an easily reproducable design based on UK components.

FET-buffer

A couple of practical suggestions can be gleaned from a description of a low-power 3·5 MHz transistorized transmitter by DL7IM/OH2KT in *DL-QTC* (July, 1968) including the use of an FET as a source-follower buffer amplifier and a 2N3711 as a voltage-stabilizing (zener) diode. The actual Seiler v.f.o. (Fig. 5) is only part of a heterodyne-v.f.o. system, with its output around 500 kHz which is then heterodyned by means of a 4 MHz c.o. to provide the 3·5 MHz output.

Incidentally, Jim Fisk, W1DTY, editor of *Ham Radio*, tells me he has received a letter from E. O. Seiler (former W8PK, W2EB) who originated the Seiler oscillator in 1941 and who, though no longer active as an amateur, still keeps an eye on the world of amateur radio !

Walkie-talkie Aerials

Perhaps because of the influence of the 27 MHz CB units, amateur interest in compact, low-power, hand-held transmitter-receivers has waned—yet there are many " legal " uses for such equipment, and work to be done in improving range. One aspect of the subject that has not received as much attention as it deserves is the question of the efficiency

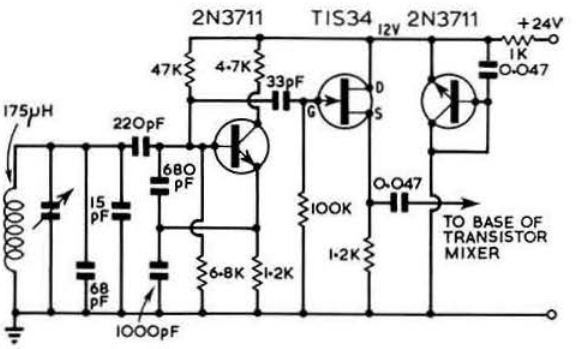


Fig. 5. 500 kHz v.f.o. with FET source-follower buffer and 2N3711 voltage stabilizer.

of short v.h.f. " whip " aerials. Some of those who helped develop equipment for police foot-patrol work, and I am thinking particularly of Ian Campbell-Bruce (G5IB) who was one of the first advocates of this type of equipment, have sometimes told me that a whip held up to speak into the microphone gives much better results than some of the various body and microphone-lead aerials. But few seem to have studied just why this should be so, apart that is from Zdeněk Krupa of the Czech Tesla-Popov research institute ("Effect of Human Body on Radiation Properties of Small-sized Communications Systems," *IEEE Translations on Antennas and Propagation*, March, 1968).

He has come up with some interesting observations and detailed measurement including an appraisal of the very considerable absorption of v.h.f. radiation (he has investigated from 30 to 150 MHz) when an aerial is close to the human body. His article provides plots of the change of impedance and radiation pattern when an aerial is held close to one side of the body (for example with the equipment in a bag or haversack suspended from the shoulder) compared with a whip held well up in front of the head.

He points out that, in effect, many of these aerial systems are really two-element arrays with the body forming a dissipative radiating element, and this results in appreciable variations in the horizontal radiation pattern (often far from the commonly accepted omni-directional pattern), with even a body resonance effect at some frequencies. Even more important is that he shows that the body may be absorbing up to 97 per cent of the transmitter power, leaving only a tiny 3 per cent actually radiating.

The conclusion that may be drawn from this article is that when using a short v.h.f. whip, it should give far better results when well up and clear of the user—otherwise you are likely to be forming a highly effective dummy load.

G3TFX Speech Compressor MkII

Richard Fusniak, G3TFX has been thinking about his speech compression circuit (*TT*, March 1967 and see also his letter, April 1967, p. 255), and believes he now knows how it could be made to work as an overmodulation suppressor before reaching the 100 per cent modulation point. He has not yet tried the modified arrangement but is convinced it would work, and so help to clear up some dirty a.m. signals.

We only need to describe the device she is holding—the SRDE binocular transceiver using a gallium arsenide lamp to work up to ½ mile.

Opto-electronic Communications

Short-range communications are by no means confined to v.h.f. and u.h.f., and the promising technique of modulating light and infra-red beams has been a good deal in the news recently. Old-timers may recall that the history of such systems goes back a very long way, and that there was a burst of amateur interest in transmitting on light in the States around 1942 when " radio " was not available.

Modern systems are usually built around gallium arsenide (GaAs) lamps (in high-power systems as lasers, in lower-power in the sub-lasing condition) though any lamp without too much thermal lag can be used in conjunction with silicon photodiode detectors. At least one London store (Proops of Tottenham Court Road) has been offering opto-communication kits, and it has now been clearly stated that no licences are required for such systems.

Recently, on a visit to the Signals Research and Development Establishment, I had a chance of speaking over one of the novel " communications binoculars" in which one just looks through a pair of binoculars and so lines up the GaAs infra-red lamp beam on the distant end, speaking over the associated head-set and boom microphone. All very neat and impressive, with a range in good visibility of up to about half a mile, and simple electronics.

Until recently, such systems tended to use amplitude modulation, varying the lamp output by the speech. SRDE however have found that pulse frequency modulation at 20 kHz is much less affected by heat haze causing signal fluctuations, hand shake, or tripod vibration within the 0·5° limit, or changes in light level.

The GaAs lamp when forward biased provides infra-red light output at about 0·9 micron (or roughly 300,000,000 MHz) and this can be modulated by switching up to a very high rate. And to go QRO on opto-electronics the usual technique is to come down in frequency to a mere 30,000,000 MHz (the 30 THz band) and use one of the new large carbon-dioxide lasers which can pump out kilowatts on 10 microns wavelength which falls conveniently into one of the low atmospheric absorption bands or "windows" allowing quite useful distances to be spanned. One experimental US link out in Southern California works over 17 miles despite the smog, and I have heard of experimental UK links of 8 and 5 miles. And for real DX, one of the Surveyor moon landing spacecraft sent back a clear photograph of a laser beam from the earth!

It would have the advantage that it relies on the percentage of modulation as sampled from the p.a. and the compression level is not set in the modulator itself, so that if the p.a. is undercoupled to the aerial (i.e., sharp plate dip) then it would not overmodulate provided that it was initially adjusted correctly.

The ratio of the resistors in the potential divider (R_B, R_A) determines percentage of modulation level before the BY100 conducts on downward excursion of the p.a. anode volts. This charges up RC and is applied to suppressor grid of the 1st a.f. amplifier via a small silicon diode (or control grid if a vari-mu valve is used). This diode also prevents the positive volts from the potential divider network affecting the suppressor grid. The resistor from suppressor grid down to earth is to keep it from floating above earth under no modulation conditions. The RC time constant would be about 0·01 to 0·05 sec (say 1 μF and 33 K or 0·1 μF and 330 K, R could be variable to control amount of compression). The values for the EF91 pre-amplifier would be as in the modulation chapter of the *RSGB Amateur Radio Handbook*.

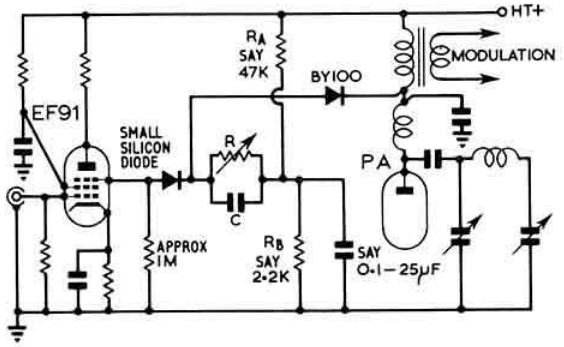
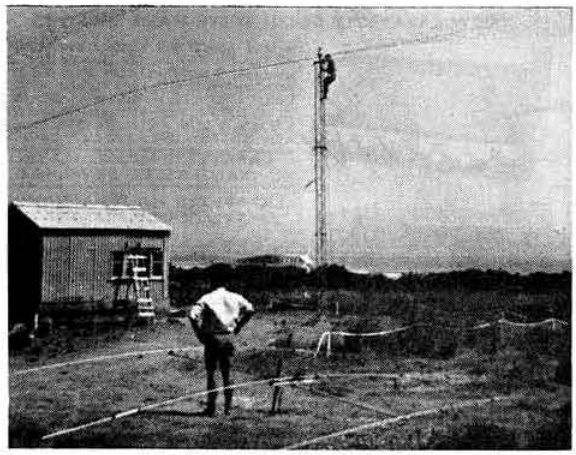


Fig. 6. G3TFX's proposed compressor cum overmodulation suppressor applied to a low power p.a.

An easy life for some . . .



WE all suffer from the problem at some time or other, but few of us manage to solve the difficulty of topping a mast with a heavy beam in quite such a sophisticated manner as that laid on by the RAF Amateur Radio Club, Akrotiri, The problem, in a nutshell, was to plant a full-size TA33 beam on to a 30 ft. lattice tower, this action justified by the beautiful take-off from the club's new site at Cape Gata, which overlooks the blue Mediterranean sea to the south-east and west, at an elevation of 300 ft.

ZC4TK/G3TKC, who supplied us with this information and the photographs, explained that much deliberation was needed to find a system of erecting the aerial. The important criterion was that no damage must be suffered to either the aerial, the mast or the people involved. It was impossible to take up the beam piece by piece and assemble it at the top of the tower, and carrying it complete did not exactly appeal to anyone, particularly at that time of year when quite high trade winds prevail at Atkrotiri. The thought occurred to ZC4TK of borrowing a chopper to lift the beam and drop it straight on to the rotator. Everybody agreed at once, but there remained a small problem of how to make the necessary approach to the appropriate authorities. ZC4TK, however, was a member of the Search and Rescue Helicopter flight and (quote: " Wish I had kept my big mouth shut! ") was naturally volunteered as liaison officer. Fortunately, though, after talking to the Flight Commander, and mentioning the cross on top of Coventry Cathedral and how easy it should be in comparison, he agreed to divert a helicopter from one of its normal training flights early one Sunday morning.

On the appointed day, the beam was assembled on the ground and a small harness made out of nylon rope attached to the centre of gravity. The chopper duly appeared and ZC4TK climbed to the top of the tower, strung himself on with a safety harness, and awaited the arrival of one air-borne TA33. Roley, ZC4RB, did the honours by slipping the winch hook on to the beam, simultaneously getting covered in dust and debris from the rotor downwash. John English, an SWL member, was to be seen frantically taking photographs (three of which are seen alongside) to record for posterity the whole sequence of operations. He too suffered from the clouds of dust which covered the camera lenses and have unfortunately given the prints a rather speckled appearance.

Within minutes the chopper lifted the beam, flew sideways for a few yards, and stuck the stub mast squarely on to the rotator, guided by ZC4TK. The winch hook was released, and one TA33 rested majestically on its new tower—no sweat, no strain, just five minutes of operations.

In case anyone else has similar ideas, we are passing on the statement that all requests for hire of the chopper should be sent (in quadruplicate plus millions of IRCs) through the normal channels!

REGULAR FEATURE

THE MONTH ON THE AIR

By JOHN ALLAWAY, G3FKM*

READERS who have been following the controversy associated with the recently ended expedition by W9WNV will be interested to learn that a letter has now been sent out by the General Manager of ARRL, W1LVQ, to all directors of the League, setting out the situation as it is at present. Amongst other things mentioned is the fact that on 15 June Dr. Miller signed an agreement to withdraw his lawsuit against the League and Mr Huntoon—" contingent upon ratification of its terms by the Board of Directors and upon action of the Awards Committee to grant credit for certain of his 1968 DXpedition operations which had been properly documented and concerning which the Committee had received no unresolved complaints." Certain important items belonging to Dr Miller have apparently been mislaid, including his passport which was of course vital in proving important dates. However this document was seen by a number of UK amateurs (including your scribe) and did appear to show that many of the places claimed to have been visited had in fact been visited.

It has been admitted by W9WNV that the alleged operation from St. Peter and Paul Rocks (PY0XA) actually took place from a ship located some 1800 miles NW of the Rocks. W1LVQ says " he could remember few, if any, specific details of any of the alleged trips during 1966 and 1967 to Chagos, Blenheim Reef, Laccadive Is., and Heard Is." " Dr Miller's explanations in an attempt to justify the St. Peter and Paul Rocks episode and many of his other actions were, in the opinion of the League's counsel, most unconvincing—and at times incredible."

" According to our counsel, few, if any, facts adverse to the League were developed during my deposition. It was established that complaints concerning Dr Miller's DXpeditions were carefully investigated and thoroughly considered by the Awards Committee. In our counsel's opinion, not one fact was developed to support Dr Miller's claim that I, rather than the Awards Committee had made the decisions, that I displayed any malice towards Dr Miller, or had called or termed Dr Miller a liar and a cheat."

The bizarre nature of this whole unhappy episode is revealed in the next section of Mr Huntoon's letter. The italics are G3FKM's: " President Denniston called a special meeting of the Executive Committee in Chicago to hear counsel's report and discuss the agreement. During the meeting Mr Brosnahan was asked why the League should enter into any agreement, in light of the most favourable facts developed to date, rather than sit tight with the hope that Dr Miller will become discouraged and give up the case. He based his very strong recommendation that the agreement be approved upon the following considerations: trial of the case would probably take at least a month, would have to be preceded by many more depositions in various parts of the US and possibly overseas, and would be most expensive, perhaps involving additional expenditures up to $35,000 and possibly even $50,000; *trial of a case before a jury always involves considerable uncertainty* and risk because of the unknown jury, and *there would always be some possibility of a judgment for Dr Miller*. Although the arrangements between Dr Miller and his attorneys are not known and cannot be ascertained, certain facts indicate that the arrangements are such that the case could be prosecuted with relatively little expense to Dr Miller, and that therefore the possibility of a voluntary dismissal or loss of desire to prosecute would be remote: and even if a judgment in the League's favour would be obtained after trial, the publicity to the League would be no more favourable than can be realized from the present agreement."

Apologies to readers for an error in last month's *QTH Corner*—the QSL manager for **ZD3D** was inadvertently given as W9JNF—this should have been **W9JVF.**

News from Overseas

Construction Camp II at 24°10′ 1N, 55° 10′ E, Abu Dhabi, is the present QTH of G3SEU, now operating as MP4TCF. Frank, a civil engineer, is supervising a £6 million motorway contract in the desert, and runs a KW2000 to a four element fixed beam and inverted-V dipole, the whole assembly aimed at the UK. He has a regular sked with G3WET (who is also a civil engineer), and hopes to keep it up until he leaves in December. A KW1000 linear should arrive shortly and should do something to strengthen MP4TCF's signals. Civil engineers are invited to join in during these skeds, and interested parties are invited to write to " the WET " for details. QSL's will be dealt with by G3WET. (See *QTH Corner*).

G3XHE has now received his new call-sign and may be found now as MP4BGX. QSL's may be sent direct to the address in *QTH Corner*, to his home QTH, or *via* MP4BBW.

Dave Hardy, VP8HJ, writes to say that there are three new calls now to be heard on the air from the Falkland Is. Frank Dickenson, G3HVB, has now become VP8KD, and is using a Heathkit SB line to an SB200. John Wright, G3VPW, has been issued with VP8KF, and has a KW2000A and linear, and shares his equipment with Brian Levet, G3TXH, whose new call-sign is VP8KE.

A letter from G3UYO (ex-ZD7WR) says that the beacon station on St Helena closed on 4 April this year and that the gear was transferred to ZD7GO (George Owen, Longwood, St. Helena). Although George is active on 28 MHz it is not certain that the beacon will operate again as such. An analysis of the reports received during ZD7WR's year on the

* 10 Knightlow Road, Birmingham 17. Please send contribution to arrive by 11 September for October, and 13 November for December.

air is at present taking place, and anyone who sent in a report and did not receive a reply is invited to contact G3UYO at the address given in *QTH Corner*. Roland points out that mail to St. Helena takes approximately six weeks each way from the UK and that therefore anyone writing to ZD7 should allow plenty of time for a reply.

The Faroese Amateur Radio Society (FRA) now has a total membership of 100. Three new OY calls are OY6JB, OY6TE, and OY4HQ (formerly OZ4HQ). Those of us who are fortunate enough to use one of the world's major languages as our native tongue will have sympathy with our friends in the Faroes who have had to draw up a committee to " invent " suitable words in their own language to cover a number of, what are to us, everyday radio terms!

The Radio Society of East Africa once again provided radio links between check points during the recent 16th East African Safari Rally with considerable success. Unfortunately the Uganda section was not able to be covered by more than two stations due to the fact that the Ugandan authorities are not issuing any new licences or permission to operate from their territory at the present time. In all some 27 radio points are mentioned by 5Z4IX in his report—surely a magnificent effort by a club with such a limited membership. A net of ex-5Z4 stations operates on 3770 kHz from 09.30 to 10.30 every Sunday morning ; at present this consists of G3LCJ (ex 5Z4IQ), G3HWL (ex-5Z4WLH), G3WNM (ex-5X5AU), G3OOD, GW3IEQ, and G8HV (ex-5Z4HE).

A letter has been received from GM3VRR, who departed from Prestwick on 29 July en route for the New Hebrides, where he will be in charge of the radio station on Santo Is. Considerable expansion of the inter island radio services there is taking place and modern 1½ kW s.s.b., i.s.b., c.w. transmitters and teleprinter links are already in use. There are also marine services on 500 kHz and 2182 kHz. GM3VRR (who may be remembered as ZD2JM/5N2JM) is taking much of his equipment with him. This consists of a home built transmitter running 140W input to a QQV06-40, and a double conversion receiver. Aerials will be dipoles to start with, but possibly a three element beam later on. Activity is not expected before November, and when it takes place it will most likely be on 14, 21 and 28 MHz c.w. only. A special effort will be made to work the UK. No YJ8 call has yet been issued for the operation, but since the operator's initials seem to be used frequently it could well be YJ8JM. Communications should be sent to J. Macintyre, Dept. of Radio Telecomms., Santo (Luganville), New Hebrides, Western Pacific.

Awards

The WADM award—**Worked all DM**—may be obtained by accumulating " points " by working DM stations since 14 July 1953 on c.w. or phone only (not mixed) on 3·5 to 28 MHz. Class 1 requires 150 points and 15 districts, Class 2 100 points and 15 districts, Class 3 40 points and 13 districts, and Class 4 20 points and 10 districts. For each district one QSO per band is one point. Bonus points may be obtained by working the same station on four (4 points) or five (5 points) bands, but this may only be claimed once per district. A certified list plus full log data and 8 IRC's (only 4 IRC's for Class 3 or 4) should be sent to Radioklub der DDR, PO Box 30, DDR-1055 Berlin, Germany. Stations with the prefixes DM7, DM8, DM9 and DM0, and those whose last letter is P to Z may be counted instead of missing districts on the band they are worked on. Districts are indicated by the last letter of the call-sign—A = Rostock, B = Schwerin, C = Neubrandenburg, D = Potsdam, E = Frankfurt, F = Cottbus, G = Magdeburg, H = Halle, I = Efurt, J = Gera, K = Suhi, L = Dresden, M = Leipzig, N = Karl Marx Stadt, and O = Berlin.

Those taking part in the SAC Contest may care to be reminded of the **WASM** and **WASM II** Awards awarded by SSA for working Swedish stations. For WASM Europeans must have confirmed QSOs with two stations in each call area (SM1—SM7, and SM0). QSLs plus 25 IRCs should be sent to SSA Diploma Manager, Enskede 7, Sweden. The high cost of this certificate is accounted for by the fact that it is made of cloth. The WASM II requires QSLs from 25 " lanns " (Swedish counties) since 1 January, 1953, on c.w., phone, or mixed modes. Lanns are as follows: A = Stockholm City, B = Stockholm Laan, C = Uppsala, D = Sodermanland, E = Ostergotland, F = Jonkoping, G = Kronoberg, H = Kalmar, I = Gotland, K = Blekings, L = Kristianstad, M = Malmohus, N = Halland, O = Goteburg, P = Alvsborg, R = Skaraborg, S = Varmland, T = Orebro, U = Vastermanland, W = Kopparberg, X = Gavelborg, Y = Vasternorrland, Z = Jamtland, AC = Vasterbotten, BD = Norrbotten, QSLs plus check list and 5 IRCs to SM7ID, Karl O. Friden, Valhall, 262 00 Angelholm, Sweden.

The Wireless Institute of Australia advise that the Federal Awards Manager is now Mr Geoff Wilson, VK3AMK, 7 Norman Avenue, Frankston, Victoria, Australia, 3199. Their **W.A.VK.C.A. Award** requires confirmations from 22 VK stations since WW II. The 22 should consist of one card from each of VK1, VK8, VK9, and VK0, and three cards from each of VK2, VK3, VK4, VK5, VK6 and VK7. QSLs plus sufficient return postage should be sent to the address above.

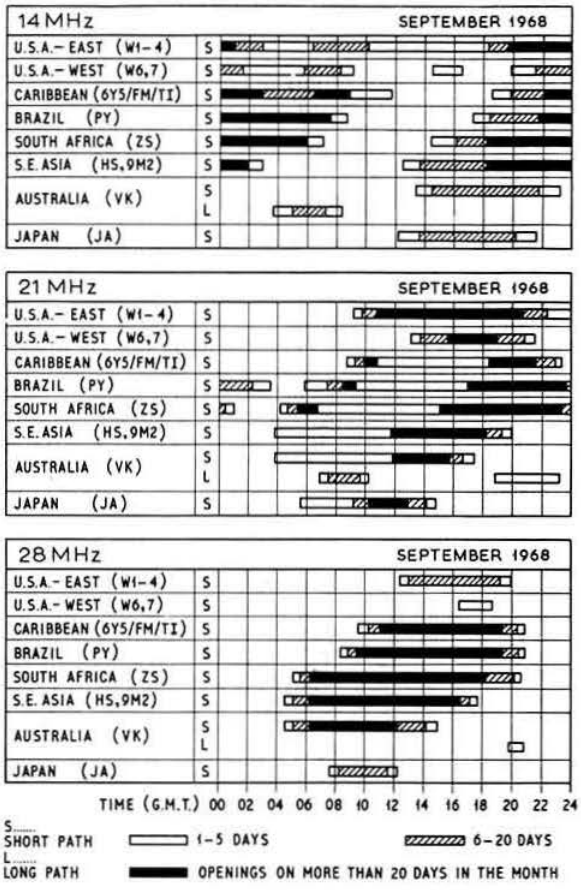
Expeditions

There are still rumours of an impending visit to Chatham Is. by a group of Royal New Zealand Air Force amateurs. Mid-September is one time mentioned as the most likely for this to take place. WA6NFI (Jerome Ginsberg, 2437 Irma Way, Castro Valley, Calif. USA 94546) is mentioned as their intended QSL manager, and donations towards the cost of the trip should be sent to ZL1TU.

ZD8GA has been heard saying that he will be moving to Cocos Keeling Is. (VK9) in late October.

According to the *DX'ers Magazine*, Gus, W4BPD, who will be remembered for his marathon DXpeditions of a few years ago, is beginning to develop " itchy feet " again. He has already started preliminary work on some aspects of a new trip, and says that he would like to operate on all bands 10 to 160m. This should be most useful to those interested in the new 5 band DXCC award when it becomes available. 1 January, 1969 is mentioned as a possible target date for the start of the new expedition. Further information is awaited with interest.

DXers still needing Malpelo Is. (HK0) will be surprised to learn that of the 2212 W/VE contacts made by the HK0TU expedition in 1961 on c.w. 691 did not bother to QSL! Some stations had more than one contact per band and three distinguished themselves by having five QSOs per band. In all, 39·2 per cent of the W/VE stations worked were not interested in obtaining a QSL from what was a brand new



PROPAGATION PREDICTIONS

While the F2 m.u.f.'s are relatively low during the period June to August, they begin to increase again during September. For this reason DX conditions of the h.f. bands (28 and 21 MHz) will improve steadily during the month to reach a maximum at the end of October or beginning of November.

On 28 MHz on favourable days (i.e. with F2 m.u.f.'s above average) the East Coast of North America and Japan should once more be heard after a long break. The West Coast of North America, however, will only be heard under exceptional conditions, for which the latter half of the month should be more favourable. In general, contacts on the h.f. bands with North America and East Asia will be easier from Southern Europe than from stations further north. This difference will become more marked in the winter months. In contrast to the summer months Central and South America as well as South East Asia and Australia should be heard with certainty. Contacts with these will improve markedly towards the end of the month.

The improvement in conditions on 21 MHz compared to the previous month is not as much as on 28 MHz and is mainly limited to contacts with North America, Japan and Australia. With the coming of spring in the Southern Hemisphere the period for traffic with Australia and South Africa will increase. In September the season for short skip contacts via sporadic-*E* layer reflection usually comes to an end. As the nights become longer in the Northern Hemisphere, traffic with North America on 14 MHz will experience a slightly worsening condition in the latter half of the night. As darkness falls earlier there will be more opportunity for DX before midnight.

Local contacts will be possible over greater distances on 7 MHz during daytime. With the approach of winter the DX opportunities on this band improve when the major portion of the transmission path lies in darkness and if the QRM permits.

On 3·5 MHz too, the daytime transmission distances will increase slowly. Interruption of local traffic by the dead zone will only occur in the latter half of the night in disturbed conditions.

The provisional sunspot number for July 1968 from the Swiss Federal Observatory was 97·3, with the period of greatest activity occurring during the second half of the month. The predicted smoothed sunspot numbers for November, December and January 1969 are 104,102 and 100 respectively.

" country " not likely to be reactivated for some considerable time. 79 stations made a total of 260 contacts with a rare station whose total operating time was only 82 hours, all which were on 20m. These figures come from W4DQS, who suggests that K6BX might decide to issue a certificate for hoggery to these gentlemen!

An expedition to Coibita Island, off the coast of Panama (7° 39′ N. 81° 42′ W) will take place between 9 and 14 September. The call-sign will be HP0A, and activity on both c.w. and s.s.b. is expected on all bands. This will be a good one for the prefix hunters, and will count as Panama for DXCC. (See *QTH Corner*).

Apropos last month's remarks concerning slow delivery of QSL cards from the Iris and Lloyd Colvin/YASME African trip last year, a letter has been received from G2DC who very kindly offers to take up the matter. He invites anyone having difficulty in obtaining QSLs from this expedition to contact him with full details and he will investigate. Jack's address is: Major J. L. Drudge Coates, Morseden, Hightown Hill, Ringwood, Hants.

OD5BZ advises that the projected expedition to Qatar, MP4QBW/QBY/QBZ, which was imminent, has had to be postponed.

Contests

The **10th SAC Contest** this year run by the Swedish amateur organization SSA, will take place as follows: c.w. section 15.00, 14 September to 18.00, 15 September, phone section between the same times on 21/22 September. The object is to work as many Scandinavian stations (LA, JW, JX, OH, OH0, OX, OY, OZ, SM/SL/SK) as possible on all bands. There are single and multioperator classes and the same station may be worked on each band for QSO points. Each QSO counts 1 point, and exchanges should consist of RS(T) plus serial number of contact (starting from 001). The QSO point total is multiplied by the number of SAC countries worked on each band (maximum 45). Logs should show date, time, station worked, number sent/received, band, and each multiplier as worked. The usual summary sheet containing claimed score details and a declaration that all rules and regulations have been observed must be enclosed, and entries must reach SSA Contest Manager, Karl O. Friden, SM7ID, Valhall 26200, Angelholm, Sweden, no later than 15 October. The results of the 1967 SAC contest have not yet been received from SRAL.

