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The
SHORTWAVE
Magazine



**EXCLUSIVELY FOR THE
RADIO EXPERIMENTER &
TRANSMITTING AMATEUR**

VOL. VIII No. 5 JULY 1950

H. WHITAKER G3SJ

10 YORKSHIRE STREET, BURNLEY Phone 4924

XTALS. The complete Xtal Kit in sealed cartons for the SCR, 536 (BC611) Walkie Talkie. 14 xtals in all with 14 coils, 7 osc. and 7 final covering the complete freq. range of the unit. There are 7 tx. freqs. and a further 7 xtals spaced 455 kc for the receiver. All are in Ft 243 holders with $\frac{1}{2}$ " pin spacing. The complete range is as follows: 3885/4340, 4080/4535, 4280/4735, 4397/4852, 4840/5295, 5327/5782, 5437/5892 kc.

The complete kit including coils, 56/-, post free. Set of 14 xtals less coils, 48/-, set of 14 coils, 8/-, Any pair of xtals, 8/-, with the exception of 5327-5 and 5295, these 7/6 each. All xtals are by leading U.S. makers.

XTALS. 1000 kc Bliley, Valpey or Somerset, standard $\frac{1}{2}$ " pin spacing, 20/-, 100 kc RCA, Bliley, sub-standards, 17/6. Marconi, etc., 500 kc British $\frac{3}{4}$ " pin spacing, 6/-, Western Elec. 500 kc $\frac{1}{2}$ " Ft 243 holders, 7/6.

XTALS. 3-5 Mc Band any spot freq., 15/-.

FOR 144 Mc. Any freq. 8000 kc to 8110 kc Ft 243 fitting at 15/-, A few Bendix $\frac{3}{4}$ " pin spacing 8007-69 kc at 12/6.

FOR 28 Mc. Any spot freq. from 7 Mc to 7500 kc at 12/6, with the following specials, 7200, 7225, 7250, 7275, 7300, 7325, 7350, 7375, 7400, 7425, 7450, 7475, 7500 kc at 7/6 each or 72/- per doz. All $\frac{1}{2}$ " Ft 243 holders.

FOR 7 Mc. 7000 to 7300 kc any spot freq. at 12/6, with the fone band specials as above.

6 Mc Band for 144. 6000 kc to 6083 kc any spot freq. at 12/6, Ft 243 holders.

FOR 21 Mc. 5250 to 5350 kc any spot freq., 12/6. Ft 243 holders.

TOP BAND. Double, 850 kc to 863.5 kc and 937 to 1038.5 kc, Ft 243 holders, by Western Elec. Prolific harmonic generators, Plated type, spot welded contacts, mounted in air gap, at 5/- each. To Commercial users and others. A complete range available from 2 Mc to 9 Mc in either $\frac{3}{4}$ " or $\frac{1}{2}$ " holders. The entire range by: RCA, Bliley, Valpey, Stand, etc., and all leading American manufacturers. Quantity quotations are available on request. Export enquiries welcomed.

VALVES RX AND TX. Another exceptionally keen 3SJ offer. All are brand new in sealed cartons and carry our full guarantee.

6J5 gt, 2/6, 24/- doz.; 813 RCA or Westinghouse, 22/6, £12 per doz. 805, 12/6; 832, 12/6, all £6 per doz., can be mixed if desired.

100th, 25/-, £13 per doz.; 866/866a, 10/6, £5/8/- per doz.; 807, 6/-, 60/- doz.; VU 508 Vac. Rec. 4v Fil. 2750v at 125 Mills, 8/-, 80/- doz.; 5R4 GY, 1625, 4/-, 36/- doz.; 6L6 G, 1622, 6/6, 8/-, 80, 6C4, 6AG5, 7/6, 72/- doz.; 5Z4, 6N7, 6N7 gt, 6K8, 717a, 6/-, 60/- doz.; 6V6, met. 6F6 G, 6SK7 met. 6SK7 G, 6SK7 gt, 6J7, 6J7 gt, 6K7, 6X5, 6C5, 6C5 gt, 6AC7, 6SH7, 6SQ7, all at 5/-, 48/- doz. 1T4, 1A3, 707, 955, 9001, at 5/6. 12C8, 12SR7, 12SG7, at 4/-, 36/- doz.

VR 150, 8/-, Sylvania Xtal diodes, 3/-, 30/- doz. VCR 97, 32/6.

BC 221. Brand new. Another small stock, £17/10/-.

POWER UNIT. Type 247. Input 230/50cy. Output 500v at 300 mills plus 6-3v 3 amp. In grey steel ventilated cases, £3/19/6, carr. paid.

MORSE KEYS. U.S. Signal Corps. Flameproof, J5a, 2/6, 24/- doz. Ditto, Nr2 Mk2, 1/9, 18/- doz.

PILOT LAMPS. Small Bay, 6-3v, 12v or 28v, at 6/- doz.

MODULATION TRANSFORMERS. R.C.A. P.P. 805s to P.P. 813s, 60/-, carr. paid.

THERMADOR. 400 watt. Pri. 6,700 ohms ct.—Sec. 4,500, 5,000 or 5,500 ohms, 7" x 6" x 5", Porcelain Standoffs, and completely screened at 50/-, Woden. UMI, 2, 3 or 4, immediate delivery from stock.

PLATE TRANSFORMERS. Thermador, Primary 210/230v 50 cv. Secondary, 2280/1725/1420/0/1420/1725/2280 at 800 Mills. Porcelain standoffs. Sec. test volts 6,000. In original sealed crates, nett weight 150 lb., £7/10/-, carr. paid.

R.C.A. 230v primary. Output 2000/1500/0/1500/2000 at 800 mills, £4/10/-.

HALLICRAFTER. Switched Primary 110/230v. S20.R. replacement, 30/-.

HALLICRAFTER. Output transformers. P.P. Primary. Separate High and Low impedance secondaries. 55C019. 30/10,000 cv. 7/6 each.

BC 454 complete with Dynamotor, brand new and boxed at 50/-, carr. paid.

THERMADOR. 350/0/350, 150 Mills. 5v 3 amp, 6-3v 3½ amp, 230v Primary, 30/-.

THERMADOR. Output trans. Primary 5,000 ohm plate to plate load. Secondary 5, 7½ or 15 ohm and 500 ohm line, plus winding for 10 per cent. inverse feedback, 20/-.

R.C.A. Filament trans. 230v primary, 10v ct Twice for a pair of 805s or 813s at 25/-. Ditto Thermador, 230v primary Output 10v ct 10 amp plus 10v ct 8 amp at 30/-.

THERMADOR. 230v Primary. Output 2½v 10 amp twice for a pair of 866s. Sec. test volts 7,500. Porcelain standoffs, 30/-.

DRIVER TRANSFORMERS. R.C.A. P.P. 6L6s to 805s or TZ 40s, 25/-, Ditto Thermador, 500 ohm line to Split Secondary 805 grids, 1 to 2-7, 20/-.

AUDIO LF CHOKES. 150 by, BC221 replacements, 5/-.

L.F. SMOOTHING. Miniature U.S.A. By Siancor Thordarson, etc. A well-assorted dozen at 12/-, post free.

THERMADOR. 10 hy at 225 Mills., 20/-, R.C.A. Swinging 5/15 hy at 450 Mills. Weight 30 lb. carr. paid, 20/- Thordarson 8 hy 80 Mills. Max cur. 150 Mills., 6/-. Parmeko 8 hy 50 Mills., 3/6.

U.S.A. JACK PLUGS. 3 circuit for BC 348, etc. A seldom seen line, 6/- doz.

CONDENSERS. Thermador, 20 mf 450v wkg. Metal can round. In tropicalised cartons of 5 at 10/-. Mallory 30+10+10 450v wkg., + 25 mf 25v wkg. met. can round at 2/- each. Cornell-Dubilier 25 mf 25v Bath tub or Tubular, 1/-, 10/- doz. R.C.A. 10 mf 25v met. can round at 1/6, Cornell-Dubilier 40 mf 250v wkg., 2/-, Solar 20 mf 50v met. can round, 1/3, 12/- doz. R.C.A. 40 mf 25v, 1/6. I.C.C. 4 mf 600v met. can round, 2/9. Mallory met. can 2,000 mf 15v wkg., 12/- doz.

PAPER & OIL. 650v wkg., 5" x 4" x 2½", 4/-, 36/- doz.

KELLOG. 4+4+4+2+1 650v wkg. in detachable cracked cases with Dzus lid these are exceptionally good, 7/6 each. T.C.C., etc. 4 mf 2,000v wkg. 5 x 5 x 3, 5/-, Ditto, 4+2 mf 2,000v wkg., 9 x 5 x 3, 7/6. 10mf 1,000v wkg. 5 x 4 x ½, 5/-.

Please note Shop Premises Closed July 8th to 16th inclusive.

RADIO EXCHANGE Co. for Bargains!

9. CAULDWELL STREET, BEDFORD.



RECEIVER TYPE 18. With four battery operated valves, covering 6-9 mc/s, and complete with batteries, circuit and connecting data. OUR PRICE, 27/6.

MERCURY HT BATTERIES. The new super-capacity dry batteries with a straight discharge curve and extra long life. 94v HT and 1.3v LT (sufficient for 1.4v valves), 5/6 each.

MIDGET ACCUMULATORS only $1\frac{1}{2} \times 1\frac{1}{2} \times 4\frac{1}{2}$, 3AH capacity, brand new, and made by famous manufacturers to naval specification. 2/- each, or £1 per doz.

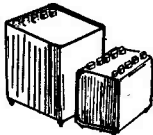
BALANCED ARMATURE PHONES. Matched to most ex-service low-impedance outputs—with jackplug fitted. 2/9.

RECEIVER 21. With 9 battery-operated valves, covering 4-2-7-5, and 18-31 mc/s, plus a crash limiter, BFO, and precision dial, these are complete with circuit connecting data, and super capacity all-dry battery, 43/6.

NEW CONDENSERS (not stripped). Tubular : .05-750v, 1/9 doz. ; .25-350v, 1/9 doz. ; Mica : .00003-3,000v, 2/- doz. ; .001-2,000v, 2/- doz. ; .0002-2,250v, 2/6 doz. Electrolytic 25 μ F-25v, 12/6 doz.

METERS. 0-1mA (new and boxed), 7/6 each ; 0-8A thermocouple, 3/6 ; 0-3A thermocouple, 3/6 ; 0-2.5A, 3/6.

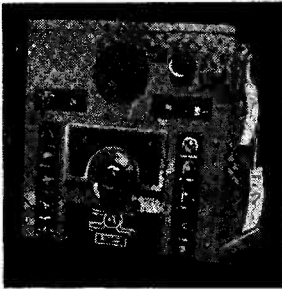
BRAND NEW 1355's, as specified in "Short Wave Listener and Television Review", for conversion to Sutton Coldfield TV. Complete with 11 valves, in original maker's cases, these may have slightly discoloured metal-work due to long storage. 55/- plus 7/6 carr.



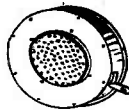
TRANSFORMERS. To match class B.211 modulators to a class C.211 final running some 100w, these will function as step-down transformers for mains use. ONLY 5/-.

INPUT TRANSFORMERS. Originally intended to couple one 211 to class B.211's in a high-power modulator, a multi-tapped low resistance winding permits these to be used as first-class heavy duty output transformers. 3/9.

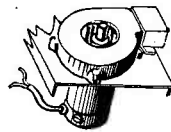
RECEIVER V.R.L. Need we describe this now famous Rx? All who have heard it enthuse—those who have not yet listened to its amazing performance have missed a unique experience. Leaflet "V" fully describes it. Offered at a fraction of original cost, in SEALED MAKER'S CARTONS, and complete with 19 spare valves. £29/10/-.



VALVES AR8 (HL23DD) double-diode-triode, 2/11 ; ARP12 (VP23) HF pentode, 2/6. ATP7 (V226) output pentode, 3/6.



BRAND NEW SPEAKERS. In attractive metal cases (9" o.d.), fitted with transformer for 15 ohm or 3.5 ohm input, and in original maker's cartons. OUR PRICE, 25/-.



MIDGET MOTORS, developing 1/135 h.p., on 27v AC or DC, these will operate from 12v, or from the mains with a suitable lamp or resistance in series as a dropper. The fan and bakelite housing may, of course, be removed. Price, 9/6.

FIELD TELEPHONES. Of American manufacture, these are complete with bell, ringing generator and standard type handset, and only require batteries for immediate use. In stout webbing case, 35/-, or in solid leather cases, 47/6.

STATIC INTERFERENCE LIMITERS. A completely-enclosed unit which plugs into the low impedance output of any Rx. fitted with jack plug and socket, 3/9 each.

FOR STRIPPING. Small pensils with two .17 μ F 450v, one .01 350v, one .1 600v, one 8 μ F 150v condensers, one LF choke, one Mazda octal holder, etc., mounted on a small panel. These are brand new and individually boxed. Only 1/9 each.

VIBRATOR PACK 21. Store soiled, but complete with two 4 μ F 350v, two 75 μ F 12v, six .1 μ F 350v, one .025 μ F 1,000v condensers, vibrator transformer, five chokes, switch, plugs, two metal rectifiers, etc. ONLY 7/6.

All goods are sold as used unless otherwise stated
PLEASE write your name and address in Block Capitals
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 9 CAULDWELL STREET, BEDFORD. Phone: 5568

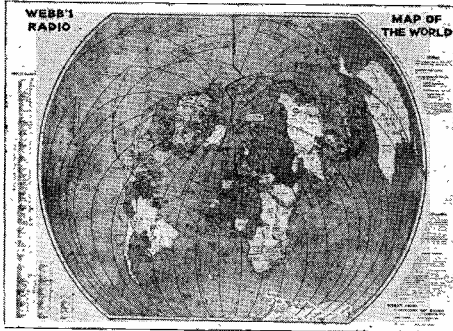
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To make space in our Warehouses in preparation for reorganisation we are "slaughtering" prices of goods offered below. Help us and help yourselves while supplies last. First come, first served, so avoid disappointment and order early.

R.1155 COMMUNICATIONS RECEIVERS. This world-renowned 5 waveband R.A.F. receiver is too well known for the specification to be repeated. Every set is guaranteed in working order, and is aerial tested before despatch. Full conversion details for mains use supplied. ONLY **£7/19/6** (carriage 12/6).

RECEIVERS TYPE 25/73. Part of the TR.1196. Covers 4.3-6.7 mcs, and makes an ideal basis for an all-wave superhet, modification details supplied. Complete with six valves : 2 ea. of EF 36 and EF 39, and 1 ea. EK 32 and EBC 33. New condition. ONLY **19/6** (postage, etc., 2/6).

RECEIVERS 18. Covers 6-9 mcs, and only requires normal battery supply to operate. Complete with 4 valves : 3 of VP 23 and 1 of HL23DD. New condition. ONLY **15/-** (postage, etc., 2/6).

BATTERY AMPLIFIERS. Ex R.A.F. Originally used for intercomm on aircraft but ideal for use as a pre-amp or with a gram pick-up. Complete with valves QP21 and HL 210 in original transit cases. ONLY **19/6** (postage, etc., 2/6).

RECEIVERS R.1132A. Covers 100-124 mcs, but lends itself to conversion for other frequencies. Has superb slow motion drive and tuning scale, and 0-5 ma tuning meter. Complete with 11 valves and only requires normal power pack for 6.3v valves to operate. ONLY **59/6** (carriage, etc., 12/6).

T.1154 TRANSMITTING ASSEMBLY. A vital part of the famous T.1154 Transmitter this assembly contains some beautiful transmitting condensers, pre-set tuning devices, variable inductances, large bar and circular knobs, etc., etc. Designed as a complete replacement unit these are BRAND NEW IN MAKERS' CARTONS. ONLY **7/6** (carriage 3/6).

POWER UNITS TYPE 10. Ex R.A.F. Input 24v, Output 6v 5a, 150v 10a, 300v at 70-240 ma. ONLY **12/6** (carriage 5/-).

AMERICAN INDICATOR UNIT APN4. Less valves but complete with CR Tube 5CP1. Ideal for conversion into a scope, or worth pounds in breakdown value. In perfect condition. ONLY **37/6** (carriage, etc., 12/6).

AMERICAN RADAR RECEIVER APN4. Less valves. In addition to the receiver components this aircraft receiver contains the power supply for the indicator. Contains shoals of components, including 15 valve holders, high voltage condensers, switches, I.F. transformers, etc., etc. Perfect condition. ONLY **17/6** (carriage, etc., 5/-).

INDICATOR TYPE 62. Less valves and CR Tube. This fine two-deck unit is another first class proposition for component value. Contains 20 valve holders, condensers, resistors, potentiometers, etc., etc. ONLY **17/6** (carriage, etc., 7/6).

Cash with order and please write name clearly.

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Remember, money back guarantee. Phone : Park 6026 Please add postage when writing.

AR88D Receiver. Fine condition, £40, carriage extra. One only.

Valves. 5U4G, 6Q7GT, 6/6 ; V960 EHT rectifiers, 5kv 10ma, 6/6 ; 9001, 9002, 9003, 5/- ; metal 6K7, 5/6 ; 954, 955, 3/6 ; 6V6, 6C8, 807, 7/6 each ; 1S5-1S4, 6/6 ; IT4-1R5, 7/6. Y63 Tuning Eye, 8/- ; 354, 8/6 ; 6L6, 10/6 ; 117Z6, 12/6 ; 6X5, 6K7GT, 6/6. All post paid.

Selenium Rectifiers. H. W. 250v 60mA, 4/6 ; 120mA, 6/6 ; 120A, 6/6. F.V.V.6 or 12v 1.5A, 10/6 ; 6 or 12v 4A, 25/-. Postage 6d. on each.

Mains Power Supply Unit. In black enamelled case, 9" x 6" x 5", contains heavy-duty transformer, rectifier valve, smoothing choke, condensers, panel light switch and fuses. Input 200/260v AC. Output 6.3v at 3.5 amps. H.T. 350v at 80 ma. Power unit for R1155-R1132A, etc. Jones Plugs supplied with each. Price £3/5/-.

250-watt Double-Wound Transformers, 230v 110v. Made by G.E.C. With steel shroud. New, £2/7/6 each, carriage paid.

Plessey Speakers
5" P.M., 10/6 each, plus 1/- postage.
8", 16/- each, plus 1/- postage.
10", 20/- each, plus 1/- postage.

New IN34 Crystal Diode Cartridges, 5/3. Post paid.

Type R1359 Receiver Power Pack. In grey steel cage 8" x 9" x 6", contains two separate complete power units with outputs of 390v at 80 mA and 300v at 60 mA. Each with 6.3v 3A LT, Price £4/12/6.

Mains Transformers. Our own make. Input, 200/240v, output 6.3v 1.5A, 7/6. Post 9d. 6.5v x 6.5v 2A, 25/6, post 9d. 4v 8A, 25/6, post 9d. 300-0-300v 120ma, 6.3v 3.5A, 5v 2.5A, 21/6, also 350-0-350v, at same price, post 1/-. Output 6.3v 6A, 25/6, post 9d. Special 230/4 or 6v 4a, 6/9. Post paid.

Multi-Ratio Output Trans., 30 watts, 25/-, post 9d.

New Miniature Condensers, in ali. cans. 450v 8 mfd., 3/6. 16x8 mfd., 8x8 mfd. and 32 mfd., 4/9 each. Post paid. 32x32 mfd., 350v, 6/-.

Miniature Slow Motion Dials. 100-1 worm geared, 2 1/2" x 2". Beautifully made, 3/6 each. Post 6d.

TU9B Units. Complete in black crackle cases, 17/6. Carriage paid.

0-500 Microammeters, 2" .500 ohm internal resistance, 7/6 each. Post 6d

U.S. Carbon Microphones, as used with Type 58 sets, 2/6. Post 6d.

Phone Adaptors. Converts low impedance phones to high impedance, 1/-. Post 6d.

New Brown's Moving Reed Phones. 5/- pair. Post 9d. Finest made.

Miniature Motors with geared spindle, 24v or 110 AC/DC. 3 1/2" x 2 1/2" x 2 1/2", 8/6. Post paid.

M/C Microphones, 5/6. Post paid.

Trans., to match, 5/6. Post paid.

RF24 Units. Converted to 28 mcs band, variable tuned with 100-1 geared SM. dial. Complete with plug and leads for immediate use. £2/5/-. Post paid.

New Army Morse Keys, 2/9, post paid.

Army Morse Key & Buzzer Set, 4/6, post paid.



The type JCF200 unit illustrated above is representative of the wide range of vacuum type unit available for low and medium frequencies.

FOR FREQUENCY SUB-STANDARDS

Type JCF200, 100 KC/S

Available from stock adjusted to $\pm 0.01\%$. Higher accuracies supplied to special order.

FEATURES

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NEW VALVES. At 2/9, 6H6, 7193, EA50, LD210, LP220, SP41. At 4/-, 6J5GT, 6SH7, PN2, EB34, 991. At 5/-, 2X2, 2C26A, 6K7G, 6SL7, 7V7, 12A6, 12C8, 12AH7, 12J5, 12SH7, 12SK7, 12SG7, 12SR7, 28D7, 37, 713A, 865, 956, 9006, ARP12, AR8, P61, SP61, 8D2, V872, VT52. At 6/6, 3Q5GT, 5R4, 5U4G, 5Y3G, 5Z3, 5Z4M, 6C5, 6C8, 6B8, 6J5, 6K6, 6K7GT, 6Q7GT, 6SK7, 6S7, 6SN7, 6SQ7, 6V6GT, 6V6G, 6X5GT, 6Y6G, 807, 957, 9001, 9002, 9003, EBC33, EF36, EF50, ECS2, EL35, AU5, NR77, KTZ41, RL37, VS70, VT60A, VU111, VR91, VR137. At 7/6, 1A5, 1R5, 1S4, 3B26, 6AC7, 6AG5, 6AG7, 6B4, 6C4, 6F6, 6F7, 6J7, 6K7, 6L7, 6N7, 6SA7, 6SF5, 6SG7, 6V6M, 12K8, 25L6, VR105/30, VR150/30, 9D6, PEN46, 72, 73, 83V, 2050, 2051, VR136, EF39, EF54, CV66, ECH35, PEN44, 1625, VR136, VU39, MU12/14. At 10/-, 6AK5, 6L6, 717A, 6J6, 1616, P27/500, PX25. At 15/-, 832, 866A, 721A, 724A, 1B24, 3FP7. At 17/6, XFG1. At 25/-, 446, 811, 8025. At 27/6, 813, 931A, (Photo Cell) 8013A, 8020. At 35/-, 715B, 805, VCR97. At 45/-, 829B, 5CP1. At 50/-, 2J22, 725A (complete with magnets). At 75/-, 723A/B. All guaranteed. Two or more valves post free, otherwise add 6d. postage.

NEW TRANSFORMERS. R.C.A. Type 901142. Primary 0-190-210-230-250v 50-60cs. Secs.: 5-0-5v 5A, 5-0-5v 5A. Potted 4" cube, terminal panel. In maker's cartons, 13/6. Also R.C.A. Power Transformers, Primary as above. Secs.: 400-300-0-350-400 150 mA. 6.3v 6A CT., 5v 3A. Screened, fully shrouded, drop-thru type. No better transformer is made. In maker's cartons, new, 35/-.

NEW MULTI PURPOSE TEST METERS, MODEL 856. Made by Precision Instruments Inc. An advanced AC/DC instrument with a 20,000 ohm per volt movement, provision being made for optional 1,000 ohm per volt sensitivity by means of panel switch. Numerous ranges, within the following limits: 60 microamps-12 amps; 3v-6000v; 0-60 megohms on internal batteries; also output range calibrated in decibels. Fitted in stout teak case with test prod compartment and carrying handle. Ideal for Television service and other exacting work. Fully guaranteed, much reduced at £15.

NEW BENDIX RADIO COMPASS RECEIVERS BC433G. (SCR269G). An advanced 15-valve superhet with D.F. circuits, tuning 200 kcs-1.5 mcs., in three bands. Two R.F. stages. Suitable for conversion to a super performance broadcast set. In sealed maker's cartons, with comprehensive manual. £7/10/-. Limited stock.

TELESCOPIC AERIAL MASTS. 8 ft. Lightweight, made of alloy. Very useful for field day tests, dipole elements, etc., 6/-.

NEW POWER PACKS FOR COMMAND RECEIVERS BC453-4-5. Plug on to rear platform and operate the set from AC mains without modification to heater wiring, etc. Complete with rectifier 6X5, 45/-.