The **WADM Contest** is a c.w. only affair covering all bands 3·5 to 28 MHz, and extends from 15.00, 19 October to

1968 COUNTRIES TABLE

	160m	80m	40m	20m	15m	10m	Total
G8JM	—	—	4	181	98	65	348
G3OLY	—	3	8	122	67	53	253
9J2BC	—	—	17	106	54	64	241
G8VG	5	15	25	45	54	51	195
G3IAR	—	33	23	79	53	19	207
G3TBK	—	4	26	37	30	23	120
G3VJG	—	2	9	10	16	12	49
G3PQF	8	6	24	52	5	22	117
G3XDV	15	10	17	38	1	18	99
G3ING	9	11	12	5	11	7	55
SM2BYD	—	14	6	49	16	—	85
G3VPS	12	21	18	39	3	—	93
BRS30094	10	32	26	156	146	103	473
A5390	4	21	33	144	150	87	439
BRS25429	3	55	54	171	125	93	490
BRS27806	4	27	17	168	136	78	473
A5662	12	30	35	133	102	95	407
A4886	14	56	50	187	103	89	489
A5154	3	25	21	140	121	70	380
A5489	—	10	6	99	86	51	262
BRS28198	2	32	46	66	32	92	270
A3942	14	38	36	58	60	50	256
A5135	4	20	25	100	54	45	248
A5126	2	31	31	81	53	44	242
A6015	6	13	11	54	41	40	165
A5459	8	25	34	84	37	22	210
A5466	5	21	23	98	33	25	205
A5610	10	71	17	35	25	31	191
A5943	5	15	30	29	30	23	162
A5437	3	24	3	19	18	6	73
A5805	—	—	42	—	—	—	42

(This month's table is in order of 21 plus 28 MHz totals.)

15.00, 20 October. Exchanges consist of the usual RST plus serial QSO number and each contact counts 3 points. Incomplete QSOs count 1 point. Stations outside DM work only DM stations and each station may be worked on each band for further credit. Each DM district is a multiplier on each band. Special DM7, DM8, and DM0 stations will be active but may only be used as substitute for another missing area on the same band on which they are contacted. There are single and multioperator categories, and listeners may also enter (1 point for each DM logged with relevant QSO data). Separate log sheets should be used for each band and the claimed total shown on the entry. They should be sent to: Radioclub der DDR, DM Contest Manager DM2ATL, DDR 1055 Berlin, Box 30, Germany, before 20 November.

This year's **VU/4S7 Contest** (c.w. section) will take place between 06.00, 7 September and 06.00, 8 September. The phone section will cover the same period on 14/15 September. The object is to work as many stations in India and Ceylon as possible on a single band or on all bands. The same station may be worked once on each band or by multiband entrants. Exchanges consist of RS(T) plus serial number of QSO starting from 001. Each QSO is worth 2 points and there is no multiplier. SWLs may enter and should count 2 points for each VU/4S7 station logged and 1 point for each other station taking part in the contest. The usual summary sheet showing scoring and a declaration that all rules and regulations have been observed should accompany the log and be sent to: ARSI Contest Committee, Post Box 534, New Delhi 1, India, before 15 October.

A reminder that the **CQ WW DX Contest** (Phone) takes place on 26/27 October and c.w. on 23/24 November. Full details will be given in October *MOTA*. Some log sheets, etc., are available from G3FKM. It would be appreciated if applicants could give an estimate of the number of log sheets required (40 QSOs per sheet), and enclose a large s.a.e. They may also be obtained from *CQ* WW DX Contest, 14 Vanderventer Ave., Port Washington, LI, NY, USA 11050.

The winners of the 1967 **Islands on the Air** contest are as follows: World leader I1JT (116 islands in seven continents = 812 points). UK winner **G8JM** (721 points), World top SWL was Erskil Eriksson (SM5-2086) (798 points—a record), and top UK SWL Frank Parkhurst (ISWL G-9601) with 546 points. Continental winners were I1JT, 5Z4KL (616), PY2CTL (511), ZL1HW (357), K4RZK (322), and JA1VZM (16).

DX Briefs

Visitors to Eire will in future receive call-signs in the series EI2V——. Another new visitor's prefix is FP0, which is now being issued by the authorities in St. Pierre et Miquelon (FP8) to foreign amateurs.

As mentioned in an earlier *MOTA*, Iwo Jima has now changed its status and has returned to Japanese jurisdiction. Don, the present operator of KA1IJ (formerly KG6IJ), leaves on 22 August, and all QSLs for either call-sign for contacts between 1 October, 1967 and that date should be sent to him at his home QTH—K8WXV (see *QTH Corner*). The former Marcus Is. station call-sign KG6IG appears to have been changed to KA1MI.

The recent 4L1A operation was from Kaliningrad, UA2, and was carried out by UA3JD, and UW3's IT, JO, and OD. QSLs should of course be sent via Box 88, Moscow. Other unusual prefixes reported recently included 4A0, which is allocated to visitors to Mexico, and 4M7 which was the prefix used by YV7AV during the Venezuelan Contest. According to *NARS Newsletter* the following commonly used prefixes appear to be inappropriate for the territories in which they are being used—AC3, AC4, and AC5 are all in the US block allocation, M1 (San Marino) is in the UK section, PX (Andorra) should belong to Brazil, and 7G (Guinea) should denote Indonesia!

W4DQS wishes to point out that the only EA0AH logs in his possession are those for January 1968. QSOs since then should be QSLd direct to PO Box 92, Santa Isabel, Fernando Poo, Rio Muni.

PY0QBG has been reported on 21 MHz and is supposed to be K8WNU on Fernando de Noronha Is. He is with RCA and will be there for one year.

TA1QR is in European Turkey. Operation from the same area by TA2BK/1 was due to take place during the WAE c.w. contest.

According to the *DX'ers Magazine* some of the logs for VS9MB operations by an operator called Colin between April and September 1967 have never been received by that station's QSL manager W2CTN. A special QSL is being issued by VS9MB to commemorate the 50th anniversary of the RAF. This may be obtained by QSL'ing direct to VS9MB, RAF, BFPO, 180, GPO London, enclosing one IRC (for postage).

FB8WW (Crozet Is.) is once again active on 21 MHz s.s.b. He has been reported between 21,200 and 21,270, and has 9U5BB acting as M/C for him. QSLs should be sent via W4MYE (as previously).

QSL cards for JT1AG and JT1KAA may be obtained from UA1CK (Vladimir Cuploon, PO Box 2, GPO, Leningrad, USSR). Readers may remember that Vlad operated from Mongolia last year as UA1CK/JT on s.s.b.

YA5RG has skeds with several DL stations on 14,300 at 16.00 on Sundays and Wednesdays. He is also on 21,400

at 17.00 Thursdays, and joins the CHC/FHC net on 14,340 on Saturdays between 12.00 and 16.00, taking time out to be on 14,105 at 15.00. He is using a Swan 350 and Hy-Gain three-element three band beam. QSLs should go via DL6ME Hermann Gerls, Schillerstr. 18, 34 Goettingen, Germany.

VK6US is a club station at Exmouth, Western Australia, operated by a group of six US amateurs. Amongst them are K2UTU, W4HCX, and WA7IFW. VK6IZ and VK6KK now both have a W QSL manager in the form of W5AG, Box 416, Carrollton, Texas, 75006 USA.

Band Reports

Due to the comparatively short interval since last month's MOTA, and to the holiday season, reports received have not been as numerous as usual. Many thanks are extended to those who supported your scribe during a thin month!

Conditions on the l.f. bands appear to have been remarkably good for the time of year and a high level of activity on 40m appears to have been maintained. No DX has been reported on 160, but two good QSOs were reported on 80m when TU2AE was worked at 23.24 on c.w. (RST 549) and VK2AVA at 19.30 on s.s.b. Twenty metres has once more been the main DX band and has been open into some part of the world throughout the whole 24 hours. Openings into the east coast of the USA in the early afternoon have started to take place again, and very good signals have been arriving from Australia on the long path (over Central America) around 06.00 and later. Fifteen metres appears to open early very occasionally, but in general the Pacific signals are not audible before most operators depart for business. Very little activity is reported on ten metres and the band is usually totally dead whenever G3FKM monitors it (could it be that we are *all* listening and therefore cannot hear anything?).

In the following calls those in italics are c.w. stations; the others are s.s.b. unless otherwise stated.

Reporters this month include GW3AX, G3HCT, G3HDA, G3NKQ, G3NMH, G3TDW, G3WTJ, G4MJ, G8VG, BRS30094, A5390, A5637, and A6015.

40m. CR6FY (22.00), EA6BG (21.40), PZ1CF (21.40), TA1SK (21.00), VKs 2AVA, 3XW, 3ZL, 7SM (21.00-21.30), YV1BE (23.10), ZD9BE (21.00), ZL2BCG (05.50), ZS1s JA, KJ, PF (21.30), 3V8AA (21.00), 5N2AAK (23.10), 6W8s AQ, XX (22.00), 9Y4KR (23.10).

20m. AP2MR (19.30), *DU1OR* (21.15), *FB8WW* (12.40 *FG7TG* (22.10), *HL9KQ* (19.30), *JX5J* (07.14), WB6ERT/KH6 (08.35), *KS4CG* (06.45. Present operator leaving on 7 August). MP4BGU (07.34), OA5AS (22.07), OK8AAA/M (07.04. Op. G3LQB —the first OK reciprocal licence), PK1TD (11.45), *TA2FM* (10.40), *TG4SR* (22.45), *UA0YT* (15.50, Zone 23), VP2AW (06.52), VP2AZ (08.45. QSL via WB6HGH), *VQ9B* (19.30), *VS6AA* (17.30), *XW8CAL* (17.03), 3V8AA (14.30), 4S7PB (17.39), *5A2TV* (19.07), *7G1IX* (22.15), *7P8AB* (17.01).

15m. CE0AE (21.56), *CM1AR* (21.42), CR4BK (17.36), CR9AK (16.46. QSL via PO Box 541, Hong Kong), *CT2AV* (21.06), FM7WE (on a.m. 21.30), *HC2SB* (22.05), HL9US (10.56), KX6GL (11.30), MP4s MBB, MBX (12.01), OX3DX (23.21), *ST2SA* (Box 244, Port Sudan, 14.54), *TG4SR* (22.10), *VK2FU* (Long Path 21.49), VK9BJ (Papua, 12.13), VK9LR (12.40, T.N.G.), VK9WD (11.02), VP2AQ (22.31), VP2DAJ (a.m. 21.35), VQ9DH (17.21), VR2DK (10.05), VS9MB (16.06), YA1ZC (17.10), ZD8LMR (16.50), ZD9BE (16.00), ZS3HF (17.25), 4S7EA (13.57), 4W1ADO (15.30, QSL via F8RU), 5R8AD (15.30), 5W1AS (09.52), 6O1GB (19.01) 9K2CC (17.00, QSL via 9V1OI), 9L1KZ (10.17), 9N1MM (10.55), 9Q5LC (17.36, QSL via ON5PQ).

10m. *CE3ZW* (18.12), *CR7IZ* (17.54), FH8CD (10.40), *LA1IC* (20.25, running 5 watts, RST 599), *VQ9B* (17.50), ZD8JW (20.45), *5N2AAU* (10.51), *7Q7RM* (19.05), 9U5DR (16.25 on a.m.).

Once again sincere thanks to all correspondents, and particularly to the following for permission to use material from their publications: *DX News Sheet* (Geoff Watts), the *Ex-G Radio Club Bulletin* (W3HQO), the *DX'ers Magazine* (W4PBD), the *Florida DX Report* (W4BRB), *CQ DX* (ARI), the *HKARTS Newsletter*, *DX'press* (PA0FX), *NARS News* (5N2AAF), the *L.I.DX.A. Bulletin* (W2GKZ), *Long Skip* (VE3DLC), *QUAX* (SM4DXL), *QTC Newsletter* (5Z4KL), the *FRA Bulletin* and the *DX'er* (K6CQF).

QTH CORNER

AP2MR via VE3ACD, M. F. Wolfson, 305 Rosemary Rd., Toronto 10, Ont., Canada.
CE0AE Box 37, APO, New York, NY, USA 09339.
F0CH/FC via W1PRI, Robert Waters, 23 Derby Lane, Weston 93, Maine, USA.
F0FV/FC via DL7BV, Otto Faust, Fuldstr, 57, Berlin-Neukolln, Germany.
F0HI/M/FC via G3KFT, J. Reading, Jesmond Cottage, Cowley, Cheltenham, Glos.
FP0EB via VE2AFC, Alex Desmeules, 2525 Lafleche St., Ste. Foy, Quebec 10 Que., Canada.
HP0A via HP1AC, Box 9A-737, Panama 9A, Panama.
KA1IJ via K8WXV, Donald Janicki, 44 Magill St., Manistee, Michigan, USA.
KS4CG via W4ZXI, Russell Wicker, P.O. Box 463, Perrine 57, Fla., USA.
MP4BGX J/T Gregory, 3A.C.C., Hamela, BFPO 63, or via G3XHE.
MP4TCF via G3WET, John Evans, 17 Heathfield Rd, Four Oaks, Sutton Coldfield, Warwicks.
OH2AM/OH0 via OH2AM, c/o Pekkanen, Riistavuorenkuja 6-C-24, Helsinki 32, Finland.
SM5WI/OY Harry Akeeson, Vitmargatan 2, Vasteras, Sweden.
PX1SZ via DL6SZ, H. Schmitz, Montplanetstr. 6, 4132 Kamp Lintfort, Germany.
TL8GL PO Box 704, Bangui, Central African Republic.
VP2DAL via VE3GCO, G. Hammond, RR4, Main St., Atwood,Ontario, Canada.
VP8HJ via G3NMH, 24 Hook St., Hook, Nr. Swindon, Wilts.
VP8KD via K2JXY, George Skivington, 999 Quaker St., Scottsville, NY, USA 14546.
VP8KE via W4NJF, Gay Milius, 421 Saddle Rock Rd, Norfolk 2, Va., USA.
VP8KF via G3TWV, G. Francis, 2 Wyke Lane, Farndon, Newark, Notts.
VU2OLK PO Box 53, Bangalore, India.
ZB2BQ via G3KMA, R. Balister, La Quinta, Mimbridge, Woking, Surrey.
ZD3D via W9JVF, R. C.Williams, 1849 E. 49th St., Indianapolis 5, Ind., USA.
ex-ZD7WR Roland Whiting, 9 Western Gardens, Jarvis Brook, Crowborough, Sussex.
4L1A via Central Radio Club, Box 88, Moscow, USSR.
5N2AAU via WA9UFV, Leonard Bandala, 5417 W. Wrightwood Av., Chicago, Ill., USA.
6Y5SR (ex-VS4RS etc), Ron Skelton, PO Box 31, Kingston 5, Jamaica.
9M8RY via WB6LED, Gary Daitch, 12631 Divan Pl., North Hollywood, Calif., USA.

RSGB QSL Bureau: G2MI, Bromley, Kent.

REGULAR FEATURE

FOUR METRES AND DOWN

By JACK HUM, G5UM*

Five Bands for Field Day?

BY the time this copy of *Radio Communication* reaches the radio room the Sixth 144 MHz (Open) Contest will have come and gone, leaving as always half a dozen well sited and intensively operated stations predictably at the top of the table, and half a hundred others wondering " whether it's worth putting in a log." We say again: *It is.* From individual contributions, however lowly, contests become cross-sections of v.h.f. activity as it existed in this country at the time. The low scorer's log is as important as the top scorer's.

The 3-4 August event will have been exceptionally useful as a dress rehearsal for the biggest contest event in the metre-wave year, V.H.F. National Field Day, the rules for which appeared on page 324 in May. All participants who have read them will know that when they turn in their entries they should write on the back of the Summary Sheet replies to the questions about V.H.F. NFD which are printed on page 325. Your answers will help make the event even more enjoyable and productive next time. Comments were also required by the V.H.F. Contests Committee in a more general vein. See last month's contest news on page 544.

As for *this* year's Field Day, it could well turn out to be a five band event, if the development work on 13cm which has been going on in a number of groups is deployed on The Day in the form of operational hardware. The incentive to compete on 2304 MHz will be fired by the significant results obtained *last* V.H.F. NFD by G3THQ/P and G3PSH/P (G3RPE) and by the alluring bonus of a multiplier of 500 for every 13cm contact made (by contrast, the multiplier for 2m will be *one*, as it should be on the dead easy band; operation is encouraged by big multipliers for the less easy bands). And as 13cm comes into the category of a " less easy band", just as 23cm did half a dozen years ago, it is as well to give it the best potential start next weekend on Field Day.

Here is some advice from one of the G5FK team, who collectively have a big store of accumulated knowledge about the band. He is Dr Dain Evans, G3RPE, whose talk at the Convention in April doubtless encouraged many to " have a go." He writes:

" Unlike 23cm, where both the operating frequencies and the cross-band working with 70cm are well established, 13cm (all 150 MHz) seems to have no such practice. It would be a pity if, as seems possible, contacts should be missed simply through lack of knowledge of which people are on what frequencies, and which band is being used for talk-back."

G3RPE therefore invites intending 13cm participants to let him have broad details of the equipment they will be operating during the contest. Write to him soon (there are not many days to go to Field Day) at 2 Juniper Green, Warners End, Hemel Hempstead, Herts.

It will be remembered that the G5FK team, of which G3RPE is a member, have been encouraging the use of crystals nominally for 2304 MHz, that is, sixteen times 144. No, there won't be any QRM! The scatter of frequencies multiplied up so many times will see to that.

For s.e.o. operation the 2304 to 2330 MHz segment is recommended, and here tone modulation has been found to be very effective. For talk-back, G5FK members have found 4m advantageous: it fits in well for contest working and is unlikely through harmonic relationship to drop any unwanted products into the 13cm band.

The following from the G5FK group are expected to be operational over Field Day weekend:

G5FK, Wembley: crystal controlled transmitter on 2304 MHz, 300 mW, with companion receiver covering 2300-2310 MHz. Broadband receiver can also be commissioned if incoming transmission warrants.

G3HWR, Hampstead: c.c. transmitter and receiver as above. Also s.e.o. transmitter 2304-2310 MHz, 300 mW, which has a 2300-2320 MHz broadband receiver.

G3THQ/P (probably near Luton for Field Day): s.e.o. transmitter 2304-2320 MHz, 300 mW, and a broadband receiver 2300-2330 MHz. A c.c. receiver will also be available for 2300-2310 MHz.

G3RPE/P (will be at Brill in North Bucks): c.c. transmitter on 2304 MHz with 150 mW, and accompanying c.c. receiver 2303-2305 MHz, plus an s.e.o. transmitter with possibly a broadband receiver to go with it.

* * *

By the way, the V.H.F. NFD rules give you a multiplier of 500 for 13cm and lower wavelengths. Has anyone got a 10 Gig dish for 3cm?

Class B Men Made Their Mark

Coming back to the Sixth 144 MHz Open, all those who had a go at it last month must have ended up with the impression that it was enlivened a great deal by the presence of very many Class B licensees. Two operators comparing notes after the event were heard to say that 30 out of 70 contacts and 33 out of 80 contacts, respectively, were G8-plus-three call-signs. Very likely this 40 per cent content of Class B contacts was maintained over the country as a whole.

This was the second 2m contest to offer G8 men the chance to show what they were made of: they seized it in no uncertain terms.

Some suffered by the lack of zone crystals, and lost valuable time and QSO's because operators tuning (say) " high to middle " failed to hear them because they were " low " (and vice versa). No doubt this situation will remedy

* Houghton-on-the-Hill, Leicester LE7 9JJ. Send reports for the October issue by 11 September, and for the November issue by 14 October.

itself as correct-zone crystals are purchased. Until they are, of course, out-of-zoners will find themselves persistently short of contacts simply because operators will tend not to look for them in unexpected places.

Many Class B licensees, subsisting on pocket-money, find the cost of a new crystal out of reach. To them (and all others of course) we offer our " Xtal Xchange " space as a medium for stating what crystals you need and what you have to exchange.

Surveying the " Sixth Open " as a whole, we gained the impression that the newer Class B operators have been quick to adjust to the high operating standards characteristic of v.h.f. in these islands (the older ones didn't need any telling).

If there have been any juvenile behaviour or soggy signals then one can only count oneself as fortunate that the defects have been absent from the 80 or so G8-plus-three stations in your conductor's log. Cross-section *any* group of radio amateurs and you will expose a corpus of the ignorant and the exhibitionist. It is simply because operating and technical standards on the metre-waves are so high (helped largely by the Class B licensees on 70cm) that the less experienced, of whatever age and of whatever call-sign group, show themselves up. We don't think many of them were around in that " Sixth Open."

One Watt, 82 Contacts

A copy-book example of Class B men's initiative came in just after the above was written. During the "Sixth Open " the G8APZ/G8APO/G8AZU team manning G8APZ/P at Alton in Hampshire used an 800 milliwatt rig throughout the contest, to work 82 stations in 24 counties, and to reach out 230 miles to Barrow in Lancashire.

This transmitter, built by G8AZU, is used at his Sunbury location 22 feet above Thames level, and has brought him a hundred different stations since he came on " Two." A similar rig for 70cm has roped in 56 stations when it used no more than half a watt.

" I believe that others have had similar results," says Brian Coleman, G8AZU, " and I think it is a pity that so many consider only *increasing* their power . . ."

The 13cm Record

As was briefly reported here last month, good work on 13cm was done on 21 July when G3BNL/M operating from Cleeve Hill, near Cheltenham, worked G3EEZ/P seven miles north west of Wolverhampton. This success was the culmination of a long period of development work on the part of G3EEZ in collaboration with G3OAD, which during 1967 had given increasing promise as ranges were hoisted from a few to several miles, often non-line-of-sight.

When G3OAD moved away to a new post the tests were continued with G3BNL, then at Nottingham, later at Cheltenham, with the availability of some considerable heights in the adjoining Cotswolds from which to give the 13cm signal a really good take-off.

From his not too promising site in Wolverhampton G3EEZ had done well on the band, but knew better results would be achieved if the gear were to be modified for portable use. This was done, and after a number of test runs the distance of 52 miles was covered on 21 July, RS59 both ways. And G3OAD was able to be there with G3EEZ when it happened.

A Miniaturized History of V.H.F. National Field Day

1962: (for 2m only, and held in July): 39 entries, winners Wolverhampton Group GW3KMT/P.

1963: 45 entries, winners Surrey Radio Contact Club G2RD/P-G3ODY/P, using 70, 144 and 432 MHz. Three contestants used 1296 MHz.

1964: 54 entries, winners Wolverhampton Group in conjunction with Severn Valley ARC, GW3KMT/P-G3SVR/P, using 70, 144, 432 and 1296 MHz. Ten contestants used 1296 MHz.

1965: 54 entries, winners The GB2GC Group, using 70, 144, 432 and 1296 MHz. Twelve contestants used 1296 MHz.

1966: 57 entries, winners The GB2GC Group using 70, 144, and 432 MHz. Fourteen contestants used 1296 MHz.

1967: 66 entries, winners The GB2GC Group using 70, 144, 432 and 1296 MHz. Sixteen contestants used 1296 MHz and there was one contact made on 2300 MHz.

On 1 August G3EEZ/P at Mow Cop took an RS59 signal from G3BNL/M down in the Cotswolds over a range of 80 miles. The experiments continued and on 10 August the same two contacted over a 60 mile path.

From G3IUD comes a reminder that the UK (probably world) record on 13cm was set up at *80 miles* way back on 11 June, 1962, between G3IUD/P and G3NLZ/P, N. Wales to Cumberland. More about this next time.

Beacons: " A Wonderful Service "

" I think the RSGB beacons provide a wonderful service, and the keepers deserve our sincere thanks. Any new beacons, particularly on 70cm, would be particularly welcome . . . and I must say I admire the spirited way in which people have come forward to volunteer their services. . . ." Thus Bill Burton, G8ANQ, of Whitby; and we have heard lots more comment along similar lines.

A job which the receiving members can usefully do in this area of activity is to provide the Society's V.H.F. Committee with reports on reception of the beacons. Already a rather nice QSL is to be had to acknowledge reports on GB3VHF. Cards for the other beacons are planned.

It hardly needs stating—but we had better do so—that reports on beacons which can be heard at any time are valueless. Two examples of scientific worth were reported last month: the Thurso beacon on 4m heard in Gibraltar, and the Swansea beacon on 2m heard in Sussex off the side of its beam. Not all listeners enjoy conditions that throw up feats of reception such as these, but at least the example is there.

What is also useful to report is any deterioration noticed in the quality of signal or keying characteristic. These may occur on only rare occasions, but when they do it helps if they can be reported quickly.

* * *

And so to " Four's " own special beacon, the one at Gibraltar. It has been so strong at times during the last several weeks that G stations in local phone QSO, whose knowledge of Morse was not perhaps as good as it should be, have been heard to wonder at the c.w. QRM on the channel!

Now that Ossie has returned to the UK the operation of ZB2VHF continues under the aegis of John Patrick, ZB2BO; which brings us to . . .

BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emission	Aerial Direction
GB3ANG	Craigowl Hill, Dundee	145·985 MHz	A1	S
GB3CTC	Redruth, Cornwall	144·13 MHz	A1	NE
GB3GI	Strabane, N.I.	145·990 MHz	A1	N/SE
GB3GW	Swansea	144·250 MHz	A1	E.N.E.
GB3GM	Thurso	144·995 MHz	A1	N/S
GB3GM	Thurso	70·305 MHz	A1	N/S
GB3GM	Thurso	29·005 MHz	A1	Omni
GB3GEC	W. London	434·000 MHz	F1	N/W
GB3SX	Crowborough,Sussex*	28·185 MHz	A1	E/Omni
GB3VHF	Wrotham, Kent	144·500 MHz	F1	North-West

* Not operational

GB3VHF

The Society's v.h.f. beacon transmitter frequency at Wrotham, Kent, measured by the BBC Frequency Checking Station (nominal frequency 144·50 MHz):

Date	Time	Error
25 June	10.41 GMT	30 Hz low
3 July	10.30 GMT	687 Hz low
9 July	09.38 GMT	160 Hz low
18 July	09.56 GMT	520 Hz low
23 July	10.20 GMT	710 Hz low
6 August	09.23 GMT	240 Hz low
13 August	10.50 GMT	780 Hz low
22 August	10.45 GMT	230 Hz high

Gib-Scene

In assessing conditions on 4m over the past summer, ZB2BO rates the DX season as running from the third week in May until mid-August, with big openings in June and mid-July. On 16 July he worked 30 stations in GW, G and GI. Later that month the band opened weakly to the UK during the 70 MHz Portable Contest, and although no contacts were made, G3WIN/P as far north as Cumberland was logged, together with G3IMV in Bucks and G2BHN down in the South West.

Just how open the band was on 16 July may be gathered from a report turned in by G3UWT that he worked ZB2BO when in his car near Doncaster using just a Pye Reporter running at 2·5 watts input feeding a quarter wave whip. And by way of showing how this DX activity can encourage newcomers to the band, G3VPS was overjoyed when on his second day on " Four " he heard ZB2VHF on both phone and c.w. at vast strength, again with a quarter wave whip on a car parked at his home at Hailsham in Sussex.

Another interesting item of Gibraltar news: ZB2BC is planning 50 MHz operation in the autumn. Both he and ZB2BO could get on to " Six " at short notice, and are hoping the MUF will go high enough to permit contact across the Atlantic.

Simple Sideband for " Two "

Are there other, *easy* methods of applying s.s.b. to 2m besides transverting? The question was put here last month in the context that if you don't have an h.f. sideband rig and want to use sideband at v.h.f., what do you do?

Says old timer G6SN (" Shack " of Harrogate): " At present 144 MHz is split into two groups, those who can afford the s.s.b. unit and those who can't . . . the majority. If a man can build satisfactory 144 MHz gear he can make the s.s.b. unit *if* he can find a suitable design. No frills, no band changing, no VOX, simple press to talk, Class A output, low power and above all 500 kHz bandspread.

" There is no need why the s.s.b. unit should come out at 14 MHz or 28 MHz. Any band of frequencies around this region would do, and it is surely not beyond the skill of some of our s.s.b. design specialists to suggest a suitable harmonic free band."

A technical challenge indeed: and to " Shack's " design criteria many members will no doubt like to add a couple more, that there shall be ease of setting up with the non-professional equipment found in a large proportion of stations, and that there shall be a complete freedom from the type of unwanted product which some transverter rigs can be heard to radiate.

Code for Class B Men ?

A very active G8-plus-three has suggested to us that the use of c.w. by Class B licensees should not be expressly forbidden: its use for identifying weak and fading 23cm signals is often imperative, and contacts are lost because it cannot be employed by the terms of the licence. Even 5 w.p.m. would be better than not at all, he thinks.

Instant Prediction

Much of this summer's sporadic *E* propagation on 4m has been predictable from a study of solar activity and a knowledge of its effect on DX paths. To provide himself with instant information in this field, Ron Ham, BRS15744, of Storrington in Sussex, decided he would construct a radio astronomy installation for use in his own back garden, even though this might mean taking a sabbatical half-year from his more usual activity of monitoring the amateur v.h.f. bands.

The aerial system erected, shown in the accompanying picture, is aligned on the sun and is cut for 137 MHz. A 10 by 6 ft. reflector is of ¼ in. wire mesh. The incoming solar signals on this frequency are fed to a home constructed transistor converter which is housed in a shed under the trees to the right of the picture. The i.f. output at 27 MHz is piped along an underground co-axial cable of BICC T3279 to the radio room in the house and the station AR88D. The output from the latter drives a pen recorder via a d.c. amplifier.

The BRS15744 radio astronomy equipment is in operation daily for a couple of hours around noon, the recorder chart speed of half-an-inch per minute being just about right to

Sun-gazing aerials at Storrington

accept any solar manifestations which might occur at those times.

The increased sunspot activity which had been predicted by various authorities, amateur and professional, as being likely to occur in early May arrived punctually on the trace at Storrington. The first solar burst went on the chart just before noon on 7 May and was accompanied by a characteristic " whoosh " from the associated loudspeaker. Its value in assessing band conditions became at once evident: there was a black-out on the 21 MHz band, duly confirmed by a neighbour, G3FEX, who was operating there at the time.

Listen Out Specially For . . .

. . . G8BRB/M, of Sanderstead, Surrey, on 144·88 MHz using n.b.f.m. and 25 watts. He has just returned from Australia (ex-VK5ZPB).

. . . DL5KL, also known as WA6ZCA, who has just joined the Society (welcome, OM!) and offers c.w., a.m., and sideband from his location at Hof Saale, in West Germany, near the Czech border. He has two stacked 8-element Yagis and a 500 watt linear for " Two," with 70cm coming along.

. . . G3BPM/P on 144·018 MHz c.w., from Cromer in Norfolk, during V.H.F. NFD this coming weekend.

. . . GM3KSU, poorly sited at 35 Howard Place, Edinburgh 3, who especially requests local schedules on " Four," phone or c.w.

Tech Corner

From G8ARV (David Taylor, Dudley, Worcs.):

In view of the interest shown in the all-transistor 2m transmitter referred to here in July, some further notes are offered; the design follows that given in *Mullard Technical Communications* as noted in Tech Corner for April.

As was stated in July, arrangements have been made for G8AEV, J. R. Hartley, to supply the components to go with

continued overleaf

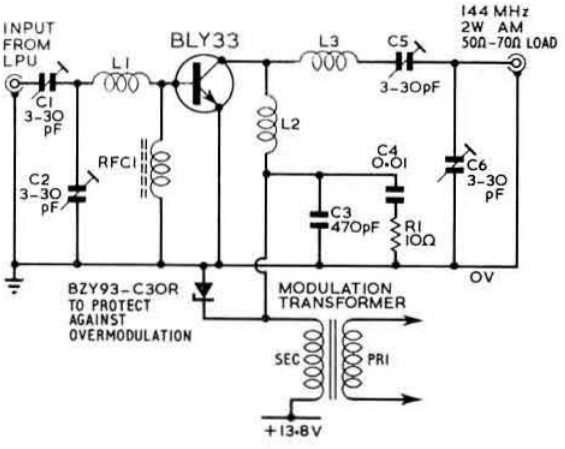


Fig. 1. The p.a. stage using a Mullard BLY33 described by G8ARV. For the 145 MHz band coil values are: L1, 3 turns 18 s.w.g., 8mm diameter, 8mm long; L2, 5 turns 18 s.w.g., 8mm diameter, 10mm long; L3, 3 turns 16 s.w.g., 12mm diameter, 10mm long. The choke RFC1 has 2 turns of 26 s.w.g. wound on a ferrite bead FX1115.

V.H.F. PERSONALITIES: No. 3

John Hazell, G8ACE, of Hatfield

Just south of Hatfield in Hertfordshire the A1 trunk road (it was called the Barnet By-pass when Minister of Transport Winston Churchill opened it in 1927) ascends a gentle rise before its final dash to London. Giant poplars, also *circa* 1927, flank it. Down in the hollow below the embankment, and behind the poplars, lies the QTH of G8ACE.

One look at the site is enough to tell visiting v.h.f. friends that there is little chance of radiating 70cm and 23cm signals eastwards except under anomalous propagation conditions —and even then, if the microvolts successfully penetrate the poplars and the A1 embankment, they next face the serried rows of those reflective aluminium-roofed New Town houses which came into the news a few years ago when a gale whipped their aerofoil-shaped tops off.

To the west and south of G8ACE the land is flat enough to give good propagation on both 70 and 23cm. To the north-east the attenuation from poplars in leaf in summer is something like 10dB compared with leafless winter; and when they are wet with rain they absorb a few more decibels from the signal path.

In the light of these site disadvantages John Hazell's preoccupation is to keep his 23cm dish and the 70cm 14-element long Yagi as high as possible—though the growth of the poplars inevitably exceeds the rate at which he can add sections to the mast. Even so, he now has the dish (an open-net design to reduce windage) up at 42 ft. on a mast tabernacled at the base.

At the foot of the garden a well equipped and thermally insulated shed houses a 25 watt transmitter for 70cm and a 2C39 rig for 23cm. There is no interest in " Two " apart from reception for duplex contacts. The preferred direction is up in frequency, not down. A great deal of the equipment is transistorized to original G8ACE designs, and a complete station can " go portable " at short notice.

The picture above shows G8ACE (right) at a Woburn Rally in company with Peter Simpson, G3GGK, one of the well known equipment reviewers for *RADIO COMMUNICATION*.

the printed circuit board which the writer, G8ARV, had made up. The board comes with a layout diagram, so that the constructor need only mount and solder the components on to it and he has a low power unit ready to feed a transistor p.a., of which more in a moment. As supplied by G8ARV, the p.c. board costs 15s. and the components cost another 61s. 9d. A 48 MHz crystal will be required.

Constructional points:

1. Solder emitter of last transistor to top side of p.c. board.

2. Twelve dip links round the outside of the board join top to bottom side.

3. Seven apparently unused holes are for soldering a wire through the board from top to bottom.

4. Referring to the Mullard circuit, increase L1 to 10 turns and all other coil diameters by 2 mm to hit 145 MHz. Capacitor values same.

5. Do not push the 4-29 pF trimmers hard down on to the board or the thick part of the lug may short to the top of the board.

Although this low power unit will deliver nearly half a watt and give a good account of itself on the air, many constructors will wish to add a p.a., and a suitable circuit is therefore shown at Fig. 1, using a BLY33. Components for this unit cost £3 15s. 11d. from G8ARV.

The p.a. may be built on a sheet of brass or tinplate, constructional points to watch being as follows:

1. Keep the emitter lead of the BLY33 very short, not to exceed 2 mm.

2. Mount the BLY33 on a Redpoint 5C heatsink.

3. Insulate the transistor from the heatsink by a thin mica or polythene washer.

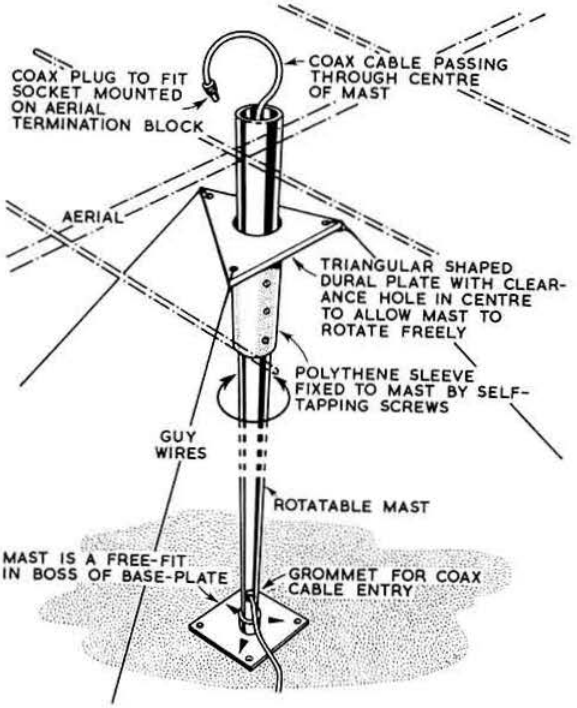


Fig. 2. The G3GGK aerial mast for portable v.h.f. working. The triangular guy plate is also shown.

4. The secondary of the modulation transformer will need to have an impedance of 65 ohms to match the p.a.

Alignment notes will be given at a later date.

From G3GGK (Peter Simpson, Cambridge):

With V.H.F. National Field Day approaching, members may like to have a reminder of a well tried method of facilitating aerial mast rotation without the need to uproot all the guy wires each time the beam is to be turned.

The sketch shows the essential arrangement. To a triangular shaped plate of dural three guy wires are attached, and the mast passes through a hole in the centre of it. This plate bears against a polythene or similar plastic sleeve secured at the top of the mast. The mast-with-sleeve rotates, the triangular plate-with-guys doesn't: and that's really all there is to it.

The mast should rotate on a base plate provided with a boss at the centre. This base plate may be conveniently marked with arrows to denote the 120 degree angles at which the guy wires should be disposed before hauling up the mast.

If the co-ax feeder is passed through the top section of the mast, it will not foul the guy wires. Fit a co-ax plug and socket on the aerial terminating block to avoid the need for threading the co-ax each time the mast is used. Thus the co-ax can be stored with the mast when not in service.

Here and There

"In the Yeovil area we have a number of licensed amateurs interested in 2m and 70cm who have found that the Cumulative activity periods have been most stimulating even when conditions are poor. Now that the G8+3 licence holders can operate on 2m would it not be possible to run the contests for the winter of 1968 to assess the band population more accurately?"—G3XFW.

* * *

" I am pleased to see the contributions to ' Four Metres and Down ' on amateur television, and find some of the hints and ideas expressed most helpful "—GM6ADR/T.

* * *

" Asked how he caught the openings, ZB2BO replied that he had the receiver on at all possible times for 70 MHz and that a north France beacon on 70·25 MHz gave a fair indication of South Coast openings "—G3JHM.

* * *

" When 2m is open most of the DX is toward the bottom end of the band. Many anti-social G stations move down there too in order to improve their chances of working the DX . . . "—G3EDD.

* * *

" If I call an a.m. station on his own frequency (which is only phone-station to phone-station) he does not answer me, even if he can receive my s.s.b., just because he doesn't listen on his own frequency in his own zone"—G3WW (Note.—G3WW, who is at March in Cambridgeshire, has returned to 2m after 11 years on the lower frequency bands. In two months he worked 62 stations, of whom 56 were on sideband. And to G6CW he was the 112th sideband station to be worked).

* * *

" . . . trying to get hold of a KW2000 and rig it up in a hospital here in Whitby for G3AJB who is a permanent inpatient. Have managed to scrounge, cajole, threaten £95 of the £110 needed, and have good hopes of getting the last £15 "—G8ANQ, Whitby.

SOCIETY AFFAIRS AND NEWS SUPPLEMENT

A brief report of the RSGB Council Meeting held on 12 July, 1968 in the Kingsley Hotel, London

Present: The President, J. C. Graham (in the Chair), Messrs B. Armstrong, N. Caws, J. Etherington, R. J. Hughes, A. Hunter, E. G. Ingram, L. E. Newnham, G. M. C. Stone, J. Swinnerton, E. W. Yeomanson (Members of Council), C. P. Pope (Secretary), A. E. Dowdeswell (General Manager) and T. R. Preece (Assistant Editor).

Apologies for absence were received from Messrs H. E. McNally, A. D. Patterson, J. Petty, R. F. Stevens, D. W. Thomas.

Membership and Affiliation

It was resolved (1) To elect 133 Corporate and 32 Associate Members.
(2) To grant Corporate Membership to eight Associates.
(3) To waive the subscriptions of four members on the grounds of blindness or other disability.

Applications for Affiliation

The following applications were accepted by Council: Standard Radio Club G3NIS, Middleton & District Scout Amateur Radio Club, The Woolwich Polytechnic Amateur Radio Society and the Leuchars Radiophonic Club.

Radio Communication Handbook

After discussion Council agreed to a special price to members of 55s. plus postage on orders received up to the last day of the Exhibition. After this date the price would be 63s. plus postage.

Festival of London Station GB2LO

The General Manager reported that the project had been a great success and had attracted a large number of visitors.

Visit of US Amateurs

It was reported that about 60 American Amateurs were chartering a plane to attend the FOC Dinner in London and it is hoped that they will be able to attend the reception for overseas amateurs on the Friday evening.

Committee Minutes

The following Committee Minutes were accepted by Council: Education Committee (25.5.68), V.H.F. Contests Committee (28.5.68), Technical Committee (5.6.68), IARU Working Group (11.6.68), Exhibition Committee (14.6.68), Mobile Committee (17.6.68), H.F. Contests Committee (20.6.68), and the GPO/TVI Committee (21.6.68).

Mr J. Etherington resigned from the Mobile Committee owing to pressure of work. The President read the results of the 1968 NFD Contest. Council recorded its appreciation of the speed with which the results of NFD were produced.

A letter was received from a member asking why the address of pirates, who were fined, was published. After discussion Council agreed to continue this policy.

Council was in session for 4½ hours

Swedish V.H.F. Manager, Lennart Berg SM6BTT (left) and Beugt Olov Wieck, SM6APH, visited RSGB HQ on 3 August to have talks with Geoff Stone, G3FZL, on v.h.f. matters of mutual interest. SM6BTT is well known for making the first meteor scatter contacts in Europe in 1958. They were on a two week holiday in England.

NEW HEADQUARTERS—THE END IN SIGHT

Since our August issue the first stage in the preparation of our new Headquarters has been completed. The structural alterations are complete, the central heating is tested, and the main services are " on." The decorators have finished their work, and the final " clean-up " is under way.

But this is not quite " the end of the road," as floor coverings and some curtains have to be obtained and fitted. Finally Headquarters Staff will have to bear the brunt of the actual move, which will be undertaken at a week-end to ensure minimum dislocation of Society business and least disturbance to other occupants of the building we are vacating. *You* can help by keeping correspondence and enquiries to a minimum during the weeks preceding and following the move. Our new telephone number will be 01-837 8688 (omit 01 in the London area), and we have obtained three sequentially numbered lines, so that you will be put through automatically on any one which is free. Unfortunately we couldn't get " 7373 " and to take it from the old Exchange would have been too costly.

As our plans come in sight of fruition two Council members can relax a little—and perhaps sleep at nights. Roy Stevens, G2BVN, has been Council's " watchdog " and liaison officer with the supervising Architect, while our Treasurer Norman Caws, G3BVG, has planned the financial wizardries which have kept the operation within the scope of the Society's purse. To both of these we say a very grateful " thank you " for the tremendous amount of time and effort they have willingly given.

But the prime " givers " are of course the members, and they continue to support us, both as individuals and clubs. Donations and Debentures applications are still coming in, and are as welcome as ever. Very few contributing clubs have given us an up-to-date membership total, so this month we confine ourselves to acknowledging recent contributions from:

Crawley ARC (further donation)	£1. 0s.
South Shields & District ARC	£3. 15s.
Verulam ARC	£5. 7s.

Added to amounts previously reported, these donations bring the total to £125. 9s. 6d.

And finally we need your help in another direction. A Headquarters Building worthy of the Society is worthy of a name; can you think of a good one? If so, write to Society HQ—mark your letter " for the attention of Council " and it will be given every consideration.

Election of Council, 1969

In accordance with Article 52 of the Society's Articles of Association, the Council has nominated the following Corporate Members to fill the vacancies on the Council which will occur on 31 December next.

Ordinary Members

Mr A. D. Patterson, GI3KYP
Mr G. M. C. Stone, G3FZL

Not later than 10 October next any 10 Corporate Members may nominate any other Corporate Member to serve on the Council by delivering their nomination in writing in a single document to the General Manager, together with the written consent of such nominee to accept office if elected, but each nominator shall be debarred from nominating any other person for this election.

Council Members Elected by Zones

Not later than 10 October next any 10 Corporate Members resident in Zone B (Regions 3 and 4) and Zone C (Regions 5, 7, 8 and 16) may nominate any other duly qualified Corporate Member resident in the Zone concerned to serve on the Council by delivering their nominations in writing in a single document to the General Manager, together with the written consent of such nominees to accept office if elected but each such nominator shall be debarred from nominating any other person for this election.

Candidates for nomination as Council Members elected by Zone must be resident within the Zones for which they are nominated and the nominators must be resident in the same Zone.

The present Council Member for Zone B is Mr F. K. Parker, G3FUR, and for Zone C Mr R. J. Hughes, G3GVV.

Silent Keys

Sid Waters, GW3GO

The death occurred on 16 July, 1968, of Sid Waters, GW3GO, at St. David's Hospital, Cardiff. In the period following the War, Sid was one of the most active and best known amateurs in South Wales. Generous to a fault, and always ready to help others, he was well liked and respected. For some years bad health had limited his activities.

The funeral services at Porthcawl were attended by GW5VX, GW3FSP, GW3BFH, GW3VLP, GW3UUZ, GW5BI, GW3UO, GW3XHV, GW4CG and ex2ABJ.

The deepest sympathy of the membership of Region 10 is extended to Mrs Waters and the family. C.H.P.

Hugh E. Cockrem, G3ZC

On 6 July, 1968, Hugh Cockrem, G3ZC, died aged 61 years at his home in Stoke-on-Teignhead, near Torquay, after a long illness.

G3ZC was at one time a sea-going W/T operator, an engineer at the GPO Radio Station, GBR, Rugby, a Captain of the Special Branch Royal Signals in the last war and a member of the RSARS. He was an intrepid brass-pounder and DX sked keeper, whose fist will be missed by his great many W friends and his cheery voice on Top Band by the local Torbay fraternity. Prior to his illness, he gave some valuable service to the Torbay Amateur Radio Society as Honorary Treasurer.

The funeral service and cremation at Torquay was attended by G2GK, G2CWR, G3ABU, G3BBF, G3LKJ, (RSGB ASR), G3UXN, G3VNG and G3VTQ.

Sympathies are extended to his widow Jean, sons Peter and Jonathan and to his daughter Tessa. B.E.S

RADIO AMATEUR EMERGENCY NETWORK

By S. W. LAW, G3PAZ*

IT is popular in this day and age to speak glibly of " minorities " and to go on to lean over backwards in the traditional British manner on the vexed question of privilege. Yet oddly enough the minority group which comprises the radio amateur fraternity is, at best, looked upon by the public as somewhat of an oddity (have you ever tried to tell a group of TV addicts or pop-tranny slaves *who* started this broadcasting?). Yet we now have a widespread agitation on foot for " Free Radio." This might be harmless enough were it not for the unwanted (and illegal!) practical demonstrations of " independence " by the clowns who put out pop music on the amateur bands. The unfortunate thing is that, whilst any broadcast listener is entitled to complain of interference, the licensed amateur has no redress if his enjoyment of his hobby is marred by unwanted r.f.i. True, we can (and should) report any identifiable illegal transmission but if a faulty TV receiver in the vicinity puts out a 9+ hash the authorities are not empowered to assist the amateur in any way. Yet the slightest flicker on the screen of the offending TV can bring down the full majesty of the law on the long-suffering amateur, as broadcasting is a " protected service " whereas the " amateur service " is not. Unfortunately this goes for RAEN also, since we must operate within the terms of our licence. It is therefore obvious that our communications should retain a certain degree of elasticity where it is possible, since one faulty TV could completely ruin local contact on a particular frequency in an emergency. Could *your* Group QSY confidently at a moment's notice if requested by Control?

Fait Accompli

Have you heard the South Bucks (Mid-Thames) Group (70·355 MHz) QSY to the Surrey frequency (70·365 MHz) in 3 seconds flat to exchange news and greetings?

Nomadic

The winds of change affect us all in turn, and the Surrey Group are as prone as others. Due to the two major developments from which most Groups in the English Counties at least are suffering to a greater or lesser degree, Surrey have had quite a few changes in the venue of their meetings over the last twelve months. For their July meeting the site was a User Service hall at Dorking. Excellent in every way (including catering facilities!) as this place is, there is the disadvantage that it is not central in the area covered by the Group. The previous sites in the area of Guildford were better in this respect in view of the wide-spread membership (which extends into the North of Hampshire). No doubt something will turn up eventually—their Controller is both capable and energetic!

Colourful Correspondence !

We must express thanks to all those who responded to the recent query about transparent green laquer. The samples which arrived were also very welcome, and if any would like the " dope " (as it were!) we shall be only too pleased to pass on the information.

* 11 Chisholm Road, Croydon, Surrey, CRO 6UQ.

Honorary Registrations Secretary : **Mr R. A. Ledgerton, G2ABC 1 Latchingdon Gardens, Woodford Bridge, Essex.**

Honorary Secretary, RAEN Committee : **Mr E. R. L. Bassett, BRS16075, 57 Upper St. Helens Road, Hedge End, Southampton, SO3 4LG.**

Still they Come

This year so far there are at least a dozen transmitting members in GM-land. We wonder if conditions will get any of them a contact with that very lively Norfolk Group Sunday morning net? Top Band can do wonders in daylight at times. Kent also are forming up nicely, and G3ODB will be glad to hear from any prospective members in the Orpington area. For those nearer Maidstone, contact G3WXL—he has special reasons for his interest in this area. Incidentally, the South Bucks Group have now decided to adopt the title " Mid-Thames Raynet " as being more descriptive of their coverage. Both Kent and Mid-Thames are active on 4m.

Over the Ditch—and Down Under

One occasionally hears news from the USA of excellent emergency operation by amateurs, but not so much is heard from Canada. Checking the *Alberta Amateur* (official bulletin of the Amateur Radio League of Alberta) we are delighted to find a very healthy activity in emergency operation. Amateur Radio Public Service Communications (ARPSC) is a regular facet of our hobby in Canada, and the particular aspect of emergency operation is well provided for in Amateur Radio Emergency Communications (AREC). As the distances involved are greater than we have in this country the techniques employed are somewhat different from those used here. Nevertheless, 2m is a well-used band, and if any of our DX hounds happen to strike an opening during their annual Simulated Emergency Test much may be learnt. This test is a two day event and uses a number of frequencies including their " 75m Band." Australia too is active in emergency operation, and a recent letter we received brought this to our notice. The body concerned " Down Under " is the Wireless Institute Civil Emergency Network, and any of our members who might like to learn more of this organization may care to contact G8BRB (ex VK5ZPB) of Surrey who was a member in Australia before he came to this country.

The Show

As we may have intimated in a previous column, RAEN will be well represented at the Show this year. The Manchester Group have the matter well in hand, and those who have followed the work done by this Group will know that their exhibit will be worth seeing. Don't miss it.

Mains/Battery Operation

Once again on the subject of the " Reporter " there are a few about which are designed for instant change-over from battery to mains drive. The model may be identified by the extra length from front to back. This only amounts to a couple of inches or so and is compensated for when the set is fitted to its mobile cradle by having the side " Quick-release " screws set further back on the case. The sets are completely inter-changeable with the normal battery model and operation is no different. In the rear is a mains input recessed two-pin plug, and when a mains supply is plugged in, relays instantly operate to change over from battery to mains working. If a battery is left connected, the relays will reset immediately the mains are switched off and reception or transmission may continue uninterrupted. The usefulness of this set will be obvious as a " short-haul " base station. True, the relay operation is a little noisy but this is a small price to pay for such a handy rig if you are lucky enough to find one. A small improvement which may readily be made to this, and indeed any other, model is to fit an ordinary " panel handle " to the front of the set. When fitted to the lower edge, the balance is just right for carrying and also is a boon when extracting the set from the mobile cradle.

CONTEST NEWS

Fourth 144 MHz (Portable) Contest 1968

A remarkably high number of entries was received for the Fourth 144 MHz (Portable) Contest held on 19 May, 1968. At the top of the results table an extremely close finish between GW3BA/P and GW3NUE/P. It is interesting to note that the scores, number of contacts, location and power of these top two stations was quite similar. GW3NUE/P, however, was operating from over twice the height (a.s.l.) of GW3BA/P, which further confounds the theory that height alone is indicative of performance! Of course in this case GW3BA/P was obviously able to work similar distances to GW3NUE/P, but no doubt at lesser signal strength.

Special awards will be made to G3OXD/P as leading G station and to GM3PWJ/P as leading GM, who with 38 contacts made 8039 points. There were seven contacts in the log of GM3PWJ/P made over 300 km. Congratulations go to all the winners.