NEW CATHODE RAY INDICATORS TYPE LD-11/APS4. A small American unit, containing two valves 6J6 and three-inch CRT 3FP7, precision components, etc. In maker's cartons, 35/-.

RECEIVERS R1155. The well-known communication type set which gives a really good performance. Simple modification required to operate on AC mains. In new condition, complete with all valves, circuit and conversion details, £12/10/-. Limited stock.

RECEIVERS R208. Extremely sensitive Communication type for the higher frequency bands, tunes 10-60 mcs. Integral power packs for 6v DC or AC mains. Controls for RF and AF gain, BFO, etc. Exceptional performance on 10 metres. Fitted in metal cabinet which has drawer containing all leads, phones, etc. Built-in Loudspeaker. In new condition. A real bargain at £12/17/6.

NEW HEAVY DUTY AUTO TRANSFORMERS. Type 336. Tappings on terminal panel for: 0-110-150-190-230v. Rated at 1500 watts continuous, 50/-.

INTERFERENCE SUPPRESSORS. Fitted in aerial lead-in to set. Small unit in screening can. 1" x 1½" x 2½", 3/9. Aerial Lightning Arrestors, highly efficient. Sealed in evacuated glass tube resembling a valve. Complete with insulated holder, 3/6.

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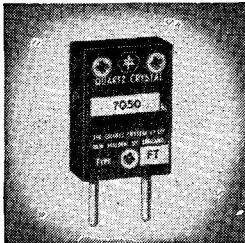
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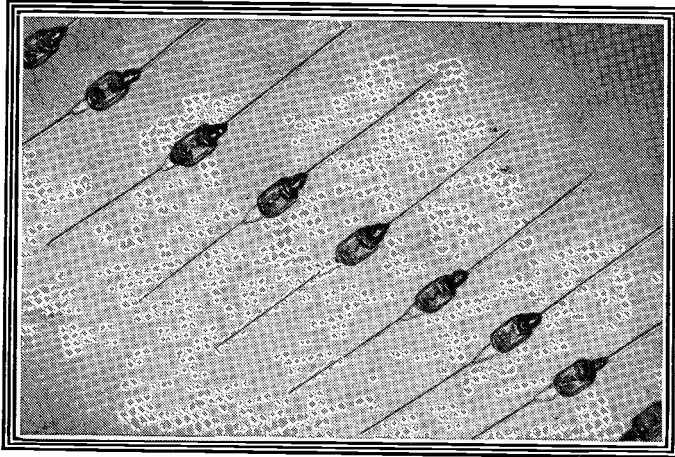
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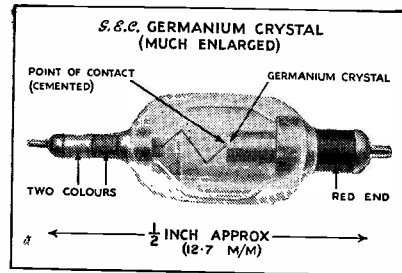
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FOR THE RADIO AMATEUR & AMATEUR RADIO

Vol VIII

JULY 1950

No. 84

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Editor: AUSTIN FORSYTH, O.B.E. (G6FO)

Advertisement Manager: P. H. FALKNER

Assistant Editor: L. H. THOMAS, M.B.E. (G6QB)

Published the Friday following the first Wednesday each month at 53 Victoria Street, London, S.W.1 Telephone: Abbey 2384.

Annual Subscription: Inland 20s. Abroad 22s. post paid

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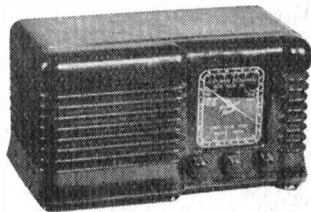
WORKING MODELS CAN BE SEEN DURING TRANS-
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VALVES. We have large stocks of new boxed valves at very low prices. All exempt from Purchase Tax. 1L6C, 1L6D5, 1L6N5, 184, 185, 1N6, 1T4, 3A4, 3D6, 5U4, 5Y4G, 5Z4, 6A07, 6AG7, 6J06, 6P6, 6J3, 6J7G, 6K7, 6K8, 6N7, 6Q7, 68A7, 68J7, 68K7, 68C7, 68L7, 68N7, 6U5, 6V6, 717A, 12A6, 9008, 9005, VR55 (EBC33), VT52 (RL32), VR56 (EF36), VR57 (EK32), VR116, VR136 (EF54), VR137 (E52), OV66 (RL37), OV1190 (8U2150A), OV1137 (RL18), OV1068 (AW4), OV189 (U19), OV2941 (EL50), YU39, 807, HYVAC XY, HYVAC XW, KT61, KTW61, U50, 6P6, AW4, 4060A, all 6/6. 6H6, 6BH7, 7193, VR78 (D1), all 2/6. VR54 (EB24), VR65 (SP61), VR92 (EA50), VR95 (954). VT121 (955), OV649 (956), OV102 (Xtal Diode), 1628, all 3/6. 6X5, HL28, RL18, VU111, VU133, VU134, OV6, OV73 (1L63), OV1189 (AC6 Pen), OV659 (1825), OV639 (848), N82, DQP, BL43 (OV1102), 1616, OV87 (klystron), U17 (OV1118), PT25H (OV1046), all 5/-, 1Q5, 1C5, 6C4, 6J8, 6AB7, 68Q7, 68G7, all 6/6. 2X2, U74, OV1262 (GU1), OV1141 (G1T4B), GU50 (OV1073), VT30 (OV1800), VR81 (EF50), all 7/6. 6V4, 6B8G, 25Y5, 25Z6, 2050, VT127 (Pen 46), OV1075 (KT66) (matched pairs, 18/6), all 8/6. 6L6, P27/600 (PX26), 705A, 832, OV662 (8012), DET76, all 10/-, 803, 10/-, 805, 10/-, 931A, 30/-, CV186, 40/-, CV19 (EH7T), 80/-, 861, 80/-, 838, 15/-, OV15 (EL266), 40/-, HY114B (CV3505), 15/-, MR300/E (CV3666), 15/-, EL232 (CV92), 20/-.

C.R. TUBES

VOR37B, 20/-; VOR522, 15/-; AOR8, 15/-

PREMIER MIDGET RADIO KIT. Due to greatly increased production, we are now able to offer this kit at a greatly reduced price. Including an attractive Bakelite case, 12in. long x 5in. wide x 6in. high. The valve line up is R.F. Pentode, Detector, and Beam Power output, and a Selenium rectifier in the A.C. model. The A.C. D.C. model is the same, but 12A6 output. Please state which is required. Both are for use on 200 to 250v mains. The dial is illuminated and the receiver presents a very attractive appearance. Coverage is for the medium and long wavebands. Complete kit of parts with cabinet in brown or ivory and diagrams. £4/19/6, including Purchase Tax.



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SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR AND AMATEUR RADIO

E D I T O R I A L

Trends

As time goes on, so fashions change, in Amateur Radio as in many other interests and occupations. It is within the experience of some of our readers to have built and operated single-valve transmitters on 23 metres—slung on rubber mounts to absorb vibration and prevent that characteristic shudder on the note!—and soon the idea of large rack-and-panel assemblies, with their rows of meters, will seem equally out of date.

For we are now beginning to see another change in transmitter design, with equipment less elaborate in appearance and much more economical of space. The table-top or cabinet transmitter, built to match the receiver, is a manifestation of this tendency.

The design of transmitting equipment can be simplified still further, with no loss in efficiency or effectiveness and a vast reduction in local interference problems. For it is again beginning to be understood that it is the radiating system that is the most important factor in the equipment chain. The generation of a few watts of RF is a simple matter.

Thus, we shall begin to see designs for transmitters which, while maintaining the essential requirements of frequency stability and quality of signal, are merely RF generators in the simplest form. The emphasis will once again be on getting the signal out, with the appearance of the station a minor consideration.

The thing to remember is that a watt or two of RF, fed into a well-designed radiating system and combined with a high standard of operating ability, will achieve much more on the DX bands than many operators suppose to be possible.

*Arthur Foxgk
G6FO*

100-WATT TWO-METRE TRANSMITTER

Four-Stage Crystal Control Circuit with 829B Straight PA

By T. W. BLOXAM (GM6LS)

METHODS of obtaining crystal control on the VHF bands have always presented scope for much experiment. There is no doubt that the most popular approach is one whereby the number of individual multiplier stages is reduced to a minimum. This was the primary factor in the design of the transmitter to be described.

A considerable amount of current literature on the subject was reviewed, and the relative merits of each arrangement were put to the test on the bench. An 829B seemed to be the natural choice for the final amplifier, and the preceding stages were governed by its requirements. This meant a driving power of something over a watt at 144 mc to provide a comfortable amount of RF power to the final. On the face of it this appeared pretty simple, but in actual fact that one watt of RF drive can prove to be very elusive.

The Crystal Oscillator/Tripler

It was decided to make a start at 8 mc. Crystals of 36 mc were available, but experience with 28 mc crystals in the past had shown that the rigours of initial experiment and actual operation all too often result in a fractured crystal! In *QST* for November 1947 there appeared an article on methods of obtaining high frequency harmonics from a regenerative crystal oscillator. Along these lines a 6J6 was tried, one section acting as the CO/Tripler and the section following as a doubler. If all went well we should obtain a 48 mc output from one valve. After many attempts however we were forced to abandon this idea. The main trouble seemed to be the crystals. First the holder capacity was too high, and secondly the crystals appeared to be inactive on the third harmonic. This inactivity necessitated so much feed back that the oscillator became quite unstable and would "take off" on its own at the slightest provocation. If a good third harmonic cut crystal were available this arrangement would, without a doubt, work very well.

It now appeared that two stages would be necessary to obtain 48 mc with any reasonable comfort. A 6F6 Tritet forms the CO/Tripler, and its operation is smooth and reliable. The setting of C1 was not very critical, but a point will be found where the output peaks. A

This is a practical arrangement, on sound principles, for an effective 145 mc transmitter; the final amplifier is operated straight and ample drive is available for it. No experienced operator, contemplating activity on Two, should have the slightest difficulty in getting results with this design.—Editor.

6V6 and 6L6 both worked equally well in place of the 6F6.

The Doubler

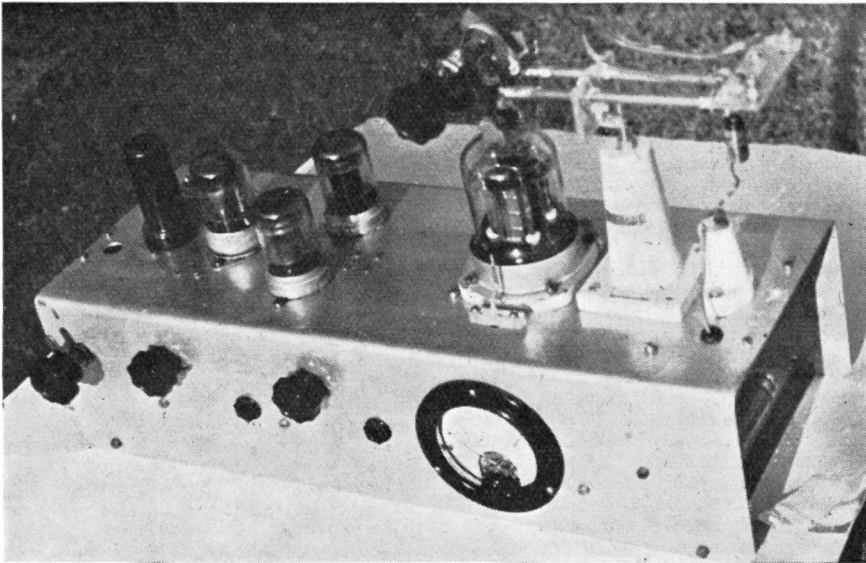
The 24 mc output from the CO/Tripler is capacity coupled to a QVO4/7 doubler. To obtain good efficiency from a multiplier it should operate under Class-C conditions but with a somewhat higher value of RF drive and grid bias. Component values suggested here were found by experiment to give optimum results. No difficulty was encountered in obtaining enough output to light a 6 volt, 0.3 amp bulb in series with a 1-in. loop of wire. The plate circuit is split as shown to provide a balanced output for the push-pull stage following.

The Tripler

This stage comprises a pair of QVO4/7's in push-pull tripling to 144 mc. It is at this point where great care in layout and correct operation are necessary to obtain a safe margin of drive to the 829B. An 832 in place of the QVO4/7's would no doubt give satisfactory results, but with single-ended valves no orientation of components and the valves themselves is required. With this method of approach brackets and other metal details will be reduced to a minimum and the finished result is more compact.

The plate voltage on the triplers is 250 volts. This should supply sufficient power at 144 mc to light the 6-volt bulb and provide 20 mA of grid current to the 829B if necessary. According to the data on the QVO4/7's the output at 144 mc should be 3.5 watts. In actual fact however it was a little under 2 watts due, no doubt, to the inevitable circuit losses at this frequency.

Coupling the triplers to the 829B grids requires careful attention if the maximum transfer of power is to be realised. Direct coupling between the plate and grid circuits gave superior results to that of a link; the coupling can be adjusted to give broad-band tuning; the settings of C4 and C5 then require no further adjustment over the band 144 to 146 mc. Correct coupling is obtained by alternately switching in the highest and lowest frequency crystals it is proposed to use, and varying the coupling between L4 and L5 until an approximately constant value of grid



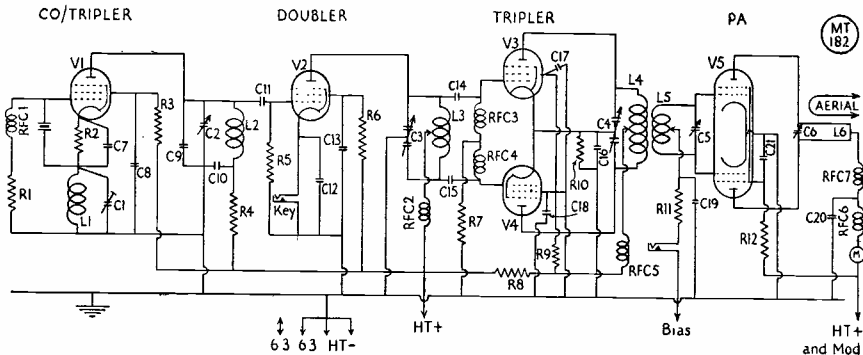
General appearance of the 100-watt Two-Metro transmitter described by GM6LS.

current is delivered to the 829B. Each time the coupling is altered C4 and C5 should be reset for maximum output. Once the correct coupling has been found the two coils can be cemented in position with polystyrene dope.

With a fixed bias of 22.5 volts on the 829B and a grid leak of 4,700 ohms it should be possible to deliver about 20 mA of grid current—in other words, about twice the drive actually required. Excess grid current can be reduced, preferably by reducing the plate and screen voltages of the triplers.

The Power Amplifier

This is quite straightforward ; the only difficulties being constructional ones. The parallel bars are made of 1/4-in. hollow copper tubing spaced 1 in. centre-to-centre, each bar being 5 1/2 in. long. The method of supporting the bars should be apparent from the photograph. Connection to the plates of the 829B is made through two 3/4-in. lengths of copper foil. This will take up any movement of the bars and safeguards the valve seals. Two 4BA screwed rods are inserted into the ends



Circuit of the 100-watt transmitter designed and described by GM6LS in the accompanying article. Ample drive is available to run the 829B final as a straight amplifier on Two at 100 watts input.

of the bars and soldered in. An angle bracket is secured to the 4BA rods by means of lock nuts. A polystyrene strip carrying the output link and aerial coupling is screwed to the angle bracket.

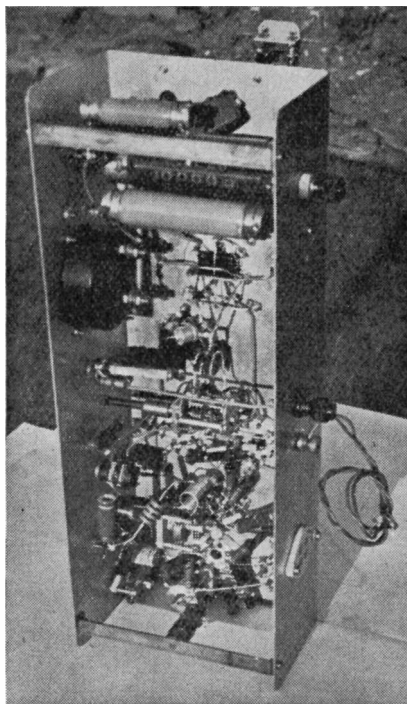
Provision was made for neutralising but, whether by design or good fortune, neutralising was not really necessary. Chokes in both grid and plate circuits are to be avoided; the only trouble with self-oscillation encountered was cured by removal of the grid choke.

Operation and Setting Up

The exciter portion requires 300 volts at about 150 mA. A receiver set on the third harmonic of the crystal is the first step. If the CO appears to be oscillating, detune the receiver from the crystal harmonic by a few kc and vary the CO plate tuning condenser C2. No response should be obtained if the oscillator is being properly held by the crystal.

The doubler can be checked with a lamp and wavemeter. If the tuned circuits are on the right frequency it should give no trouble at all. No further comment on the push-pull triplers is necessary.

A fixed bias on the PA of 22.5 volts is satisfactory for phone operation, but this should be increased to 90 volts for CW. With a grid drive of 10 mA and a 60-watt lamp load, HT should be cautiously applied and C6 swung for resonance. The dip in plate current is quite small, but positive nevertheless. A careful watch should be kept on the 829B for signs of colour at the plates. It is very sensitive to over-drive and excessive input; a few milliamps over the rated plate current will very quickly produce colour.



Under the chassis of the 145 mc Transmitter, showing general layout details.

Table of Values

Circuit of Four-Stage Two-Metre Transmitter

C1 = 60 $\mu\mu\text{F}$ var.	RFC1, RFC2 = 20 mH
C2 = 15 $\mu\mu\text{F}$ var.	RFC3, RFC4, RFC5, RFC6 = 20 turns No. 24 enam.
C3 = 25 plus 25 $\mu\mu\text{F}$ var.	$\frac{3}{16}$ in. dia, close wound.
C4 = 5 plus 5 $\mu\mu\text{F}$	RFC7 = 16 turns No. 20 enam.
C5 = 5 $\mu\mu\text{F}$ (Phillips concentric) var.	$\frac{1}{4}$ in. dia, close wound.
C6 = 8 $\mu\mu\text{F}$	L1 = 18 turns No. 24 enam.
C7, C12, C16 = .001 μF	$\frac{3}{8}$ in. dia, close wound.
C8 = .005 μF	L2 = 13 turns No. 20 silvered copper $\frac{1}{2}$ -in. dia. Turns spaced to clear.
C9 = 4.7 $\mu\mu\text{F}$	L3 = 12 turns, No. 18 silvered copper $\frac{1}{2}$ -in. dia. Turns spaced to clear, CT.
C10 = .008 μF	L4 = 4 turns, No. 18 silvered copper $\frac{3}{4}$ -in. dia, $\frac{1}{4}$ -in. long, CT.
C11, C14, C15 = 100 $\mu\mu\text{F}$	L5 = 2 turns No. 18 silvered copper $\frac{3}{4}$ -in. dia (interwound with L4).
C17, C18 = 470 $\mu\mu\text{F}$	L6 = (see text)
C13 = 680 $\mu\mu\text{F}$	M1 = 0-20 mA
C19, C20 = .002 μF	M2 = 0-250 mA
R1, R6 = 22,000 ohms, 1 watt	V1 = 6F6
R2 = 400 ohms 1 watt	V2, V3, V4 = OCVO4/7 (Mullard)
R3, R7 = 50,000 ohms, 1 watt	V5 = 829-B
R4 = 5,700 ohms, 2 watt	
R5 = 100,000 ohms, 1 watt	
R8 = 200 ohms, 1 watt	
R9 = 7,500 ohms, 1 watt	
R10 = 100 ohms, 2 watt	
R11 = 4,700 ohms, 1 watt	
R12 = 15,000 ohms, 10 watt	

Finally, a good check for stability is to reduce the fixed bias on the PA to zero and, with HT applied, switch off the exciter *for a few seconds*. Running a neon up and down the plate bars and swinging C6 all the time should provoke any tendency to self-oscillation that may be present.

The purpose of this article has been to review the design of the transmitter in general

terms; the details of chassis drilling and the like have been purposely omitted as everyone has their own ideas on layout. An aluminium chassis 16 in. \times 6 in. \times 4½ in. deep forms 99 per cent. of the metalwork. After drilling the bulk of the large holes the chassis was treated in a bath of washing soda. This provides a lasting matt finish and facilities good electrical contacts.

THE ZL SPECIAL

High-Gain Two-Element Beam for Ten or Twenty

By F. C. JUDD (G2BCX)

DATA on the aerial to be described came to the writer from New Zealand, hence the name "ZL Special." Little is known of its origin save that it was designed in the U.S.A., just prior to the late war, for commercial purposes. Since the war it has been modified and developed for amateur use by W5LHI, WØGZR and ZL3MH. Further tests and measurements made by the writer may be of interest.

Performances Claimed

Forward Gain : 7 dB (over a dipole).

Back-to-front Ratio : 40 dB down.

Broad Band Characteristic : Variation of only 6 mA at 600 watts when tuning from 14 to 14.4 mc.

This was actually the information received from a ZL correspondent, but the following figures have been obtained from models made to operate on 144 and 288 mc and from full-size versions on 10 and 20 metres. At a height of half-a-wavelength a scaled-down model working on 288 mc and cut from the formulæ given showed a forward gain of 7 dB as claimed (equivalent to a four-element parasitic beam), and a forward vertical radiation angle of 15 to 20 degrees. These measurements were taken over a perfect earth, *i.e.* a metal sheet ground. The aerial radiates in one direction only as a normal two-element beam, and has a horizontal radiation pattern as shown in Fig. 1. It is compact and easy to construct either as a fixed beam indoors or outside, or as a rotating array on a suitable tower. It can be cut to operate over a wide frequency band from the formulæ and measurements given, without the tedious tuning procedure normally

Though it does not offer any theoretical proofs for the results claimed, this article describes an aerial array well worth trying by those interested either in indoor fixed beams or working in one or two main directions only. The design suggested can also be applied to a rotary beam on the same principle.—Editor.

required to obtain peak performances from the parasitic type of beam.

Constructional Features

The elements can be made of either self-supporting tube, open wires or 300-ohm twin transmission line. Tubing up to 1½ in. in dia. can be used without changing the dimensions. The elements are parallel to each other and on a plane horizontal to the ground, the general construction being similar to the W8JK beams (*see* Fig. 2). Apart from rotating, the directivity can be reversed by "flopping the aerial

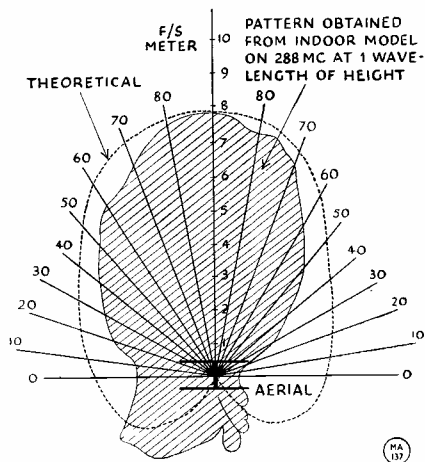


Fig. 1. Horizontal radiation pattern, compared with the theoretical polar diagram, as obtained by G2BCX with a scaled-down model of the "ZL Special."

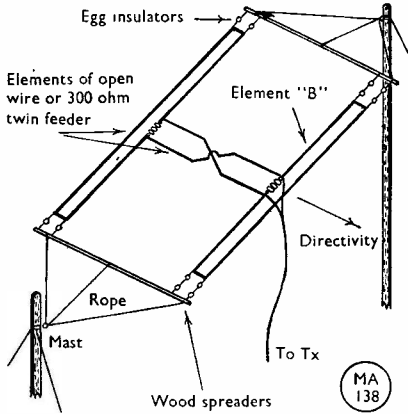


Fig. 2. Construction of the "ZL Special," points regarding which are discussed in the text.

over." A model constructed to operate on 288 mc was made with open-wire lines supported on a wood frame-work, and for 10-metre operation a similar arrangement would no doubt afford a compact and useful rotating beam (see Fig. 3).

Electrical Characteristics

The aerial consists simply of two folded dipoles fed approximately 135 deg. out of phase, the impedance at the point of feed

being 70-75 ohms, so that a standard 72-ohm twin line can be used for feeding (any length) from the transmitter. Alternatively, a 300-ohm line plus a Q-matching stub of 150 ohms impedance may be used (see dimension E in formula). Both systems have been used on models and each has worked to satisfaction.

FORMULÆ

For Diagram of Layout see Fig. 4.

- A. $492/F.mc \times 0.95$
- B. $492/F.mc \times 0.9$
- C. $984/F.mc \times 0.1$
- D. $123/F.mc$
- E. $246/F.mc \times 0.77$ (Matching stub for 300-ohm line).
- F. $123/F.mc \times 0.9$ (Phasing line).

DIMENSIONS

10 metres		20 metres	
A.	16 ft. 3 in.	A.	32 ft. 6 in.
B.	15 ft. 5 in.	B.	30 ft. 10 in.
C.	3 ft. 6 in.	C.	7 ft. 0 in.
D.	4 ft. 3½ in.	D.	8 ft. 7 in.
E.	6 ft. 7 in.	E.	13 ft. 3 in.
F.	3 ft. 10 in.	F.	7 ft. 9 in.

The phasing line (F) can be made of 300-ohm ribbon feeder with the cross-over at the centre, or from open-wire line made of 14 SWG wire spaced 2 in. If open-wire line is used the length of the phasing link should be reduced to 7 ft. 6 in. for 20 metres and 3 ft. 9½ in. on 10 metres.

Results

Contacts made by ZL3MH with VK's resulted in S9 plus signals with the aerial only 10 ft. off the ground. He comments also on

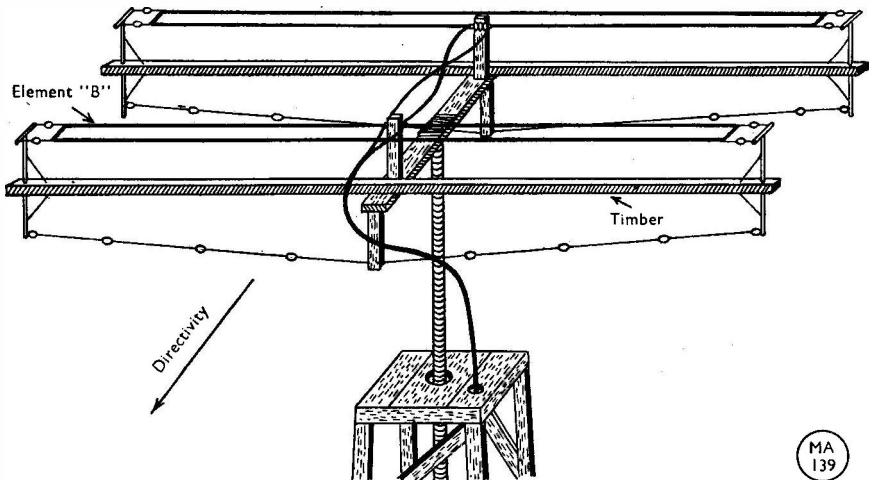


Fig. 3. For a rotating version of the "ZL Special" described by G2BCX, this is a suitable arrangement.

very good reports from the W's and on the exceptionally good receiving properties of this aerial. G3YF (Chingford, London) has been operating with the same design on 20 metres and has obtained reports of S9 plus phone from VE5 and VE7 with 100 watts input, and from W's and other VE's at strengths varying from S6 to S9 under adverse conditions. G8SK (Enfield, London) with the aerial in a loft 22 ft. above ground operating on 10 metres, has had reports as follows : W8, W9, WØ, S9 to S9 plus 15 dB, on phone with 25 watts input. G2BCA (Enfield) has also been using his version of it in a loft and has obtained good reports from DX stations, with 25 watts input on 10-metre phone. The performances obtained from the scaled-down models support the claims made for operation on the normal wavebands of 10 and 20 metres.

Conclusion

Thanks are due to G8SK, G3YF, and G4GA for their co-operation in erecting the 10- and 20-metre versions of this aerial and passing on information on the results obtained. The writer's article in the January issue of the

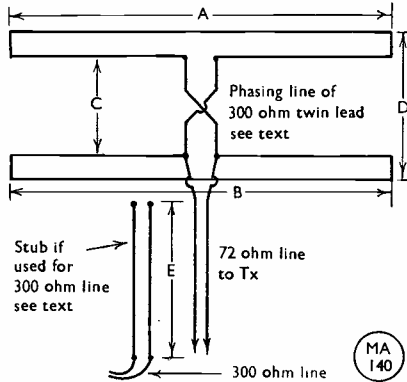


Fig. 4. Electrical layout sketch of the "ZL Special" ; it is clear that the directivity of a fixed version could be changed simply by throwing the aerial over. (See Fig 2)

Short Wave Magazine covers in some detail the methods of obtaining gain data and radiation patterns from scaled down models of aerials operating on longer wavebands.

A TU6B DRIVER UNIT

Incorporating a Frequency Meter

By L. KNIGHT, Grad.I.E.E., (G2DXK)

THE building of a master oscillator unit around a TU6B is, admittedly, not a very original idea. But that in use at G2DXK is thought to have several novel features, and it was felt that a description of it might be of interest to others of the VFO fraternity.

The Oscillator

The first problem was to choose what oscillator circuit to employ. The Clapp is receiving much publicity these days, and seemed to be the obvious choice. Unfortunately, the beautiful variable condenser and the temperature compensated coil in the TU6B were not suitable, and the author felt very reluctant to modify them or scrap them !

The main point about the Clapp oscillator is that the grid and cathode are connected

This is another useful and practical VFO design, with the well-known TU6B as foundation. Our contributor has gone further than most VFO designers by providing a crystal-checked heterodyne frequency meter as part of the same unit.—Editor.

across taps in the tuning capacity which have as low an impedance as possible consistent with reliable oscillation. Why not use an ECO and connect the grid and cathode to the lowest impedance taps possible on the inductance ? That is what was done.

The cathode is tapped one-tenth way up the

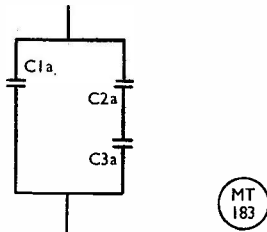


Fig. 1. Composition of capacity C1 (see text) in the complete circuit diagram of Fig. 3. C1a is 200 µF, C2a 47 µF and C3a 100 µF ; these are silvered mica negative temperature coefficient Erie Type N68OL.

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coil, and the grid one-third way up. It was found necessary to include small resistors in each lead to prevent parasitic oscillations. By adding about 250 $\mu\mu\text{F}$ across the tuned circuit the frequency range became, very conveniently, 1.75 mc to 1.9 mc with a few kc over at either end.

The anode coil is wound on a $\frac{1}{2}$ in. dia. former, and is pretuned by means of an iron-dust core to about 3.65 mc. The tuning is broad enough to give sufficient output over the whole range 3.5 to 3.8 mc.

C2 is a 5.25 $\mu\mu\text{F}$ trimmer mounted on the front panel and used for correcting the calibration. The fixed capacity C1 is composed of silvered mica condensers and a negative temperature coefficient capacity. The correct amount of temperature correction is fairly easily found by experiment, although it can be a little exasperating waiting for everything to cool down again before making each new test. Only one negative temperature coefficient condenser of about 100 $\mu\mu\text{F}$ is needed for these tests because its effect can be reduced as desired by placing silvered mica condensers in series with it.

The final arrangement on the model being described was that shown in Fig. 1. The original temperature-compensating condenser was damaged in the author's TU6B, and was removed. In any case it would not have given the correct compensation in the present circuit because it would not have allowed for the positive temperature coefficient of the silvered mica capacities which have been added.

Further oscillator stabilisation has been obtained by using a CV287 neon stabiliser on the oscillator HT supply, and running a cathode follower buffer stage which reduces the loading on the oscillator to a minimum.

The oscillator is switched by a Siemens high speed relay in the HT line, the relay being used for keying on CW or operated by the transmitting Send/Receive switch on telephony. The additional switch S3 allows the oscillator to be switched in without the transmitter for netting.

The final amplifier uses a 6V6 in a conventional circuit. The output is taken from a small coupling winding on the anode coil, and through a Pye plug for connecting to the transmitter by 72 ohm coaxial line.

Heterodyne Wavemeter

The built-in heterodyne wavemeter is a most useful addition, and is well worth the trouble of squeezing it into the box.

The triode section of the 6K8 is used in a 100 kc oscillator. The crystal (Q.C.C. Type Q5/100/M) is cut to resonate slightly high in frequency, and the pre-set capacity is there to adjust the frequency to 100 kc exactly. This is most conveniently done by adjusting for

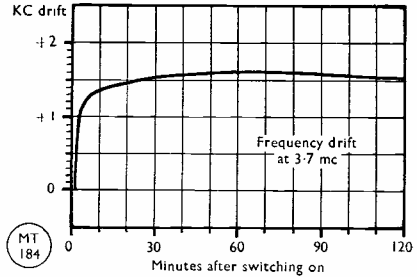


Fig. 2. The frequency drift curve obtained by G2DXK on the model as described in his article on the TU6B Driver.

zero beat between the second harmonic of the crystal and the long-wave Light Programme BBC transmitter, the frequency of which is held to 200 kc within extremely close limits.

A voltage from the cathode follower is applied to the mixer grid of the 6K8. This produces beats with the harmonics of the crystal oscillator at 3.5 mc, 3.6 mc, 3.7 mc and 3.8 mc. The beats are amplified by the 6V6 and fed to the loudspeaker. The amplification is not quite sufficient to satisfy the author's noisy acoustic tastes, but nevertheless the output is ample, and the secondary beats at 3.55 mc, 3.65 mc and 3.75 mc are strong enough to be usable.

The wavemeter is switched on by a DPDT toggle switch, S1. Section (a) transfers the HT from the final amplifier to the two wavemeter valves. The 25,000 ohm resistor is included to maintain the HT load approximately the same for both switch positions, thus avoiding a major voltage change which might alter the oscillator frequency slightly. The other section of the switch interrupts the loudspeaker from the receiver and connects it to the wavemeter. A 20 ohm resistor has been connected across the receiver output to maintain some loading when the speaker is disconnected.

Mechanical Details

The left-hand compartment is reserved for the master oscillator tuned circuit, the only foreigner being the AF output transformer—which just could not be accommodated anywhere else! Since it is only in use while making calibration checks the heat dissipated by it is negligible.

All the wiring of the tuned circuit is done in heavy gauge, small ceramic feed-through insulators being used for the connections through the screen to the grid and cathode. The trimmer condenser is mounted on the front panel below the main tuning drive and the padding capacities are soldered across

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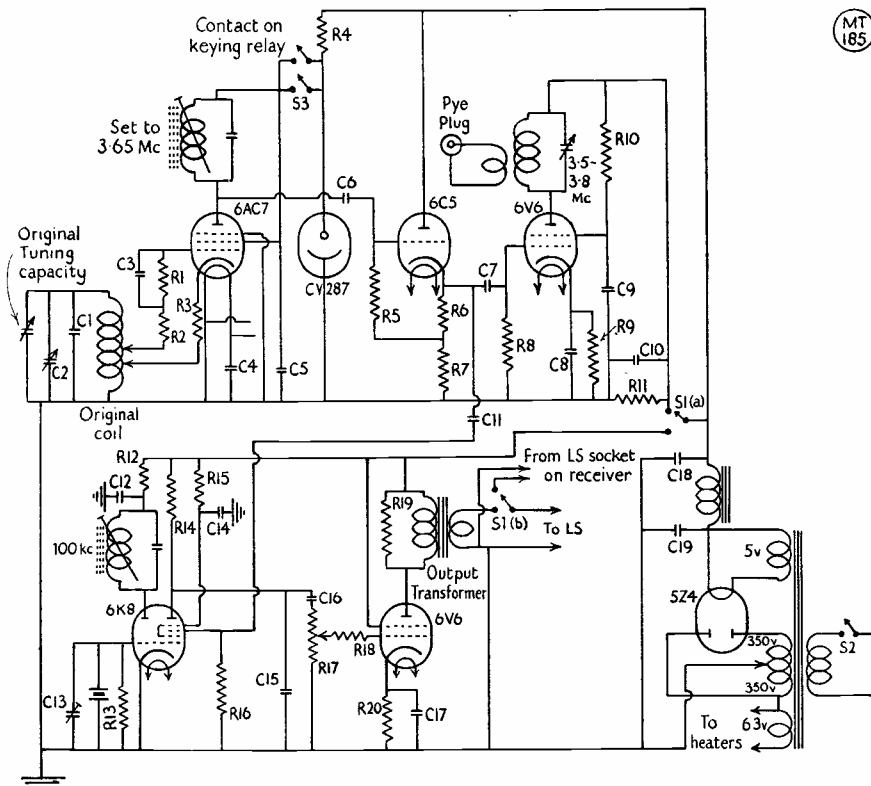


Fig. 3. Circuit diagram complete of the TU6B Driver with incorporated crystal-checked heterodyne frequency meter. (Note : LT junction lower right in this drawing should be taken to centre tap of 350v winding.)

the wires to the trimmer.

To prevent air currents circulating through the oscillator compartment the holes in the left-hand halves of the cover and the base-plate have been covered with plywood. Small wooden strips have also been fixed along the top and bottom of the dividing screen to complete the sealing of the oscillator compartment.

The rest of the circuit is crammed into the right-hand compartment which has been completely stripped of its original components. Adequate ventilation has been achieved by leaving gaps (1½ in. and ½ in.) either side of the chassis, and by drilling a vertical row of ½ in. dia. holes in the back opposite each valve. 1½ in. dia. holes have been punched into the top and bottom of the outer cover. Wooden runners, about ¼ in. thick, have been fixed to the bottom to allow the air easy access to the holes in the bottom. An aluminium plate, about 1½ in. × 3 in., has been fixed to the dividing screen and spaced ¼ in. from it

Table of Values

Fig. 3. Circuit of the Frequency Checked Driver Unit

C1	= see Fig. 1
C2	= As fitted TU6B
C3	= 200 µF
C4, C14	= .01 µF
C5, C9, C10	= .005 µF
C6, C7, C11	= 100 µF
C8, C12, C16	= 0.1 µF
C13	= 5.50 µF
C15	= 500 µF
C17	= 50 µF
C18, C19	= 16 µF
R1	= 150,000 ohms
R2	= 100 ohms
R3	= 47 ohms
R4	= 10,000 ohms, 3-watt
R5, R8	= 100,000 ohms
R6	= 330 ohms
R7	= 15,000 ohms
R9, R20	= 470 ohms
R10	= 6,800 ohms, 1-watt
R11	= 25,000 ohms, 15-watt
R12	= 39,000 ohms
R13	= 2 megohms
R14, R18,	= 47,000 ohms
R15	= 22,000 ohms
R16	= 470,000 ohms
R17	= 220,000 ohms

opposite the 5Z4. This reflects back much of the heat radiated by this valve, preventing the screen becoming too warm at this point—which is close to the oscillator coil.

An octal valve holder has been mounted on the back of the unit for connecting to the loudspeaker, the receiver and the transmitter Send-Receive switch.

The top of the escutcheon on the front panel has been filed so that calibration cards can be slipped in and out without removing the escutcheon. The author has compiled three calibration charts (after the style of logarithm tables) covering (a) 3,500 kc to 3,650 kc, giving every kilocycle. (By multiplying the frequencies by two this chart can be used for Forty also); (b) 3,650 kc to 3,800 kc, giving every kc; and (c) 28,000 kc to 30,000 kc, giving every 10 kc. (By dividing the frequencies by two this chart is also usable on Twenty.) A borrowed BC221 was used for

calibrating the oscillator, the work not proving as laborious as might be expected, due to the fortunate coincidence that, over most of the range, 1 kc on 80 metres is exactly eight divisions, and 1 kc on Ten is exactly one division.

Performance

The modification of existing apparatus always imposes certain limitations and, had the unit been constructed entirely from scratch, it is certain that a better layout of components could have been devised. Nevertheless, the performance of this VFO has been very satisfactory. The frequency stability is good. Thumping the panel causes a frequency shudder of less than 100 c.p.s. and the reaction of the transmitter tuning on the oscillator frequency is very much less. Fig. 2 shows the frequency drift for the first two hours after switching on, which it is suggested leaves little to be desired.

MEET THE 6F12

Some Practical Applications for a Versatile RF Pentode

By J. HUM (G5UM)

FROM time to time a valve appears in the Amateur Radio firmament (to use an astral analogy) and becomes, as it were, a classic of its type. Examples are the LS5 of a quarter of a century ago, the 6L6 just before the war, and the EF50 just after it. Indeed, a perfectly adequate and efficient amateur station could, to this day, be built round nothing but these two last-named valves, with consequent elimination of the interchangeability and replacement problem. That is perhaps a separate story. The writer's immediate purpose is to invite attention to another valve which could quite easily become a classic, were its attributes more widely known. The reference is to the Mazda 6F12 miniature RF pentode—a valve which already finds wide favour in television and commercial electronic circles, just as the EF50 did before it (and still does).

There are many high-performance RF pentodes available, of course; but additional features about the 6F12 which will particularly attract the amateur are its economy; its use of the B7G base, so widely employed for

The 6F12 is a miniature RF pentode with numerous intriguing possibilities in the amateur field, and it can be operated over a very wide frequency range. Of its type, it is probably one of the best valves obtainable to-day. The author suggests here some of the many uses to which the 6F12 can be put.—Editor.

American types and in general favour in amateur circles; and above all, its miniature construction. A brief digression based on this last theme may be pardoned.

In the writer's view the stereotyped rack-and-panel construction for amateur stations is on its way out, except for the highest-powered installations, and perhaps even for them. It is wasteful of space and for that reason is probably fairly inefficient. It was

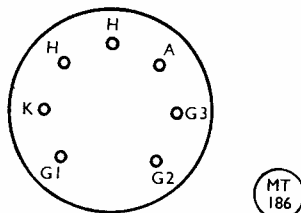


Fig. 1. Base connections, B7G holder, for the 6F12.

due for a review, anyway, as with many things which become too firmly rooted; and the wider acceptance of miniature valves and the miniaturisation of amateur equipment which they allow should accelerate its obsolescence. An up-to-the-minute version of our "all 6L6 and EF50" station might be a string of 6F12 valves in an exciter driving, say, a pair of QVO4/7 tetrodes on all bands—and perhaps nothing but 6F12's in the receiver.

After that digression let us examine the 6F12 in more detail.

Characteristics

The basic electrical characteristics of the Mazda 6F12 may be set out for convenience as follows:

Heater voltage	6.3
Heater Current	0.3 amp.
Max. anode voltage	250
Max. screen voltage	250
Slope	7.5 mA per volt.
Grid voltage	2
Anode current	10 mA
Socket connections	See Fig. 1

These details can be culled from any data sheet about the valve. What may not be so evident is the variety of uses to which it can be put in the amateur station. Although it is proposed to discuss primarily one or two possible applications to transmitting purposes, its uses in reception should not go unmentioned. For example, the 6F12 when used at VHF will out-perform most American counterparts. And it will produce excellent gain as high as 150 mc. Used as a reacting detector on the 2-metre band it shows excellent consistency as between one sample and another; substitution of samples caused only a few kilocycles deviation from a given frequency. For TRF purposes it enables a receiver to be built on a 5 in. by 4 in. chassis with space left over—presuming of course that the other components used are of comparable size.

As a Buffer Amplifier

Readers of the *Short Wave Magazine* who recall the valuable list of buffer amplifier valves compiled by G4QK and published in the June 1949 issue will have noted that the 6F12 came in the first half-dozen best valves (with the conventional octal tetrodes in the last few of the hundred listed!). It was shown to possess the following characteristics:

- Gm (mA per volt), 7.5
- Capacity grid-to-anode, .0045 μ F
- Gain factor 1667
- Watts-anode (min), 2.5

Encouraged by these figures the writer proceeded to incorporate a 6F12 as an untuned buffer in the Franklin VFO. It was

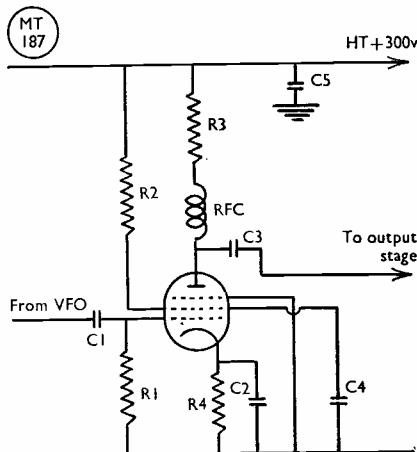


Fig. 2. Using the 6F12 as a buffer amplifier, as described by GSUM.

Table of Values

Fig. 2. Suggested Buffer Stage.

- C1 = Coupling VFO to buffer, 300 μ F
- C2 = Cathode by-pass, .01 μ F
- C3 = Coupling buffer to output, 300 μ F
- C4 = Screen decoupling, .01 μ F
- C5 = HT line decoupling, .01 μ F (not critical)
- (All above 350 volts working)
- R1 = Grid leak, 100,000 ohms, $\frac{1}{2}$ watt
- R2 = Screen decoupling, 50,000 ohms, 1 watt
- R3 = Anode decoupling, 3,000 ohms, 3 watt
- R4 = Cathode bias, 150 ohms, 1 watt
- RFC not critical, an old winding from a 465 kc IF transformer will suffice.

followed by a 6V6GT which fed output to an 80-ohm co-axial socket. So great was the output from the 6F12 that the 6V6GT provided over 3 watts of RF on 1.7 mc—and what can be done with 3 watts of drive is nobody's business! In fact, here one had a little self-contained Top Band transmitter all ready to put out a CW signal, with full break-in facilities (if a VFO oscillator cannot be keyed direct then it had better be rebuilt!).

The circuit of the 6F12 buffer stage is shown at Fig. 2.

As A Crystal Oscillator

To determine the valve's suitability as a crystal oscillator was the next consideration. Its characteristics suggested that it might have distinct possibilities here. The writer is always on the look-out for fresh types of valves to use in the CO stage (e.g. the EF50) which will break the tyranny of the 6L6-6V6 fashion. Accordingly, a 6F12 socket was used in a

CO circuit driving a TT11 PA stage running in Class-A with automatic bias. Both stages were operated from a common power pack. Here are the measured results :

- 6F12**
- Anode volts 180
- Cathode current (non-oscillating condition) .. 7 mA
- Cathode current (oscillating condition) .. 6 mA
- TT11 output stage cathode current, undriven .. 28 mA
- TT11 output stage cathode current, driven .. 35 mA

When a 6V6G was substituted for the 6F12 greater output should have been obtained but in fact was not, for the 6V6G drew so much more current from the small power pack in use as to rob the volts available at the PA anode ; in fact, the PA cathode current could still not be driven above 35 mA even with the 6V6G.

This was rather a salutary test ; for it proved the superiority of the 6F12 for services where power is limited, as for example in portable equipment. It suggested, too, that a chain of 6F12 valves used as crystal oscillator-plus-doublers would show such a saving in power consumption as substantially to reduce the cost and weight of the power pack needed to run them. This would not be all ; for a stage wired around a 6F12 socket occupies about half the physical space demanded by the larger and more conventional octal sockets. So in a multi-stage transmitter the saving in size and weight would indeed be considerable.

Be it noted that the 6F12 was under-run in the circumstances described above, not only as regards anode voltage but in respect of its screen voltage as well. As the characteristics show, the screen can be run up to the full anode potential.

The writer is, however, averse to under-running valves, so finally the 6F12, blissfully oblivious of any such American invention as I.C.A.S. ratings, was subjected to 500 volts as a CO. Apart from going a little blue in the

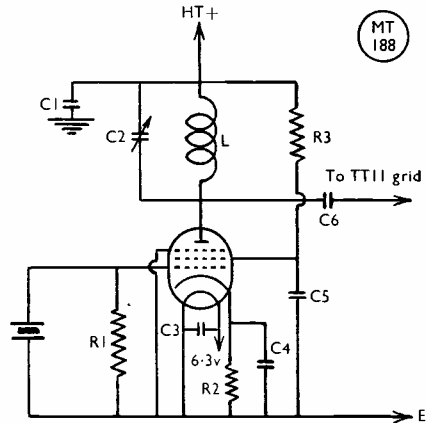


Fig. 3. With this crystal oscillator circuit, G5UM has obtained good results using a 6F12.