There was general approval of the rules. The scoring system gave rise to the following comments: " I like the new scoring system because it is easier to work out the results " (G3EJO, Op of 3BA); " easy to use but is it fair? " (GW3NUE); " We like the new scoring system; it makes life a little easier " (G3OBD); " The new scoring system did not help at all at this distance " (GM3PWJ); " The concept of distance measurement by zones is excellent, but we and many others in outlying areas feel that the station multiplier is ill conceived " (G3SEK of NJN); " Scoring system satisfactory " (G8AFN); " We like the new scoring system " (G3THX). To sum-up the position on the scoring system; it seems that the use of the radial system is very popular, but there seems to be concern as to the fairness of the system. The Committee feels that the present system is working at least as well as the old method, with the added advantage of quickness. However, it is hoped to improve the system for 1969. Entrants should realise that conceiving a " fair " system is impossible and that no system will please everyone. In fact most agree with the present system and it does not seem to be giving the bias towards the home counties as originally predicted. The committee still seeks your views as only by this approach will we achieve an acceptable system.

Conditions during the contest were described by most entrants as " rather poor " and one nameless entrant used an unprintable four letter word to describe his views! Despite these adverse comments on propagation G3OBD/P worked GM3PWJ/P.

The standard of logs in the main was high but many are not using the correct cover sheet. In addition several had hand written the new cover sheet, which is very commendable, but a large s.a.e. to HQ or the contest adjudicator will secure these cover sheets. The V.H.F. Contests Committee wishes to thank all the entrants and the following for check logs: G3IRM, G2HCG, BRS28005, BRS15822 and A5032. Lastly a comment from G3HRH. " Someone had to be last in the table! "

Call-sign Portable	Position	Score	QSOs	QTH (county)	Height a.s.l. (ft.)	Power (Watts)
GW3BA	1	52875	128	Mont.	1300	60
GW3NUE	2	51832	128	Breconshire	2624	50
G3OXD	3	25117	114	Salop.	1700	25
GW3ITZ	4	23205	90	Flintshire	980	25
G8ATK	5	15936	93	Berkshire	902	25
G3FTK	6	15900	84	Gloucestershire	950	25
G3SLJ	7	14938	96	Bedfordshire	798	28
G3OBD*	8	13720	80	Wiltshire	—	25
G3PMH	9	13032	77	Cambridgeshire	120	50
G3JEQ	10	11899	81	Surrey	890	10
G3NJF*	11	11256	60	Lincolnshire	—	24
G3KKP	12	10350	64	Yorkshire	710	22
G3SBR*	13	9499	68	Staffordshire	1260	15
G3UUT	14	9275	61	Yorkshire	664	50
G8APV*	15	9176	79	Surrey	—	30
GM3PWJ	16	8039	38	Kirkcudbrightshire	750	100
G8ACB	17	5687	53	Worcs.	1675	10
G8BNR	18	5136	63	Hertfordshire	860	12
GW3TXR	19	5100	47	Radnorshire	1500	25
G3WIZ	20	5035	59	Buckinghamshire	780	25
G3TND	21	4915	53	Somerset	700	60
G3UUP*	22	4761	61	Hertfordshire	602	25
G3KEU	23	4680	43	Yorkshire	1328	14
G8AWO*	24	4595	60	Hertfordshire	—	12
G3FD*	25	4576	56	Hertfordshire	540	15
G5HZ	26	4565	72	Berkshire	779	15
GW3WVG	27	4429	55	Mon.	1000	10
G3CMH*	28	4356	50	Wiltshire	—	25
G3NJN	29	4002	35	Lancashire	1300	25
G3WIR	30	3867	72	Buckinghamshire	250	24
G8AAL*	31	3577	41	Salop.	—	9
G8AFN*	32	3496	45	Leicester	—	12
G3EFX*	33	3218	48	Buckinghamshire	647	8
G3UI	34	3069	39	Yorkshire	1400	12
G8AWN	35	2835	40	Yorkshire	985	12
G3BPM*	36	2713	38	Wilts.	—	20
G5UM	37	2646	37	Rutland	560	9
G3RAL*	38	2497	54	Leicestershire	—	10
G8AWV	39	2470	44	Buckinghamshire	400	13
G3FKO	40	1892	15	Cardiganshire	1030	6
G3CGQ	41	1749	33	Dorset	—	20
G3APZ	42	1402	41	Hertfordshire	410	12
G3THX	43	1386	25	Lincolnshire	290	10
G3OTK	44	1375	33	Somerset	870	4
G8AJC*	45	1260	27	Kent	—	8
G6XM*	46	1235	39	Hants.	240	24
G3MA	47	1219	29	Gloucestershire	900	8
G3SMY*	48	940	26	Gloucestershire	625	12
G3RZG	49	936	23	Dorset	777	8
G8BBN	50	920	29	Hants.	409	9
G3IGV*	51	567	16	Cornwall	520	20
G2WS	52	647	23	Somerset	400	6
GW3OHW	53	540	15	Cardiganshire	1790	10
G3SID	54	200	18	Middlesex	400	5
G3HRH*	55	162	16	Hertfordshire	—	10

* Incorrect cover sheet used.

144 MHz Summer (Open) Contest, 1968

It was gratifying to see such a good entry for a Contest (6/7 July) arranged at such short notice, and the thanks of the Committee go to all participants. To most operators,conditions were only average, although one might hardly think so to look at the score achieved by GW3NUE/P. The coincidence of this contest with that arranged by members of IARU was responsible for many good long distance contacts, but few QSOs were made over the normal tropospheric range.

Log-keeping was generally satisfactory but several operators failed to include details of the best DX. In view of the fact that there are still a number of the old type cover sheets in circulation, this information was extracted without penalty by the adjudicator, but competitors are asked to ensure that they have a supply of the new cover sheets for the next contest and that they are completed correctly. These may be obtained from an adjudicator on receipt of an s.a.e. or direct from RSGB HQ.

Comments: " Scoring system again proves easy, had my score worked out 45 minutes after the end of the contest " (G8APJ). " Rule 9b (ii) should be changed to QRA or QTH, preferably both. Think scoring system bad, should go back to km total " (G8AWW). " Would s.s.b. gents please put their rigs on " (G3RXK). " Too many people seem to be using phone in c.w. part of the band seriously jeopardizing DX contacts " (G3BPM). " It is a pity that the c.w. zone is still not respected " (G3GZJ). " I would advocate penalties in the case of non-compliance with the band plan. It is during a Contest that the plan should show benefits " (G8BHL).

" Access to site made difficult by rain erosion and land slips; will soon need helicopter or an absolutely fearless Land Rover driver " (GW3NUE/P). " We entered to have a good time and to show that low power transmitters are not just a gimmick " (G8AZU).

The committee congratulates the winners and runners-up to whom appropriate awards will be made (subject to the approval of Council) and thanks G3JFY, GC2FZC and BRS 18456 for check logs. A final note about the results table, in order to save space and therefore include more information, the standard RSGB county code letters have been used instead of printing the county name in full.

SECTION A Single operator, fixed stations

Posn.	Call-sign	Points	QSOs	Best DX Call	Km	QTH (County)	Power (Watts)	Aerial
G8BBB	1	19370	88	PA0CML	350	CE	50	10 el.
G3NEO	2	16500	74	G3GZJ	435	YS	150	5/5
G3NOH	3	11029	100	F9FT	370	HF	30	12 el.
G3HRH	4	10004	73	ON4RY	365	HF	20	4 × 8 el.
G3SHZ	5	9868	107	PA0HVA	326	MX	30	10 el.
G3GJY	6	8624	47	G2JF	365	YS	18	8 el.
G3EHM	7	7722	67	G8AEJ	230	SD	60	6/6
G8BJK	8	6052	79	ON4RY	340	HF	40	8/8
G8APJ	9	5030	80	GW3NUE	225	LD	14	8 el.
G3RXK	10	4816	55	G2JF	250	WK	150	6/6
G5UM	11	4424	44	PA0HVA	460	LR	40	10 el.
G2AIQ	12	3657	35	PA0MOD	490	CE	100	4/4
G3AHF	13	2574	30	G3AUE	230	HE	25	2 × 4/4
G3UIK	14	2310	58	GW3NUE	208	HF	15	6/6
G3BPM	15	1897	44	PA0HVA	395	MX	20	5 el.
G8AWW	16	1885	34	GW2BVW/M	186	LR	25	5 el.
G3PKV	17	1351	37	G2JF	117	HF	25	6/6
G3GZJ	18	1160	15	G3NEO	440	CL	12	6/6
G8BCH	19	816	21	G3GZJ	210	HE	28	5 el.
G8BJG	20	760	32	G3SEK	65	KT	15	8 el.
G8ABZ	21	507	21	GW3NUE	225	YS	66	5 el.
G8ATM	22	455	15	G2JF	250	NM	18	9 el.
G3XFW	23	322	14	G3VDX	150	ST	38	3 el.
G3JKY	24	200	17	G8ARO	92	KT	27	5 el.
G8BHL	25	183	38	G8BJZ	125	LD	14	8 el.
G3WDG	26	161	16	F5JY	140	HE	18	6/6
G3NBU	27	72	10	G3FAN	95	BE	9	5 el.

SECTION B Club, /A and Multi-op fixed stations

G8AWM/A	1	110662	185	DL0WI	480	EX	15	8/8
G8BEJ	2	19404	77	ON4RY	507	SY	100	8 el.
G8ARC	3	14805	110	F1GG	337	LD	40	8 el.
G5PI/A	4	12000	69	PA0PYT	335	CE	120	8 el.
G3XEB	5	8167	88	GW3NUE	205	LD	30	4 el.

SECTION C Portable Stations

GW3NUE/P	1	212054	235	PA0HVA	510	BR	50	10 el.
G3APV/P	2	77262	120	F9VX/M	900	SX	30	8 el.
GW3OXD/P	3	61992	139	G2JF	302	RN	8	3 el.
G4JJ/P	4	36724	118	PA0HVA	437	DY	10	8 el.
G3TND/P	5	17556	88	G8BCL/P	307	ST	68	2 × 8/8
G8ACB/P	6	12770	91	G8AWM/A	239	SE	10	6/6
G3EFX/P	7	12527	80	ON4RY	365	BS	10	6/6
G8ARO/P	8	12398	76	F9ZG/P	363	BE	15	8 el.
G8AZU/P	9	7405	81	F1GG/P	309	SY	800 mW	8 el.
G8AJC/P	10	7160	43	PA0VVH/P	370	KT	12	6 el.

Third 70 MHz (Portable) Contest 1968

The 21 July contest saw no less than 86 portable stations active on 70 MHz, 11 of them located in Northern Ireland. GC was the only British Isles prefix not represented in the entries but GC3OBM figured in several logs. The only Scottish entrant, GM3WOJ, deserves special mention for a log consisting of four GIs, two EIs one GM, and one GD. He promises to appear during V.H.F. NFD with better gear and a better site.

First and second place in the results are taken by Albright and Wilson ARS and Worcester V.H.F. Group respectively. Both stations made less than 20 contacts with the 100 km radius. GI3VPK made almost the same distance score as the leading station by virtue of the non-linear scoring system but, as might be expected, was lacking in sufficient contacts to make a correspondingly good multiplier. Of his 58 contacts, 34 were worth 10 points or more.

Conditions seem to have been good almost throughout the contest and several contacts were made at distances better than 500 km. The best recorded was that between GI3VPK and G3RCV, the latter located at Wrotham, Kent.

Little variation in equipment was noted, with QQV03-20s producing most of the r.f. and 4 element Yagi aerials radiating it. G3JHM, operated by the South Coast V.H.F. Group, used a 4-over-4-over-4 array while at the other end of the scale GW3KTA employed a 2 element beam.

Several doubtful QRA locators were received, the best one being from a station apparently on the west coast of Iceland! On the subject of locations, G3RLE may be amused to know that one operator logged him as " 4 km East of Seattle " (G3RLE/W7?).

Comments received included:
Rules favour remote stations with good locations (G3OYU).
Multiplier makes sure that no-one from a remote area can win or even do well (GI3VPK).
Let's not change to *another* ridiculous locator system (G3RLE).
Conditions were the best ever experienced for GDX on 70 MHz (G3JHM).
Contest was 4 hours too long as far as my battery was concerned! (GW3KTA).

Subject to the approval of Council, Certificates of Merit will be awarded to the winner and runner-up. Certificates will also be awarded to the leading G station G3WIN/P and to GI3VPK/P as leading GI station to mark his excellent performance. Check logs from: G2WS, G3WQP, EI2W and BRS 28005 are acknowledged with thanks.

A.J.G.

Call-sign (Portable)	Posn.	Points	QSOs	Ft. a.s.l.	R.F. Stage	Power (W)
GW3OXD	1	54495	107	1765	6CW4	20
GW3NUE	2	47548	107	2600	TIXM12	50
G3WIN	3	39840	83	1000	MPF102	21
G3XLH	4	31800	78	664	6CW4	40
G3NKS	5	29808	84	659	6CW4	25
GI3VPK	6	29355	58	1000	Transistor	40
G3WYX	7	26846	62	1170	E88CC	50
G3RLE	8	25085	77	1300	TW	10
G3SLJ	9	24168	81	1772	2N3823	15
GI3VJS	10	21837	72	920	TW	50
G3THQ	11	18415	72	602	6CW4	25
G3KKP	12	17516	61	710	6CW4	22
G3JHM	13	16448	72	783	—	25
G3OGY	14	15718	71	1400	6DS4	15
G3RCV	15	14326	73	597	Transistor	20
G3ULT	16	13907	66	780	—	15
G3TND	17	12960	52	1000	2N3819	24
G3VPF	18	11655	46	776	FET	17
GW3ITZ	19	11400	64	970	E88CC	10
G2DJ	20	9253	52	513	ECC81	23
G3NEO	21	8883	46	380	6CW4	40
G3JEQ	22	8516	75	890	6CW4	10
G3OYU	23	7503	56	782	EF183	50
G3OJE	24	7436	49	850	E88CC	25
G3VFD	25	7323	73	850	3N140	15
G3WQK	26	5977	48	560	Nuvistor	10
GI3ILV	27	4623	36	1170	JXK	2.5
G3VCP	28	4514	51	850	BCC	10
GI3VAW	29	4054	32	1700	R220	16
G3WIR	30	2881	51	250	6CW4	18
GW3ERB	31	2808	40	850	R220	15
G3TDM	32	2337	32	540	6AK5	6
G3BZG	33	1457	30	480	TW	10
GW3KTA	34	1340	22	1000	BCC	5
G5UM	35	1335	22	700	Transistor	10
GM3WOJ	36	172	8	—	EF91	10

Disqualification: G3PAO, G3RIK, No QTH's or QRA's logged, Rule 9.
G2AVC, G3XAC, EI6AS, logs not sent to adjudicator, Rule 2.
GD3EKP, No power declaration, Rule 18
G3WKF, Late entry, Rule 18

The D/F Story Continues

The Amateur Radio equivalent of " Fox Hunting " is very popular on the Continent, and although it is usually defined as a v.h.f. D/F hunt on foot to locate a moving station, a group of amateurs from Ashford in Kent held a very similar exercise on 21 July. G3VJF/M, G3PKT/M, G8AJC/M and G3TDP/M equipped themselves with 2m receivers and an assortment of aerials from dipoles to four element beams, and set off from the Motorway Cafe on the M2 to track down G3EMU/M. The distance between the start and finish was some 13 miles, the destination being Harty Ferry, 3 miles north of Faversham. The first station away left the cafe at 14.45, and the first to locate G3EMU/M was G8ACJ/M at 17.20. G3VJF/M found himself very near to the fox quite early in the hunt, but was unfortunately separated from the station by a mile of water; he had travelled over to the Isle of Sheppy and was faced with a 20 mile drive to make contact. G3PKT/M was about 6 to 7 miles away at the finish, and G3TDP/M about 1 mile.

The afternoon was thoroughly enjoyed by everyone, and it is planned to run another in September. Any amateurs in the area are welcome to contact G3EMU or G3TDP if they would be interested in taking part. G3TDP's address is T. Groombridge, 28 Sprotlands Avenue, Willesborough, Ashford, Kent.

Rugby D/F Qualifying Event

This year the Rugby qualifying event was organized by members of the new Rugby club, " Rugby and District Amateur Radio and Electronics Club," assisted by members of the " Ariel Radio Group (Daventry)." The Contest took place in an area between Daventry and Banbury on Sunday 30 June.

For both their qualifying event and the National Final last year, Rugby had used a low power transmitter close to the start for one of the stations. Competitors seemed to think that they wouldn't dare to do this again. They did! In fact G3IKL/P was only 1¼ miles from the start, with G3NDM/P only one mile further down the same bearing. Needless to say both transmitters were extremely well hidden, away from roads in a complex of muddy, overgrown tracks. Both transmitters used enormously long, twisted, and looped aerials, designed to make D/F near them as difficult as possible.

Although G3NDN/P could have been reached in ¼ hour, with only ¼ mile walk (if you knew the way!), Martin Gee was the first to find this transmitter 1¼ hours after the start. He was closely followed by Paul Tyler. The transmitter team told later how, " these two burst through the bushes like bulldozers." All the competitors went to this station first, and most walked in the hard way along a mile of muddy track. By using this route they were able to follow the full 1,270 feet of G3NDN's monster aerial.

G3IKL/P was as invisible as usual in a ditch under a thorn bush. The Grimsby teams had bad luck here, and took bearings on the other station only 30 yards away from Bob; then, without even noticing the dummy aerials around them, they went away towards the other station. Eric Mollart also inspected this site, 5 minutes after the start. He came back many miles, and 2½ hours later.

There was an attendance of 54 at the tea afterwards, where Mrs J. J. Grant presented the Rugby Cup to Eric Bristow, G3WNN.

Thanks to G3CYH, G3IKL, G3MDC, G3NDM and G3XCT for organizing this qualifying event.

Posn.	Name	Call	Club	A Stn.	B Stn.
1	E. W. Bristow	G3WNN	Oxford	15,17½	15,59*
2	M. P. Hawkins	G3WMM	Oxford	15,20½	15,59½†
3	M. J. Gee	—	Oxford	15,00½	16.03½*
4	E. L. Mollart	—	Oxford	15,16½	16.20†
5	T. Gage	—	Oxford	15.30	16.27*
6	R. J. Pearce-Boby	—	Oxford	15.16	16.30
7	D. Newman	G8BGD	Rugby	15.46	16.31
8	J. R. Vickers	G3ORI	Stratford	15.50	16.37
9	P. Tyler	—	Oxford	15.00‡	16.44½
10	G. T. Peck	—	High Wycombe	15.34	16.44‡
11	R. Curnow	—	Oxford	15.18	— †
12	I. R. Butson	—	Oxford	15.30	—
13	A. R. Green	G8BNG	Derby	15.30‡	—
14	O. L. Harding	—	Lincoln	15.35	—
15	J. J. Grant	—	Rugby	16.26	—
16	D. Nsaey	GW3ATM	Chepstow	16.45	—
—	J. R. Reynolds	G3RSD	Grimsby	—	—
—	R. P. Smith	G3SVW	Manchester	—	—
—	M. Knights	G3NJF	Grimsby	—	—

* Qualify for National Final.
† Previously qualified.

Stratford-upon-Avon D/F Qualifying Event

This event, held on 14 July, followed the worst flooding in the Vale of Evesham for many years, and only the previous day the organizers were anxiously surveying the start, at Pershore Bridge, which was then under a foot or so of water. Fortunately the waters receded overnight and 18 teams were able to assemble and take their bearings. However, roads still impassable due to the floods were an unusual complication encountered by some competitors during the contest.

The A station was sited in a small but dense wood on Nottingham Hill near Bishops Cleeve, 10½ miles from the start. Station B was perched on a steep wooded slope above the River Avon at Cleeve Prior, 8½ miles from Pershore. Torrential rain during the morning had made this bank extremely muddy and slippery as well as soaking the transmitter crew. However, after the contest got under way the rain abated and gave way to fine weather.

The winner, M. P. Hawkins, succeeded in locating both transmitters by 15.33, with a good lead over P. Tyler who finished second at 16.10. E. L. Mollart, however, introducing a visiting Norwegian " fox hunter " to the techniques of transmitter hunting in this country, seems to have gone in for long distance walking. Not content with a mile walk to the B transmitter he started walking again when some 4 miles from the A site and was still two miles away when the contest ended!

Of the five contestants who located both transmitters, P. Tyler and I. R. Butson qualified for the National Final. A further seven found one station. A total of 55 participants sat down to tea at Broadway, followed by the announcement of the results, discussion of the day's events, and presentation of prizes.

			Time of Arrival	
Posn.	Name	Club	A Station	B Station
1	M. P. Hawkins	Oxford	14.50	15.33
2	P. Tyler	Oxford	14.55	16.10
3	I. R. Butson	Oxford	16.13	15.04
4	E. W. Bristow	Oxford	16.16	15.15
5	B. J. Mahoney	Rugby	15.26	16.19
6	G. T. Peck	High Wycombe	—	14.53
7	E. L. Mollart	Oxford	—	14.54½
8	O. L. Harding	Rugby	—	15.04½
9	T. C. Gage	Oxford	15.26	—
10	W. J. North	Chiltern	15.38	—
11	M. Gee	Oxford	15.41	—
12	D. E. Newman	Rugby	—	15.55½

Third 432 MHz (Open) Contest 1968

1. **Date and Time.** 5 October, 15.00 GMT to 6 October, 15.00 GMT.

2. All entries must be sent to the adjudicator at: V.H.F. Contests Committee, 39 Angle End, Great Wilbraham, Cambridgeshire.

The following **General Rules** will apply: 3a, 4, 5a, 6a, 7a, 8a, 9b, 10a, 11–21, 23–28 (Rule 22 does not apply).

Second 1296 MHz (Open) Contest 1968

1. **Date and Time.** 13 October, 09.00–17.00 GMT.

2. All entries must be sent to the adjudicator at: V.H.F. Contests Committee, 60 Merlin Grove, Beckenham, Kent.

The following **General Rules** will apply: 3a, 4, 5b, 6b, 7a, 8a, 9a, 10a, 11–21, 23–28 (Rule 22 does not apply).

BERU Contest

Rules for the Thirty-Second Event, 8-9 March, 1969

RADIO amateurs throughout the British Commonwealth are invited to take part in the Thirty-Second BERU Contest to be held on 8–9 March, 1969. The Contests Committee is again arranging to secure the maximum amount of overseas publicity but invites the assistance of members in bringing the dates and rules to the notice of operators throughout the Commonwealth. The attention of all entrants is drawn to the amended scoring system. Note, also, the requirement of a check list.

1. Sections. The contest is divided into two sections: (*a*)High Power—maximum licensed power; (*b*) Low Power—maximum input 25 watts.

2. Duration. The contest (both sections) will start at 00.01 GMT on Saturday, 8 March and end at 23.59 GMT on Sunday, 9 March, 1969.

3. Eligible Entrants. The contest is open to all fully paid-up corporate members of the RSGB resident within the United Kingdom and all amateurs licensed to operate within the British Commonweath and British Mandated Territories. All entrants agree to be bound by the rules of the contest.

4. Operator. Only the entrant will be permitted to operate his station for the duration of the contest.

5. Entries. Entries should be set out, on ONE SIDE ONLY of foolscap or International A4 log sheets. **Entries must be postmarked not later than 1 April, 1969,** and must be addressed to BERU, Contests Committee, Radio Society of Great Britain, 35 Doughty Street, London, WC1, England. Log sheets are available from RSGB Headquarters on request. A check list showing call areas worked on each band is also be to included.

6. Bands. Operation is restricted to the following bands: 3·5, 7, 14, 21 and 28 MHz. Transmission must be of type A1 (pure c.w) only, and frequent tone reports of T8 or less may result in disqualification.

7. **Licence Conditions and Power Input.** Entrants must operate within the terms of their licences.

The following cover sheet is required:

BERU CONTEST, 8-9 MARCH, 1969

Claimed Score.....

Section: (High or Low Power) .....

Name ..... Call-sign.....

Address .....

Transmitter .....(D.c. input to any stage of the transmitter should not exceed 25 watts in the Low Power Section)

Receiver ..... Aerial(s) .....

DECLARATION: *I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and agree that the decision of the Council of the RSGB shall be final in all cases of dispute. I certify that the maximum input to the final stage of the transmitter was*

..... watts.

Date ..... Signed .....

Failure to sign the declaration may involve disqualification of the entry.

8. Contacts. Contacts may be made with any station using a British Commonwealth call-sign except within the entrant's own call area. British Isles stations may not work each other for points. Contacts with unlicensed stations will not count for points. The decision as to whether or not a contact is valid will rest with the RSGB Contest Committee. Only one contact on each band with a specific station will count for points. **Duplicate contacts should be logged,** but no points claimed.

9. Scoring. Each completed contact will score **5 points.** In addition a bonus of **20 points** may be claimed for the first, second and third contacts with each new Commonwealth call area (as defined on the next page) on each band. All British Isles stations (G, GB, GC, GD, GI, GM and GW) count as only one call area.

10. Contest Exchanges. Contest numbers must be exchanged and acknowledged before a contact may count for points. The contest number of six figures shall be made up of the RST report and three figures starting with 001 for the first contact and increasing by one for each successive contact, e.g., 559001 for the first and 439002 for the second contact, and so on.

11. Awards. These are at present under review by Council. Details will be announced as soon as possible.

Rules for the BERU Contest Receiving Section 1969

The rules for the Receiving Section of the BERU Contest 1969 are as follows:

1. Eligible Entrants. The contest is open to all fully-paid-up members of the RSGB resident within the United Kingdom and to all short wave listeners resident within the British Commonwealth and British Mandated Territories. All entrants agree to be bound by these rules. Only the entrant may operate his receiving station for the duration of the contest. Holders of amateur transmitting licences are not eligible to take part.

2. Duration. The contest will commence at 00.01 GMT on Saturday, 8 March, 1969, and end at 23.59 on Sunday, 9 March, 1969. The BERU Contest for transmitting amateurs will take place during the same period.

3. Entries. (*a*) To count for points, a station outside the entrant's own call area must be heard in a contest contact and the following details logged in columns headed as follows: (i) Date/Time (GMT) (ii) Call-sign of Station heard; (iii) Report and Serial Number sent by Station heard; (iv) Call-sign of the Station being worked; (v) Band in MHz; (vi) Bonus Points claimed; (vii) Points claimed. CQ or Test Calls will **not** count for points.

(*b*) Entries must be set out on ONE SIDE ONLY of foolscap or International A4 log sheets. Entries must be postmarked not later than **8 April, 1969** and must be addressed to BERU, Contests Committee, Radio Society of Great Britain, 35 Doughty Street, London, WC1. Log sheets are available from RSGB Headquarters on request. A check list showing call areas head on each band is also to be included.

(*c*) All entries must contain the following declaration:

I declare that this receiving station was operated strictly in accordance with the rules and spirit of the contest and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute. I do not hold an amateur transmitting licence.

Date ..... Signed .....

4. Scoring. Each complete log entry will score 5 points, In addition, a bonus of 20 points may be claimed for the first, second and third stations heard in each new Commonwealth call area on each band. The British Isles (G, GB, GC, GD, GI, GM and GW) count as one call area only as indicated in the Appendix to the rules of the Transmitting Section. A station may be logged only once on each band for the purpose of scoring. Where both stations in a contact are heard, they should be logged separately; points may be claimed for both entries.