Table of Values

- Fig. 3. The 6F12 as Crystal Oscillator
- C1, C3, C4, C5 = .001 μ F
 - C2 = 100 μ F
 - C3 = 300 μ F
 - L = 24 turns, 24 SWG on $\frac{1}{2}$ -inch former
 - R1, R3 = 50,000 ohms
 - R2 = 150 ohms

face and developing some heat, it showed no signs of fatigue. But that was sheer cruelty to a valve which will perform excellently in many amateur applications when operated at its designed ratings.

★ ★ ★

BRITISH OLD TIMERS' CLUB

The following new members have been accepted into the Club :

- G2IO** J. Lees, 17 Trevose Gardens, Sherwood, Nottingham (1930).
- G4RZ** A. Studley (ex-G5TD), 274 Kings Road, Harrow, Middx. (1926).
- G6JB** S/Ldr. J. C. Payne, Fore Street, Salcombe, South Devon (1926).
- VE6HM** C. H. Harris (ex-c4HM, nc4HM and VE4HM), 10806 125th Street, Edmonton, Alberta (1926).

With the deepest regret we have to record the death of one of our members, Mr. W. G. H. Brown (G5BK), of Cheltenham. He was a pioneer and was actively interested right up to the time of his death ; a true Amateur and Old Timer.

Membership total is now 183.

CARDS IN THE BOX

If the operators listed below will let us have name, address and call sign on a large, stamped addressed envelope—send to BCM/QSL, London, W.C.1—we shall be glad to clear cards held for them. The address can also be included in our "New QTH" feature, and in the *Radio Amateur Call Book*, if a note to that effect is made at the same time.

- G2BQ, 2CVB, 3APO, 3BSJ, 3DEW, 3EDI, 3EHD, 3ETZ, 3FFC, 3FKK, 3FMX, 3GHE, 3GKO, 3GOH, 4LQ, 8AK, GM3DWW, 3GGZ.

KEYING TETRODE RF AMPLIFIERS

Some Important Circuit Considerations

By J. B. ROSCOE, M.A. (G4QK)

THE great majority of HF transmitters in operation in this country use tetrode PA stages, the valves employed being generally the 807 or 813. Far too often, though, these valves are not run under the correct conditions, with resulting loss in efficiency. For instance, one reads of push-pull 807's being run with 200 volts bias, which can only result in unnecessarily large harmonic output, besides requiring a 6L6 or so in the driver stage, instead of an EF50. The reason for this is frequently the necessity for safeguarding the valves under key-up conditions. If the screens are supplied through a dropping resistor from the main HT line (which is a convenient arrangement when high-level modulation may also be used at times) the off-load volts may be sufficient to cause overheating of the screens, with consequent damage. The valves will not be cut off unless the bias is increased considerably beyond the working figure.

There are several solutions to this problem, of which four will be considered here :

- (1) Separate screen supply.
- (2) Keying the bias.
- (3) The absorber valve.
- (4) Keying the screen.

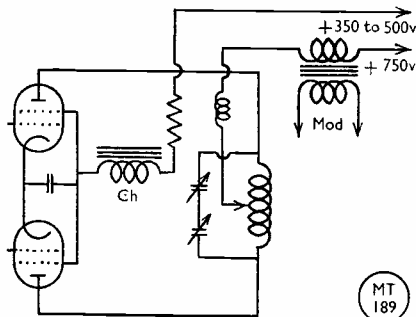


Fig. 1. Using separate screen supply to the PA stage in order to prevent excessive voltage rise on the screen when the drive is off. Where the PA is to be modulated, Ch. should be 10 Henries with .002 μ F by-pass; the choke would have to be shorted out for CW, and for 'phone working, modulation applied only to the plate of the valve.

The more one looks into the business of operating tetrodes as RF amplifiers, particularly in the PA stage, the clearer it is that they must be properly set up if the best results are to be achieved. Our contributor makes some very helpful suggestions on the subject of keyed tetrode amplifiers.—Editor.

Separate Screen Supply

In most transmitters the earlier stages are supplied with HT at 350-500 volts, and this can conveniently be used for the screens of the PA stage. When it is desired to modulate the stage, a choke of about 10 Henries may be connected in the screen supply, and the modulation applied to the anodes only (Fig. 1); the potential of the screens will then follow the AF voltage supplied to the anodes. But this choke cannot be left in circuit for CW operation, since it produces an enormous lag.

Keying the Bias

If it is desired to have different values of bias for working and off-load conditions, the change-over can be effected by the key. The key switches in a bleeder across the bias, which reduces the volts to the required value (Fig. 2). The regulation of most bias packs is not too good, and the current drawn will not be heavy. The resistance R is adjusted to give the correct working bias; if desired, this resistance may be partly composed of one or more relays, which will be keyed simultaneously. It will, of course, be easier to suppress the clicks if the keying current is low. In this circuit one side of the key is earthed, a *sine qua non*. Most oscillator circuits, both crystal and VFO, can be keyed by grid-blocking, and Fig. 3 shows the simultaneous keying of the PA and VFO; this has not, in fact, been tried with a Clapp oscillator, but it should work perfectly well.

(over)

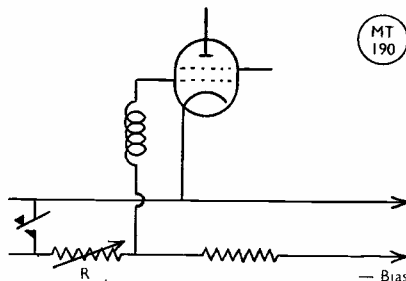


Fig. 2. Bias voltage adjustment by the operation of keying, as discussed by G4QK.

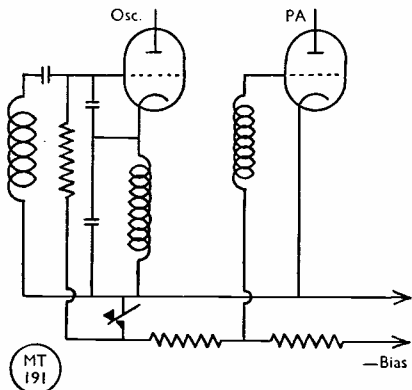


Fig. 3. The grid block circuit devised by G4QK for simultaneous keying of VFO and PA—an arrangement ideal for BK working, with full protection of the PA.

The Absorber Valve

A recent article in this *Magazine* (p. 219, May 1950) gave a useful circuit for safeguarding the screen of the PA stage; a well-known circuit using a 6Y6G in the screen of an 813 is also shown (Fig. 4). In this arrangement the absorber valve is cut off by the bias developed across the grid-leak of the PA; a high-slope type of output valve is usually required in this position.

Keying the Screen

The screen supply can be keyed, either with a relay or a keying valve; in the latter case it should be remembered that the keying valve may require a separate heater supply if the cathode is "up in the air." The author has also seen one instance of direct keying of the

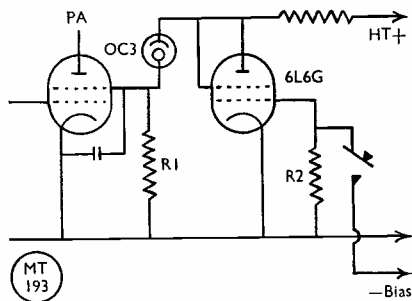


Fig. 5. Using a regulator tube to smooth out key clicks; R1, R2, should be 250,000 ohms. See text for discussion.

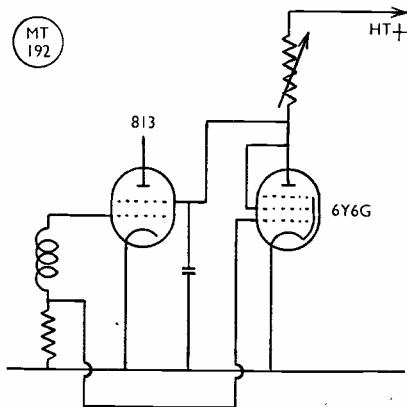


Fig. 4. A suitable absorber valve arrangement for protection of a tetrode RF amplifier.

screen of an 813, with no special precautions in evidence, either in the way of insulation or of insurance policies!

Beam tetrodes, when operated with fixed bias, often produce a characteristic click, which is a form of parasitic radiation. If the screen is keyed with a suitable time-lag it is possible to eliminate this click, and thus kill two birds with one stone. A recent circuit, due to W2RYI of RCA, uses a regulator tube to provide this time-lag, in conjunction with a keyed absorber valve (Fig. 5). The absorber valve drops the volts below the ionisation potential of the regulator tube, which then acts as a switch. The ionisation in the regulator tube, which is due to collisions between the

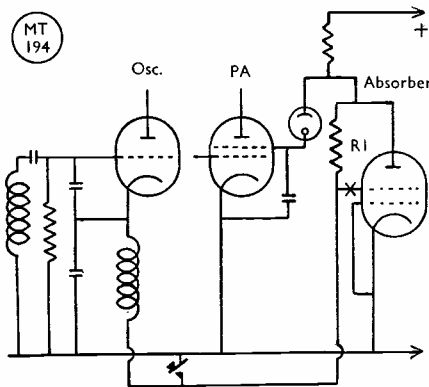


Fig. 6. Another circuit suggested by G4QK. R1 should be 100,000 ohms and an RF choke inserted at point "X" if required.

gas molecules, takes an appreciable time to build up and die down, and the resulting lag in keying the screen rounds off the abrupt edges of the signal.

In this circuit the key is used for applying bias to the absorber valve, and a relay would be required for keying the oscillator, or any other stage. In the following circuit, however, the key earths the screen of the absorber valve, and can be used simultaneously to key the cathode of a Clapp oscillator—and again the key is at earth potential (Fig. 6). Any tetrode or pentode of sufficient dissipation can be used, and the standing current adjusted by varying the screen volts. The author uses an 807 with a damaged control grid, which draws about 60 mA with 100 volts on the

screen and no bias; with the key down it cuts off completely. The Clapp oscillator is an EF50, which does not seem to object to a heater-cathode potential of 100 volts. The dropping resistor R will vary with the supply volts and regulator tube, and should be set to give the correct working volts on the PA screen. The only precaution required with this circuit is the usual one—that all leads from the PA stage to the oscillator can cause RF feed-back, and decoupling is advisable.

The circuits discussed in this article indicate some of the ways in which a tetrode PA stage can be operated under the optimum conditions, with consequent increase in efficiency, reduction of harmonic output, and improvement in valve life.

HIGH STABILITY DRIVER FOR TEN- METRE OPERATION

Series-tuned Wide Coverage Single-control Oscillator

By D. E. OSMAN (ZE2KM)

THE popularity of the 28 mc band for phone DX has increased the traffic to such an extent that if one has a crystal-controlled transmitter with the choice of only one frequency, the possibility of reliable contacts is considerably reduced. This is particularly noticeable at week-ends when activity reaches a peak.

The purchase of a reliable commercial VFO is not always within the reach of the average amateur (here in Southern Rhodesia apparatus is hard to get and if available is extremely expensive) and it is usually necessary to construct on economical lines.

Some Experiments

The writer carried out some experimental work with VFO's to see if an economical unit could be produced which would provide reasonable stability and ease of operation. Owing to the lack of negative temperature coefficient capacities, experiments with the Clapp circuit did not give satisfactory results for stability, but was not turned down for this reason alone. It was found that variation

The circuit suggested here will be of interest to those who would like to try something different in the way of a driver unit for the higher frequency communication bands. The author claims good stability with level output over a wide range of frequencies.—Editor.

in output with change of frequency was too great.

The popular idea, and a sound one too, is that a VFO should have high-C for good stability. But with due regard to this and all the excellent articles that have been offered from time to time, the writer preferred to go the opposite way and attempt to prove that stability could be obtained with higher efficiency and level output with change of frequency. The reason for this attitude is that considerable experience with high-Q tuned circuits on the 60 mc band suggested that such circuits could be modified to meet the needs in VFO construction.

The results have proved to be very satisfactory indeed and continuous checks as well as contacts with many countries show that after a few minutes allowed for warming up no drift can be detected. This indicates that the drift is so small that even on a 5,000-mile DX QSO the receiver has been untouched. The circuit also enables the operator with one control to shift the frequency 100 kc each side of the crystal frequency without any output variation.

Circuits

Fig. 1 gives the original circuit as used for 60 mc transmission, and Fig. 2 is the circuit adapted for use as the VFO.

The link coupling shown can be two turns with one side earthed and wired to a switch

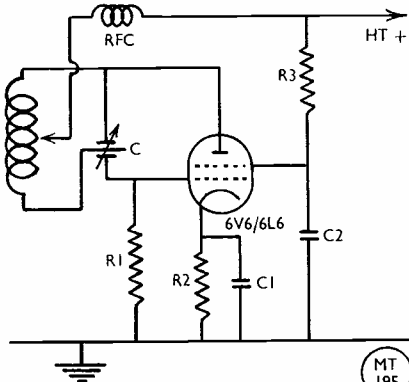


Fig. 1. The first circuit tried by ZEZKM; C is made up from a small neutralising type condenser, in such a way that one centre vane is fixed and the outer vanes independently adjustable, for setting grid drive; C1 is .01 μ F; C2, .001 μ F; R1, 50,000 ohms; R2, 300 ohms; R3, 10,000 ohms.

changing over from crystal to VFO if the VFO is built into the existing exciter stage; the coil can be wound to allow the same frequency as the crystal to be used. The 15 μ F condenser gives adequate coverage and the 10-100 μ F grid capacity will allow enough adjustment for grid drive, which should not be excessive. It will be found that the circuit is very lively and no difficulty should be experienced in getting it to function.

If it is desired to build a VFO as a separate unit the circuit in Fig. 3 (which is in use at the writer's station) can be made up and housed

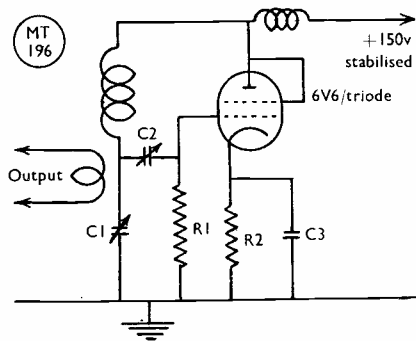


Fig. 2. In this circuit, the coil should be screened and so proportioned that on the 7 mc band C1 is half-mesh for the crystal frequency. Values are: C1, 15 μ F; C2, 10-100 μ F; C3, .01 μ F; R1, 50,000 ohms; R2, 300 ohms.

in an aluminium box with open back to allow for good ventilation.

Refinements

Several refinements are included for ease of adjustment in this design, as the writer

Table of Values

Fig. 3. Circuit of the ZEZKM VFO

- C1 = 15 μ F
- C2 = 10-100 μ F
- C3, C5, C6 = .01 μ F
- C4 = .001 μ F
- C7 = 500 μ F
- R1 = 50,000 ohms
- R2 = 200 ohms
- R3 = 100,000 ohms
- R4 = 400 ohms.

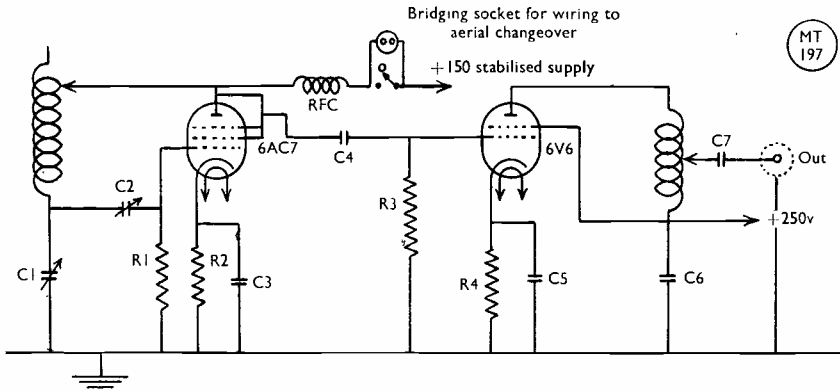


Fig. 3. The circuit as finally used by ZEZKM, and discussed in the text. It should be noted that the power pack is kept loaded whether the VFO is off or on.

wished to use the oscillator as a master for 14 mc doubling to 28 mc, and also wanted to allow for experimental work on 25 mc doubling to the 50 mc band. To allow for this a variable inductance was fitted and actually consists of one of the heavy ex-Army type solenoids with inner spiral contact. This has enabled the writer to set up the oscillator with band-spread condenser always at the same spot.

The question of coupling the output into the crystal stage, which was made switchable, gave some difficulty because it was desired to use cathode follower coupling—but sufficient output could not be obtained by this method for the transmitter in question.

The fundamental frequency being 14 mc, it was decided that an untuned buffer stage was the best method to adopt; an output of some 1.5 watts resulted which was more than enough for the writer's purpose. However, to make sure that the VFO was suitable and adaptable to anyone's needs, a variable inductance was included in the untuned buffer stage. (See Fig. 3 for circuit details.)

Operation

A 70-ohm co-axial cable can be used for connecting the VFO to the transmitter doubler, and the method of switching is left

to the constructor to meet his own requirements.

It is simplicity itself to set the VFO in action; it is only necessary to have a known frequency which every amateur has (or should have) on his crystal. A calibrated receiver, although helpful, is not by any means essential. Once the crystal point is known it is only a matter of tuning the oscillator to this frequency, and as most operators have the top and bottom ends of the band marked on their receivers, it is easy to check the bandspread given by the tuning control on the VFO.

As already mentioned, a single control for shift is all that is necessary for this VFO; this feature makes it easy to handle and distant contacts a simple matter because output does not vary with frequency up to 100 kc each side of the crystal frequency. For wider coverage, readjustment of the intermediate tuning is required.

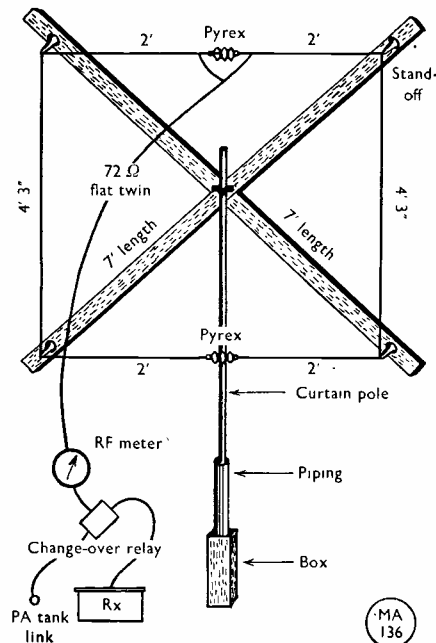
The writer would like to express his appreciation for the enthusiasm and co-operation of ZE3JD, who carried out practical tests on the air while he accumulated data in his laboratory. Using this VFO he has been in contact with many G's, and with him I express my gratitude for the accurate reports he and I have received in the very pleasant QSO's with them.

SIMPLE INDOOR AERIALS

Directivity on Ten or Twenty

By N. P. SPOONER (G2NS)

PROCURE a length of piping and to steady it in an upright position nail round it a rough box-shape of wood. Into the pipe drop a length of curtain-pole, or even a long stout broom handle. Cut two 7 ft. lengths of batten or any wood available that will form a cross. Place stand-off insulators about 6 in. from each end of the cross-pieces. Screw the frame to the upright pole and place it near the operating position from which it can be conveniently rotated by hand. For 28 mc, cut a half-wave length of 14 SWG, split it in the centre and connect 72 ohm flat twin feeder. Stretch the wire on the frame so that each corner is held by a stand-off. If a change-over relay is available use it to connect the



Sketch of the assembly suggested by G2NS, and suitable as an indoor hand-rotated directional aerial for Ten.

feeder by a 2-turn link to the PA tank and also to the receiver input terminals in order to take advantage of the marked directional properties of the system.

To operate, simply rotate the frame by hand until the desired signal is peaked in the receiver and leave it in that position for transmitting. An RF ammeter in one side of the twin feeder will indicate correct coupling to the PA for maximum RF output. Although there is certainly nothing original in this idea some

surprising results will be obtained in practice.

For 14 mc operation, multiply each of the dimensions given by two—but as this now approaches the cumbersome for rotation a stationary system can be arranged by using the picture-rail and the skirting-board, and you have two directions from which to choose. The four stand-off insulators are spaced, two on the picture-rail and two on the skirting, to form the corners of an 8 ft. square. Try these indoor systems, and see !

SINGLE SIDEBAND RECEPTION

Design of a Suitable Ring Demodulator

By R. BRETT-KNOWLES, B.A.,
(G3AAT, KV4AAT), Lieut., R.N.

IN order to demodulate a single sideband suppressed carrier transmission, all that is necessary is an introduction of the suppressed carrier at the detector of a normal receiver. This will usually be the second detector stage of a superheterodyne and the introduced carrier will be at the intermediate frequency. The temptation is to use the BFO for this purpose and avoid making any alterations to the receiver. Unfortunately, this means of SSBSC reception does not allow us to take full advantage of the system; but by re-designing the second detector stage for the purpose, a gain in signal-to-noise ratio can be achieved.

With the conventional BFO and single diode demodulator, apart from the desired signal all other AM double-sideband signals within the pass-band of the receiver will be demodulated and get through to the audio section of the receiver, increasing the noise level. By using a balanced demodulator, these signals can be eliminated, giving a reduction of noise level.

Thus, the problem of SSBSC reception becomes the converse of the system of transmission and similar circuits can be used. The balanced ring modulator, as used in some transmitting circuits, is taken as the basis of the demodulator, and its accompanying circuits are here described.

One input to the ring is a band of frequencies centred about the IF of the receiver and the

Here is a logical approach to the business of receiving an SSBSC signal in such a way as to make the most of the system of transmission; it would be entirely possible to apply the circuit suggested to any usual type of receiver, retaining the ability to take conventional AM signals by making provision to switch out the demodulator and restore the circuits to normal.—Editor.

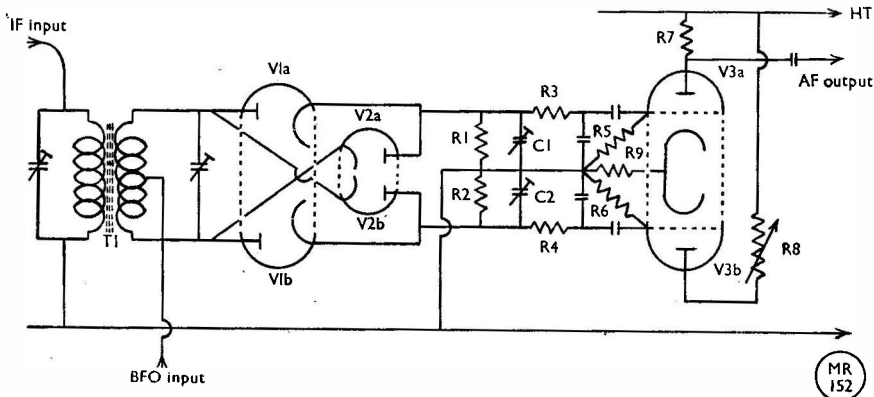
other input is a continuous oscillation of frequency corresponding to that of the suppressed carrier when changed to the IF. The available output of the ring is at the input frequency plus the local oscillation frequency, and at the difference of these two frequencies. The latter is entirely within the AF range and the former is at approximately twice the IF making the separation a very easy matter.

Any signals on the input side differing by an audible frequency will produce no output if the ring is balanced, but they will, of course, beat with the local oscillation. If, however, these signals are AM the upper sideband will cancel the lower sideband, unless the carrier frequency equals the frequency of the locally introduced carrier. (The basis of the synchrony receiver, in fact, where a similar arrangement is used, but the local carrier is locked in phase to the incoming carrier of conventional AM.)

Practical Considerations

It is very easy to draw circuits on paper which will work, but for the construction of unusual circuits, unusual and expensive components may be required. By a slight increase in the complexity of other circuits, the need for double primary transformers is obviated and quite standard components can be employed.

The output of the last IF stage of the receiver is fed to the primary side of T1, which is an IF transformer of the kind used to feed crystal filters. The output of the BFO is taken to the centre-tap of the secondary of T1, and the secondary outers feed a ring modulator consisting of two double diodes, or if obtainable, four matched germanium crystals.



The circuit suggested by G3AAT for SSBSC reception, and applicable to any communications type receiver. It would be possible to incorporate a simple switching arrangement to restore the receiver to the AM mode, as a balanced demodulator of this type would give very poor results on conventional amplitude modulated signals. Values for this circuit call for a certain amount of calculation and experiment.

To avoid a double primary transformer, condensers are used to enable any disparity between diodes to be balanced out, and to keep the diode load reasonably high, the outputs from the ring (which are balanced with respect to earth) are combined in a valve. If desired, push-pull output can be taken from each valve anode. A balancing resistor is provided in one anode to compensate for any difference between valves and can be replaced by a fixed resistor if push-pull output is not required.

Operation

To set up the balancing condenser, remove the BFO input and tune in an AM station; adjust till it becomes as weak as possible, and then seal the condenser. Replace the BFO and all is ready for SSBSC reception.

CW reception with reduced noise is possible, but not AM, as we have adjusted the ring to give *no output* from an AM station. To get an amplitude modulated signal it is only necessary to feed in DC in lieu of the BFO, and a switch could be provided to do this. The ring will require about two volts of bias, will only handle small signals and cannot give AVC, so there is little to recommend it for normal AM reception.

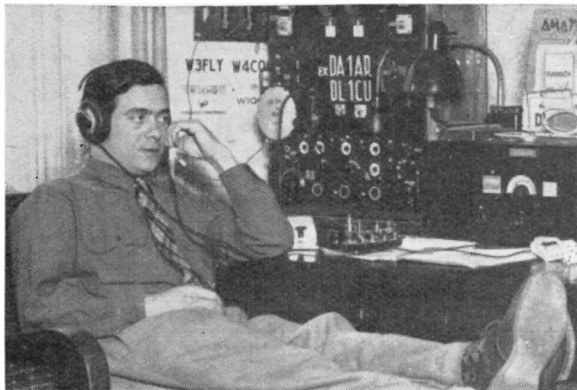
All the advice given previously on SSBSC reception applies equally to a receiver using this demodulator. The RF gain must be turned down with AF gain at maximum, and the triode valve in the demodulator will compensate for any loss of gain in feeding T1 from the receiver. AVC cannot be used because an SSBSC signal has nothing constant about it to enable an AVC circuit to operate.

Miniature valves are specified to conform with present-day practice, but it is possible to use older and larger equivalents, if desired. The configuration of the diodes should be adhered to, in case of differences between valves, it being more likely that the two in one envelope are better matched than the two in different envelopes.

XTAL XCHANGE

A very small offering this month—which gives us the space to say that insertions here are free, but can be in respect of exchanges of crystals only; notices should be set out on separate slips in the form shown below, headed "Xtal Xchange—Free Insertion," and the crystals offered should be (a) within the amateur bands or harmonically related or (b) 100-1,000 kc bars for frequency calibration standards, and (c) have a calibration certificate; if not, this should be stated. All negotiations respecting offers in this space should be conducted direct.

- G2FGD, 35 Burlington Road, Southampton.
Has 7010 kc crystal, 3/4-in. pin spacing. Wants 1750 kc, or 1760-1763 kc.
- G3CGC, Lt. R. Soden, R.N., Royal Naval Air Station, St. Merryn, Cornwall.
Has ex-Service 100 kc bar, 3/4-in. pin spacing. Wants 7389 kc crystal, or any frequency 8066-8078 kc.
- G3EMW, 89 Hurstfield Crescent, Hayes, Middlesex.
Has BC-610 type crystals, 3/4-in. pin spacing, frequencies 3510, 3570 and 3580 kc. Wants similar crystals for 3530, 3540, 3560 and 3600 kc.



DX COMMENTARY

CALLS HEARD, WORKED & QSL'd

RATHER a mixed bag this month; the June conditions have frightened some of the regular DX-chasers off the air, but the relative lack of QRM has attracted others on. Summer DX is really in a category by itself, and usually well worth the trouble. On the other hand we have every sympathy for those who regard DX as a winter pursuit and spend the summer gardening, "messaging about with boats" or just sun-bathing, when the sun is there.

There are, too, those who leave the DX bands alone in the summer and have their fill of 7 mc phone, 3.5 mc CW, Top Band QRP, VHF working and the various other pursuits that bring their own rewards. This, of course, is all to the good; versatility makes for greater enjoyment.

Anyone Want FP8?

One news-item that might bring a few of the chasers back on to 14 mc is that a genuine FP8 is *now* on the air, and will be until roughly July 20. For full details read on, under "News From Overseas"; but if you want a QSO, remember your manners, or you will certainly be ignored!

Other scarce ones that will probably be active—if you can find them—are VR1A, VR1C and ZK2AA. FY7YA, 7YB and 7YC continue to look in from time to time at the LF end of Twenty.

The 14 mc DX

G2BJY (West Bromwich), normally a

By **L. H. THOMAS, M.B.E. (G6QB)**

hardened ten-metre man, has nothing to report for that band, but has unearthed two new ones on Twenty (MP4BAO and UQ2AB!) He has found conditions good between 1830 and 2000 most evenings, and has collected UAØAA, VE7's and 8's, W7's (including Wyoming) and KH6LG.

GM3ASM (Paisley), reporting for the first time, says South and Central America have filled most of the picture. With his CC on 14019 he raised a long list of PY's, LU's, KP4's and also FY7YB, FM7WF, YV5AN, HP1BR and KV4AA. On phone he snagged LU's, PZ1Z (\$9 plus 50) and OX3BD. He has had a phone QSL from ZS9F but nothing from M1B; and he adds that MA3XX is going to Scotland on leave, so he hopes to collect his QSL direct!

G3BNE (London, N.W.3) has made his 40th Zone at last; after calling every HC and OA he heard, he finally did it the hard way with CP1AP. Other new ones were TI, ZS3, PK1 and PK4, and among the old-stagers he worked VS1's and 6's plus MS4FM. G2GM (Torquay) found the arrival of a new junior op. very helpful—the resulting periods on the air between 0100 and 0500 brought in FM7WE, VP9OO, XE2OK, OY3IGO, UI8KBA and KL7UM. At more normal times he worked some quite nice ones, too, including FM7WF, UAØSJ and XE1CM.

G3BDQ (St. Leonards) brought up his score with Y13DYN, FY7YB, ZD2LMF and some others, and his "usual stuff" included MP4 and MS4, MI3, VS7, lots of Africans and another KG6—his third in three weeks after wanting one for years.

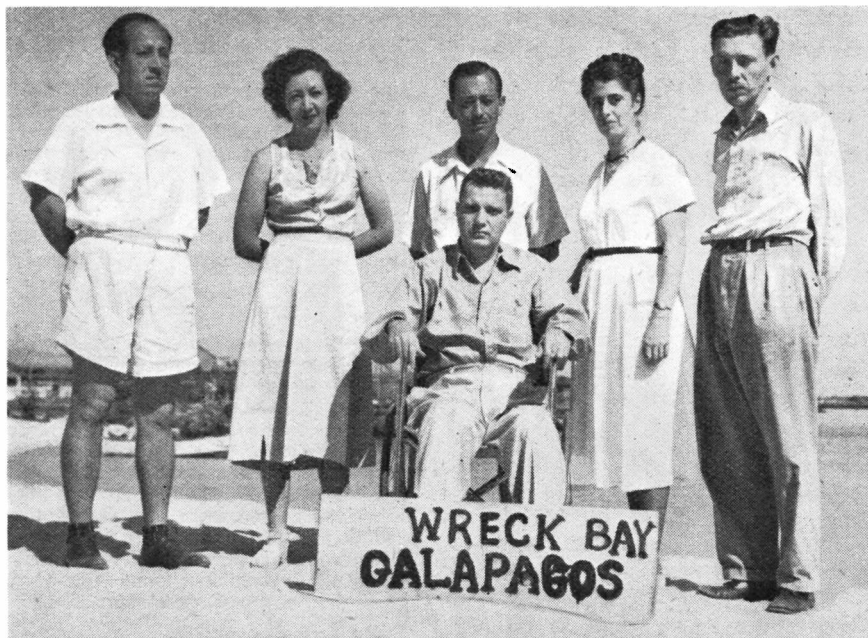
G6QX (Hornchurch) still needs that XE, and remarks that W1FH said that a Phone/CW contact with one of the many XE's on phone might be the only way out. New ones for 'QX were HK, TA3 and 4X, but he also wants XZ, VQ8 and UAØ badly—with New Mexico for WAS thrown in. G3ESY (Hereford) uses a B2 with 25-30 watts, and has raised VQ4KRL, UA9KCC, VK's and W6/7; he can't get up an ambitious aerial owing to living in a flat, but seems to have found the clue to getting out. Incidentally he should be in great demand on the Top Band, judging from the QTH.

G2WW (Penzance) collected F9QV and HR2RF for two new ones on 14 mc 'phone, along with VS6BI and 6BS, HZ1KE, HP1BR, TI2HP, YK1AE and EA6CT. His CW brought in UF6, UJ8 and VE6. G3FXB (Hove) on 14 mc CW found EQ3Q, KZ5IP, MF2AB, VP5AM, YI2UW and 3V8AJ,

among many others. He's a bit doubtful about EQ3Q, who said QTH Teheran but was rather lavish with the "dr ob" stuff.

G3ATU (Roker) has been on in the early mornings for the first time in three months, and had wild hopes of finding a band full of ZM, ZK, KC6 and all that; but on his first morning the only thing there was HK3AU on phone (14050), splattering all over the place. He describes conditions as "pretty average stinko," but has put up a 14 mc W8JK for Africa and the Pacific, and hopes for some luck. He mentions MB4BWK (Bahrein) and PK6LN (Celebes) and adds that FB8XX is back in France—so good-bye to Kerguelen.

Some nice ones came the way of G3AIM (Liverpool), among them being CR4AG (2130), FM7WF (0900), VS1's, PK1's, HP1LL, CM6NF and UAØAA (2000). HP1LL gives his QTH as in the Canal Zone, which seems a bit queer. CR4AG's QTH would be appreciated. G6TC (Wolverhampton) collected eight new ones which took him past the 100 mark. That FM7WF must have worked a lot of G's lately! Others were HK6JH (0730) VQ3SS (2020), YV4AX (0120) and VP6JL (0250). 'TC hands a bouquet to



One of the most interesting DX stations on the air has been HC8GRC (HC2JR), for a short time recently on the Galapagos Islands. The party making the trip is seen above, 1. to r.: HC2KB, XYL HC1JP, OM HC1JP, HC2TR, HC1PK, with HC2JR himself seated. On the way out, they also operated as HC9GRC.

G3LP for helping him across to VQ3 instead of telling him he was a spiv for breaking in.

G6BB (London, S.W.2), after reporting a "doubtful" AC4KK last month, is equally

dubious about PJ1C, worked on 14088 at 0825. No QSL was promised and no full QTH given. 'BB would welcome news of a VQ8 on 14 mc CW—for his 40th, of course. G5FA (London, N.11) has rather gone off DX, but kept the pot boiling with TA3GVU, VS7SV and SP1KM on phone, along with LU, EA8, VS1 and YI on CW.

FOUR BAND DX

Station	Countries Worked					Power
	14 mc	7 mc	3-5 mc	28 mc	Total	
W2QHH	188	69	71	100	193	35
G3ATU	183	70	26	100	190	150
G6BS	182	112	28	4	191	150
G2WW	170	52	21	105	181	150
G3DO	161	37	23	103	191	150
G2VD	161	60	29	98	168	150
G3AKU	137	66	31	58	153	100
G8KU	132	45	9	70	148	50/120
G5FA	130	95	19	68	146	35/120
G2FYT	120	31	5	31	128	150
G5WC	120	50	1	12	122	45
G3ABG	117	51	22	3	118	45/50
G8IP	115	42	13	66	132	3/150
G3FNJ	114	45	24	71	135	150
G6BB	114	60	25	52	129	10/85
G2YS	113	32	23	34	127	150
ZB1AR	109	45	31	43	120	150
G8VG	108	55	24	26	?	60/75
G6QX	106	29	16	46	120	30/150
G3ACC	105	13	21	6	114	150
G8PW	103	60	15	58	117	25/100
GM3EST	102	23	20	2	106	150
G2BJY	97	24	4	104	138	25
G6TC	96	43	11	18	105	20/75
G3FGT	90	37	32	47	112	60/100
G2DHV	89	20	22	7	93	25/60
G6AT	88	46	21	1	94	100
G3FXB	72	48	21	28	88	25
GW3CBY	48	29	21	19	66	15/30
G6CB	42	6	1	94	112	20/150
G3EIZ	39	23	36	15	54	25
G3BOC	34	25	17	72	83	15/60

Odds and Ends on 40

'FA has actually been playing with "quality phone" on 7 mc, and can now modulate his full 150 watts. His 35T went soft, and six "new" ones, all in a row, were in the same state, so he now runs a 100TH. DX on 7 mc was represented solely by CM2CT.

G3FXB raised UO5KAA and heard other "U" districts, and says you can still get a mile-long queue of W's on the band, all very pleased to work G. G2WW was working a W5 who asked him whether he had heard HC8GRC on 7004 kc. He had a look and there he was—and he came straight back to a short call. So 'WW, after missing him on 28 and 14 mc, collected the rarity after all.

The 28 mc DX

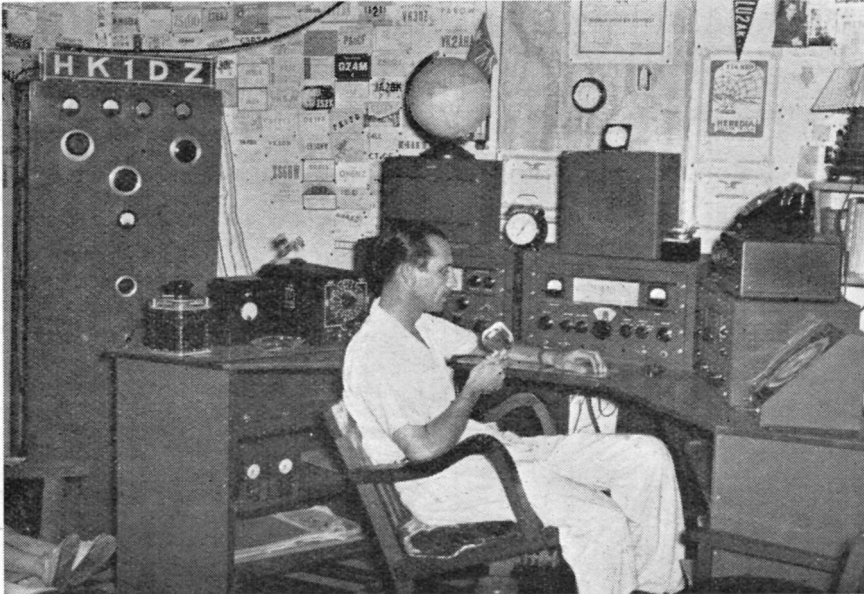
Just a few notes on Ten, but no one has been doing very much there. GM3ASM, on phone, raised HC1JW, KV4AQ, MA3XX, VQ4's, CR6 and VS1, and also heard HH2PAS and FF8AH. G2WW worked ZD2FAR, ZS3M and CR6AI. G3FXB winkled out PZ1QM, who was running four watts, also VQ4BL, ZB2A and several new European countries. In general, although there are times when some nice DX comes up on phone, at present the band seems to be too erratic to attract many people. (That's just what makes it so sparsely populated—it's a vicious circle. Likewise, if a few dozen would start using 28 mc CW the position at the LF end might improve).

Eighty Metres

Very little to say of this band (but see the note from ZL3NE in "News from Overseas"). G3FZW heard VK5KO at 2200 on June 8, but the DL's had a well-organised queue on him; he does come through a good deal earlier than that. Here, again, the trouble is that people are so convinced that the band is *not* open for DX that they don't bother to listen for it; furthermore, they all settle down and work locals, which makes it even more difficult. Just a tiny slice of 5 kc, labelled "DX Only," would be a grand thing on this band—but, of course, quite impracticable.

Top Band News

G3AKU (St. Ives, Hunts) says activity is falling off and conditions deteriorating. However, he plans to build a TVI-proof rig, and



HK1DZ of Barranquilla sent us this photograph of his latest outfit.

optimistically adds that he may be off the air for years. G2CZU (Bath) will have sweated out his twelve months by September and so hopes to be on phone then; he missed a lot of new counties during the local field day event by being out in the field himself. 'CZU tells us that he is afflicted with deafness—so much that he is unable to follow ordinary conversation—and he thinks that he actually scores over the average individual when it comes to reading through a high noise level. We should be interested to hear more on this subject from other sufferers from deafness.

G3NT (Northallerton) tells us that he achieved a "WAEC" on March 11, when he

worked G3AKU for his last county—all since 1946. The other "WAEC's" are, of course, only concerned with counties worked since we began the ladder last August. 'NT didn't work them all on the Top Band, either—he still needs Cornwall and Shropshire up there.

When we referred last month to G5LF/P on Islay we made a first-class bloomer by describing it as "in the Hebrides." Sorry—we didn't look at the map! G5LF (Stanmore) tells us that the complete rig is ready, with Tx, Rx and power pack all built into a TU8B case. This includes a VFO and an aerial coupling unit, and both Tx and Rx are gang-tuned and all. GM6MS (Rutherglen) tells us that he will also be operating portable between July 1 and 14 (on 7 and 14 mc, though).

GM3FBA (Helensburgh) thinks we are "scraping the barrel" on Top Band at present; he does find conditions good at times, but not too often. He has heard some of the regular Top-Banders on 80 metres, so a migration seems to have set in. 'FBA will be looking for G5LF/P, because he needs Argyllshire as a county, although he lives on its edge. G3FZW finds it very difficult to come by new counties now, and still hasn't heard Cambridge or Rutland since the end of the winter.

There are various buzzes about nice DX countries getting ready to invade the band



"... Sorry, OM, local QRM—please ring me on the landline..."

when next season really starts. We suggest that it would be a good thing if all these DX'ers keen on working G's would use the frequencies between 1715 and 1775, which, for some quite unknown reason, are always sparsely populated. Why on earth is it that even during a contest the vast majority of stations will hang around between 1800 and 1900 kc, with a peak near 1875 ?

News from Overseas

G3GPP (now licensed in Burbage, Wilts) is

TOP BAND LISTING Starting August 1, 1949		
Station	Counties	Countries
G6AB	61	16
G2YS	60	16
G4LX	60	14
GM2HIK	58	13
G2AJU	57	13
G3AKU	56	10
G3GDW	56	8
G6ZN	55	10
G3FZW	53	8
G3AGQ	52	10
G6VC	52	7
G2HD	51	11
G5XF	50	8
G2AOL	49	10
GW3CBY	49	10
G3NT	47	8
GM3FBA	47	6
G3BOC	45	7
G2CZU	44	7
G3EJF	43	7
G3BTP	42	11
G3FGT	41	8
G2BON	40	9
G3GGN	38	11
G8NF	38	10
G3ATU	37	8
G3BEX	37	7
G2ABT	36	6
G3ABG	34	10
G3ALE/A	28	4
G6OM	21	5
ZBIAR	13	4

ex-VS6BK and is already appreciating the great difference between calling DX and being DX. He worked all Zones, all VK and ZL and nearly WAS during a couple of months in VS6. While there he met VS6JH (G2FSR) who, he reports, seemed delighted to be DX once more. VS6BL has also returned to this country.

ZBIAR has just got back to ZB1 from Egypt but hasn't opened up again on the Top Band yet ; during the night of June 3/4, owing to a howl from the Junior Op., he listened round on 1.7 mc and heard the following portables : G2DW, G2FMF, G2VP, G2MM, G3BF, G3CU, G3EFA, G4KF, G6RC, GM6RV and MP4KWX. ZBIAR will be back in "G" soon, but before that he hopes to make the first ZB1/G QSO with SSSC. He asks whether LZ1Z (giving QTH as Box 830, Sofia) is OK, and also queries KG4AD. KG4 is the new prefix for Guantanamo Bay. Also mentioned—MP4AMO in Bahrein.

It was quite exciting to hear direct from HC2JR with details of the Galapagos outfit—apart from the pleasure at seeing our HC8GRC card ! John Reed forwards a summary of the results from HC8. During a week of operation they made 2,116 QSO's of which only 115 were with Europe. U.S.A. naturally claimed the lion's share, with 1,464, but they also worked 109 in Oceania, 2 in Asia and 5 in Africa. Of the 115 Europeans, 72 were G's—33 on 28 mc phone, 24 on 14 mc phone and 15 on CW. DX conditions were very poor and the results with Asia and Africa were particularly disappointing. All the same, their score of 27 Z, 69 C and WAC in one week doesn't seem too bad ! All cards received are being QSL'd through the various bureaux and were up to date at the time of writing.

Mal Geddes, formerly G2SO, is now ZE3JO in Salisbury, Southern Rhodesia—see box for full QTH. He is active with 50 watts on 14050 and 14100, and looking out for G's.

ZB1IH (G5IH) has now got up a fairly decent aerial but impossibility of finding an earth is rather trying. He says his only means of getting one is to dig up the road outside the hotel. Things have gone quite well on 10 metres with 25 watts of phone, and he looks forward to some real DX when (and if) the band opens wide later this year. Geoff also reports that the Malta Amateur Radio Society is going great guns and that even a hardened old stay-at-home like himself never misses a meeting.

VQ3AA has now become VQ6AA and is hoping for even more contacts—see his full QTH in the box. MF2AD (Trieste) is ex-DL2CU, and the same remarks apply.

VS2CP (Sungei Patani) actually enjoys reading the "grouses" in this Commentary—or so he says—but has none to add. He has now put up a three-element rotary using 18-



G3FWE, Sandown, Isle of Wight, is on 7 and 14 mc mainly, with a CO-FD-PA transmitter and R.1155 receiver. Using an 84-ft. tuned aerial, 35C had been worked to the end of January since operations commenced in September last year.

gauge elements, with a folded dipole fed directly with 72-ohm line. Running 35-40 watts and doubling in the final, he finds this goes well. VS2CP has heard G's on 7 mc at 1000-1030 GMT; on May 16 he logged G2FFX, G3GKT, G5UI, G8JU, as well as loads of Europeans, in the space of this half-hour.

W2QHH (Hamilton, N.Y.) has now snagged VR1C, who completes his 30 Pacific countries for "WAP"—so that's another certificate for Howy and his 35 watts.

Ken Ellis of HZ1KE asks us to make it quite clear that his Top Band contacts were G6AB, G6BQ, GD3UB and GM2HIK—no one else. He has apparently received quite a few cards from "hopefuls" who heard him come back with a QRZ? He will be on the band for sure next winter, but QRN from tropical storms will make it quite impossible until then. Ken adds that HZ1JC is either in Aden or *Yemen*—and did we hear some eyebrows twitching?

From ZL3NE comes the news that he is hearing lots of DX on 3.5 mc between 1900 and 2000 GMT; prefixes logged have been OE1, YO3, OK, UA, ON, DL, G, PA, F, HB, FA,

SM and VU7. He runs 75 watts into two half-waves in phase, facing Europe, and operates Mondays to Fridays from 1915-2000 GMT, and Saturdays until 2100 GMT. ZL3NE is on 3501 kc unless QRM is bad, when he shifts to 3600, but will answer on the frequency of any station calling CQ DX.

VS1BQ (Changi, Singapore) has been in hospital and on leave, but should be back on the air by now. His XYL is taking Morse lessons and they hope to be on the air with two ops. before long. He forwards an article from the local Sunday paper, all about Amateur Radio, and unusually correct with its facts.