5. Awards. These are at present under review by Council. Details will be announced as soon as possible.

A list of Commonwealth Call Areas appears overleaf.

Commonwealth Call Areas

The following call areas are recognized for the purposes of scoring in the BERU contest:

AC3	Sikkim
AP	(West Pakistan)
AP	(East Pakistan)
G, GB, GC, GD, GI, GM, GW as one call area	
MP4	(Bahrein)
MP4	(Muscat and Oman)
MP4	(Quatar)
MP4	(Trucial Oman)
VE1	
VE2	
VE3	
VE4	
VE5	
VE6	
VE7	
VE8	
VK0	(Australian Antarctica)
VK0	(Heard Island)
VK0	(Macquarie Islands)
VK1	
VK2	
VK2	(Lord Howe Island)
VK3	
VK4	
VK4	(Willis Island)
VK5	
VK6	
VK7	
VK8	
VK9	(Admiralty Island)
VK9	(Christmas Island)
VK9	(Cocos Island)
VK9	(Norfolk Island)
VK9	(Nauru)
VK9	(New Guinea and Bismark Island)
VK9	(Papua)
VO	
VP1	
VP2	(Angilla)
VP2	
VP2	(Antigua and Barbuda)
VP2	(British Virgin Islands)
VP2	(Dominica)
VP2	(Granada and Dependencies)
VP2	(Montserrat)
VP2	(St. Kitts and Nevis)
VP2	(St. Lucia)
VP2	(St. Vincent and Dependencies)
VP5	(Turks and Caicos Islands)
VP7	
VP8	(Falkland Islands)
VP8	(Grahamland)
VP8	(Sandwich Islands)
VP8	(South Georgia)
VP8	(South Orkney Islands)
VP8	(South Shetland Islands)
VP9	
VQ7	(Aldabra Island)
VQ8	(Chagos)
VQ8	(Agalega)
VQ8	(Rodrigues)
VQ8	(St. Brandon)
VQ8	(Mauritius)
VQ9	
VR1	(Gilbert and Elice Islands)
VR1	(British Phoenix Islands)
VR2	
VR3	(Christmas Island)
VR3	(Ganning Island)
VR4	
VR5	
VR6	
VS5	
VS6	
VS9	(Gan)
VU2	
VU4	(Laccadive Islands)
VU5	(Andaman and Nicobar Islands)
ZB2	
ZC4	(5B4)
ZD3	(The Gambia)
ZD5	
ZD7	
ZD8	
ZD9	(Gough Island)
ZD9	(Tristan da Cunha)
ZE	
ZF1	(Cayman Island)
ZK1	(Cook Islands)
ZK1	(Manihiki Island)
ZK2	
ZL1	
ZL1	(Kermadec Island)
ZL2	
ZL3	
ZL3	(Chatham Island)
ZL4	
ZL4	(Auckland and Campbell Islands)
ZL5	(NZ Antartica)
ZM7	(Tokelau)
ZS3	
ZS8/7P8	
ZS9/8Q	
4S7	
5H3	
5N2	
5W1	
5X5	
5Z4	
6Y5	(Jamaica)
9Y5	
7Q7	
8P	(Barbados)
8R	(Guyana)
9G1	
9H1	
9J2	
9K2	
9L1	
9M2	
9M6	
9M8	
9V1	
9Y4	(Trinidad and Tobago)

RSGB Affiliated Societies

The following Societies have recently become affiliated to RSGB:

Douglas and District Amateur Radio Society, W. T. McEvoy, 19 Rosemount, Douglas. Isle of Man.

Dunstable Downs Radio Club, G. N. Bath, G3NMZ, 9 Chalton Heights, Chalton, Luton, Beds.

Halifax and District Radio Society, D. G. Perkin, 16 Bentley Avenue, Lightcliffe, Halifax.

Mexborough Grammar School Amateur Radio Society, M. Valentine, Grammar School, Maple Road, Mexborough, Yorks, W.R.

Sunderland Amateur Radio Society, F. Erskine, G3WTE, 30 Hunter Terrace, Sunderland.

Wycliffe College Amateur Radio Society, R. K. T. Williams, Wycliffe College, Stonehouse, Stroud, Glos.

22 Tactical Signals Unit Amateur Radio Club, Q4287670 SAC Hoskins, A.C.H., 22 T.S.U., RAF Sharjah, BFPO 64.

The Eccles and District Radio Club's secretary is now R. W. Mothersole, 57 Devonshire Street, Salford, Lancs.

YOUR OPINION

Protected Power Supply Units

From S. F. Weber, G8ACC, Wimbledon, London.

I must congratulate Mr W. H. Bond for his article in the August 1968 issue of *Radio Communication*. However, I should be very interested to know what the circumstances were that led to the demise of two tunnel diodes in a p.s.u which was similar to a design which I described in the *RSGB Bulletin* of July 1967.

The maximum permitted current in the forward direction in a 1N2940 diode is 5mA which it would pass with about 600–700 mV across it (V_{max}). With the design published, this current could only pass through the diode with about 5A shorting current, and this doesn't take into account the division of current between the diode and the base of TR1 (Fig. 9). The maximum shorting current at the output would be approximately 50–60A which would mean a corresponding increase in diode current, and if the diode were just a plain resistance, that would be that. The diode is in parallel with a timing capacitance so that the current in the circuit, although supplied effectively by a current source, would divide between the diode and the capacitor until the voltage across the pair had risen sufficiently for TR1 to switch over (V_e in Fig. 4).

With 50–60V across R8, the time taken to reach V_e with the circuit values indicated for C3, VR9 and R10 would be somewhat less than 1 μSec. In more or less double this time, the voltage would have reached V_{max}, so that this is the critical period as far as the diode is concerned. The switch has to be completely operative in this period (the switch starts operating from just less than V_v which would give a little bit more time) and this explains why TR1 and 2 have an FT in excess of 50 MHz and the series stabilisers—TR4 and 5— are high frequency transistors (5 MHz) as well. The complete switching operation can and does take place in well under 1μSec. which is sufficient to protect TR5 and the tunnel diode. Perhaps the end of the last paragraph but one in my article was somewhat optimistic in that I did not mention F_T or h_{FE} if different transistors were used: these must be sufficiently high in frequency to give complete switching in less than 1μSec. Of course the time delay will only go to its full value if the overload is just above the switching current.

What I said about C3 in my circuit applies equally well to Mr Bond's arrangement: I would hate to see TR1 in his circuit with about 15 volts from base to emitter (with the output shorted) even for as long as it took the Eccles-Jordon switch to go over.

I am somewhat dubious about Mr Bond's reference to latching in his article: both circuits are basically the same in this respect.

May I say in conclusion that the two circuits were designed to fill differing requirements and redesign would obviously be called for to cope with altered voltages and currents.

Guilty or Not Guilty?

From: F. Thompson, G5LH, Newcastle upon Tyne, Northumberland.

I am concerned to see a continued preoccupation with transistor circuitry in the Society journal. Even the hitherto excellent "Technical Topics" has rarely talked about anything else for the past six months. Do you sir, like the politicians, believe you know what is best for us?

As I see no remarkable migration away from valves by commercial interests catering for the amateur market, and as I believe it can be fairly said that for the majority of our purposes the valve is still better than the transistor, surely the editorial policy is open to question?

Perhaps our professional members are responsible for this trend? They are better equipped than most of us to offer material to the journal and undoubtedly their interests will be forward looking.

However, we are primarily an amateur society and the journal should adequately serve the majority interest. I am by no means suggesting that every article accepted for publication should be a "how to make it".

I have sounded local opinion on this matter and I find almost unanimous agreement that solid state is being overdone. In passing, may I also query the value of some rather advanced mathematics we have had, comprehensible perhaps to only a small minority?

Transistor Receiver

From: K. Parkins, A4772, Lincoln

Would someone please design a transistorized receiver covering the amateur bands on shortwave? I am always seeing designs for v.h.f. but never h.f. Prefer two intermediate frequences but not too complicated, i.e., a good basic design with room for additions. I think such a design would be welcome by many listeners.

This is not the only letter of this type—it seems to be a very common request. So, any offers?—Ed.

TVI

From: J. B. Roscoe, GM4QK, Strathaven, Lanarkshire.

I wrote to you earlier this year and told you that my Pye-Group dual-standard transistorised TV receiver was completely incapable of excluding my 3·5 MHz signal, and a little later to say that the manufacturers, although doing their best, had been unable to cure the interference. I have now had the solution to this problem given to me.

Breakthrough on 3·5 MHz results from the co-axial feeder acting as a vertical aerial, and can be eliminated by isolating the feeder. This is done by putting a 1:1 transformer at the receiver end of the feeder. The transformer consists simply of two turns each in the primary and secondary windings, wound round the opposite sides of a ferrite bead.

Having obtained this information, I then tried to buy some ferrite beads while on a brief visit to London. Eventually I called on Mullard, who said that they are not available. They did, however, give me the name of a factor in Glasgow, who kindly contributed two free of charge. He does not wish me to reveal his name!

The " beads " that I have are the highest grade of ferrite, the 200 MHz variety, and are, I think, type FX 2270. They are about the size of a 6 BA washer, and will accordingly accommodate tolerably thick wire: I have used 26 s.w.g., but obviously thinner wire can be used with more " bead-shaped " beads.

On my TV receiver the cure is complete: there is no trace of breakthrough on 3·5 MHz, and the attenuation of the local BBC-1 and ITV signals is effectively nil. It is only important to note that this is a full transformer, and not an auto-transformer; i.e. the co-ax outers are not connected.

Cheshire Homes

There are between 40 and 50 Cheshire Homes in the UK. At the moment three are licensed transmitting stations and there are five listening stations. It is probable that these stations are active as a result of help and interest from clubs and amateurs in their locality. Group Captain Cheshire would like all homes to have call-signs eventually.

The Chippenham and District Amateur Radio Club is taking an interest in the Greathouse Home near Chippenham. An 80m dipole is now aloft there and plans are in hand for a receiver. The Bristol ARC are making contact with their nearest home at Timsbury. This still leaves over 30 homes . . . I wonder if other clubs would like to take similar action; they would find it very well worth while?

Club secretaries can obtain addresses and telephone numbers of their nearest homes by writing to " The Cheshire Homes for the Sick," 7 Market Mews, London, W1.

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

These Slow Morse Practice transmissions are sponsored by the RSGB. Alterations and additions to this list should be sent to the Honorary Organizer, M. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.

Clock Time	Call-sign	MHz	Town
Sundays			
09.30	†G3KZZ / G3TNF	1·920	South Shields, Co. Durham / Gateshead
09.30	G3HZL	1·940	Isleworth, Middlesex
09.45	G3USK	1·975	Mablethorpe, Lincs.
10.00	G2FXA	437·000 to North	Stockton-on-Tees
10.00	G3TTK	1·860	Coalville, Leics.
10.00	GM3PIP	3·590	Mintlaw, Aberdeen
10.15	G3CGD	1·875	Cheltenham
10.30	G3SJE	28·100	Harrow, Middlx.
10.30	G2FXA	437·000 to South	Stockton-on-Tees
10.30	G3NPB	1·875	St. Ives, Cornwall
11.00	G2FXA	1·900	Stockton-on-Tees
11.30	G3KKU	1·940	Liverpool
12.00	G3HVI	1·890	Stoke-on-Trent
12.00	G3GNS	1·910	Weston-super-Mare
12.30	G3FWW	1·880	Burnham-on-Sea, Soms.
17.30	G3TNF	1·920	Gateshead
Mondays			
17.30	G3TNF	1·920	Gateshead
18.00	G3SWR	1·980	Birmingham
18.30	GW3UMB	1·880	Colwyn Bay
18·30	G3NCZ	1·920	Blackburn, Lancs.
18.30	G3RXH	1·910	Skipton, Yorks.
19.00	G3WGU	1·880	Bispham, Lancs.
19.00	†GC4LI / GC2FMV	3·600	Jersey, C.I.
20.00	G3USK	1·975	Mablethorpe, Lincs.
20.00	G3KAN	1·990	Northampton
20.00	G3IBJ	1·910	Southampton, Hants.
20.00	GI3JEX	1·860	Belfast
20.00	†G3WDW / G3VTY	1·915	Leeds, Yorks.
20.15	G3SAZ	1·845	Ashford, Middlesex
† Alternately			
Tuesdays			
17·30	G3TNF	1·920	Gateshead
19.00	†G3UFO / G3XAM	1·980	Wirral, Cheshire
19.30	G3SWP	1·850	Doncaster, Yorks.
19.30	G3WGU	433·500 to South-East	Bispham, Lancs.
20.00	G3UPA	1·850	Meriden, Warks.
20.00	†G3FAU / G3KSS / G3OVT	1·980	Stevenage, Herts.
20.00	G3FWW	1·880	Burnham-on-Sea, Soms.
20.00	G3TPV	1·910	Hythe, Hants.
20.00	GM3UWX	3·590	Bishopton, Renfrewshire
20.30	G3UNV	1·845	Ashford, Middlx.
20.30	G2ABC	1·915	Woodford, Essex
21.00	G4RS	1·865	Blandford, Dorset
21.30	G2ABC	144·750	Woodford, Essex
22.00	G3HZM	1·925	Manchester
Wednesdays			
17.30	G3TNF	1·920	Gateshead
18.30	G2FXA	1·900	Stockton-on-Tees
19.30	G3WGU	433·500 to South-East	Bispham, Lancs.
19.30	G3UJD	1·825	Farnborough, Hants.
20.00	G8QU	1·970	London, N22
20.00	GM3PIP	3·590	Mintlaw, Aberdeen
20.30	G3HZL	1·845	Isleworth, Middlx.
20.30	G3KGU	1·915	Theydon Bois, Essex
21.00	G3HVI	1·890	Stoke-on-Trent
21.00	G3LQI	1·990	Lancing, Sussex
† Alternately			
Thursdays			
17.30	G3TNF	1·920	Gateshead
18.00	G3SWR	1·980	Birmingham
18.30	GW3VBP	3·590	Barry, Glam.
18.30	GW3UMB	1·880	Colwyn Bay
18.30	G3NC	1·968	Swindon, Wilts.
19.00	G3WGU	1·880	Bispham, Lancs.
19.30	G3GNS	1·910	Weston-super-Mare
20.00	GI3JEX	1·860	Belfast
20.30	G3SJE	1·875	Harrow, Middlx.
20.30	†G3ROE / G3RSF / G3TIQ	1·915	Harlow, Essex
21.00	G4RS	1·865	Blandford, Dorset
Fridays			
17.30	G3TNF	1·920	Gateshead
18.30	G3NCZ	1·920	Blackburn, Lancs.
18.30	G3VLT	1·913	Chelsfield, Kent
19.00	G3NPB	1·875	St Ives, Cornwall
19.30	G3PQF	1·825	Farnborough, Hants.
20.00	†G3UCZ / G3WIX	1·915	Pudsey, Yorks. / Bradford, Yorks.
20.15	G3SAZ	1·845	Ashford, Middlesex
Saturdays			
09·30	G3UNV	1·940	Ashford, Middlesex
10.00	G3PLE	1·820	Stourbridge, Worcs.
13·00	G2FXA	1·900	Stockton-on-Tees
14.00	†GC4LI / GC2FMV	3·600	Jersey, C.I.
17.30	G3TNF	1·980	Gateshead
17.30	G3EFS	1·913	Bromley, Kent
18.45	G3WTA	1·920	Morpeth, Northumb.
20.00	G3KPO	1·980	Peterborough
20.00	G3WPR	1·915	Ilford, Essex
21.00	G3TTK	1·823	Coalville, Leics.
† Alternately			

Members might like to be reminded that the Royal Naval Amateur Radio Society using their call-sign G3BZU, transmits c.w. as a proficiency test at 19.00 GMT on the first Tuesday of each month. Frequencies used are 1·875 MHz for practice only, and 3·520 MHz for speed proficiency tests. Certificates are issued against correct copy submitted to: The Royal Naval Amateur Radio Society, HMS Mercury, Leydene, Hants. A small charge is made to cover costs.

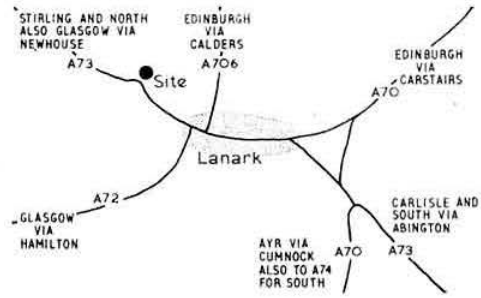
Listeners: These slow Morse practice transmissions are promoted specifically to help you, and unless you play your part it will become increasingly difficult to keep the service going. If you benefit from any of these transmissions you owe it to the operator concerned to let him know you listen. This service is a call upon the operator's leisure time, and he is more likely to sacrifice it to help you, if he knows he has an audience.

RSGB SCOTTISH MOBILE RALLY

SUNDAY, 22 SEPTEMBER, 1968

CARTLAND BRIDGE HOTEL, LANARK

Talk-in stations on 160, 80, 4 and 2m from 10 a.m.



Exhibitions, displays and trade stands will be open from 1 p.m.

Separate programmes for ladies and children have been arranged.

Afternoon tea will be provided, and all other meals can be obtained at the hotel.

A bring and buy sale will cater for both junk and goodies! Please bring equipment with you on the day, and mark it with the price, allowing for 10% to go towards rally funds.

The price of entry, which includes tea, the prizedraw, and entry to all competitions is 5s., with children at half-price (under 10, free).

Further information from Ian Swan, GM8BSE, 10 Alexander Drive, Wishaw.

Organized by the Mid-Lanark RSGB Group

REGION 1 (NORTH WEST)

OFFICIAL REGIONAL MEETING

SUNDAY, 29 SEPTEMBER, 2.30 p.m.

FLORAL HALL, SOUTHPORT

"Talk-in" stations from 10 a.m. will be 160m, G3SZV/A, 4m, G3XIM/A and 2m, G3VNQ/A.

Lunch or Snacks are available in accordance with visitors' own requirements. The two restaurants are licensed and a car park is available.

Council will be represented by

Messrs J. Petty, A. D. Patterson and H. E. McNally.

Attractions include trade shows and in the evening there will be a lecture and demonstration on " Video Tape Recording " by Ron Ratcliffe, G3XIM.

TICKETS. 15/- includes the cost of a " high tea " at 5.30 p.m. and may be obtained up to 23 September from

G2CUZ, 34 Sandbrook Road, Ainsdale, Southport, Lancs. or

G2AMV, 1 Waterpark Road, Prenton, Birkenhead, Cheshire.

RAE COURSES

More courses were listed on page 536, August issue

Bedfordshire. Westfield School, Queens Park, Bedford, Beds., Tuesdays, 7–9 p.m. Enrolment 9–11 September, 7–9 p.m.

Derbyshire. South-east Derbyshire College of Further Education, Ilkeston Road, Heanor, Derbyshire. Fridays, 7–9 p.m. Commencing 20 September, Enrolment 9–10 September, 6.30–8.30 p.m.

Durham. Durham Technical College, Framwellgate Moor, Durham. Fridays, 6.30–9.30 p.m. Commencing 27 September. Enrolment on 27 September or beforehand. Lecturer, P. G. Martin, B.Sc., G3PDM.

Essex. Mid-Essex Technical College, Chelmsford, Essex. Fridays, 6.30–9 p.m. Commencing 27 September. Lecturer G3NPM.

Lanarkshire. Allan Glen's School, Cathedral Street, Glasgow, Lanarkshire. Tuesdays, 7 p.m. (RAE), Thursdays, 7 p.m. (Morse and Licence Conditions). Commencing 10 September. Enrolment 2-5 September, 7.30-9.30 p.m. Fee £1.

Leicestershire. Loughborough Technical College, Radmoor, Loughborough, Leicestershire. Department of Electrical Engineering. Tuesdays, 6-7 p.m. (Morse), 7–9 p.m. (RAE). Commencing 17 September. Fee £3 14s. 6d. Lecturer D. R. Doughty, G3FLS.

Hampshire. North End Evening Institute, Drayton Road, North End, Portsmouth. Thursdays. Commencing 26 September. Details from L. E. Newnham, G6NZ, Eastney Secondary Modern School for Boys, Reginald Road, Portsmouth, Hants.

Hertfordshire. Boreham Wood College of Further Education, Elstree Way, Boreham Wood, Herts. Wednesdays, 7–9 p.m. Commencing 18 September. Enrolment 9 and 10 September. Lecturer, G. L. Benbow, G3HR.

London, N12. Centre of Adult Education, Stanhope Road Finchley, N12. RAE, Wednesdays 7.30-9.30 p.m. Morse, Thursdays, 7–9 p.m. Details from Central Office, Stanhope Road, Finchley, London, N12. Tel. 01-445 6068.

Surrey. Brooklands County Technical College, Heath Road, Weybridge, Surrey. Mondays, 6.30–9 p.m. Commencing 16 September. Enrolment 9 and 10 September, 2–4 p.m. and 6–8 p.m. Details from J. E. Lacy, c/o Mechanical and Electrical Engineering Dept.

Warwickshire. Bedworth Evening Institute, Nicholas Chamberlaine School, Bedworth, Warwickshire. Mondays, 7–9 p.m. Commencing 16 September. Enrolment 10-12 September. 7-8.30 p.m. Lecturer, G3ORY.

Pheasey Evening Institute, Birmingham. Details from R. K. Furness, G3RUI, 17 Hillingford Avenue, Great Barr, Birmingham.

Yorkshire. Bradford Technical College, Great Horton Road, Bradford, 7. Mondays 7–9 p.m. Commencing 23 September, Enrolment 9–13 September. Enrolment 6.30–8.30 p.m. No fee for students below the age of 19 on 1 September.

West Park Secondary Modern School, Leeds, Yorks. Wednesdays, 7 p.m. Commencing 23 September. Enrolment 16-19 September.

Western Road Evening School, Sheffield 10, Yorks. Wednesdays, 7 p.m. Commencing 25 September. Details from J. Bell, G3JON, 30 Alms Hill Road, Sheffield, Yorks, S11 9RS.

CLUB NEWS

Please send all information direct to Regional Representatives, giving full details of future meetings, and any snippets of activities which would be interesting in print. When listing meetings, please be sure to include the date and time, the meeting place, the lecturer's full name and the call-sign to whom prospective members can refer. The last day on which Regional Representatives can accept letters for inclusion is the first of the previous month.

REGION 1

Ainsdale (ARC)—11, 25 September, 8 p.m. 77 Clifton Road, Southport.

Allerton (Liverpool) Scout Radio Hobbies Society—Thursdays, 8 p.m., 3rd Allerton Scout Group Headquarters, Church Road, Woolton, Liverpool.

Ashton-under-Lyne (AUL & DARS)—Fridays, 7.30 p.m., 6 Stamford Street, Stalybridge.

Blackburn (East Lancashire ARC)—5 September, 3 October, YMCA, Limbrick, Blackburn.

Blackpool (B & FARS)—Mondays, 8 p.m., Pontins Holiday Camp, Squires Gate, Morse tuition from 7.30 p.m.

Bury (B & RRS)—10 September (" Astronomy " by J. Ashworth), 8 October (Surplus equipment sale), 8 p.m., George Hotel (Private Room), Market Street, Bury. Club Secretary G3VVQ, 411 Holcomb Road, Greenmount, Bury.

Chester (C & DARS)—Tuesdays, 8 p.m., YMCA.

Crewe & District—No Meetings will be held for the time being as no accommodation is available. However, the Area Representative, R. Owen of 10 Circle Avenue, Willaston, Nantwich, will welcome visitors at his home.

Eccles (E & DRC)—Tuesdays, 8 p.m., Patricroft Congregational Schools, Shakespeare Crescent, Patricroft. Every Thursday, Club Top Band net at 8.30 p.m.

Leyland Hundred Amateur Group—Weekly net each Thursday at 7.15 p.m. (1·915 MHz).

Liverpool (L & DARS)—Tuesdays, 8 p.m., Conservative Association Rooms, Church Road, Wavertree.

Liverpool (NLRC)—13, 27 September, 11 October, 8 p.m., Landsbury House, 13 Crosby Road South, Liverpool, 22.

Macclesfield (M & DRS)—10, 24 September, 8 October, 8 p.m., The George Hotel, Jordangate.

Manchester (M & DARS)—Wednesdays, 7.30 p.m., 203 Droysden Road, Newton Heath, Manchester 10. Hon. Secretary, G. Tillson, G3TJX, 95 Kelverlow Street, Oldham, Lancs.

(SMRC)—Fridays, 7.45 p.m., Rackhouse Community Centre, Daine Avenue, Northenden.

North West V.H.F. Group—Following the loss of their Headquarters, Meetings are taking place on a temporary basis every Tuesday at 50 Great Ancoats Street, Manchester. Members are asked to keep in touch with the Committee for any changes which may take place at short notice. G3FNM, 141 Norris Road, Sale.

Preston (PARS)—5, 19 September, 3 October 7.30 p.m., " Windsor Castle " (Private Room), St Paul's Square. Members are busy planning the arrangements for the Mobile Rally, which will take place on Sunday, 1 September.

St. Helens (SES)—3, 17 September, 1 October, 7.30 p.m., IVS Centre, 55 College Street, St Helens.

Southport (SRS)—Wednesdays, 8 p.m., and Sundays, 2.30 p.m., The Esplanade.

Southport (73 S.S.B. Society)—Tuesdays, 8 p.m. (all commencing with a talk on part of the RAE Syllabus), 73 Avondale Road North, Southport.

Stockport (SRS)—4, 18 September, 2 October, 8 p.m., Royal Oak Hotel, Castle Street, Edgeley. New Members are always welcome. Further details from G3FYE.

Warrington-Culcheth (CARC)—Fridays, 7.30 p.m. Chat Moss Hotel, Glazebury. All visitors will be welcome. Please note new Secretary—K. Bulgess, 32 Hendon Street, Leigh.

Westmorland—6, 20 September, 4 October, 7 p.m., The Allen Technical College, Sandes Avenue, Kendal.

Wirral (WARS)—8 p.m., Former Civil Defence Headquarters, Upton Road, Bidston, Birkenhead. Please note new address. 4 September (" Transistorized Transmitters," by Dave Oakden, G3UFO), 18 September (NFD 1969 Discussion), 2 October (Annual General Meeting). Old Civil Defence HQ, Noctorum Lodge, Upton Road, near the top of Bidston Hill. Entrance marked by a MANWEB Substation, between Thermopylae Pass Footpath and Noctorum Lane. *G3FOS*

REGION 2

Barnsley (B & DARC)—13 September (AGM), 27 September ("Talk on Sommerkamp FL200B TX " by G6UF), meetings second and fourth Fridays, 7.30 p.m. King George Hotel, Peel Street, Barnsley.

Bradford (BRS)—17 September (First meeting of new session), 7.30 p.m., Bradford Technical College, Stewart Horton Road, Bradford.