ZL1MP has been carrying out research into the question of whether Top Band signals from this country have really been heard in ZL3, but the results, so far, are negative. We hope this decision will be reversed next season. Incidentally, we have just had a card from ZL1QW, who writes "We still have your QSL verifying our reception report on G6QB's 172-metre signals in 1926 . . . how about doing it again?" So it's certainly going to be worth trying. Also from ZL1MP comes the authentic dope on VR1A, who is on Tarawa Island,

ZONES WORKED LISTING
POST WAR

Station	Z	C	Station	Z	C
Phone and CW			Phone and CW		
G6ZO	WAZ	221	G2FYT	36	128
G6QB	WAZ	200	G2YS	36	127
G2FSR	WAZ	196	G3ABG	36	118
G4CP	WAZ	195	G6CB	36	112
G3DO	WAZ	191			
G3ATU	WAZ	190	G2AKR	35	123
G8IG	WAZ	175	G6QX	35	120
G5YV	WAZ	172	G6TC	35	105
G2VD	WAZ	168			
G3BI	WAZ	162	GW3AHN	34	129
G3AAM	WAZ	154	G3ACC	34	114
G3YF	WAZ	152	G3FDV	34	100
G3AZ	WAZ	133	G6AT	34	94
G8IP	WAZ	132	G2DHV	34	93
G5BJ	WAZ	126			
G5VU	WAZ	124	G3FGT	33	112
G2WW	40	181	GM3EST	31	101
G3AKU	40	152	GM3CVZ	31	97
G3FNJ	40	135	G2BBI	30	97
G3BNE	40	128			
G5MR	40	125			
ON4AZ	39	156			
G3DCU	39	148			
G8JU	39	148			
GM3CSM	39	147			
G5FA	39	146			
G3BDQ	39	135			
G6BB	39	129			
			Phone only		
G2BJY	38	138	G3DO	37	154
G3COJ	38	136	G6WX	37	125
G3AIM	38	124	G2WW	36	130
G3CVG	38	124			
G8PW	38	117	G3COJ	35	103
			G2HIF	32	111
G3WH	37	138	G2BBI	30	95
G3AWP	37	138			
G5WC	37	122			
ZBIAR	37	120			
G2GM	37	103			

about 100 miles South of VR1C on Makin Island. He is an Australian, and says he will be there for many years. His usual times are 0630-0830 GMT, 14020-14060 kc, and at the time of writing he had not heard any G stations. See panel for his full QTH. David, at ZL1MP, has been hearing G stations daily on a nice quiet 7 mc band at 2000-2130 GMT—usually working other G's or Europeans.

Now here's the news you have all been waiting for. W6SAI will be operating from St. Pierre-et-Miquelon as FP8AC until July 20, looking for G's during the hours of 0100-0500 GMT. His cards are already printed—we have two of them!—and he will be only too ready to fill 'em in for QSO's. He will be active on 7 and 14 mc CW and Phone, frequencies being 7004, 7032, 7058, 7100 and 7200—and harmonics. Power will be 30 watts. QSL to W6SAI.

And if on Twenty you should hear ZE3KAP, that will be ZS2AT operating portable from a

caravan near Salisbury, Southern Rhodesia, he having trekked the 3,000 miles or so (in the caravan) to get there. A personal contact made on arrival was with an amateur worked from VQ5 some 19 years ago for ZS2AT's very first QSO over the air! The rig now in operation under the ZE3KAP call is necessarily a simple QRP outfit, as primary power is from car batteries.

Piracy Corner

The pirates and phoneys have been more than usually active this month. Sufferers reporting are DL2QD, whose home call G3FCL is being pirated by "George," of Dover, on 7 mc; G3GGF, who does *not* answer to the name of "Wally" and did not operate at all before May 18; G3GMC, who only uses 14 mc and is being reported on 7 mc; G3ERK, who is not "Alf" and doesn't live at Hoddesson and doesn't work 3·7 mc phone, And G3EQE (Hoylake) reports working G3FXN, who stated that he was in "Poole, Devon" (!), whereas the real call seems to be GD3FXN. G2BOC (Lincoln) is another sufferer, he having been off the air altogether since April 1949. An unusual bag of dirty work which can produce no good result for anyone at all.

Queries

At the beginning of last month we heard lots of stations (mostly W's) calling AD3AC; but no further trace of him has emerged. Then, just before writing this, a new one in the shape of "BM7KA" appeared on 14 mc, calling CQ with a chirpy T7 or T8; a few stations answered, but he didn't seem to work anyone. "BM" would officially be the prefix for China, but at the moment we prefer to regard it as Mittel-Europa again.

The Callsign Record

A card from MP4BAO reveals that J. M. Thomson, the operator, now has the following calls behind him: VQ2JT, 3JT, 4JMT, 4AWH, 5JMT, ZC1JT, ZD2T, 3AF, 4JT, 6JT; ZS6OL, ZS9C; and, of course, GM3AFG! (And just to think of it—we have been stuck with this G6QB call ever since our first licence arrived. But there was quite an interesting variety before that!)

W6PBI, whom we worked not long back, reminded us that he was the power behind XU1YO, who operated from Tsingtao in 1946 and 1947. He still has a few XU1YO cards left, if anyone who worked him then hasn't had one. Cards from CR10AA have apparently begun to filter through; several people report having (or seeing) them.

Pet Aversions

Having spent the month listening to rather

DX QTH's

EA8LP	Box 175, Las Palmas, Grand Canary.
FD3RG	Lome, French Togoland.
KR6CA	APO 331, c/o PM, San Francisco.
MF2AD	Sgt. K. Shaw, 65 (GT) Coy., RASC, Belfor, Triceste Free State.
PJ5FN	via W5FNA, 122 W. White Ave., San Antonio, Texas.
VP7NK	D. Hawkins, Box 1280, Nassau, Bahamas.
VQ3AK	Box 457, Dar-es-Salaam, Tanganyika
VQ4AA	S. H. W. Tanner, c/o Stationmaster, East African Rlys., Mombasa, Kenya.
VR1A	Chas. Adams, Betio, Tarawa, Gilbert Is.
VS1BQ	Cpl. J. B. Smith, SHQ Signals, RAF Changi, Singapore.
ZE3JO	M. Geddes (ex-G2SO), Box 1976, Native Administration Dept., Salisbury, Southern Rhodesia.
ZK1BC	Radio Station, Rarotonga, Cook Islands.
ZL1ADF	E. Davenport, Portland, North Auckland, N.Z.

more phone than has been the usual custom, we have decided that the main cause of unnecessary QRM is the fellow who comes back and says "Solid, all OK. OK on everything. OK on your 150 watts. OK on your folded dipole-Hi. OK on your QTH-FB-Hi". And so on, *ad nauseam*. In the Good Old Days, "Solid," on phone, or "RR" on CW ("Solid" is quite unnecessary on the key) used to mean "OK on everything," without reading out the whole catalogue afterwards. It's not exclusively a phone pest—some of the CW chaps do it too.

Equally pestiferous are the "Hello-hello, hello" merchants, and those who blow out a simple calling-on or signing-off into a palaver that lasts five minutes. And some of those Goodbyes! (The Yanks call them "Door-knob polishers"). It's sad to think that we need nothing more than a sensible adoption of some sort of agreed "procedure" to halve the QRM—free of charge, needing no new gear and no changes except the injection of a little common-sense into some thickish skulls.

The CW (if you can call it that) pest of the month was an F3 who called PK1HX at great length with an honest T1 note, and then repeated the whole works without giving the PK time to send more than the odd dash or so. And when we say T1 we mean just that—not T3 or T4.

Miscellany

G6AT (Hampton Hill) is getting interested in SSBSC and intends to have a go before long. He asks whether we are sure that VO doesn't

count as a country. We are—it doesn't Sorry!

G3GKA (Ashington) worked a character signing AH2AA (2015 on 14048) who said he was in the China War Theatre with the M.A.O. Air Force. 'GKA anxiously awaits a QSL, or confirmation from some of the boys.

GM3EST (Motherwell) says his statement that we quoted last month was made in a fit of despair after several DX tit-bits had got away. He realises that a well-operated QRP station can put up a fine score, but he sticks to the point that DX should be dead easy for the QRO station with a good aerial. Of course, in a way the QRP man's lot is easier, because if that DX rarity doesn't come straight back he doesn't worry unduly.

On the QRP theme, G3EYD (Sale) sends a card from F9PC, 'way down on the French-Spanish frontier, confirming that the Frenchman was using an input of 1 watt to a single valve Tx of the "Reaction Cathodique" variety. Power supply was an 80-volt battery. By the way, 'EYD is no newcomer, as he built his first receiver in 1913!

Next month's deadline is regrettably early and will have to be first post on July 11, so please sit down as soon as you have read this and pour out your innermost feelings (or not, as you prefer). The date for the September issue will be August 15—correspondents overseas please note. Address it all to "DX Commentary," *Short Wave Magazine*, 53 Victoria Street, London, S.W.1. Take a good look for FP8AC but please don't all speak at once—leave a corner for G6QB! Until next month, 73, BCNU and Good Hunting.

BREATH FROM THE PAST

In the year 1913, a "Directory of Amateur Wireless Stations" was issued by, of all people, the now world-famous firm of A. W. Gamage, Ltd., even in those days with an address in Holborn, London, E.C. This was probably the first complete "G QTH List" ever published; it shows some 250 British stations licensed all over the country, in the callsign sequence ABX-ZUX, the former station owned by F. Bennett, of Highgate (using a $\frac{3}{8}$ -in. spark coil) and the latter by D. T. Wright, of Birmingham, who banged it out with 8 watts from accumulators and a $\frac{1}{2}$ -in. coil. Many distinguished names appear in this call list, including Dr. J. Ambrose Fleming (UCX); some others remain active to-day, notably J. E. Catt, G5PS (ex-CXD), H. W. Pope, G3HT (ex-PZX) and R. H. Klein, who was KXJ in 1913, and still operates from the same address in West Hampstead as G8NK. What memories!

DX ACROSS THE WATER

Some VE Experiences

By H. A. M. Whyte (VE3BWY)

ONE expects that a lot of G's have frequently wondered what it is like operating an amateur station "on the other side." Speaking numerically, in terms of radio amateurs North America is the most congested part of the earth. From time to time we hear of moans from G's about the "disgraceful" way in which otherwise respectable American citizens operate BC-610's with 600 watts or so in the Occupied Zone of Germany; such grumbles are mostly concerned with the QRM caused by these stations. Of course no groans are heard when equally respectable United States men operate BC-610's in remote Pacific Islands!

However, to come away from the moralising for a moment, we feel sure that some readers will be interested to learn of the secret fears and hopes that were ours when we left the friendly but austere shores of England at Easter 1947 for the equally friendly but not so austere Dominion of Canada. What was the QRM situation going to be like? Surely 14 mc would be quite impossible, and as for 7 mc—well, that was too much to expect! As one who had worked his 100 countries in G-land, was there any possibility even of working G through the welter of BC-610's and worse?

A glance at the map will show that Toronto is really on a tongue of land tucked into the U.S.A., and this tongue terminates in the wonderful and inspiring Niagara Falls where a most friendly interchange between VE's and W's occurs (in spite of BC-610's!).

In addition to the QRM situation, we had to live and operate in a city in which street cars (trams) and automobiles (cars) are numbered in thousands. Surely it would not be possible to work G now, thought we, but at least the 1kW signals from the U.S.A. should be heard and we could still go on working W, which had been our hobby from England for most of 20 years.

In keeping with the North American tradition, but not wishing to be too indecent, a 400-watt transmitter was installed at VE3BWY, attached to a simple dipole 50 ft. high. This, we thought, would put a nice signal into the States and maybe would net us the odd G friend from time to time—for of course,

The author of these notes is ex-G6WY, who will be well known to many readers not only as an outstanding DX worker but also as, at one time, the contributor of our "DX Commentary."

—Editor.

remembering those D4's, we simply had to bore our way through the permanent hedge of high-power W's.

Results on Twenty

Our first reaction to coming on the air on 14 mc was the amazing absence of signals. It is true we hit a bad spell, but even so, these overpowering BC-610's (and worse) didn't seem as terrible as had been imagined—in fact we used to hear many W's far stronger in England than in Canada, and owing to the skip many of them were not audible at all. Just to make it feel like old times a string of W6's was worked. But it wasn't the same; they didn't fade much and had no flutter. Somehow, W6 didn't seem to be DX any longer, so we had to do a bit of digging, vaguely wondering (you know the feeling) if our newly installed transmitter would ever put a signal outside North America. But then PY1DH came back and after that we heard a G5! He didn't romp in like the W's used to into G-land; of course, we called him, as we knew him, but he didn't come back. (I began to see that 400 watts wasn't enough after all!) Then G2AHP was heard calling CQ and he came back at the second attempt; to cap it all, G6ZO, an old friend, broke in to say he was hearing VE3BWY. So in spite of street cars, automobiles, electric fans (summer) and an incredible number of noises off, the eventual result was that by Christmas, 1949, we had managed to work over 100 countries for DXCC Certificate No. 2.

Operating Conditions

The main difference that a G would notice over here in Canada is the truly terrific competition that greets every rare DX station that dares to creep out of the background noise. The W's sure "turn up the wick" and some have said that it is a case of "dog eat dog." When you switch off the transmitter to listen for the rare DX, your ears are temporarily deafened by the strength of the kilowatts, and it is rarely possible to hear the DX again. However, being a VE one has definite advantages over the W's because such interesting pieces like ZD2, EA9, ZC6 and others have come back to "CQ DX": even then, one has to be very careful that the QSO is not snatched by the hounds from across the border.

Another remarkable fact is the relative weakness of G's in Canada compared with W's

over there in Great Britain. In South London W6's used to block the receiver, but G's never do that with 150 watts. However, many a G3x3 has been worked with his 25 watts, and even 10-watt G's have been contacted successfully.

Week-ends present a problem on this side of the Atlantic; so please be patient if we complain of QRM as the W's can be very loud indeed, especially around midday E.S.T. But in spite of this high-power problem we get along very well on the bands and one can have consistent contacts on 7 mc any evening of the week.

Portrait Gallery

G6RB

ARTHUR BARTLETT of G6RB has been busy keeping Bristol on the amateur bands since 1927. He is one of those Old Timers who confess to a certain degree of nostalgia for the old days—but also to getting a worthwhile kick out of Amateur Radio even after all these years.

His pre-war interests are described as "CW on 3.5, 7, 14 and 28 mc" and his present-day activities as "same." Research among some old QSL cards reveals that in 1928 G6RB was using 48 watts to a TP-TG circuit with chemical rectifiers (no oddity in those days) and that the receiver was a modified low-loss Reinartz 0-V-1. DX included U.S.A. (all except 5, 6 and 7), Canada (1, 2 and 3), South Africa and the famous WNP at the North Pole.

A card of about a year later adds VK, ZL,



VQ4, CX, CO, TI, PY, LU, CE and many other prefixes that *were* DX in those days, the receiver being the same and the transmitting side having the alternatives of "TP-TG, 50 watts" or "CC, 10 watts."

Arthur states boldly in his letter, "I get a kick out of taking part in contests"—which probably explains why he is still an active and successful operator. Nowadays, 80-metre DX gives him a thrill (he does plenty of it) and his pet aversion is "the CQ fiend."

In the course of his general remarks about DX working, G6RB adds, "Haven't some of those who hold forth got a lot to learn! With the advent of poorer conditions some of them still expect DX on every CQ—they'll probably learn after another poor season."

G6RB is 50 years of age and a company director—and he still operates from the same Bristol address as in 1929. The DXCC Certificate is a recent addition to his wallpaper and if you are on when the 3.5 mc DX season comes round again—you will find him there.

TVI—AN IDEA FOR CLUBS

It has been suggested that clubs within the TV areas could do much to help their members and themselves, as well as educating local dealers and others concerned, were they to organise public lectures on the subject of TVI problems and their elimination. There is now not only a useful literature about TVI, but the authorities will be found very willing to co-operate in such endeavours, since it is clearly to the advantage of everyone affected that the relationship between the amateur, the TV viewer and the GPO should be thor-

oughly understood. The interest of the local press should be cultivated, and dealers encouraged to support the campaign. Much TVI trouble is still due to misunderstandings (not to say gross ignorance) all round.

M.O.S. STAFF APPOINTMENT

It is announced that E. P. Harris, G3GFN, has been appointed Technical Manager at "The Radio Centre," Mail Order Supply Co., 33 Tottenham Court Road, London, W.1, and will also be responsible for the production of the *M.O.S. Newsletter*.

“THEY DON’T CATCH ME”

The Multi-way Menace

By NONET

HAVING been invited by a large number of amateur spiders to enter their parlours, and having, in unguarded moments, succumbed to their entreaties, I have now decided to give up being a fly.

It may be that I am in a minority, but *I do not like nets*, and in future I will have none of them. And, furthermore, I am not making my escape from these extremely sticky traps for the unwary in discreet silence, but am taking this opportunity of telling some of the spiders in whose parlours I have wasted so much time just *why* I am not their future meal.

To start with, the net is a time-waster. The time wasted increases roughly as the square of the number of people in the net. This tendency manifests itself right at the start, when a duet is transformed into a trio. Two chaps having a contact will each say what they want to say and then cut loose; but if a third comes in, the chances are that each of the original two will repeat practically everything that he has already said—whether interesting or not—for the benefit of the third party. All the usual “I’ll be brief about the rig” stuff, and so on, together with some theory (possibly sensible but maybe half-baked) about aerial systems, 807’s, microphones or what-have-you.

By the time eight or nine members have joined the assembly, everyone talks *at* the others instead of *to* someone else; everyone has to remember, or note down, innumerable comments on divers subjects made by all the others; and one such comment is sure to touch someone off on his pet subject, on which he is a well-known bore. It is a mitigating circumstance, I admit, that the said bore will only have his turn about once in every forty minutes; but perhaps most of the others have, by then, been touched off on their particular bore too.

I am convinced that when a net has become really large there will be two or three members who will talk just for the sake of talking—even if they have to think quite hard to find something on which they can talk for a long time.

The theme developed by our contributor is that on the amateur bands a duet is ideal, a trio tolerable, a quartet a bore, but an octet or nonet impossible. In short, No Net.—Editor.

Reducing the QRM?

Now about the only argument ever put forward in favour of netting is that it reduces the QRM by keeping, on one channel, eight or nine stations who might otherwise be spread over the band. This carries a dangerous grain of truth but is, nevertheless, a complete fallacy. Nine stations transmitting for five minutes each will cause precisely the same amount of QRM, whether they occupy the same frequency for nine consecutive periods of five minutes or whether they spread over the band for sporadic periods.

In fact, to my mind, it is slightly more annoying to find one channel apparently occupied for ever than to hear various short and snappy conversations being spread out over 200 kc or so.

Even the multi-way QSO in which the participants are on different frequencies is rather less devastating than the tight net which goes on for hours and constantly admits more and more who are foolish enough to yield to the urge to break in.



“... Want to go QRT at midnight, chaps, so will now say 73 and all the very best to G3— Ted, G4— Bill, G5— Sam, G6— Frank, G6— did not quite get the handle there OM, G6— Eddie, G2— Mike, G4— Tom, G3— Bob, and I’ll just stand by for one more time round...”

The one thing I really *enjoy* about nets is to come in towards the end of a long session and to hear everyone talking in that unnatural voice produced by the quite unnecessary suppression of a healthy yawn; knowing that, one by one, the various bodies will be dropping out rather in the manner of Haydn's "Farewell" Symphony.

Club Nets

It seems to me that the Club Net and, of course, the Emergency Net, which we don't meet with over here, are legitimate. Club members can hold a sort of quick meeting over the air, using the Top Band on a Sunday morning; or—next best thing—active Top-Banders in a certain County can get together for a weekly exchange of news. This sort of thing is usually done with some celerity and at least an approach to good, snappy operating. But such nets are few and far between compared with the regular Yatter-Party in which everyone starts by knowing all the answers, learns nothing and signs off in that same state in which he will assuredly begin the next one.

Another legitimate form of ganging-up on

one frequency is what we might call the DX QSP, starting when a DX station that one is working hears yet another DX station who would like to join him. These rarely go beyond a maximum of three, and are over in fairly quick time.

Maybe the time will come when a duration-limit will have to be imposed on all QSO's, whether simple two-way affairs or blown-up nets, and that will, at any rate, have the merit of keeping the gasbags down to a reasonable volume of verbiage.

So I wait, unabashed and unafraid, for the cascade of brickbats which will inexorably descend upon me *via* the Editor. Until someone convinces me to the contrary, my opinion is that nets are a menace, for the main reason that everyone who joins them *will* talk for the sake of talking, instead of remembering the simple rule "Stand up, speak up and shut up." When I once hear this ideal of after-dinner speakers in action on the amateur bands I shall once more feel that it is not a dangerous matter to renew my acquaintance with the spiders and spinners of yarns.

Did I hear someone trying to break in there? Well, he can wait until next month!

G1BF HERE

Reappearance

HAve decided it high time I responded popular clamour (three letters in last three years not counting one from Box 88 signed Popoff saying Need ur advice badly) and emerged seclusion again to give eager beavers benefit my unrivalled experience—remember motto at G1BF is "Any problem has personal attention and no punches pulled."

My famous station completely rebuilt and now signing DX call OMØTO as am using key with no dots; this to show up old pal MO1FFI with phoney call SI5EH swinging fast bug sending all dots. His note still like rusty nails dropping in tin bucket so must disclaim responsibility for operators like him unable take my advice.

All readers naturally anxious know about new Tx at OMØTO. This right bang up to date with blown T20 in ultimate, getting draught from ½-horse fan and flue from 2,000-volt auto xformer with bank 24 neon tubes as paralleled half-wave rectifiers (en-

tirely new development power pack technique). Am unable measure *exact* output voltage but know it is high as T20 goes red even with draught full on. Self-excited push-pull 807 oscillator with 750 volts stacked on neck and grid T20 coupled direct (through .01 blocker of course) to one side driver tank gives ample urge of about 60 mills into PA. As experience OMØTO (this of course is me G1BF) proves T20 gives max RF output when running free, do not bother with humguffery like bias or neutring. This quite out of date these enlightened days with blown PA's.

New rig gives clean sharp buzz-saw note always reported T9x FB by operators anxious QSL from new country OM. Laughable attempts jealous locals SI5EH and UU3UU to persuade me note sounds rough passed off with some crack like Do W6's queue up for you? (Have never worked W6 yet but they don't know.)

So G1BF once more back on DX map and readers may be assured regular appearance my technical hints tips and advice for beginners in spite attitude Editor who says he won't wear it. (Susie, Pse QSL.)

(It is with deep regret that we give space to this stuff.—Editor).

Is Your Equipment always Safe to Handle?

POWER INPUT AND QRK

How the Watts Affect S-Meter Readings

By V. G. P. WILLIAMS, M.A.
(G3FYY)

THE relationship between power input at the transmitting end and signal strength at the receiver does not appear to be well understood by the generality of amateurs.

One sometimes hears an operator say that his increase in power from 25 to 40 watts has enabled DX to be worked which could not be raised before; or that an S7 signal from a 5-watt station on 80 metres at a range of 100 miles is "very FB."

In terms of power used, and reckoning 5 or 6 dB to 1 S-point, the relationship between input and signal strength can be simply expressed as follows:

Increase Input	Increase QRK
× 2	3 dB ($\frac{1}{2}$ S-point)
× 4	6 dB (1 S-point)
× 10	10 dB (2 S-points)

From this it is clear that pushing up the input from 25 to 40 watts could not possibly result in any noticeable increase in signal strength; and that dropping from 25 to 5 watts should reduce QRK by little more than one S-point. In fact, this is the sort of result that any average station gets when carrying out a test with a distant contact under stable conditions.

Signal strength depends far more upon the efficiency of the transmitter, feeder system and aerial than on the input. A *much greater* increase in signal strength can be obtained by proper attention to the utmost efficiency in these respects than merely by increasing power within the normal amateur limits. The only real advantage of 150 watts would seem to be that, in conditions under which a station using this power is only just readable, a 25-watt would not show up through the background noise.

If a 150-watt G station of reasonable efficiency is reported as S9 by a VK, then under the same conditions and with the same factor of efficiency a 25-watt station should be reported as S7-8. The power level, in terms of DC input to the PA, is not and never has been any indication of what sort of DX results a particular station should achieve.

IMPROVING THE 6J6 CONVERTER

Variations on the Original Design

By W. J. CRAWLEY (G2IQ)

IN view of the large amount of correspondence and the number of queries received by the writer regarding the all-6J6 144 mc converter described in the August 1949 issue of the *Short Wave Magazine*, it was decided to cover some of the points raised by correspondents and describe one or two improvements that have since been made to the original design.

The Input Circuit

Considerable simplification of the original has been achieved by dispensing with the grid tuning condenser in the RF stage and making the grid coil "self-resonant." This means that

In our issue for August 1949 there appeared an article on a two-metre converter which has been a most successful design and has met with considerable popularity; in the notes below, our contributor discusses some possible improvements and deals with certain queries that have arisen in its construction.—Editor.

the only capacity across the coil is that of the valve (about 1 $\mu\mu\text{F}$) plus strays, and a worthwhile increase in inductance is obtained. Instead of the original 6 turns, the coil may now be increased to 8 turns $\frac{1}{4}$ in. inside diameter with the turns spaced the diameter of the wire (20 SWG). It will be found that by judicious squeezing or opening of the turns the coil can be resonated within the band. By over-coupling the aerial—that is, by using a comparatively large aerial coil of 3 or 4 turns wound over the centre of the grid coil—the resonance curve is further broadened and it will be found possible to peak up the response at 145 mc and rest assured that the circuit is effective from 144 to 146 mc. Incidentally, there is a very slight improvement in the signal-to-noise ratio with this over-coupled aerial coil although the stage gain will be down a little.

Neutralising

In every case of difficulty over non-neutralisation it has been revealed that condensers other than those originally described have been used. Only a very small capacity of between 1.5 and 2 $\mu\mu\text{F}$ is required and this was obtained by using condensers with miniature plates of about $\frac{1}{4}$ in. \times $\frac{1}{2}$ in. spaced approximately $\frac{1}{8}$ in. Anything bigger than this adds to the external inductance of the tuned circuits and makes neutralising more difficult. The writer can only repeat the description of the condensers originally specified and advise their use against any other type. The type number is AP.52487 and the condensers consist of three fixed and four moving plates. All but one of each of the plates are removed and the remaining pair prised open until the spacing is approximately $\frac{1}{8}$ in. The required capacity for correct neutralising is then obtained with the plates somewhere near three-quarters in.

The Oscillator

Some trouble has been experienced with squegging from the oscillator. This can be recognised by the presence of "birdies" as the oscillator tuning is varied. This should not be confused with the self-oscillation caused by faulty neutralising and may be easily recognised by taking out the RF and mixer valves when the trouble will persist if the cause is squegging. Apparently the manufacturers' tolerance for types 6J6 is wide; the writer has no data as to 6J6 tolerance, but it is known

that the type 6AK5 is issued with a tolerance in gm of about 3,500 to 6,500! So in the case of the 6J6 squegging, the trouble may easily be remedied by increasing the decoupling resistor to either 5,000 or 10,000 ohms; one or the other is always effective.

The oscillatory circuit used in the original converter (known, the writer believes, as the "Kallitron" oscillator) is remarkably stable under varying conditions and moreover is very tolerant of widely different component values. For example, the grid-to-plate capacities may be varied from 2 to 10 $\mu\mu\text{F}$ with no noticeable difference in performance; likewise, the grid resistors may be any value between 10,000 and 25,000 ohms.

Incidentally, if anyone obtains other than an extremely pure T9 note from this oscillator then there is something wrong. The only occasion when an impure note was encountered turned out to be due to a faulty 6J6.

Oscillator and Mixer Coupling

This is not at all critical and the capacity from the oscillator grids consisting of stiff wires may be wrapped around the mixer grid pins or may be left lying within an inch of them. The gain is slightly higher with the tighter coupling, but the noise factor is not affected. Indeed, provided that the RF stage is properly neutralised there is nothing critical at all about this receiver and it may safely be left for months on end without further attention.

DANISH RADIO EXHIBITION

For those who may be on holiday in the delectable OZ country about the middle of next month, a visit to Copenhagen during the period August 11-20 will coincide with the Danish Radio Exhibition. This is being held in the Forum, opposite the Danish State Radio building, and is to mark the 25th anniversary of the State Radio. Some 60 firms will be exhibiting a wide range of equipment, and manufacturers in countries outside Denmark will be represented by their sales agents. The official announcement says that the Exhibition Committee will be glad to look after foreign visitors; enquiries should be addressed to: Radio Exhibition Secretary, 6 Kollegievej, Charlottenlund, Denmark.

AMERICAN BROADCASTING MAGAZINE

The Radio Corporation of America publishes at two-monthly intervals their *Broadcast News*. This is almost exclusively concerned with the transmitting aspect of commercial sound and television broadcasting, and, therefore, circulates widely among engineers interested in these subjects. The subscription

rate is £2 for 12 issues (two years), and orders can be placed through: R.C.A. Photophone, Ltd., 36 Woodstock Grove, London, W.12.

SOME PRICE COMPARISONS

It is not at all unusual to hear amateurs of the present generation complaining about the price of new equipment. We have just glanced through the catalogue of the Static Scientific Co., of East Ham (circa 1911), probably one of the first firms to offer equipment for the radio amateur. Such essential items as induction coils "giving a 4-in. continuous spark" cost £9 10s., oil-immersed condensers "equivalent to 7 quart size Leyden jars" are £4 10s., telephone headsets are priced at 40s. and a silicon detector "complete with gold point" is the cheapest available at 8s. 6d. When it is remembered that in those days 30s. a week was considered an adequate living wage for a working man, and that all these figures must be multiplied by at least four and possibly five to make them comparable with present-day values, the prices we pay to-day are seen in a much more favourable light.

VHF BANDS

By E. J. WILLIAMS, B.Sc. (G2XC)

***New Records on Both Bands—
DL Worked on Two Metres—
Station News and Views—
Conditions Maintained, with
Increasing Activity***

WITH the recent and generally maintained improvement in VHF conditions, together with greatly increased activity, the boundaries are steadily being pushed further out. This month we are happy to be able to record, not one, but several new achievements on the VHF bands ; they are as follows :

First, the 70 cm. DX record has been raised to 161 miles as a result of contacts between G5BY (Bolt Tail, S. Devon) and G6LK (Cranleigh, Surrey). This is another piece of outstanding work by two of our leading VHF men, and judging by the signal reports exchanged between them on the occasion of their QSO on June 4, it will not be long before still greater distances are covered.

Secondly, the two-metre DX record is now in the hands of GW2ADZ (Llanymynech) for his contact with PAØHA (Hoogezand) on May 13 ; their distance of approximately 417 miles slightly exceeds that between G3AHT and PAØWL, mentioned last month.

The third great milestone passed is a contact with DL G3DIV/A (Eastbourne) worked DL4XS/DL3KE (Wiesbaden) on June 5 at 2340 BST, and signals were RST-579 both ways.

Heartiest congratulations to all these operators on their achievements, which again show what can be done (and what is to be expected) in the way of breaking entirely new ground on the VHF bands.

The Details

The new Seventycm record was built up, so to speak, from a period of sustained effort by the South Coast 430 mc stations. The first signs of improving conditions appeared on May 30, with the two-metre band in excellent

shape for East-West contacts across Southern England. Following a QSO early that evening between G2XC and G3ABH, your conductor kept a careful watch on both Two and Seventycems. Soon after 2200 G5BY was heard calling G3RI on two metres and saying that the latter's 70 cm. signal was being received at S8. As G3RI did not appear to be responding to these calls an attempt was made to attract G5BY's attention on Two with a view to a 70 cm. test with G2XC. Meeting with no success that way either, a rather long and not very hopeful CQ was put out on 70 cm. and much to the surprise of the striker G5BY came straight back calling him ! Thus, the contact was effected on 70 cm. without any previous arrangements being made on another frequency. It is worth recording that at G2XC we are on the wrong slope of a hill so far as working G5BY is concerned and the path on two metres is not a good one. G5BY was using a 24-element stack on his Tx and 48 elements on the Rx, while at G2XC a corner reflector was in operation.

Had G6LK been operating on May 30 it is extremely unlikely that G2XC would ever have made his short-lived record* as the 161-mile path to Cranleigh was almost certainly open. It was, therefore, not expected that this record would last for long and on June 4 (after G6LK had been activated by landline calls from G2ANT and G6OH, both of whom had heard G5BY calling G6LK on two metres and getting no replies), G5BY and G6LK had an excellent QSO on 435 mc. Contact was made at 2215. G5BY reported G6LK at RST 569 rising to 599, while G5BY was RST 599 on CW and S8 on 'phone at G6LK ; the QSO was completed at 2229. Earlier in the evening G5BY had heard fading signals from G2XC, and about two hours later, in the early hours of June 5, he had a two-way contact with G5TP (Stoke Row) over a 155-mile path. G5TP's signals started at RST 569 and worked up to 599, while G5BY's CW was 559 in Oxfordshire, and his 'phone S3. G5BY comments that this June 4-5 period

*And we would not have had to organise that red slip into the last issue !—Editor

was undoubtedly the best on 145 and 430 mc so far this year. It is also to be recorded that G6LK heard G5BY on 70 cm. on June 10 and 11, so it is evident that these distances are repeatable on Seventycems.

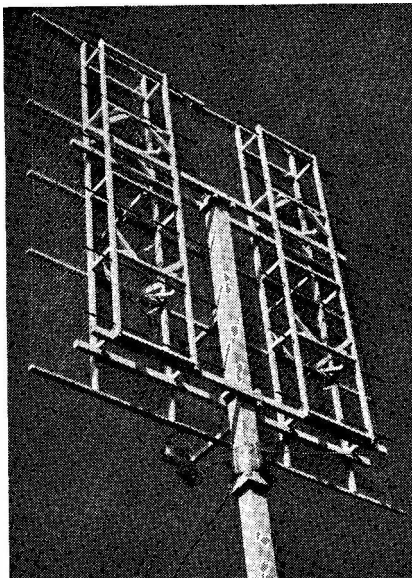
The two-metre contact with DL4XS/DL3KE was made by G3DIV/A, after an attempt with DL3FM (Essen) on June 5 had been unsuccessful. DL3FM was heard calling "CQ-G" at RST 339, but could not be raised in spite of several calls. On June 9 DL4XS/DL3KE was heard signing off at 2340 on CW and G3DIV/A put out a "CQ DL" call to which the DL station replied. Signals were held for a half-hour with occasional short and deep fading. Another contact was made on June 11, when phone was received from DL4XS/DL3KE at S6. The double callsign is understood to be due to the station being run by two separately licensed operators. They are active most nights on 144.5 mc. On the evening of June 5 G3DIV/A worked five countries—DL, F, G, ON and PA—in itself another meritorious achievement, though he is favourably placed for some of the Continental directions.

Before passing to general news of station activities for the month, one other happening is worthy of comment, and that is the very pronounced hiss on two metres which many operators have reported during mid-June. This hiss, which is continuous, obviously emanates from the sun and it is possible to D/F the sun quite accurately on a narrow-angle beam. It was particularly strong on the evening of June 14 when it recorded S7 on the receiver S-meter at G2XC. Working to the West during the evenings has been difficult due to this high noise level, but as it disappears abruptly at sunset, late evening working has not suffered.

Station News—The North

GI2FHN (Bangor) found conditions average. He has a cascade converter in use with a 6AK5 triode connected, 6J6 GG, and a 6AK5 triode connected mixer, with 955 oscillator and 6C4 cathode follower output. So far it has not proved any better than his previous 6J6 type converter. A number of contacts have been made with GM and northern G.

GM3DIQ (Saltcoats) has worked G3BW and heard GI2FHN. He has also been hearing a number of weak phone signals from the south, only partly readable, and asks that G's have a look for him. The 16-ele. array is still not up and all work so far has been done with the 4-ele. rotary. GM5VG (Glasgow) sends a list of 14 GM's active on two metres. At GM5VG there is a 12-ele. stack. GM3BDA has worked much DX and heard G3EHY (Banwell), while GM3EGW



This is the 430 mc receiving array as now being used by G5BY, Bolt Tail, and on which he has heard G2XC, GSTP and G6LK.

has also managed some excellent contacts. There is still activity on 70 cm.

G3BW (Whitehaven) is now challenging many of the Southern stations in the two-metre "Counties Worked" table. His signals have been jumping the mountains and reaching the East Coast, enabling contacts to be made with G3CYY and G4LX, while to the South G5WP and others in the Home Counties have been worked; G3BW quotes May 13, 14, and June 2 and 5 as good days. G4LX (Newcastle) proposes that official action be taken against members of the Fiveband Club who fail to QSL after six months. Although very sympathetic with G4LX and others who cannot get their much-desired cards, the Club Secretary must point out that Fiveband Club members do not make any promise to QSL, nor is it a condition of membership. Membership of the VHF Century Club is, however, conditional on QSL'ing fully and we are quite prepared to consider such action in the case of that club.

G4LX finds he is most successful in working GDY when the barometer is high, irrespective of whether the high pressure is accompanied by still air or winds; he has heard G3ABA and G3ENS spasmodically. G8AO (South Shields) was at sea during the mid-May opening and had a grand time logging the

Continental DX, although it would have been even grander working it! His Rx is a 6J6-type with two of them as RF stages. In all, 25 Continental signals were heard by G8AO from a position off Scarborough. A new converter of the cascade type is being tested ut with good results so far.

G8SB (Horwich) has his "City Slicker" rotatable now and has added 7 new counties. Signals described as "colossal" have been heard from G5BY as well as other Southern stations, while regular contacts have been made with GI and GM; G8SB promises 70 cm. activity before long, having completed a G5BY-type converter. G2DCI (Speke) has been finding conditions much improved and his activity list shows he is hearing and working much of the DX. G6TF (Sheffield) has been on 2 metres since the end of May with 20 watts to an 832, and a 4-over-4 beam fed by 300-ohm ribbon through two $\frac{1}{4}$ -wave transformers and delta match. The receiver uses 6J6 stages as in the G2IQ circuit. Activity on 70 cm. is probable in the near future and already a start has been made with

the G3EJL converter. G6TF is a supporter of the present 2-metre Zone Plan, although he feels the London area could have a larger slice.

GW2ADZ (Llanymynech) worked eight PA's, three ON's and one F station on May 13, while the following morning he had a 30-minute chat with PAØEO. A claim is made for the first GW contacts with F (F3LQ), ON (ON4YV) and PA (PAØHA) on 2 metres. Now for DL and OZ! GW2ADZ has also maintained remarkably consistent contacts with G2CPL at over 200 miles, and G3BW and GW3KY have been heard through solid rock containing copper deposits. Early evening activity is too low for his liking as he has to be up and about at 0530 in the morning.

The Midlands and East

G3APY (Kirkby-in-Ashfield) reports after a long absence due to work on TV. 50 watts to an 829 are now in use on 2 metres and 9 watts to a CV53 as PA on 433 mc. A five-ele. Yagi is provided for each band. G2FNW (Melton Mowbray) asks us to keep the Zone

TWO-METRE ACTIVITY REPORT

G3BW, Whitehaven, Cumberland.
WORKED: G2AJ, 2BUJ, 20I, 3ABA, 3AHT, 3BLP, 3CSC, 3CXD, 3DA, 3DCI, 3EHY, 3ENS, 3FMI, 4LX, 5RW, 5TH, 5VN/P, 5WP, 6NB, 8KL, 8SB, G12FHN, 3GQB, GM3BDA, 3DIQ, 3EGW, 3FOW, 5VG. (May 17 to June 13.)

G8SB, Horwich, Lancs.

WORKED: G2AOK/A, 2BUJ, 2DCI, 2FZU, 3ABH, 3AHT, 3BK, 3BOB, 3BW, 3CXD, 3EHY, 5BY, 5CP, 5MA/P, 5TH, 5VN, 5VN/P, 5WP, 6NB, 6XM, 8KL, G12FHN, 3GQB, GM3BDA, 5VG, GW5SA.

HEARD: G2ATK, 2XS, 3A0O, 3ATZ, 3AYT, 3BLP, 3CGY, 3COJ, 3DA, 3EEZ, 3ENS, 3FMI, 3GMX, 4LU, 4OS, 5JU, 5RW, 5TP, 6LC, 6TL, 6VX, 8IL, 8SM, GW3KY.

G2DCI, Speke, Lancs.

WORKED: G3AHT, 3ATZ, 3BW, 3CSC, 3DA, 3EHY, 3GMX, 5BM, 8SB, GW2ADZ.

HEARD: G2CYN, 2XS, 3BLP, 3CXD, 3FMI, 5BY, 5RW, 6XM (May 31 to June 13.)

G6TF, Sheffield, Yorks.

WORKED: G2AJ, 2FNW, 2FO, 3CGO, 3EHY, 3ENS, 3WV, 5WP 6NB, 6XM, 6YO.

HEARD: G2HMA, 2IQ, 3ABH, 3APY, 3AVO, 3BLP, 3BUJ, 4HT, 5RW, GW2ADZ.

G4HT, Ealing, Middlesex.

WORKED: G2AIQ, 2ANL, 2AOK/A, 2DSW, 2FNW, 2HCG, 2KF, 2OI, 2QY, 2RI, 2XC, 2XS, 3ABA, 3AHT, 3AVO/A, 3CC, 3DIV/A, 3EBW, 3ENS, 4GR, 4MW, 5BM, 5IO, 5LK, 5LN, 5MA/P, 5RW, 5JK, 5UD, 8DM/A, 8KL, 8QY, 8SB, 8SY, GW2ADZ.

HEARD: G3APY, 3FMI, 5BY, 6WT, GW3EJM. (May 14 to June 11.)

G3AVO/A, Ramsey, Hunts.

WORKED: G2ADR, 2AJ, 2BUJ, 2CPL, 2FNW, 2FQP, 2HCG, 2NH, 2UI, 2XS, 2XV, 3AKU, 3BK, 3BOB, 3CGQ, 3CXD, 3DCV, 3DIV/A, 3EHY, 3ENS, 3FIJ, 3WV, 4DC, 4HT, 4MW, 5IB, 5MA, 5RW, 5WU, 6LL, 6NB, 6XM, 8SM, 8SY, PAØEO, ØHA, ON4IF.

HEARD: G2OI, 3ABH, 5BM, 8IL. (May 12 to June 10.)

G2AOL, Otford, Kent.

WORKED: G2XC, 3ABH, 3BHS, 3BNC, 3CGQ, 3EJL, 5MR, 5TP 6NB, 6WT, 6XM, 8IL.

HEARD: G2RI, 2BMZ, 2CPL, 2DSW, 2FNW, 3ABA, 3AVO/A, 3BK, 3DLG/A, 3EHY, 3ELV, 3FAN, 3RI, 4AP, 4MW, 5BY, 5HN, 5JO, 5MA/P, 5SK, 5UF, 5UM, 6JK, 8QY. (All over 40 miles. May 1 to June 12.)

G3DIV/A, Eastbourne, Sussex.

WORKED: DL4XS/DL3KE, F3DC, 3LQ, 8AA, 8JR, 8OL, 8QL,

F9DI, 9AE, G2AOL, 2KF, 2WJ, 2WS, 2XV, 2YL, 3AVO/A, 3BK, 3BLP, 3CAZ, 3CGG, 3EBW, 3FD, 4HT, 5JO, 5MR, 5RO, 6LO, 6VC, 8VR, ON4HC, 4HN, 4IF, 4IW, 4YV, PAØBAL, ØDT, ØEO, ØFN, ØTG, ØUN.

HEARD: F8GH, DL3FM, G2CIW, 3ELV, 8KZ, 8SK, 8SY. (May 14 to June 12.)

G5MR, Hythe, Kent.

WORKED: F3LQ, 8AA, 8GH, 8JR, 8LO, 8OL, 9AE, 9DI, G2AVR, 2UI, 2WS, 2XV, 3AFV, 3DIV/A, 3EBW, 5JU, 5RO, 5UM, 6XM, 8VR, GW2ADZ, ON4YV, PAØPN.

HEARD: F3DC, 8NW, 9MX, G2CIW, 2FMF, 2MV, 2NH, 2YL, 3ABH, 3AHB, 3AHT, 3BLP, 3CGQ, 3FXG, 3FYR, 3GBO, 3GSE, 5MA, 5MA/P, 5TP, 5WP, 6LK, 6NB, 6WU, 8IL, 8SM, PAØIK, ØMU. (May 13 to June 12.)

G3EHY, Banwell, Somerset.

WORKED: G2AIQ, 2CPL, 2HCG, 2IQ, 2NH, 2OI, 2RI, 2XV/P, 3AHH, 3AHT, 3AKU, 3AVO/A, 3BOB, 3BW, 3CGQ, 3CHY, 3CSC, 3DA, 3DAH, 3FD, 3FMO, 3FYR, 3GBO, 3GHI, 3GMX, 3VM, 3WV, 3YH, 4GR, 4KD, 4RK, 5IB, 5ML, 5TH, 5UD, 6CI, 6JK, 6LX, 6NB, 6TF, 6WU, 6VC, 6XM, 8GL, 8KZ, 8SB, 8SM, 8UZ, GW2ADZ, 3EJM, 5SA.

HEARD: G2DD, 2FZU, 3ABH, 3BK, 3CVO, 3CXD, 3EMY, 5JO, 5JU, 6OT, GM3BDA, GW3KY (May 15 to June 13.)

Plan going, and mentions that G3ALC (Oakham) will be active on Two shortly. G3AVO/A (Ramsey) put up a folded dipole in a hurry to work the May DX and knocked off one Belgian and two Dutch contacts. He asks if 270 miles is a record for a folded dipole contact on Two! An 8-ele. stack is now up and doing well, outperforming the original 4-ele. Yagi. G3AVO is another strong adherent for the Zone Plan.

G2CPL (Lowestoft) has heard DL3FM and DL4XS but could not raise them. The former was RST 589 on the evenings of June 5 to 9, and on June 11, while DL4XS was heard working G3DIV/A at midnight on June 9, RST559. A number of daily schedules are in operation from G2CPL and all are working smoothly. G3VM (Norwich), still using 18 watts, is maintaining his series with GW2ADZ, and in addition has worked some of the rarer Northern counties. Sussex is still needed in the South.

The South

G3FIJ (Colchester) is preparing seriously for 70 cm. and has an ASB8 working as well as a 5-ele. Yagi. A CC transmitter is also complete. G2AOL (Otford) is another who has trouble getting QSL's from VHF CC members. A G2IQ type converter has been completed and tested out on Two and outperforms the earlier Rx. An 8-ele. 430 mc. array is mounted over the 2-metre beam, and it is hoped to start activities on Seventycems soon. His experience of the Zone Plan has so far been favourable, and as G2AOL was one of its earlier critics your conductor is grateful to him for that comment.

G5MR (Hythe), facing Europe, wants a "Countries Worked" table introduced! As soon as space permits this will be considered, although it may not be possible for it to make a regular monthly appearance. Due notice will be given of its *debut* so that all claimants can be listed. G3DIV/A (Eastbourne) supplies the news that ON4YV has heard OE2PK. G4HT (Ealing) condemns any proposal to divide the 2-metre band into phone and CW sections. He also points out that of the 1167 contacts on 2 metres which he has made since last July, 814 have been with stations within 30 miles of him—this should answer those who have been heard declaring over the air that G4HT never works local stations! G5WP (Woking) has managed to contact G3BW several times and so hoists himself one up the Counties table.

G3DLG/A is active in Gosport with 24 watts to an SCR522 and a 5-ele. Yagi. G3BNC (Southsea), also at sea-level, has worked some DX including G2WJ, G2BMZ

TWO METRES COUNTIES WORKED SINCE SEPTEMBER 1, 1949 Starting Figure, 14	
Worked	Station
40	G6NB
38	G3BLP
37	G2OI
35	G3CGQ
34	G3EHY, G4HT
31	G2AJ, G2XC, G3ABA
29	G2XS, GW2ADZ, G8SB
27	G2CIW, G2CPL, G3 VM, G8IL
26	G5UD, G8IP, G8QC
25	G2FNW
24	G3FXG, G6VC
21	G3AVO/A
20	G3GBO, G3FIJ
19	G3BHS, G3EJL, G3GSE
18	G3BK, G6CB
17	G6CI
16	G8VR
15	G2AOL, G5MR, G5SK
14	G3CAZ, G3CWW, G3DCC

NOTE : Scoring for this table is cumulative and it will run for one year to August 31, 1950.

and G6WT. G3GOP (Southampton) using 16 watts and a CC converter into an S640 has also managed to work down to Devon.