Hull (H & DARS)—6 September (" Rx comparisons "—Part 1, HRO and 750), 13 September (" Friday 13th "), 20 September (Junk sale), 27 September (" RTTY "—Pete Hall), 7.45 p.m. 592 Hessle Road, Hull.

Northern Heights—11 September (Pea and Pie Supper), 18 September (" Top Band DXing " by Stew, W1BB, recorded lecture), 22 September (DF Foxhunt), 25 September (" Modern Receivers " by T. C. Lamb, G6LD), 7.45 p.m., Sportsman Inn, Ogden, Halifax.

Scarborough (SARC)—The club has changed its meeting place to RAF Association, Fulbeck House, 3 Westover Road, Scarborough. Meetings Thursdays, 7.30 p.m.

Spen Valley (SVARS)—19 September (" TV DX " by G8AKQ), 27 September (" Electronic Organs " by G3USH), 7.30 p.m., The Grammar School, Heckmondwike. On Saturday 21 September, G3SVC will be used at a Fete at Hartshead Moor Special School).

South Shields (SS & DARC)—13 September (AGM), 8 p.m., Trinity House Social Centre, Laygate, South Shields.

REGION 3

Birmingham (MARS)—Third Tuesday in the month 7.45 p.m., Midland Institute, Margaret Street, Birmingham 3.

(South)—4 September (" Transistorized Transmitters," A Talk), 8 p.m., The Scout Hut, St Stephen's Church Hall, Selly Park, Birmingham.

Bromsgrove (B & DARC)—7 September (Exhibition Station, Burcot Village Hall), 12 September (A talk by Droitwich YCC on " Amateur Radio "), 13 September (Stereo Demonstration), 8 p.m., Co-op Hall.

Coventry (CARS)—6 September (Final preparation for V.H.F./NFD), 13 September (Lecture by G3ROD), 20 September (Night on the Air with Club's KW2000), 27 September (AGM), Scout HQ, 121 St Nicholas Road, Radford, Coventry.

Dudley (DARC)—Exhibition Station at the Hobbies Exhibition to be held in the Town Hall, Dudley on 7, 9 and 10 September. Meeting has been changed to Tuesday evening, 10 September, 24 September. 8 p.m., Central Library, St James's Road.

East Worcestershire (ARG)—12 September (Elements of Computers by Mr D. Waller), 22 September (A Mobile Picnic, in Conjunction with Redditch Carnival. Held near Ipsley Church off B4093), 8 p.m., Old People's Centre, Park Road, Redditch.

Hereford (HARS)—First Friday in the month, Trinity Hall, Whitecross Road, Hereford.

Lichfield (LARS)—17 September, 7 30 p.m., Swan Hotel, Lichfield.

Mid-Warwick (MWARS)—9 September, 8 p.m., Winter opening session (Cheese and Pickles Evening, Guest will be RSGB Executive Vice-President, J. W. Swinnerton, G2YS. All members and visitors welcome). 28 Hamilton Terrace, Leamington Spa.

North Staffs (NSARS)—Every third Tuesday in the month at Moorland Road, Junior School.

Salop (SARS)—12 September (Junk Sale), Old Post Office Hotel, Milk Street, Shrewsbury.
Stourbridge (STARS)—September (Visit to Sutton Coldfield: Colour TV).
Wolverhampton (WARS)—9 September (Morse Class, Film Show), 16 September (Club Decoration & Natter), 23 September (Morse Class Preparation for AGM), 30 September (Morse Class Committee Meeting).

REGION 4
Burton on Trent (BoT ARS)—4 September (D/F Challenge Cup event 7 p.m.–9 p.m. starting from the Club Room, G3NFC/P), 18 September (D/F Practice event 7.30 p.m., 9 p.m. starting Derby Airport Road, SK 289300, G3ERD/P), 29 September (D/F Challenge Cup 3 p.m., 5 p.m. starting from Club Room, G3NFC/P) *G3ACR.*
Chesterfield (C & DARS)—Details from G3VDI.
Derby (D & DARS)—4 September (Surplus Sale), 7/8 September (V.H.F. NFD at Harborough Rocks, Brassington), 11 September (Visit to Test House at International Combustion, Sinfin Lane, Derby), 18 September (D/F Practice event with Burton on Trent A.R.S.—Non participants—Club Room), 25 September (RSGB Tape Recorded Lecture, " The Human Machine as a Radio Operator," by F. J. H. Charman, B.E.M., G6CJ), 7.30 p.m. Room 4, 119 Green Lane, Derby. The Society has been fully occupied over recent weekends with demonstration exhibition stations at various local events . A recent interesting evening was a working demonstration of apparatus covering spark (1910) to the straight receiver of 1929. *G2CVV.*
Grimsby (GARS)—5 September (Spare Night), 8 p.m., North Lincs Photographic Society's Room, back of 50 Welholme Road, Grimsby. *G3RSD.*
Heanor (TSEDRS)—17 September (Coffee Evening—Ladies invited), 7.30 p.m., Club Room South East Derbyshire College of Further Education, Ilkeston Road, Heanor, Derbys. *G3LGK.*
Leicester (LRS)—Mondays 7.30 p.m., Sundays, 10.30 a.m., The Club Rooms, Gilroes Estate Cottage, Groby Road, Leicester. *G3UQX.*
Lincoln (SWC)—An enthusiastic nucleus is re-organizing the Club. Further details from G3TJO.
Mansfield (MARS)—First Friday in each month, 7.45 p.m., New Inn, Westgate, Mansfield., *G8HX.*
Melton Mowbray (MMARS)—details from G3FDF.
Newark (NSWC)—Mondays, Thursdays, 7.30 p.m. Guildhall, Guildhall Street, Newark. *G3TWV.*
Nottingham (ARCN)—Tuesdays, Thursdays, 7.30 p.m., Room 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham. *G3SRX.*
Peterborough (P & DARS)—for details G3KPO. 2 September (Mobile Rally, River Bank, Peterborough). Lectures at Peterborough Technical College on the first Friday in each month. Other Fridays 8 p.m., at the Club HQ in the Old Windmill, Peacock, London Road, Peterborough.
Worksop (NNARS)—Tuesdays, Thursdays, 7.30 p.m., Club Room, Gateford Road, Worksop.

REGION 5
Bedford (B & DARC)—Thursdays, the Dolphin Inn, The Broadway, Bedford.
Bishops Stortford (BS & DARC)—Details of meeting from G3VWS.
Cambridge (C & DARC)—6 September (Informal and Assembling Gear for V.H.F. NFD), 7 and 8 September (V.H.F. NFD), 13 September (Grand Junk Sale), 20 September (Informal), 27 September (Two Metre Mobile Contest), 4 October(Informal). Fridays 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge.
Cambridge University W.S.—After the four months of inactivity during the long vacation, meetings will recommence in the Michaelmas Term. Freshers, and others wishing to join should visit Stand 104 at the Society's Fair to be held in the Corn Exchange on Tuesday, 8 October (2 p.m.–9 p.m.) and on Wednesday 9 October (from 10 a.m. to 5 p.m.). The Honorary Secretary is Malcolm Pritchard G3VNQ, K2 St Mary's Court, Caius College, Cambridge.
Dunstable (DDRC)—The Secretary of this newly formed radio club is George Bath (G3NMZ), tel. Fancott 487. Alternate Fridays at 7.30 p.m., " Star and Garter," High Street, South Dunstable, Beds.
March (M & DARS)—Tuesdays, 7.30 p.m., Old Police HQ, High Street, March, Cambs.
Shefford (S & DARS)—Alternate Thursdays, 8 p.m. Church Hall, High Street, Shefford, Beds. Meetings are preceded with a Morse class at 7.45 p.m.
Stevenage (S & DARS)—First and third Tuesdays in each month, 8 p.m. 5 September, ("Radio Control" by Terry Hudson), 19 September (" Amateur Printed Circuit Production " by G8BBO), 3 October (" Lasers " by G3DGN), 17 October (Demonstration by Daystrom Ltd.). Meetings at Hawker Siddeley Dynamics Ltd., Gunnels Wood Road, Stevenage.

REGION 6
Cheltenham (RSGB Group)—First Thursday in each month, 8 p.m. Great Western Hotel, Clarence Street, Cheltenham.
Cheshunt (CARC)—Full details of activities from M. Invest, 93 Manor Court, Enfield, Middx.
Chilton (CARC)—Last Thursday in each month, British Legion Hall, High Wycombe. Details of meetings from M. G. Pemberton, 205 Bowerdean Road, High Wycombe, Bucks.
Oxford (O & DARS)—Second and fourth Wednesday in each month, Cherwell Hotel, Water Eaton Road, N. Oxford.

REGION 7
Acton, Brentford, Chiswick (ABCRC)—17 September ("My First Contact," by G3XPC), 7.30 p.m., Chiswick Trades and Social Club, 66 High Road, Chiswick.
Addiscombe (AARC)—Second and fourth Tuesdays in each month, 7.30 p.m., 158 Lower Addiscombe Road (Toc H Hall).
Ashford (Middx.), (Echelford ARS)—12 September, 26 September (Talk on " S.S.B."), St. Martins Court, Kingston Crescent, Ashford.
Barking (B & DEC)—Tuesdays and Thursdays, 7.30 p.m., Gascoigne Recreation Centre, Gascoigne School, Morley Road, Barking, Essex.
Bexleyheath (NKRS)—12 September (Film Show), 26 September (Open evening), 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Chingford Group—Fridays. For details of meetings telephone 01-524 0308.
Chingford (SRC)—Fridays, 8 p.m., except the first Friday in the month, Friday Hill House, Simmons Lane, Chingford, E4.
Civil Service Radio Society—Meetings are held on the first and third Tuesday of each month. Civil Service Sports Centre, Monck Street, Westminster, SW1.
Croydon (Surrey RCC)—17 September (Junk Sale), 7.30 p.m., Blue Anchor, South End, Croydon.
Crystal Palace (CP & DAC)—17 September (Mobile evening), 21 September (" Receiver Measurement Techniques," by G3FZL and G3OOU), 8 p.m., Emmanuel Church Hall, near Dulwich.
Dorking (DR & DRS)—10, 24 September at the " Wheatsheaf," Dorking.
Ealing (E & DARS)—Tuesdays, 8 p.m., Northfields Community Centre, Northcroft Road, W.13.
East London—The first meeting of this club will take place on 15 September at 5 p.m. Full details may be obtained from G3AAJ.
Edgware and Hendon (EADRS)—9, 23 September, 8 p.m., St. Georges School, Flower Lane, Mill Hill, NW7.
Gravesend (GRS)—Third Wednesday of each month, 8 p.m., RAFTA Club, Overcliff Road, Gravesend.
Guildford (G & DRS)—13, 27 September (Natter Nights), 8 p.m., Guildford Engineering Society in Stoke Park.
Hampton Court (TVARTS)—First Wednesday in each month, 7.30 p.m., Cardinal Wolsey, Hampton Court.
Harlow (H & DRS)—Tuesdays (General), Thursdays (c.w. practice), Fridays (Juniors), 29 September (Mobile Rally, Magdalen Laver), 24 September (" V.H.F. Propagation "). Mark Hall Barn, First Avenue.
Harrow (RSH)—6 September (Pre V.H.F. NFD), 13 September (Junk Sale), 20 September (Practical), 27 September (Lecture), 4 October (BBC Tour of Crystal Palace or Practical evening). Roxeth Manor School, Eastcote Lane, Harrow.
Havering (H & DARC)—11, 25 September, 8 p.m., British Legion House, Western Road, Romford, Essex.
Holloway (GRS)—Mondays, 7 p.m. (RAE), Wednesdays, 7.30 p.m., (Morse), Fridays, 7.30 p.m. (Club), Montem School, Hornsey Road.
Kingston (K & DARS)—Second Wednesday in each month, 8 p.m., Penguin Lounge, 37 Brighton Road, Surbiton.
Leyton & Walthamstow—Tuesdays, 7.30 p.m., Leyton Senior Institute, Essex Road, E10.
London U.H.F. Group—First Thursday each month, 8 p.m., White Hall Hotel, Bloomsbury Square, Holborn, WC1.
Maidenhead (M & DARC)—17 September, 7.30 p.m., Victoria Hall, Cox Green, Maidenhead.
New Cross—Wednesdays and Fridays, 8 p.m. 225 New Cross Road, London, SE14.
Norwood and South London—See Crystal Palace.
Paddington (P & DARS)—Thursdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W2.

Purley (P & DRS)—First and third Thursdays each month, 8 p.m., Railwaymen's Hall, 58 Whytecliffe Road, Purley.
Reigate (RATS)—4 September ("Introduction to S.S.B." by G3SGA), 7.45 p.m., George and Dragon, Cromwell Road, Redhill.
Romford (R & DRS)—Tuesdays, 8.15 p.m., RAFA House, 18 Carlton Road, Romford.
Scouts (Kensington)—19 September, 7.30 p.m., Baden Powell House, Queensgate, South Kensington, SW7.
Sidcup (CVRS)—5 September (J. C. Graham, G3TR "About the RSGB"), 19 September (Natter Night), 3 October (AGM), All Saints Church Hall, Bercta Road, New Eltham. All meetings commence at 8 p.m.
Southgate (SRC)—Parkwood Girls School, (behind Wood Green Town Hall).
St Albans (Verulam ARC)—18 September (Talk on "Goonhilly Tracking Station," by Chad Gordon), 7.30 p.m., Cavalier Hall, Watford Road, St Albans.
Sutton & Cheam (SCRS)—17 September ("Fundamental Calculations for Transistor Circuits" by DJ0DV). 25 August (Sutton and Cheam Mobile Rally).
Welwyn (Mid Herts ARS)—Welwyn Civic Centre, Welwyn.
Wimbledon (W & DRS)—13, 27 September, 8 p.m., St John Hall, 124 Kingston Road, South Wimbledon, SW19.
Wembley (GECARS)—Thursdays, 7.30 p.m. The club is open to non GEC employees by invitation, Telephone ARNold 1262 first. Sports Club, St Augustin Avenue, North Wembley.

REGION 8
Mid-Sussex (MSARS)—12 September ("High stability oscillators" by Bert Allen, G2UJ), 26 September (Informal) Note that as from 12 September the club will meet every other Thursday at Barle Place Education Centre, Leyland Road, Burgess Hill, Sussex. It is hoped to have a home-brew club station built by members. A small design is being set up for this purpose.
North Kent (NKRS)—12 September (Film Show), 8 p.m., Congregational Church Hall, Bexleyheath.
Crawley (CARC)—A really special event is organised for 25 September, when F. J. (Dud) Charman, M.B.E. (G6CJ) will be giving his famous aerial lecture and demonstration. In order to cover expenses, and to support the RSGB Headquarters Fund, Crawley will be charging an admission fee of 5s. (including refreshments) for this meeting. An open invitation is extended to all; the meeting place is the Trinity Congregational Church Hall, Ifield Drive, Ifield, Crawley, Sussex, and the time is 8 p.m. Contact G3FRV for details.
South Coast (South Coast V.H.F. Group)—Details from G3JHM.
Worthing (W & DARC)—Rose Wilmot Youth Centre, Worthing.

REGION 9
Bristol Group—16 September, ("DX working for Transmitting Amateurs" by H. E. Perkins, G3NMH), 7.30 p.m., Beckett Hall, St Thomas Street, off Victoria Street, Bristol 1. E. C. Halliday, G3JMY, gave a talk on the history, and the functions of semi-conductors to a widely varying age audience at the July meeting. The older members found the talk most interesting as it is more difficult for them to grasp the workings of transistors after being many years used to valves. Longleat Mobile Rally again this year was another great success, helped by a glorious sunny day and the hard efforts of many Bristol amateurs from the wide area that it covers. Overnight stay is increasing in its popularity with its noises "off" from the surrounding wild animals. No one has been reported missing from the safari. *G3PFD.*
Bristol (BARC)—Mondays and Thursdays, 7.30 p.m., University Settlement, 41 Ducie Road, Barton Hill, Bristol 5. *G3WLZ.*
Cornwall (CRAC)—First Thursday in each month, 7.30 p.m., SW Electricity Board's Social Centre, Pool, Camborne. 5 September (Talk by G3WJP on "His African Experiences" and an electronics Junk Sale). All visitors to the area welcome. *G3NKE.*
(S.S.B. Group)—Second Thursday in each month, 7.30 p.m.
(V.H.F. Group)—Third Thursday in each month, 7.30 p.m. Both Groups meet at the Barley Sheaf, Truro, *G3OCB.*
Exeter (EARS)—First Tuesday in each month, 7.30 p.m., George and Dragon, Blackboy Road, Exeter. *G3HMY.*
Plymouth (PRC)—First and Third Tuesdays in each month, 7.30 p.m., Virginia House, Bretonside, Plymouth. *G3UQF.*
Saltash (S & DARC)—6, 20 September, Burraton Toc H Hall, Warraton Road, Saltash. *G3UBY.*
South Dorset (SDARS)—First Friday in each month, 7.30 p.m., Labour Rooms, West Walk, Dorchester. *G3AKF.*
Taunton Group—13 September, 7.30 p.m., Lecture Theatre, Taunton Technical College. The North Somerset RAEN Group has been reformed, and G3WPJ/G8ANI would be pleased to hear from any mobiles interested in the area between Minehead and Burnham on Sea. *G3WNV.*
Torquay (TARS)—Every Tuesday and Friday from 7.30 p.m. (Club nights). Business meeting the last Saturday in each month, 7.30 p.m., Club HQ, rear of 94 Belgrave Road, Bath Lane, Torquay. *G3VNG.*
Wells (WARS)—Mondays from 8 p.m., EMIE Sports and Social Club, Chamberlain Street, Wells. *G3MQQ.*
Weston-Super-Mare (WSMARS)—First Friday in each month. 6 September, 7.30 p.m., Westhaven School, Ellesmere Road, Uphill, WSM. *G3GNS.*
Yeovil (YARS)—Wednesdays, 7.30 p.m., Park Lodge, The Park, Yeovil. Members have attended most Rallies within 150 miles of Yeovil. On 24 July, G2WS gave a tape lecture "Space Travel". G3AFA demonstrated his home brew rig for 2m, 70 cm and 23cm. The Club will participate in V.H.F. NFD from Coombe Beacon site. *G3NOF.*

REGION 10
Blackwood (ARC)—7.30 p.m., Fridays. Club call-sign GW6GW. Headquarters off High Street, Blackwood, Mon.
Barry College of Further Education (ARS)—Thursdays, 7 p.m., College, Colcot Road, Barry Glam.
Cardiff (RSGB Group)—9 September, 7.30 p.m., TA Centre, Park Street, Cardiff.
Llanelli Boys Grammar School (ARS)—Meetings held at the School. Fridays, 3.30 p.m.; all interested amateurs are invited.
Pontypool (ARC)—Tuesdays, 7 p.m., Educational Settlement, Rockhill Road, Pontypool, Mon.
Pembroke (ARC)—Last Friday in each month, 7.30 p.m., Headquarters, Defensible Barracks, Pembroke Dock.
Rhondda (ARS)—Pengelli Hotel, Treorchy. Details of meetings available from the Secretary, Cyril Parry, GW3PHH, 34 Cae'r Gwerlas, Tonyrefail, Glam.
University College, Cardiff (ARS)—Details concerning the activities of this Society can be obtained from the Secretary, c/o Students Union, Dumfries Place, Cardiff.

REGION 11
Rhyl (R & DARC)—Second Tuesday in each month. Rhyl's Silver Band Room, Windsor Street, Rhyl.

REGION 13
Edinburgh (LRA)—Alternate Thursdays, 7.30 p.m. Board Room YMCA, 14 South St Andrew Street, Edinburgh.

REGION 14
Ayrshire (AARG)—8, 22 September, 7.30 p.m., Peter Boyle Bowling Club, Graigie Road, Ayr.
Glasgow University (GURC)—13 September, 7.30 p.m., Engineering South Building, University of Glasgow.
Greenock (G & DARC)—13 September (Visit to GURC), 27 September ("De-bugging home-built s.s.b. transmitters"), 7.30 p.m., Arts Guild, Campbell Street, Greenock.
Lowlands Royal Signals Group (LRSG)—17 September, 7.30 p.m., 21 Jardine Street, Glasgow.
Mid-Lanark RSGB Group—20 September ("V.H.F. by GM2CHN), 7.30 p.m., YMCA, Brandon Street, Motherwell.

REGION 15
Bangor (B & DARC)—First Friday in each month. Silverstream Unionist Hall, Belfast Road, Bangor, Co. Down. RAE class will probably start in September, for details contact GI3OLJ.
Ulster (Mid-Ulster RSGB Group)—First meeting after summer break, 6 September. Temperance Hall, West Street, Portadown. For further details contact GI3ILV.

REGION 16
Gt. Yarmouth (GYRC)—Fridays, 7.30 p.m., 98 Southmarket Road, Gt Yarmouth.
Ipswich (IRC)—18 October (Visit to sugar beet factory), 7 p.m., Red Cross HQ, Gippeswyk Avenue, Ipswich.
Norwich (NARC)—Mondays, 7.30 p.m., The Clubroom, Brickmakers Arms, Sprowston Road (Near ring road roundabout).

REGION 17
Chippenham (C & DARC)—17 September (Social meeting at the George and Dragon, Rowde. "Friends" from Swindon and Bristol are invited to join in with any other amateur without club connections. Talk-in on 160 by G3UFW), 29 October (Visit by the President of the Radio Society of Great Britain, J. Graham G3TR).
Farnborough (F & DRS)—310 Farnborough Road, Farnborough.

LOOKING AHEAD

until 6 September—DXpedition to Eire and Northern Ireland. G3RST/P and G3TXZ/P. 4m and 2m.
until 7 September—Special Event Station, GB3EIF. Edinburgh International Festival, 1968. Heriot Watt University, Mountbatten Building, Grassmarket Edinburgh 1. 80–10m, s.s.b.; 2m, a.m., c.w.
7 September—Special Event Station, GB3WRA. Wycombe Show, High Wycombe. Bucks, 160–4m, a.m., c.w., s.s.b. Details from G3FSN.
16 September—RSGB Council Meeting.
24-27 September—Electronics, Instruments, Controls and Components Exhibition, Belle Vue, Manchester. Admission tickets free, from the Exhibition Secretary, Institution of Electronics, 78 Shaw Road, Rochdale, Lancs.
29 September—Region 1 Official Regional Meeting, Southport, Lancs. See separate advertisement.
2-5 October—RSGB International Radio Engineering and Communications Exhibition, Royal Horticultural Society's New Hall, Greycoat Street, Westminster, London, SW1. 10 a.m. to 9 p.m.
6 October—EI-GI Convention.
14 October—RSGB Council Meeting.
19-20 October—Special Event Station, GB3HH. JOTA, Gravesend and District Scout Association's Camping and Training Ground, Hopehill, Meopham, Gravesend, Kent. 80-10m, s.s.b., c.w. QSLs via G3WAO.
25 October—RSGB Dinner Club, Kingsley Hotel, Bloomsbury Way, London, WC1. 7.30 for 8 p.m. 25s. per person. Reservations to RSGB HQ.
12 November—RSGB Council Meeting.
15 November—RSGB London Lecture Meeting.
16 November—Scottish V.H.F.–U.H.F. Convention, Glasgow.
3 December—Winter Radio Amateurs' Examination. RSGB Centre at the College of Preceptors, Bloomsbury Square, London WC1. Members 35s., Non-Members 45s. Closing date 31 October.
6 December—RSGB Annual General Meeting. 6.30 p.m., Royal Society of Arts, John Adam Street (off Strand), London WC2.
7 March, 1969—RSGB London Lecture Meeting.

CONTESTS

7-8 September—V.H.F. National Field Day (see page 324, May).
7-8 September—3·5–28 MHz (DARC) phone.
7-8 September—VU/4S7 DX Contest (C.W.). 06.00 Sat.–06.00 Sun. (see page 592).
14-15 September—Scandinavian Activity Contest (C.W.). 15.00 Sat.–18.00 Sun. (See page 591).
14-15 September—VU/4S7 DX Contest (C.W.). 06.00 Sat.–0.600 Sun. (see page 592).
15 September—80m Field Day (see page 472, July).
15 September—Region 1 (NW) Field Day.
15 September—Maritime Mobile D/F Competition at Alwalton. 2.30 p.m. to 7 p.m. Talk-in Station G3DQW on 1980 kHz. Details from G3KPO.
21-22 September—Scandinavian Activity Contest (Phone). 15.00 Sat–18.00 Sun. (see page 591).
22 September—D/F National Final.
5-6 October—Third 432 MHz (Open) Contest (see page 604).
5-6 October—VK/ZL/Oceania Contest (Phone). 10.00 Sat. to 10.00 Sun.
12-13 October—28 MHz Telephony Contest (see page 405, June).
12-13 October—Second 1296 MHz (Open) Contest (see page 604).
12-13 October—VK/ZK/Oceania Contest (C.W.) 10.00 Sat.–10.00 Sun.
16-17 October—YLRL Anniversary C.W. Party.
19-20 October—WADM Contest (C.W .). 15.00 Sat.–15.00 Sun. see page 591).
19-20 October—11th Jamboree-on-the-Air.
26-27 October—7 MHz (C.W.) Contest (see page 404, June).
26-27 October—CQ WW DX Contest (Phone).
6-7 November—YLRL Anniversary Phone Party.
9-10 November—RSGB 7 MHz DX Contest, Phone.
9-11 November—ARRL SS Contest (Phone).
11 November—Seventh 144 MHz (S.S.B.) Contest.
16-17 November—Second 1·8 MHz Contest.
16-18 November—ARRL SS Contest (C.W.).
23-24 November—CQ WW DX Contest (C.W.).
1 December—Fourth 70 MHz (C.W.). Contest.
6 January, 1969—First 144 MHz (S.S.B.) Contest.
26 January—Second 144 MHz (C.W.) Contest.
16 February—First 70 MHz (Open) Contest.
1-2 March—Third 144 MHz (Open) Contest*.
12-13 April—Second 70 MHz (Open) Contest.
3-4 May—Fourth 144 MHz (Portable) Contest*.
24-25 May—First 432 MHz (Open) Contest*.
24-25 May—First 1296 MHz Contest*.
22 June—Second 432 MHz (Portable) Contest.
5-6 July—Fifth 144 MHz (Open) Contest*.
27 July—Third 70 MHz (Portable) Contest.
4 August—Sixth 144 MHz (S.S.B.) Contest.
10 August—Third 432 MHz (Open) Contest.
17 August—Fourth 70 MHz (C.W.) Contest.
6-7 September—V.H.F. National Field Day*.
21 September—Seventh 144 MHz (C.W.) Contest.
5 October—Second 1296 MHz (Open) Contest.
3 November—Eighth 144 MHz (S.S.B.) Contest.
7 December—Fifth 70 MHz (C.W.) Contest.

* To coincide with IARU Region 1 contests.

MOBILE RALLIES

13-15 September—Radio Amateur Convention, Knokke, Belgium. Details from Lucien Vervarche, Lippenslaan, 284, Knokke, Belgium.

22 September—RSGB Scottish Mobile Rally, Cartland Bridge Hotel, Lanark.

29 September—Harlow Mobile Rally, Magdalen Laver Village Hall, east of the A11. Open from 10 a.m. Talk-in station on 160, 4 and 2m. Details from R. A. Sinclair, G3VAD, 244 Stanstead Road, Hoddesdon, Herts. Tel. Hoddesdon 66806.
20 April, 1969—North Midlands Mobile Rally, Drayton Manor Park, near Tamworth, Staffs.

ECHELFORD COMMUNICATIONS

32, FELTHAM HILL ROAD, ASHFORD, MIDDLESEX

Many visitors to Echelford Communications ask—Why Echelford? What does it stand for? Those of you who live in SE England will no doubt know that a town of no small size in Kent is called Ashford, as with the towns of Newport, the county becomes as important as the town itself (the GPO have a stamp "Not known Ashford Kent try Middlesex"). To avoid confusion with Ashford Kent, history was delved into.

So it came to be that a village in Middlesex referred to in the Domesday Book as "Exforde" became "Echelford" in the middle ages and around the 17th century it became "Ashford". The river bearing the name has since long disappeared into a gravel pit !

To get to Ashford from London, proceed down the A30 past London Airport, to a roundabout with a large sign "Princes Ski Club" follow that sign. About 1 mile on you will come to a cross-roads, turn right. 200 yds another roundabout, straight across and 150 yds on the right you will find "Echelford Communications".

In stock amongst other items you will find:—

HALSON MOBILE WHIPS, Complete with one coil ... £6 17 6
Extra coils (160, 80, 40, 20M) £3 17 6
Telescopic aerial sections only £2 5 0

J BEAMS for 4 Metre, 2 Metre and 70 cms.

ECHELFORD 4 Metre TRANSMITTER, 5W DC to final, self contained with HC6/U xtral etc. (SAE details) £30 0 0
(2 Metre version available shortly)

100 mixed 1W & 2W resistors, brand new 2s. 3d. a bag. 3 bags 6s. (Post free)

RSGB, Data and Iliffe Publications in stock—can get any books you require.

Weekday opening times (inc. Sats.) 9.00-6.00 (closed 1.00-2.00)

CLOSED ALL DAY WEDNESDAY

Ashford (MX) 55265 up to 9.30 pm any evening. Alan Wheeler G3RHF

N. W. ELECTRICS

G3MAX

Business hours: 9 a.m.—6 p.m. Tuesday—Saturday

CLOSED ALL DAY MONDAY

AR88 SPARES

Full Set of Valves ... ... **£3 0 0... Total**
Matching Speaker ... ... **£2 5 0... Value**
Handbook " D " Only ... ... **£1 5 0... £6 10 0**

SPECIAL PRICE COMPLETE **£5 15 0**
Postage 9s.

Control Unit. type 384, 17/6d., pp. 4/6d. This unit contains, 3½ in. Desyn Indicator, 5 mA Right Hand Zero meter 1½ in. dia. 6 var res with gear drive on 2-2 DP push buttons, 2 1p 12 way, 1 8p 5 way 2 bank switches. 3 62, 2 42 ohm 5W Res. Excellent value.

We still have small quantities of most items, from previous adverts.

EDDYSTONE RECEIVERS AND COMPONENTS, T.W., VHF., DENCO, REPANCO, etc.

We welcome all enquiries however small. Stamped addressed envelope please.

52 GT. ANCOATS STREET

MANCHESTER 4

G3SMI Tel.: 061-236 6276

MARK EQUIPMENT

V.H.F. U.H.F. ELECTRONICS

021-783 6399 *G8ABP*

70 C.M. TRIPLIER, AMPLIFIERS

ME70. QQVO2/6 trip, QQVO2/6 P.A. 8 watts input. Copper, aluminium chassis 8 in. × 3½ in. HT 180/200 volts, 6.3 and 12 volt heater, **£14/10/-.** Power supply available.

ME/SK70. QQVO2/6 trip, 2XPC88 P.A. 5 watts RF output, 12 volt heaters only, chassis as above, **£14.** P. & P. both units 5/9. Satisfaction or money refunded.

Transistors: TIS88 **14/-,** AF239 **13/-,** AF139 **11/6,** GMO290A **14/6,** MPF105 **8/6,** 2N3826 **6/-.** Post 4d.
Send S.A.E. for Lists and enquiries.

46 VERA ROAD, YARDLEY, BIRMINGHAM 26

DERWENT RADIO

SCA 63982 S.A.E. ENQUIRIES

We stock: KW, Star, Trio, Eddystone, Codar, Lafayette, Hallicrafters, Joystick, Sommerkamp, etc.

Best trade-in allowances for good used equipment.

Hallicrafters SX100 ... **£85** **National NC183D** **£65**
Heathkit SB 10 ... ... **£25** **Heathkit DX100** **£45**
Star SR 550 ... ... **£38** **Eagle RX80** **£25**
DA-1 el-key ... ... **£14** **WANTED 940s, EC10s, EA12s**

28 HILLCREST AVENUE, SCARBOROUGH, YORKSHIRE

J. BIRKETT

RADIO COMPONENT SUPPLIERS ★ **25 THE STRAIT, LINCOLN**

Partners: J. H. Birkett, J. L. Birkett Tel: 20767

W.G. 16 X-BAND WAVE-GUIDE

90° Bends E Plane No. AP61751 .. .. 20/-
90° Bends E Plane No. AP61752 .. .. 25/-
90° Bends E Plane No. AP61752A 25/-
90° Bends H Plane No. AP61756A 25/-
Flexible Wave-Guide WG 16 AP63483 .. .. 30/-
Flexible Wave-Guide WG 16 AP63482 .. .. 27/6
CRYSTAL HOLDER Type AP63907 .. .. 20/-
RINGS No. 5985-99-085-0002 .. .. 3/-
RINGS No. Z830005 .. .. 2/6
FLANGES SQUARE No. Z83005 .. .. 3/-
FLANGES ROUND No. 5985-99-083-0004 .. .. 3/-
FLANGES ROUND No. 5985-99-085-0003 .. .. 3/6
CRYSTALS similar to SIM 2 .. .. 2/6
DUPLEXOR type 5M162 .. .. 60/-
P.I.N. SWITCHES type X2/551 .. .. 100/-
O, V, K, BAND COUPLERS 8/6

PARMEKO MICROPHONE TRANSFORMER type P2570 ratio 1 to 10 fully screened 6/6

FT271A 200 Kc/s CRYSTALS 6/6
CONDENSERS 10 + 10 + 10 — 10 uf 450 v.w. 3/-
1000 + 1000 uf 35 v.w. 3/6
2000 uf 50 v.w. 4/6
3000 uf 15 v.w. 2/6
Block paper 1 uf 600 v.w. 2/6
25 uf 235 v. a.c. 6/-

SILICON CONTROLLED RECTIFIER 400 p.i.v. 5 amp 9/-
B9A VALVE HOLDERS WITH SKIRT .. .. 4/- dozen
B7G VALVE HOLDERS WITHOUT SKIRT .. .. 3/6 dozen

TRANSISTOR TUNING CONDENSERS

100 + 100 pf with S.M. drive 3/-
240 + 240 pf with S.M. drive 3/-
370 + 180 pf with S.M. drive 3/-
500 + 500 pf standard midget 4/-

SURPLUS TRANSISTORS 2N2926 green, 2/—; yellow, 1/10; orange, 1/6; red, 1/3
Mixed gains .. .. 12/- dozen
GENERAL PURPOSE SILICON P.N.P. TRANSISTORS .. 2/6 each
R.F. N.P.N., BF216, BF217, BF218 .. .. 2/6 each
AUDIO N.P.N., BC151, 2N3393, 2N3394 .. .. 2/6 each
UNTESTED GENERAL PURPOSE GERMANIUM TRANSISTORS 4/- dozen
WIRE-ENDED SILICON RECTIFIERS 800 p.i.v. 750 mA .. .. 22/6 dozen
1000 p.i.v. 750 mA, 30/- dozen; Stud Mounting 200 p.i.v. 2 amps, 1/6 each; 100 p.i.v. 10 amps, 2/6 each; F.E.T.S. P Channel Most, 5/-; N Channel MPF102, 8/6; MPF105, 8/6; 2N3819, 13/-.

Please note holidays 28/8/68 to 11/9/68

J. BIRKETT, 25 THE STRAIT, LINCOLN. **Phone 20767**

GAREX ELECTRONICS

MOBILE SOLID STATE POWER UNITS AND RF CONVERTERS READY BUILT

2 metre converter AFZ 12 1st RF amp; AFZ 12 2nd RF amp: AFZ 12 osc-multiplier: GEX 66 mixer: or equivalent transistors of equal performance. Built on printed circuit. Will operate from 8 to 12 volt neg. or pos. earth. Space inside case (5" × 2" × 6") to take battery for portable use. IF adjustable from 12 to 29 MHz. Crystal supplied is in this band, but cannot be specified at this price. Low noise figure. Guaranteed for 3 months. Postage 3/6. £8 17 6. Delivery 21 days.

Garex ABP70. Transistorised 70cm converter. GM0290a grounded base RF amp. GM0290a mixer. Two trough line circuits at 432 Mc/s. Cathodeon VHF crystal. 4½ db. noise figure. Built on copper clad fibre glass laminate and housed in 4½ in. × 3½ in. × 2 in. diecast box. IF 28-30 MHz ex stock; others to order over 20 MHz. 12 volt DC operation.
Postage 3/6 **£14 17 0**

NEW POPULAR
12 volt DC input. 300v DC 150ma output, or 175v at 100ma. Built on aluminium chassis 6 in × 4 in. × 2½ in. with Toroidal transformer (2¼ in. × 2 in. × 1⅜ in.) mounted on top of chassis.
Postage 4/6 **£6 18 6**

HEAVY DUTY
12v DC in, 390v DC 200ma out.: or 160v at 145ma. Built on chassis 8 in. × 5 in. × 2½ in. with Toroidal transformer (2⅞ in. h. × 2½ in. w. × 2¼ in.) and large heat sink mounted on top of chassis
Postage 6/6 **£8 18 6**

DE LUXE DUAL OUTPUT
12v DC in. 400v DC 200ma out plus 250v at 150ma; or 200v only. Available on relay version. Built on aluminium chassis 8 in. × 5 in. × 2½ in. with Toroidal transformer (3¼ in. h × 2¾ in. w. × 2¼ in.)and heat sink mounted on top of chassis.
Postage 6/6 **£13 12 0**

All above available with inputs and outputs relay controlled at 37/6 extra. All units are fully fused. Transformers are completely potted. Negative or Positive earth without change, complete and working with 3 months Guarantee. Delivery 21 days. Outputs are measured with mobile vehicles. With static vehicle they will be a little lower

KITS
2 metre transmitter kit (4m version available shortly). 6BH6—6BH6—QQV03-10—QQV03-20a. 6 or 12 volt heaters. Includes AE relay, 6 or 12 volt; and kit of spare valves. Full circuit and point to point wiring instructions. Items not included: Crystal (8 MHz), Modulator or P.S.U. Delivery 14 days **£14 5 0**
Or less spare set of valves: £11 5 0.

Based on ready built units less chassis. All components, Toroidal transformer, relays and cirucit supplied.

POPULAR	Postage 4/6	**£3 15 0**
HEAVY DUTY	Postage 6/6	**£4 12 0**
DE LUXE DUAL	Postage 6/6	**£8 18 6**

MOBILE SOLID STATE MODULATOR KITS
De Luxe 12 volt input. 15 watts output. Pre-tested wired and dipped printed circuit boards. OC700a and OA81 limiter. NKT 224 emitter follower. NKT223a amplifier. NKT224 emitter follower. NKT404/OC35 driver. Push Pull NKT404/OC35 output. Complete with transformer (includes P.A. winding) to match QQV03-20a. Inc. tailored mike, press to talk 300-3500 Hz. Average *wiring* time 30 minutes. Less chassis
Postage 6/6 **£7 17 6**

Standard Model 12 volts input. 15 watts output. OC71 amp. OC72 amp. on pre-tested wired and dipped, printed circuit board. NKT404/404/OC35 driver. P.P. NKT404/OC35 output. Including transformer to suit QQV03-20a. Inc. tailored mike 300-3500 Hz. Less chassis.
Postage 6/6 **£4 15 0**

QQV03-10 modulator and audio amplifier dual purpose kit, relay switched. OC 200 mod. compressor, NKT 223 emitter follower, NKT 223a Tx mod. amp and Rx audio amp. NKT 223a emitter follower. NKT 404 Tx and Rx driver. P.P. NKT 404 Mod. and Audio output. Complete with transformers. Pre-tested wired and dipped printed circuit board. Inc. tailored mike, press to talk. 300-3500 Hz. Less chasiss.
Postage 4/6 **£4 18 6**

Built with selected and tested components from modern radio-telephones. All kits include instructions and circuits. Negative or positive earth. Deliveries ex. stock.

Valves
QQV03-10 6/6
QQV03-20a/C1134 38/6
OB2 new 2/9
TD03-5/DET 23. 2000 MHz Disc Seal triode 12/6

Modulation Transformers

6V6/EL84p pto QQV03-20a	Postage 4/6	**17 6**
6AQ5pp to QQV03-10	Postage 3/6	**12 6**
Single EL84 to QQV03-10	Postage 3/6	**10 0**

Transformers
Toroidal transformer for transistor power supplies. With secondary taps up to 390V 200ma 12V. DC input. New 2¾h × 2½ × 2⅞ circuits provided **47 6**
Auto 250w 230v to 100/110/150/200/240v & 250v at100ma. ... Fully shrouded. Postage 4/6. **15 0**

Meters
All new British manufacture

0-500 microamp 4½ by 4⅛	**35 0**
0-100 microamp 3⅛ by 3¼	**37 6**
25-0-25 microamp 3⅛ by 3¼	**25 0**
Edge reading British 100 microamp calibrated in DB's scale slides out. Depth 3 in. overall width 2¾ in. height 1¼ in.	**27 6**

Capacitors

0.1 350 vwkg 1 1/16 × 7/16 3/- per doz.	
330 pf silva mica 2% box of 500	**20 0**
.04 150 vw packet of 50 7/16 in. × ¼ in. dia	**3 6**
All new	
Aerial relay up to 200 mc/s 25 watts 6v or 12v coil	**5 0**
Coax relay up to 2m, 3 plugs and extra set of switching contacts 50v coil. *New* ... ... Postage 2/6	**£1 7 6**

Postage packing insurance 2/6 except on valves large type 1/- & small type 6d each Orders over £2 post free unless otherwise stated. Early closing Wednesday

SATISFACTION GUARANTEED OTHERWISE MONEY REFUNDED

GAREX ELECTRONICS, CHINNOR, OXON

Callers welcome by arrangement please telephone G3MMJ Kingston Blount 476 ex. ZS6QP

Government of MALAWI

REQUIRES

RADIO TECHNICIAN

to serve in Police Department on contract for one tour of 24-36 months in the first instance. Commencing annual salary according to experience in scale rising to £1835 (including overseas addition). A supplement of £100 a year is also payable. Gratuity (free of Malawi tax) 25% provided a tour of at least 30 months is served, otherwise 15%. Outfit allowance £30. Free passages. Liberal leave on full salary. Generous children's education allowances. Contributory pension scheme available in certain circumstances.

Candidates, up to 45 years, should have at least 5 years practical experience in radio, preferably in a Police Force or the armed forces. Preference will be given to candidates who possess City and Guilds Intermediate Telecommunications Certificate or equivalent. A good knowledge of transistor circuitry, multi-channel carrier telephone equipment and/or diesel plant and petrol/electric alternators would be an advantage.

Apply to CROWN AGENTS, M. Dept., 4, Millbank, London, S.W.1., for application form and further particulars, stating name, age, brief details of qualifications and experience, and quoting reference M2K/64949/RC

AIR FORCE DEPARTMENT

ARE YOU:

★INTERESTED IN DOING VITAL WORK ON RAF RADAR AND WIRELESS EQUIPMENT?

★ Aged 19 or over and of good educational standard (GCE "O" level passes in English Language, Maths and Physics, City and Guilds Telecommunications Technicians Certificate or equivalent qualifications are desirable though not essential).

★ Experienced in radio/radar servicing, with at least 3 years training and practical experience.

IF SO, WE OFFER:

★ A first class opening as a Civilian Radio Technician. Present salary starting at up to £1,130 p.a. (according to age) and rising to £1,304, and good prospects of promotion (top posts in excess of £2,000 p.a.).

★ 5-day week. 3 weeks 3 days annual leave at the start rising to 6 weeks, plus public holidays.

★ Excellent prospects of a good pension. If you do not qualify for a pension, then you receive a gratuity if you leave after at least 5 years service.

Vacancies exist at RAF Sealand, near Chester and RAF Henlow, Bedfordshire.
Vacancies also arise from time to time at other RAF stations throughout the country.

Applicants should apply for further information and trade test to:

MINISTRY OF DEFENCE (CE 3h (Air))
SENTINEL HOUSE
SOUTHAMPTON ROW
LONDON W.C.1

or call at No. 30 MU, RAF Sealand between the following times:
Monday-Friday 8.30 a.m. to 4 p.m.
Saturday 8.30 a.m. to 12.30 p.m.

Radio Technicians

required now for vital work in

Air Traffic Control

Join the National Air Traffic Control Service, a Department of the Board of Trade, and play a vital part in the safety of Civil Aviation. Work on the latest equipment in Computers, Radar and Data Extraction, Automatic Landing Systems and Closed-Circuit Television, at Civil Airports, Air Traffic Control Centres, Radar Stations and other engineering establishments in the South of England, including Heathrow, Gatwick and Stansted.

If you are 19 or over, with practical experience in at least one of the main branches of telecommunications, fill in the coupon now. Your starting salary would be £828 (at 19) to £1,076 (at 25 or over); scale maximum £1,242 (rates are higher at Heathrow). Non-contributory pensions for established staff.

Career Prospects. Your prospects are excellent, with opportunities to study for higher qualifications in this expanding field.

Apply today, for full details and application form.

Write for details to: Mr. T. H. Mallett, B.Sc. (Eng.), C.Eng., M.I.E.E., Room 705, The Adelphi, John Adam Street, London, W.C.2, marking your envelope 'Recruitment'.

Name _____

Address _____

_____

Not applicable to residents outside the United Kingdom.

NATCS

National Air Traffic Control Service

RRC

Telecommunication Engineer

WEST LONDON

Applications are invited from Engineers to join our Communications Division, installing, commissioning and maintaining integrated communication systems. Experience of radio transmitters and receivers or telephone systems desirable.

Good salary, car allowance, expenses and non-contributory Pension and Life Assurance scheme. Interviews will be conducted in the Midlands if desired.

Apply:- **Personnel Manager,**
Multitone Electric Co. Ltd.,
12-20 Underwood Street,
London N.1.

CAREER EMPLOYMENT OPPORTUNITIES

FOR

TELECOMMUNICATIONS TECHNICIANS

IN

LONDON AND THE HOME COUNTIES

A number of vacancies still remain to be filled by experienced men who have obtained the City and Guilds Intermediate Certificate in Telecommunications Engineering or an equivalent or higher technical qualifications.

Salary: £1255 (at age 25) to £1429 per annum in London.
£1130 to £1304 per annum in Home Counties.
Plus additional allowances when shift working.

Candidates and both their parents must have been British subjects at all times since birth.

Previous applicants should not re-apply.
Further details and Application Forms from:

The Personnel Officer
Diplomatic Wireless Service
Hanslope Park
Wolverton
Bucks

Please quote reference:

COMMUNICATIONS ASSOCIATES LIMITED

Require a Service and Installation Engineer for short range VHF/FM communication equipment. He should reside in an area North of London and be prepared to cover an area of 100 miles radius. Practical ability and enthusiasm are essential. Salary according to qualifications.

Apply in writing to Mr R. Zink, Communications Associates Limited, 7 Bridford Road, Marsh Barton, Exeter.

SWANCO PRODUCTS LTD.

G3NAP *AMATEUR RADIO SPECIALIST* **G3PQQ**

NEW EQUIPMENT

	£	s.	d
Sommerkamp F-Series Equipment:			
FP-DX 500 double conversion superheterodyne with crystal-controlled first mixer, 160–10 metres	125	0	0
FL-DX 500 SSB/AM/CW transmitter, 240 watts PEP, complete with built-in power supply and antenna relay	145	0	0
FL-DX 2000 linear amplifier, 960 watts PEP	100	0	0
Sommerkamp FT-DX 150 transceiver, 80–10 metres	215	0	0
Sommerkamp FT-DX 500 transceiver, 80–10 metres	250	0	0
Swan Line Equipment:			
Swan 500 SSB transceiver, 80–10 metres	250	0	0
Swan 350 SSB transceiver, 80–10 metres	218	0	0
Swan 230-XC power supply (to suit 500 or 350)	49	0	0
Swan 410 VFO and adapter	61	15	0
Hallicrafters Equipment:			
SX-130 Communications receiver	86	15	0
SX-122 Communications receiver	148	5	0
SX-146 SSB receiver, 80–10 metres	137	5	0
HT-46 SSB transmitter, 80–10 metres	192	5	0
HA-1 electronic keyer	42	15	0
Eddystone Radio Ltd.:			
Eddystone EA12 Amateur bands receiver, 160–10 metres	193	0	0
Eddystone 940 Communications receiver	143	0	0
Eddystone 840C Communications receiver	70	0	0
Eddystone EC10 receiver	53	0	0
Eddystone EB35 receiver	62	10	0
Eddystone EB36 receiver	58	5	0
Trio Communications Receivers:			
Trio JR-60 14 tubes amateur communications receiver, 540 kc/s.–30 mc/s., plus 142–148 mc/s.	61	19	0
Trio 9R59 9 tube communications receiver	34	13	0
Trio 9R59DE 8 tube communications receiver	39	15	0
Trio JR500SE Amateur bands receiver 80–10m.	68	0	0
Trio TS-500 SSB Tranceiver complete with a.c. P.S.U. and split-frequency V.F.O. 80–10 metres 200 watts PEP	199	0	0
Lafayette Communications Receivers:			
HA-500 Amateur bands receiver, 80–6 metres	44	2	0
HA-700 Communications receiver (with product detector)	37	16	0
HA-350 Amateur bands receiver, 80–10 metres	67	10	0
K.W. Electronics Ltd.:			
K.W. 201 Amateur bands receiver, 160m.–10m.	111	0	0
K.W. Vespa Mk. II transmitter (with P.S.U.)	135	0	0
K.W. 2000A SSB tranceiver, 160m.–10m. (with P.S.U.)	232	0	0
Mosley Electronics (Beams):			
TA-33Jr. Triband three element beam	27	5	0
TA-32Jr. Triband two element beam	19	5	0
TA-31Jr. Triband dipole	11	11	0
V-3Jr. Triband vertical	8	5	0
TD-3Jr. Wrie trap dipole	6	15	0
Channelmaster rotators	13	13	0
Channelmaster rotators (automatic)	18	18	0
Park-Air Electronics Ltd.:			
2 metre transmitter (complete with mic., etc.)	80	0	0
Jet Set Aircraft receiver	12	0	0
Sky Bandit Aircraft receiver	23	10	0
Kurer Aircraft, short, medium, and long wave receiver	41	9	6
Swanco/CSE Equipment:			
Swanco/CSE 2A10 solid state transmitter	43	7	0
Swanco/CSE 2AR solid state receiver	44	0	0
Swanco/CSE type II A.T.M.A. mobile/fixed/portable antenna	9	15	0
Swanco/CSE safety mobile microphone, **Type MM2**	2	17	11
Swanco SP.44 2 metre converter	10	10	0
Swanco SP.144 with mains P.S.U.	13	13	0
Swanco 100 kc/s. calibrator	5	19	6
Halson Mobile antenna, now all weather, all bands system	6	17	6
Extra coils (when more than one band is required)	3	17	6
Swanco Quad Spiders (per pair)	6	10	0
Echelford Communications Equipment:			
Echelford BI/4 transmitter for 4 metres	30	0	0
Echelford MI/4 transmitter (mains or mobile)	40	0	0
Echelford CI/4 4 metre converter	10	10	0

Full range of **Drake Equipment** available to order.
Full range of **Heathkit Equipment** available to order.

Codar Radio Company:

	£	s.	d.		£	s.	d.
CR.70A receiver	19	10	0	**CR.45RB**	11	7	0
PR30	5	10	0	**AR5** transmitter	16	10	0
PR.30X	7	4	0	**250 volt P.S.U.**	8	0	0
R.Q.10	6	15	0	**12/MS** P.S.U.	11	5	0
R.Q.10X	8	8	0	**12/RC** control	2	7	6
CC.40	6	10	0	**T28** receiver	15	10	0
CR.45K	9	10	0	**Mini-Clipper**	1	19	6

Pertridge Electronics: — **Shure Microphones**

	£	s.	d.		£	s.	d.
Joystick std.	4	15	0	Shure 201	4	10	0
Joystick de-luxe	5	19	6	Shure 202	5	0	0
Type 3 tuner	2	15	0	Shure 444	10	12	6
Type 3A tuner	3	12	6	Shure 401A	5	10	0
Type 4 tuner	4	4	0	Shure 275SK	4	2	6
Type 4RF tuner	6	6	0				

SECOND-HAND EQUIPMENT

Many items in stock including: LG-50, Tiger TR100, DX-100, SB10, K.W.76, K.W.77, 840C's, etc. Your enquiries please.
Full Service Facilities—receivers re-aligned, transmitters serviced, etc.
Illustrated Catalogue 7/6 post paid.

SWANCO PRODUCTS LTD.
247 HUMBER AVENUE, COVENTRY
Telephone: Coventry 22714
Hours: Mon.-Sat. 9 a.m.-6 p.m.

RADIO AMATEUR required for Sales and Servicing at the London Heathkit Centre, 233 Tottenham Court Road, W.1. Must be licensed and active amateur. Apply, Personnel Manager, Daystrom Ltd., Gloucester.

EXPERIENCED Television service engineer required. Summer holiday honoured. Phone for appointment. REM Radio, Ashford (Middx.) 53336,

EASTBOURNE—Old established Private Dealers require experienced Field Television Engineer with current driving licence. Greenwood (Electrical) Limited, 215 Seaside, Eastbourne.

RADIO COMMUNICATIONS DESIGNER. We need the services of a Radio Communications Designer to design transmitting and receiving equipment to our specification. Telephone Operation and Transport Services, East Grinstead 21742.

ALVAR-POLARON LTD., require ELECTRONICS TECHNICIANS qualified to at least ONC standard having at least three years experience in the electronics industry. Applicants should be capable of working with minimum supervision on various types of transistorized equipment. Apply in wriiting: R. B. Reeson, Alvar-Polaron Ltd., 4 Shakespeare Road, Finchley, London, N.3.

FOR SALE

CROFTFILM LTD

Eddystone, Eagle, Radio spares, Heathkit meters, rugs, sockets, connectors, coils, whips, kits, speakers, headphones, Tygan-Hi-Fi decks, etc.

G3EXU, 46 Friargate
Preston, PR1 2AT

COMPLETE STATION FOR ONLY £20. Comprises Eddystone 358X RX Collins TCS12 TX, coverage 160-80-40m., with all power supplies, cables, pre-amps. Would split. Delivery free London area. J. H. Carter, 91 Grosvenor Avenue, Carshalton, Surrey. Tel: WAL 1969 (weekend please).

KW2000 D.C. P.S.U. Nombrex type 27 signal genny. Brand new 2C39A's, 866A's. 1600-0-1600 V. 500 mA ex-WD transformers. RRD-900-42 Morse Pen Recorder. Philpotts cabinets. 16 x 50 binoculars. Evans, 4 Gower Crescent, Baglan, Port Talbot, Glam.

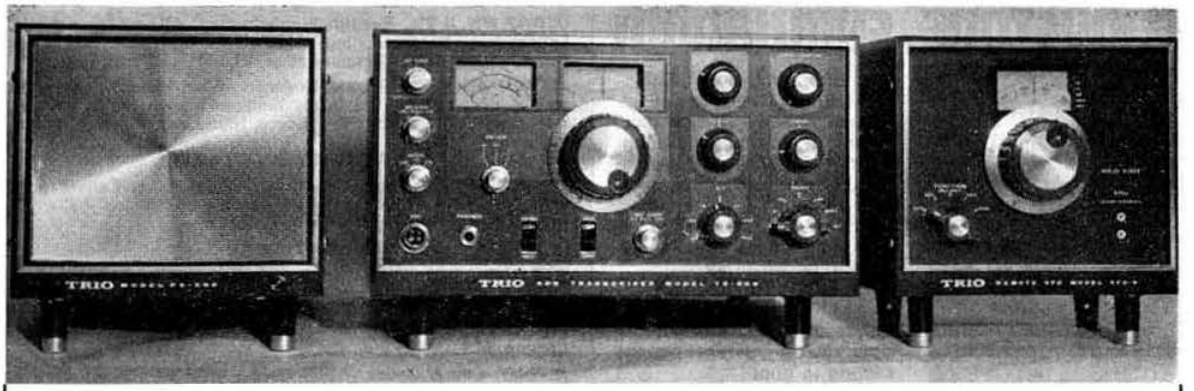
840C MINT CONDITION, £50 o.n.o. Also Cossor 339A scope, £10 o.n.o. Can deliver 50 mile. Haines, 14 Bailey Bridge Road, Braintree, Essex.

MINIATURE ELECTROLYTIC CAPACITORS suitable for transistor applications, all at 4d. each or 3/- assorted dozen, 5 μF 6 VW, 10 μF 15 VW, 30 μF 6 VW, 50 μF 6 VW. Post 4d. Forster, G3WKQ, 12 Mitchell Road, Palmers Green, London, N.13.

FT241A CRYSTALS, many available in accurately matched sets for s.s.b. and c.w. Single crystals also available 370-440 and 470 to 540 kHz. 2 metre and 4 metre transistorized converters, several IFs available, less p.s.u., £9; or with internal mains p.s.u., £10 10s. 50 to 100 watt modulators several available with mains (internal) p.s.u. and complete, in new condition, prices vary according to facilities offered. 60 and 100 watt transformers for 12 volt input d.c.-d.c. transistorized converters, various output voltages. Send large s.a.e. for full details any item. B. M. Sandall, 21 Dale View, Ilkeston, Derbyshire, DE7 4LD.

MULTICOLOURED QSL and listeners' cards at £1 per 250, £1/15/- per 500, £3 per 1000, also general printing for amateurs and societies. S.a.e. H. J. Adams, 85 Rosecroft Gardens, Twickenham, Middx.

FREE QSL samples, excellent range at right price. Log books 7/-. —Bailey and Co., Greenfield Place, Weston-super-Mare.



The TRIO TS-500 SSB Transceiver.

SWANCO PRODUCTS LTD of COVENTRY.

STOCK

Specifications:
Bands: 80-10 metres complete.
Power: 200 watts P.E.P.
Modes: SSB/AM/CW.
Ant. 50-75 ohm.
Rx Sensitivity: 1 V S/N 10 dB.

Price:
Trio TS-500
Trio PS-500AC P.S.U.
Trio VFO-5 V.F.O.

Full details from your Midland stockists

SWANCO PRODUCTS LTD 247, HUMBER AVENUE ● COVENTRY
Hours: Mon-Sat. 9.0 a.m.–6.0 p.m. ● Phone: COV. 22714 (24 hr. Service)

COMPLETE STATION of the late GM3SLW. Comprising of DX100, SB10, BDQ Rx, RX20, B44/3, BC221 with charts. Selection of 2 and 4 metre pre-amps, Converters, TX's, Channel Master Control Unit with rotator 2 metre 6/6 Yagi 4 metre 4 El. Beam plus usual test equipment, valves, components, etc. Offers to Mrs. Auld, Hillview, Halkirk, Caithness.

QSL CARDS. 15/- per 100, plus postage. S.A.E. Sample. GW3LXI, 43 Monkton, Pembroke, S. Wales.

METALWORK.—All types of cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks Ltd. (G4BI), Chapman Street Loughborough.

SERVICE SHEETS. Radio, Television, Tape recorders 1925–1968 by return post, from 1/- with free fault-finding guide. Catalogue 6000 models, 2/6. S.a.e. enquiries.—Hamilton Radio, 54r London Road, Bexhill, Sussex.

QSL CARDS. G.P.O. approved log books, cheapest, best, prompt delivery. Samples.—Atkinson Bros., Printers, Looe, Cornwall.

AERIAL GUYS, HALYARDS. Polypropylene rope $\frac{3}{4}$ in. circ., over $\frac{1}{2}$ ton B/S, 3d. ft. post free. C.W.O. to G3JMG, 14 Wessex Road, Horndean, Portsmouth

CRYSTALS. 40 assorted FT 243 & 241A 23/6 Post Paid. Illustrated Catalogue No. 17 3/- Post Free. Arthur Sallis Ltd., 28 Gardner Street, Brighton.

HEATHKIT HW32A tranceiver £40. Demonstration at weekends. A. Turner, 35 Lewes Way, Croxley Green, Rickmansworth, Herts. Tel. Watford 34123.

DX100U TRANSMITTER AR88D receiver (S-meter). Both working condition. Manuals. £65. Prefer collection. Carriage extra. Grieg, 8 Laurel Place, Kilmarnock. Tel 24149.

LM13 with charts, handbook and PSU £20. Crystal oscillator 3.5–30 MHz, £2. GDO £2. 160 metre transmitter, AM/cw self contained with p.s.u. £5. Pair 5 amp circuit breakers £2. Following at £2 per box: 5 speakers, 137 valves, 30 PO relays, 30 crystals, 12 power resistors, TX capacitors, variable, pair of TT21 £2. 10 pF 10 kV neutralising capacitor £1. Roger Bennett, G3SIH, 206 Corsham Road, Whitley, Melksham, Wiltshire. Tel: Melksham 3443.

QSL CARDS: Two-colour, variable design, attractive from only £3/3/- per 1000 (inclusive). Send foolscap s.a.e. for samples to ARA Press, 46 Moat Ave., Green Lane, Coventry.

KW VICEROY Mk IVA, excellent quality, new 6146's, £100. AR88D, good condition, handbook, £30. 1750/1750 transformer 0.62 kVA £4. 813 heater transformer £1. McElroy Bug £2. Mawdsley, 129A Metchley Lane, Harborne, Birmingham.

DX100, £45. B44, PSU/M, £2. Eagle VTVM and Signal Generator, offers. Scope, £10. Numerous Transformers. S.A.E. Box A7371, c/o *Radio Communication,* 4 Ludgate Circus, E.C.4.

TW TWO METRE TX, PERFECT (with XTAL.) £20. TW converter RX (4-6 Megs IF.) perfect £10. HRO Senior, 9 coils, with P/P & L/SPKR, perfect condition, £20. Labgear " Top Twin " TX, £10. Perfect condition, Stella ST.472 Portable Tape Recorder (Cassette), £12/10/-. K. Hall, (G3FIF), 37 Carleton Avenue, Blackpool, Lancs.

RECEIVERS. R107, £9/10/-; R209, £10/10/-; B40, £15; B41, £9. All good working order. P. & P. extra. Robert K. Marshall, Braehead, Balbardie Road, Bathgate.

MOBILE WHIP BASE SPRINGS. Similar to Hy-Gain Model SPG. 4 in. long by 2 in. max. dia. Heavy chrome plated. Bolthole tapped $\frac{3}{8}$ in. × 24 thread each end. Weight 2 lb., ex brand new RCA equipment. £2, post paid. Evans, 4 Gower Crescent, Baglan, Port Talbot, Glam.

TRIO TS500 TRANSCEIVER, complete with matching PSU, remote VFO and DMIGHL Dynamic Mic. An excellent performer in all respects, see cover IV, June '68, for full details. Two complete stations, unused except for air testing, available for immediate despatch by passenger train. Save now. At £195 each. Box A7372, c/o *Radio Communication,* 4 Ludgate Circus, E.C.4.

INTERESTED IN LISTENING to Aircraft Communications. We have a large selection of radios to let you do this, also books, maps, charts of all airways and airports, 4d. stamp please to Fraser-Hughes (AR) Ltd. (GM3EDZ), 455a Great Western Road, Glasgow, W.2.

Q.S.L. CARDS. Reasonable prices. Samples S.A.E. post paid please. Note new address. 24 Wignall Street, Poolstock, Wigan, Lancs.

MEMBERS' ADS—*continued*

Eddystone 940 with plinth, spkr, mint, offers over £75, part exchange for rx welcome. Codar RQ10X, £6, PR30X, £4 10s. Eddystone 870, £8, Leak TL25 plus variscope, 3, £20. Beam/Echo a.m./f.m. tuner, £7. M. Snowden, Swainsea Lane, Pickering, Yorks.

Codar CR45 rx 3 coils 160-10m. plus high-Z earphones, £6 inc. postage, for a quick sale, also two ADT140 transformers one with shorted leads, 6s. ea., cost 15s. bought by mistake. J. W. Rudge, Fields End, Gastrells, Stroud, Glos.

Mobile p.s.u. ex 19 set comprises 550 V rotary transformer and 275 V vibrator unit with solenoid-operated changeover, 12 V i/p £1. A. Biddell, G3GNM, 114 Kingshill Ave., Kenton, Middx.

Eddystone bug key, £2. Wanted d.c. microammeter 100 μA f.s.d. (English make), please state price. 159 Micklefield Road, High Wycombe, Bucks.

G2DAF s.s.b. tx, p.s.u., spkr., £40. AR88D vry. gd. Spkr., handbook £40. Green and Davis 2M1000 150 W 2m tx. excellent, £50. P. G. Watson, G3NBO, 5 Sandlewood Rd., Loughborough, Leics.

Valves, EF80, ECC81, EF36, EF91, ECL80, EH90, PCC84, PCL84, PL81, 6F13, 10F1, 10P13, PCF80, any six for 10s. also 832, 10s., QV04-7 5s. ea. Wanted PCR3 rx, unmodified, send details. G. A. Jeapes, 165 Cambridge Rd., Gt. Shelford, Cambridge.

AR88D, spkr., manual, £25 deliver London area. RSGB Handbook, 25s. Radio Handbook (Sams) 16th edition, 45s. American Radio and Electronics Mags, half price (s.a.e. list). Wanted freq meter, BC221 or similar. S. M. Franklin, 337 Hendon Way, London, N.W.4. Tel. 01-202 7939.

Lafayette KT320 rx, ex. condit. 550 kHz to 30 MHz g.c. in 4 bnds. plus b.s. bandspread, a.v.c., m.v.c., b.f.o., Q mult., a.n.l., S meter 1 r.f. stage, buyer collects, £18 o.n.o. Wanted Deluxe Joystick and gd. Joymatch tuner. N. A. Mason, 60 St. Mary's Crescent, Ruddington, Nottingham.

2m Green CTX2v tx in gd. order with mains and /P p.s.u., solid state modulator numerous accessories, £10 the lot buyer collects. G. N. Glover, G3AAV, 30 St. Chad's Ave., Leeds 6.

WANTED

TA33jr or TA32jr and rotator. W. E. Massingham, G3DWS, 173 Black Haynes Rd. Birmingham 29. Tel. 021 475-6276.

2m transistorised or JXK type converter 28-30 MHz i.f., also 2m linear, with or without p.s.u., preferably two 4CX250B's. R. F. Thurlow, G3WW, North House, Wimblington, March, Cambs.

Case, front panel and side supports, dials and knobs for AR88LF, would consider a burnt-out one if cheap. W. J. Pope, G3SKE, 23 Herbert Rd., Rainham, Gillingham, Kent.

Labgear type E5144 mobile converter, must be in mint condit. E. Wilders, G3TGW, 28 Highbury St., Peterborough.

3 band NCX3, Swan 240 Paros or equivalent, transmitter FL200B, Vespa, HT37 or HX50, p.s.u. not required. P. J. Wood, G3NPE, Flat 7, Manor House, Roxwell Rd., Writtle, Essex.

SB10U in wkg. order up to £25. J. R. Corbett, G3TWS, 32 Bibury Rd., Benhall, Cheltenham, Glos. Tel. Cheltenham 22366.

Pye Ranger type 2202 need not be wkg. but state condit., quote info. on rear plate, gd. price paid. W. Bilton, G3TYY, 7 Neap House Rd., Gunness, Nr. Scunthorpe, Lincs.

Set of FT243 8-8·1 MHz xtals for all 2m zones or w.h.y. Also offers for 2m gear for partially rebuilt rack, c.w. tx complete (2) 807 etc. J. H. Stacey, 3 Westpark, South Molton, Devon.

Transistorised a.f. sig. gen., 500-1500 Hz. P. Bentley, G3VUD, 3 Eddington Rd., Lytham St. Annes, Lancs.

Xtals for G2DAF rx front end, mech. filters 3/2·1/0·8 kHz prefer Collins type, carrier xtals. if poss. to suit 3/2·1 kHz filters, price and details please. J. B. Smith, G3HSR, 11 The Crescent, Milton, Weston-Super-Mare, Somerset.

TW Topmobile transistorized rx, reasonable price. R. G. Nash, G3EJA, 9 Holybrook Rd., Reading, Berks.

Continued on page 622

MEMBERS' ADS—*continued*

R.M.A. attenuator probe (switched Z) R.C.A. etc., i/p 75 Ω, o/p 75 Ω, 300 Ω, 400 Ω. J. R. Wright, 156 Thompson St. West, Darlington, Co. Durham.

CR100 or HRO gd. condit. M. J. Brenig-Jones, 113 King George 5 Drive, Heath, Cardiff.

Gonset Communicator Mk4, 2m service manual for this equipment rqd. urgently, will buy or loan. R. L. Bastin, G3LHA, 112 Attoxhall Rd., Coventry, Warks.

Two valves type 4X150A, 4X250B or 4CX250, two bases and chimneys also wanted, gd. lin. and offers for 2m Communicator G. Weale, GW3LEW, 8 Kensington Drive, Cefn Glas, Bridgend, Glam.

R216 v.h.f. rx. H. E. Thornton, 26 Stagbury Ave., Coulsdon, Surrey CR3 3PD. Tel. Downland 54130.

Xtals any frq. between 1875 and 1900 kHz, D. Denald, ZL1AYH, 27 Turanga Rd., Waihi, New Zealand.

By 16 years old amateur, female penfriend of same age interested in radio. B. Edwards, G3WCE, 18 St. Johns Ave., Friern Barnet, London, N.11.

Bandspread coil for 20m for HRO rx, must be in gd. condit. H. L. Wilson, EI2W, 23 Rathgar Rd., Dublin 6, Eire.

Kokusai MF-455-15K filter, xtals 12, 11·75, 11·5, 8, 6·25, 12·5 and 9 MHz. R. C. Shuck, G3NXD, "Tregarron", Lowe Lane, Wolverley Kidderminster, Worcs.

A2521 (6CR4) or and 7 pin v.h.f. g.g. triode. C. J. Kaye, 29 Bainbridge Rd., Headinley, Leeds 6.

Telephone handsets or similar intercoms s.a.e. to S. Butler, 50 Regent Drive, Fulwood, Preston PR2 3JB. Tel. Preston 79237.

Urgently rqd. a gd. s.w. rx (mobile) for any band(s). Can only pay up to £1 or exchange for 30 valves, commercial or home-brew, must have gd. reception. R. A. Beament, "Ladram", York Rd., Camberley, Surrey.

U.S. Call book magazine also 1966/7 CQ magazines. F. Barrett, G8CO, 2 Whitehall Rd., Grays, Essex.

QST for Sept., Oct., Nov., 1966. R. P. Smith, G3SVW, 226 Greenbrow Rd., Manchester 23, M23 8TU.

HRO MX b.s. coils for 10m, must be in gd. condit. L. A. Garratt, G3XAH, 12 Briarfiled Rd., Worsley, Manchester. Tel. Walkden 4180.

Heathkit HA14 Linear with a.c. p.s.u. also Hygain 14AVQ vertical or Mosley RV4 preferably with roof mount, please state price, age and condition. M. J. Underhill, G3LHZ, Munzil, Whitehall Drive, Ifield, Nr. Crawley, Sussex.

Tx 80-10m a.m./c.w. 40 W or more, must be compact and in perfect wkg. order. Will collect reasonable distance from London. J. W. Anderson, G2HMV, "White Lodge Cottage", Biggin Hill, Upper Norwood, S.E.19. Tel. 764-4747.

KW Vespa Mk2 or similar all bnd. a.m./s.s.b. tx, part exchange for Sphinx Mk2 or direct cast transaction. H. H. Linney, "Sunnybank," Oak Lane, Bicton Heath, Shrewsbury, Salop. Tel. Shrewsbury 51733.

Panda a.t.u. and G4ZU matching unit. P. J. McConnachle, GM3CRY, Bonfield Rd., Strathkinness, St. Andrews, Fife. Tel. Strathkinness 219.

R216 with p.s.u. in gd. condit., cash or exchange EC10. E. Bailey, G8BBA, 29 Alexandra St., Stone, Staffs. Tel. Stone 2748.

Details of a.f. oscilloscope model 33, will make gd. and charge for details and postage and oblige J. O'Connor, 20 Chevallier St., Ipswich, Suffolk.

SB400/401E, SB200, state price and condit. E. V. Neal, G8GP, 34 Manor Ave., Brockley, London, S.E.4.

Old Marconi or similar t.r.f. battery operated marine rx covering 600m, one rqring attention acceptable. E. D. Herbert, G6RF. "Talltrees", Lower Cookham Rd., Maidenhead, Berks. Tel. Maidenhead 23594.

D.c. p.s.u. for KW2000A also mount base section only of Minimitter type mobile whip. For sale Minimitter TR7 transistor rx (160m) mint condit. Offers R. J. Matthews, G3SAH, 59 Enfield Rd., Hunt End, Redditch, Worcestershire. Tel. Ashwood Bank 2573.

CLASSIFIED ADVERTISEMENTS

ORDER FORM

Please insert this advertisement in Radio Communication.

Rate 3d. per word, minimum 5s. Box nos. cost 1s. 6d. extra, which includes forwarding replies. Trade advertisements should be submitted by letter.

NAME (BLOCK CAPITALS) .....

ADDRESS .....

.....

.....

DATE ..... *SIGNED* .....

Classification

.....

Box. No.

Yes ☐ No ☐

POST TO SAWELL & SONS LTD., 4 LUDGATE CIRCUS, LONDON, EC4

MEMBERS' ADS

Closing date for October, 9 September

ORDER FORM

Classification

For Sale ☐

Wanted ☐

Please print in block letters

Name and Call-Sign

Address

Telephone number

DATE ..... *SIGNED* ..... *CALL-SIGN, BRS or A no.* .....

These advertisements are published free of charge for the benefit of members. The number of words is limited to 32, not including the address and telephone number. We must receive the advertisement at RSGB Headquarters by the date above for the following month's issue, typed or printed on a standard postcard or the form above. It must be accompanied by the current postal wrapper, the address, of course, agreeing with that in the advertisement. No advertisement obviously pertaining to a business can be accepted, but these can be submitted in the usual way for classified advertisements. We cannot guarantee the inclusion of Wanted Advertisements.

The RSGB cannot accept responsibility for errors, or for the quality of equipment offered for sale in Members' Ads. We advise members to enclose a stamped, addressed envelope when replying to advertisements.

POST TO MEMBERS' ADS, RADIO COMMUNICATION, 28 LITTLE RUSSELL STREET, LONDON, WC1

INDEX TO ADVERTISERS

RSGB PUBLICATIONS

RSGB

Amateur Radio Circuits Book	11/6
Amateur Radio Techniques	13/3
Guide to Amateur Radio	6/9
Morse Code for the Radio Amateur	2/–
RSGB Bulletin (Bound Volume, 1967)	31/6
RSGB Countries List	1/3
Radio Amateur's Examination Manual	5/9
Radio Communication Handbook (4th Ed., available Oct.)	63/– *postage 6/– extra*
Radio Data Reference Book	14/–
S.S.B. Equipment	3/6
Service Valve and Semiconductor Equivalents	5/6
World at their Fingertips (Paperback)	14/–
(De-Luxe)	48/–

ARRL

Antenna Book	21/6
Course in Radio Fundamentals	11/6
Hints and Kinks	11/6
Mobile Manual	27/–
Radio Amateur's Handbook (Softbound)	51/–
(Hardbound)	63/–
Radio Amateur's License Manual	6/9
Radio Amateur's Operating Manual	11/6
Single Sideband for the Radio Amateur	26/–
Understanding Amateur Radio	21/6
V.H.F. Manual	22/–

CQ

Antenna Handbook Vol. 1	33/6
Antenna Roundup Vol. 1	27/6
Antenna Roundup Vol. 2	33/6
CQ Anthology 1952–1959	27/6
CQ Anthology 1945–1952	18/6
Mobile Handbook	26/6
Sideband Handbook	27/6
RTTY Handbook	34/6
Shop and Shack Shortcuts	34/–

73

Care and Feeding of a Ham Club	9/–
Parametric Amplifiers	17/6
Simplified Maths for the Hamshack	5/6
V.H.F. Antenna Handbook	18/–

RADIO PUBLICATIONS INC.

Beam Antenna Handbook	34/–
Better Short Wave Reception	27/6
Cubical Quad Antennas	25/6
Electronic Construction Practices	26/–
S-9 Signals	9/6

EDITORS AND ENGINEERS

Radio Handbook	88/6

28 LITTLE RUSSELL ST., LONDON, WC1

MISCELLANEOUS

Basic Electricity	23/–
Basic Theory and Application of Transistors	13/–
Dictionary of Electronics	8/3
Dictionary of Radio and TV	38/–
Foundations of Wireless	22/6
Guide to Broadcasting Stations	6/8
How to Listen to the World	27/–
Ham's Interpreter	9/6
Outline of Radio and Television	34/6
Radio Amateur Operator's Handbook	5/6
Radio Amateur's Vocabulary (German–English)	10/–
Short Wave Listening	13/3
Short Wave Receivers for the Beginner	6/6
Short Wave Antennas	10/6
Improve your Short Wave Reception	19/6
Transistors in Practice	30/9
Understanding Television	40/–
Wireless World Radio Valve Data	10/6
World Radio TV Handbook	43/–

LOG BOOKS

RSGB Standard Log	7/3
RSGB Receiving Station Log	7/3
RSGB V.H.F. Contest Log	7/3
Mobile Mini-Log	4/–
Martin's Log	22/6

MAPS

Admiralty Great Circle Map (*In tube*)	10/6
UK Counties Map	5/–
QRA Locator Map (Western Europe) (*in tube*)	7/–
QRA Locator Maps (Europe, set of four) (*in tube*)	32/6

MAGAZINE SUBSCRIPTIONS (p.a.)

QST	58/6
QST (Societies and organizations)	65/6
CQ	50/6
73	50/-
Ham Radio	42/–
Braille Technical Press	58/6

MORSE COURSES

G3HSC Rhythm Method of Morse Tuition—	
Complete Course (two 3-speed LP records and one EP record plus books)	84/–
Beginner's Course (one 3-speed LP record and one EP record plus books)	60/6
Beginner's LP (0–15 w.p.m.) plus book	50/–
Advanced LP (9–42 w.p.m.) plus book	50/–
Three speed simulated GPO test 7 in. d.s. EP record	15/–
RSGB Morse Instruction Tape (900 ft.)	36/–
C90 Cassette	35/–
RSGB Morse Practice Tape (450 ft.)	20/9
C60 Cassette	20/–

MEMBERS ONLY

Lapel badge (RSGB or RAEN emblem, pin or stud fitting)	2/–
Call-sign lapel badge (RSGB or RAEN, pin or stud fitting)*	8/6
Call-sign lapel chrome bar (pin fitting)*	7/–
Car badge (RSGB or RAEN)	9/–
Call-sign car badge (RSGB or RAEN)*	18/–
Call-sign car badge, de-luxe (RSGB or RAEN)*	25/–
Tie bar (RSGB emblem)	5/–
Blazer badge (black or navy blue)	8/–
Key fobs (green, black or blue)	7/3
RSGB tie (maroon or dark blue)	16/6
Car window sticker (RSGB or RAEN. No adhesive required)	1/3
Members' headed notepaper (100 sheets) quarto	10/–
octavo	5/–

* delivery 4 to 6 weeks.

Prices include postage except where stated.
Stamps and book tokens cannot be accepted.

Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, New Ruskin House, Little Russell Street, London, WC1 by The Garden City Press Limited, Letchworth, Hertfordshire.

INTERNATIONAL RADIO ENGINEERING and COMMUNICATIONS EXHIBITION

2–5 OCTOBER 1968

10 a.m.–9 p.m., Wednesday to Saturday

The Exhibition Hall is only five minutes walk from Victoria Station, Southern Region, and about the same distance from St. James's Park Underground Station on the District and Circle Lines. There are also numerous bus services, Routes 10, 11, 24, 29, 39, 46, 70, 76, 127, 134, 149, running along Victoria Street, some three or four minutes from the hall.

Car parking is usually difficult during the Exhibition, but a new multi-storey park is now open in Rochester Row. The tariff is 1s. per hour between 8.30 and 18.30, and 6d. per hour between 18.30 and 8.30.

There will be a reception for overseas visitors on Friday, 4 October, at 7.30 p.m. Between 7.30 and 8.30 p.m., entry will be restricted to overseas visitors and invited guests, but Society members may also obtain tickets for this period at a cost of 7s. 6d.

See page 508, August issue, for full details of the Exhibition.

If you do not mind mutilating the cover of this issue, it will help the RSGB if you will stick the advertisement alongside, in the rear window of your car.

CUT HERE

2–5 OCTOBER

AMATEUR RADIO AT THE RSGB EXHIBITION

ROYAL HORTICULTURAL NEW HALL
GREYCOAT STREET, WESTMINSTER, LONDON

IF UNDELIVERED Return to:— RSGB, 28 LITTLE RUSSELL ST., LONDON, WC1