G8IL (Salisbury) considers many Northern and other DX stations do not tune the *whole* band. Zone J seems to represent "the band" to many. Your conductor feels there is much in this. Many DX stations come back time after time to stations within 100 kc of 145 mc and anyone higher or lower in the band than that does not stand a chance. In addition, it often seems that even if no reply is received from Zone J no search is made of other Zones. As G8IL says, the habit of finding out what is coming in from *all* directions before calling CQ has not been sufficiently developed. Many stations put a second CQ out without allowing anything like sufficient time to *search* the band. G8IL is running a

TWO-METRE ACTIVITY BY ZONES AND COUNTIES

Zone A (144 to 144.2 mc)

Ayr: GM3DDE, GM3DIO
 Dumbarton: GM3FOW
 Fife: GM3EGW
 Lanark: GM3BDA, GM3EHI, GM3NG,
 GM5VG, GM6KH, GM6WL
 Renfrew: GM4HX

Zone C (144.2 to 144.4 mc)

Cumberland: G3BW
 Durham: G2FO
 Northumberland: G3CYY, G4LX
 Lancashire: G2DCI, G2OI, G3A00, G3CSC
 G3DA, G5TH, G5VN, G6LC, G8SB
 Yorkshire: G2IQ, G3CC, G6TF, G6YO

Zone D (145.8 to 146 mc)

Co. Down: GI2FHN, GI3GQB

Zone E (144.4 to 144.65 mc)

Cheshire: G2CYN, G3ATZ, G3AYT, G3GMX,
 G4OS, G5CP, G6TL
 Derbyshire: G2FZU, G5RW
 Leicestershire: G2ANL, G2FNW, G2RI,
 G3ENS
 Nottinghamshire: G3APY
 Staffordshire: G3CXD, G3EEZ, G8KL
 Warwickshire: G3ABA, G4RK, G5JU, G8QY

Zone F (145.65 to 145.8 mc)

Anglesey: GW3KY
 Glamorgan: GW2DUR, GW3EJM, GW5SA
 Monmouth: G4GR
 Montgomeryshire: GW2ADZ
 Shropshire: G3AHT, G4LU

Zone G (144.65 to 144.85 mc)

Bedfordshire: G3CGQ
 Buckinghamshire: G3AHH, G3CVO, G3GBO,
 G6CJ, G6JK, G6NB, G8QC

Cambridgeshire: G2AIO, G2XV, G3BK, G3DCV,
 G3WW, G4MW, G5JO, G8SY

Hertfordshire: G3FD, G5UM, G6LL

Huntingdonshire: G2FQP, G3AKU, G3AVO/A

Norfolk: G2XS, G3VM, G5UD

Suffolk: G2CPL

Zone H (145.25 to 145.5 mc)

Berkshire: G5HN, G6OH, G8LG

Dorset: G3ABH, G5UF

Gloucestershire: G2AOK/A, G5BM

Hampshire: G2DSW, G2NS, G2XC, G3ARL,
 G3BHS, G3BNC, G3CGE, G3DEP, G3DLG/A,
 G3EJL, G3ESS, G3FAN, G3GOP, G3RI,
 G6XM, G8LY

Oxfordshire: G5TP, G6KB

Wiltshire: G2BUJ, G4AP, G8IL

Zone I (145.5 to 145.65 mc)

Cornwall: G3EDN/A

Devonshire: G2BMZ, G5BY, G6WT

Somerset: G3EHY

Zone J (144.85 to 145.25 mc)

Essex: G2CIW, G2WJ, G3FIJ

Kent: G2AJ, G2AOL, G2KF, G2UJ, G2WS,
 G3AFV, G3BOB, G3CAZ, G5MR, G6VC,
 G6VX

London: G3BPM, G3FXG, G5PY, G6WU,
 G8VR

Middlesex: G2AHP, G2DD, G2FMF, G2QY,
 G3CWW, G3FYR, G3GSE, G4HT, G6UH,
 G8IP, G8SK

Surrey: G2ANT, G2MR, G2MV, G2NH,
 G2YL, G3BLP, G4CG, G5LK, G5WP, G6CB,
 G6LK, G8SM

Sussex: G2AVR, G2JU, G2MC, G3DIV/A,
 G3EBW, G5RO

Note: The frequencies given above are those recommended by the Two-Metre Zone Plan, but a few stations are not conforming.

successful daily schedule with G3EDN/A in St. Merryn (Cornwall). G5RP (Abingdon) has a new beam, 5-over-5, under construction, and should be active soon. G5BM (Cheltenham) has a nightly schedule with GI2FHN, but so far there has been no signal either way. G3BW is heard nightly, however.

G3EHY (Banwell) had a good 393-mile contact with PAØMU during the May spell, and can only find five days in the past month when over-150-mile DX was not possible in at least two directions. GM3BDA has been heard three times and good contacts have been made regularly with G2CPL (221 miles) and G3BW (232 miles). In order to indicate which parts of the band are being searched G3EHY will call "CQ SE" or "CQ London" whenever he is beaming that way. If only

CQ is called, the beam at G3EHY is pointed North and the northern zones are being searched for signals.

Quickies

Last-minute news comes in from G2OI (Eccles) who heard the Continental DX even although he could not work it. He hopes to be active on 430 mc by the time this is in print. G2CIW (Romford) considers the North as a dead-loss to him. He has cured some TVI trouble and is well on the way for 70 cm. operation. G6CI (Kenilworth) has completed a G2IQ type converter and uses a BC455 as IF. GM3BDA (Airdrie) says that GM3OL is temporarily inactive as he damaged his 2-metre beam while putting up one for TV, which apparently gives excellent results in

Dumfries! GM3BDA, himself, is feeding his 2-metre beam with open-wire line and finds results superior to co-ax. feed. He apologises for being out of the correct Zone but he rubbed too much off his crystal!

G3GNR (Southwick, Sussex) sends some news of DL activity. DL7AH (Berlin) and SP5ZPZ will be active on Two. The former has the G2IQ converter in use. DL1FV also hopes to be on soon from a point 6 miles south of the Danish border.

G8VR (Abbey Wood) now has a G2IQ converter and is hearing them much better at longer distances; he worked PAØPN on June 9. A test schedule on 430 mc is being run with G2AOL at the other end. G2MC (Brighton) says he is in Zone J "like a good boy." Good boy! G3CGQ (Luton) is also a strong supporter of the Band Plan, and mentions a certain non-co-operator who almost nightly puts out auto CQ calls right on top of the GDY from the North. G3WW (Wimblington) remarks that June 4 was a very good night—G5BY was heard at great strength calling East Anglian stations on Two for a 70 cm test, after making the new record with G6LK. G3WW has had numerous repeat contacts on Two, including several new counties, and now has a 5-over-5 Yagi; a test with G2XV (Cambridge), who was using his new 3-over-3-over-3, produced S9 plus 36 dB at the G3WW end, compared with S3-4 only when taken on the single 5-ele. Yagi.

Notes from PA

PAØLU reports that G3DIV/A is consistently the strongest G with PAØUN and PAØPN, though between them the PA's are hearing or working many other G's. A spell of good conditions since May 28 has produced a number of first-time inter-Continental QSO's on two metres, with DL's, PA's, F's and ON's working one another.

Apart from DL4XS/DL4KE already mentioned, following is a short list of Europeans known to be regularly active on Two: DL1DA (Stuttgart, 144 mc), DLIHC (Heidelberg), DL3FM (Essen, 144.72 mc), DL3NQ (Mannheim, 144.33 mc), DL4CK (Wiesbaden, 144.05 mc), DL4DD (Munich), F8YZ (Nancy, 145.4 mc), ON4HN and ON4YV (Antwerp).

The PA VHF Contest, mentioned in this space last month, will be over by the time this appears—in order to concentrate some active interest in this event, we circulated to as many G's as was possible in the time a notice setting out the details, and hope that a good number were able to be on throughout the two operating periods. Please let us have your logs, under the (a) and (b) headings as set out in our notice, by the earliest date you can. And if

TWO METRES ALL TIME COUNTIES WORKED LIST Starting Figure, 14 From Fixed QTH only	
Worked	Station
45	G3BLP (263)
44	G2OI
41	G5WP
40	G2AJ (225), G5MA, G6NB
39	G3ABA (141), G3EHY (154)
38	G2IQ, G2NH (212)
37	G5BY
36	G3CGQ, G6XM
35	G4HT (220), GW2ADZ
34	G2XC, G4DC (188), G5BM
33	G3WW
32	G8WV
31	G2XS (136), G3VM, G4LU, G3CXD
30	G2CPL (149), G4AU (123), G6LK, G8SM (172)
29	G2CIW (197), G8SB
28	G2HDY, G6VC
27	G3DAH, G5JU, G8IL (103), G8IP (176)
26	G2ADR, G3BW, G8QC (126)
25	G2FNW, G6UH (184), G6WT
24	G3FXG (100), G8KL
23	G2NM, G3BOB, G3EJL, G8QY
22	G4RK
21	G3AVO/A
20	G3FD, G3FLI, G3GBO (122), G8KZ
19	G3BHS, G3GSE (116), G5SK, G6CI
18	G3BK, G6CB, GM3OL
17	GM3BDA
16	G5PY
15	G2ANT, G3CWW, G5MR, G8VR
14	G3CAZ, G4LX

NOTE: Figures in brackets after call are number of different stations worked; starting figure, 100.

anyone heard or worked SP5ZPZ, DL7AH or PA1PL on Two during the period July 1-2, they are quite genuine!

Seventycems

As is evident from the station news above, interest in 70 cm. working is on the increase and many are actively preparing for operation on that wavelength. G2DD (Stanmore) has been putting out an excellent signal on 437.7 mc using a 12-ele. stack and a wire-netting reflector. He has worked G6LK cross-band. G2ANT (Godalming) has been heard at G2XC. G8LY (Lee-on-Solent) has a Tx ready and hopes to have the Rx going before long. Others who should be there in the next month or so are G2AOL (Otford), G2CIW (Romford), G2OI (Eccles), G3FIJ (Colchester), G4HT (Ealing), G6TF (Sheffield) and G8IL (Salisbury). G3APY is, of course, on the band in Notts and G8GX is operating from Northwood Hills.

There has been an enthusiastic welcome for the new converter circuits published in the last two issues of *Short Wave Magazine*, and with reference to the dimensions of the Lecher bars in the G3EJL circuit (see the correction

in "Here and There," this issue), any who may have made them up to the printed figures will be encouraged to know that G2XC has them the "wrong" size, 1½-in. instead of 1¼-in. wide, in his converter, but they worked in spite of that by removing the tabs forming the fixed condenser C5.

It would be easy to start an argument on the relative merits of different types of aerial for Seventycems. G3BLP (Selsdon) remarks that four elements are enough for any single-tier Yagi, any additional elements giving little gain but much undesired directivity. Your conductor is of the same mind, although it must be admitted that some excellent results are being achieved by stations using multi-element Yagis. The G5BY array, pictured this month, is an example of another type of beam that is obtaining results. At G2XC a 60-degree corner reflector is in use and is believed to be slightly superior to the previous 7-ele. Yagi. It certainly has overcome the narrow-angle beam difficulty.

G5BY has put some ¼-wave shorts to ground on each of his feeders to reduce the amount of 2-metre energy radiated. That this is effective is shown by the following figures obtained during a test with G3CGE (Southampton): Direct 145 mc signal, S9 plus 30 db; 145 mc signal from 70 cm Tx, S8; 145 mc signal from 70 cm Tx with ¼-wave shorts, S2. G5BY is operating on 436.55 mc.

TWO METRES

BEST TWENTY

May 1950

Station	Total Miles	Best Contact	
		"Call"	"Miles"
GW2ADZ	6151	PAØHA	417
G3EHY	4092	PAØMU	393
G2CPL	4064	G3EHY	207
G3BW	3885	G6VX	270
G8SB	3441	G5MA/P	210
G3CGQ	3379	PAØIK	280
G5MR	3135	GW2ADZ	216
G2OI	3131	G5MA/P	195
G4HT	2817	G8SB	173
G2FNW	2315	ON4YV	250
G12FHN	2294	G2OI	162
G3FIJ	1422	PAØUW	180
G2AOL	1055	G3ABH	101

For this table send details of date, mileage and call signs of best twenty contacts made during previous calendar month. No station to be counted more than once per day (0600 to 0600 GMT).

Best Twenty of the Month

The rule which allows competitors for the Best Twenty each month to include a station once every 24 hours has been coming in for much criticism. In fact, two stations have voluntarily limited themselves to once per month for each contact in their claim! As the majority are decidedly in favour of a limit being put on repeat contacts it has been decided to return to the original rule which permitted a second contact with a station (for Best Twenty purposes) only after seven days had elapsed from the first one. This rule becomes effective again for the Best Twenty during July.

The Clubs

Several new members have been enrolled in the Fiveband and VHF Century Clubs recently, and a special welcome is given to PAØZQ, on having achieved the VHFCC distinction; he is the 68th member of the VHF Century Club.

It is with regret that we report that G6VX has found it necessary to resign from his position as Club representative in the London area. He has done much for the Clubs, including organising several very successful social functions. It is hoped to appoint a

successor in the near future and also to arrange for a club meeting in the North. Members' suggestions on this would be welcome.

THE MONTH ON SEVENTYCEMS

Two-Way Contacts

G5BY/G6LK	161 miles
G5BY/G5TP	155 miles
G2XC/G5BY	132 miles
G3EJL/G5BY	119 miles
G3RI/G5BY	119 miles
G2BMZ/G3EJL	100 miles
G3ABH/G5BY	90 miles
G3ABH/G6LK	70 miles
G2XC/G3ABH	41 miles
G5TP/G6LK	36 miles
G2XC/G6LK	32 miles
G3ABH/G3EJL	30 miles

(Only contacts over 30 miles shown above)

Calls Heard

At G2XC : G2ANT (30), G3DEP (11)
 At G3EJL : G6LK (41)
 At G6LK : G2DD (33)

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DIRECT SUBSCRIPTIONS

Readers who may now be seeing the *Short Wave Magazine* for the first time should note that it can be obtained from us by direct subscription, posted on publication day, at a cost of 20s. for a year of 12 issues. We already have a very large direct subscriber circulation, and a department specially organised to deal with it. Some overseas subscription rates are : America, \$3.08 ; Canada, \$3.40 ; France, Fr.1078 ; Belgium, Fr.154 ; Sweden, Kr.16 ; Switzerland, F.14 ; Holland, Gdr.11.70. Order, with remittance, on the Circulation Manager, Short Wave Magazine, Ltd., 53 Victoria Street, London, S.W.1.

MARINE RADIO EQUIPMENT

For those amateurs who are also yachtsmen, or otherwise in touch with owners of small craft who ask for advice about "the wireless," the brochure on the Philips "Mermaid Radiotelephone" will supply most of the answers. This is a self-contained, combined receiving and transmitting unit for operation over the band 1.6-3.8 mc, designed and built for ship-board operation by unskilled operators. Power supply can be either 12- or 24-volt accumulators, any sort of aerial can be matched in, and both Rx and Tx can be set up on a number of spot frequencies, as desired within the operating range ; the general

In Conclusion

Many thanks to all those who were kind enough to write congratulating your conductor on his very temporary holding of the 70 cm record, and also for all the interesting reports that have come in once again for this issue. Next month's news should be sent to E. J. Williams, G2XC, *Short Wave Magazine*, 53 Victoria Street, London, S.W.1, to reach us by July 13 latest. With you on August 4.

MORE TWO-METRE FREQUENCIES

G2FNW	144.4	GM3BDA	144.42
G2MC	145.11	GM3EGW	144.2
G3AVO/A	144.72	GM3EHI	145.0
G3FUJ	145.2	GM3FOW	144.2
G8SB	144.25	GM4HX	144.15
DL4XS	144.5	GM5VG	144.18

The above figures are those quoted by correspondents and have not been measured on the air.

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design conforms to statutory requirements for such equipment. Write the Communications Dept., Philips Electrical, Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

MORE HISTORY

At this writing (as they would say across the water), we have before us a copy of our respected contemporary, *Wireless World*—for July, 1913. Priced at 3d. monthly, of 62 pages, the 35 pages of advertising are mainly for W/T Schools and tailors supplying uniforms for "Marconi operators." And what fine chaps those operators were—they went to sea with spark gaps and coherer detectors, and worked coast stations from mid-Atlantic. In the section "Hints for Amateurs," H. W. Pope (PZX of those days), now active as G3HT, contributes an article on his experimental station ; the transmitter consisted of a ¼-kW transformer, a "Marconi-type sliding jigger and primary inductance," and something which is described as a "non-synchronous rotary discharger of the treadmill type with flat blades, driven by a small DC motor." Well ! The G3HT of those days could use only one wavelength, 450 metres, but he was hoping to get a bit more flexibility by making a condenser. At that time, station PZX was notching up the DX by working West Malling at 22 miles, and St. Albans at 30 miles. What memories !

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the quarterly issue of the *Radio Amateur Call Book* in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

DL2QF	Capt. G. E. Watson, R.E.M.E., M.E. Directorate, H.Q., B.A.O.R. 1.	G3GMQ	R. S. Brown, 28 Ashton Avenue, Burtonstone Lane, York.
G2BCY	J. E. Corston, 23 Whitefield Terrace, Heaton, Newcastle-upon-Tyne, 6.	G3GMV	N. H. Rhodes, 75 The Turnways, Headingley, Leeds, 6, Yorkshire.
GM2BWF	E. D. Fleming, 4a Newton Terrace, Glasgow, C.3.	G3GMX	H. G. Glover, 83 Sylvan Avenue, Timperley, Cheshire. (Tel: Sale 4724).
G2FDO	B. C. Lowing, 19 Purley Road, Edmonton, London, N.9.	G3GMY	F. E. A. Green, 68 The Drive, Barnet, Herts. (Tel: Barnet 3146).
G2FDO/A	B. C. Lowing, 98 Myddleton Road, Hornsey, London, N.8.	G3GNL	M. Frost, 15 Northbourne, Hayes, Bromley, Kent.
G2FOL	H. Yeoman, 29 Henthorn Road, Clitheroe, Lancs.	G3GNP	N. Couch, 7 Brenda Crescent, Thornton, Liverpool, 23.
G2FTQ	B. W. Finney, 24 Old Croft Road, Walton, Stafford.	G3GNT	Sig. I., P. Wood, Sgts' Mess, R.A.F. Station, Hendon, The Hyde, Colindale, London, N.W.9.
GM2FV	W. Scott Hay, Kirk Lane, Newton Mearns, Glasgow.	G3GNW	A. Taylor, 6 Springfield Drive, Blackheath, nr. Birmingham.
G3ASR	Edgware and District Radio Society (Middlesex), c/o 3 Albany Court, Montrose Avenue, Edgware, Middx.	G3GOA	H. B. Nield, Assoc. M.C.T. A.M.I.E.E., Newcot, Chichester Drive (West), Saltdean, Brighton, Sussex. (Tel: Rottingdean 3412).
G3DOW	R. J. Clarke, 43 Murchison Road, Hoddesdon, Herts.	GM3GOE	D. H. Hayward, 27 Milton Street, Abbeyhill, Edinburgh, 8.
G3EFT	G. H. Mounteny, 34 Gloucester Road, Bognor Regis, Sussex. (Tel: Bognor Regis 1749).	G3GOG	R. Mallinson, 38 West Oak Hill Park, Liverpool, 13. (Tel: STO 5371).
G3EOH	D. W. Furby, 54 Oakhurst Road, Enfield, Middlesex.	G3GOK	B. F. Glass, 54 Chiltern Road, Baldock, Herts.
G3EQW	L. D. Hunt, Victoria Cottage, Burleigh, Brimscombe, Stroud, Glos.	G3GON	R. M. Sharp, 112 St. Michael's Hill, Bristol, 2.
G3EXU	J. W. Cunliffe, King's Head Hotel, Appleby, Westmorland.	G3GOP	S. R. Tuckley, 7 Creighton Road, Millbrook, Southampton.
G3FCH	Jean D. Knowles, 8 Victory Drive, Forest Town, Mansfield, Notts.	G3GOT	B. W. Le Grys, 75 Shaftesbury Road, Romford, Essex.
G3FDU	J. A. Bladon, Stoneycroft, London Road, Alderley Edge, Cheshire.	G3GOZ	P. M. Elton, 29 Linthorpe Road, New Barnet, Barnet, Herts.
G3FGY	T. Darn, 73 Stanley Avenue, Ripley, Derbyshire.	G3GPB	R. Radford, 5 Shrublands, Potters Bar, Middlesex. (Tel: Potters Bar 4078).
G3FIQ	A. W. H. Cox, 30 Wolverton Gardens, Hammersmith, London, W.6.	G3GPD	J. Austin, 51 Adeline Street, Goole, Yorkshire.
G3FLU	P. S. Leeds, 20 Blomfield Road, Mile Cross Estate, Norwich, Norfolk.	G3GPF	S. A. Sheppard (ex-D2HQ), 25 Leopold Road, Liverpool, 7.
G3FME/A	J. C. Scott, 14a Crabton Close Road, Boscombe, Bournemouth, Hants. (Tel: Boscombe 34473).	G3GRA	J. Spencer, 31 Byng Road, Barnet, Herts. (Tel: BAR 6806).
GM3FRI	W. A. Mitchell, 32 Gordon Road, Mannofield, Aberdeen.	G3HDW	J. D. Ward, 152 Higham Road, Tottenham, London, N.17.
G3FSH	K. J. Pegg, 38 Melton Avenue, Littleover, Derby.	G3HVM	V. Male, 85 Common Rise, Walsworth, Hitchin, Herts.
G3FWH	S. G. Stephen, 6 Denewood Road, Westbourne, Bournemouth, Hants.	G6GT	W. A. T. Allen, 6 Monks Way, Reading, Berks.
G3FWX	N. J. Worthington, 11 Primrose Croft Hall Green, Birmingham, 28.	G6JZ	C. Fenton, Goat Road, Cockermouth, Cumberland.
G3GAX	E. T. McGowan, 20 St. Williams Way, Rochester, Kent.		
G3GGA	H. J. Lucas, Bartley Grange, Bartley, Hants.	DL2DV	CHANGE OF ADDRESS F/Lt. A. P. Morgan (G8DV), Officers' Mess, R.A.F. Station, Fassberg, B.A.F.O., B.A.O.R. 23.
G3GGI	A. Laurence (ex-MB9BJ), 38 The Ridgeway, Enfield, Middlesex. (Tel: Enfield 1919).	G2DVA	D. R. Bradley, 32 South Manor Way, Woolton, Liverpool.
G3GIQ	H. F. Lewis, 65 Leyborne Avenue, West Ealing, London, W.13.	G3ABI	F. T. Brown, 18 Caryl Road, St. Annes-on-Sea, Lancs.
G3GIT	Royston and District Radio Club, Community Association Centre, Old Post Office, Royston, Herts.	G3BLU	H. D. Stanley, 37 Copes Avenue, Dresden, nr. Longton, Stoke-on-Trent, Staffs.
G3GIZ	Chester and District Amateur Radio Society, The Tarran Hut, Y.M.C.A. Grounds, Chester.	G3DCC	E. J. King, 109 Marlborough Park Avenue, Sidcup, Kent.
G3GJI	E. D. Sayliss, 67 Woodhouse Road, Intake, Sheffield, 12.	GM3DIQ	W. C. Bradford, Hillside Nursery, Greenhead, Stevenson, Ayrshire.
G3GJL	Worcester and District Amateur Radio Club, City Library and Museum (Basement), Foregate Street, Worcester.	G3DZS	H. Fudge, 53 Buckland Way, Worcester Park, Surrey.
G3GKE	F. H. Irvine, 24 Greatfield Road, Farnborough, Hants.	GM3FVX	W. Forsyth, Gasworks House, Auchencleck, Ayrshire.
G3GLF	C. R. Smith, 2 Byegrove Road, Colliers Wood, London, S.W.19.	G3FWI	K. W. Keenan, 3 Linaker Street, Southport, Lancs.
		G3WS	F. S. A. Jenkins, 3 Fore Street, Chulmleigh, Devon.
		G5RY	R. Wright, 273 Northway, Maghull, nr. Liverpool.

Here and There

Bad Habit

There is an increasing tendency for operators engaged in a chatty phone QSO to sign themselves over as rapidly as possible (which in itself is no bad thing provided the call is clearly enunciated) by using an abbreviated callsign—which is a very bad thing, and contrary to the terms of the licence. Clause 10 lays it down that the callsign must be given at the beginning and end of every transmission, for identification purposes; if the prefix letter and number are left off when signing, then clearly “an offence is being committed within the meaning of the Act.” And, after all, as individuals we are identified by our full callsigns, even if in the case of G1BF the “G1” is silent.

North Atlantic Epic

On June 2 the 25-ft. sloop *Vertue XXXV* arrived at Brooklyn, New York, after crossing the Atlantic under sail in 47 days with a crew of two only. A 5-tonner, she is thought to be the smallest vessel ever to have made the crossing. The radio receiver with which she was fitted was a “Q-Max All-Dry Four” supplied by Berry’s (Short Wave), Ltd., the well-known Holborn firm of radio manufacturers.

“CC 70-Centimetre Converter”

A slight but important drawing error, to which we are hastening to draw attention, appears on p. 258 of the June issue, relating to the Lecher tuning circuit for G3EJL’s 430 mc converter. That vertical dimension in the upper section given as $\frac{5}{8}$ -in. should be $\frac{3}{4}$ -in., making the total width of the assembly $1\frac{1}{2}$ -in. In practice, it will probably be found that the effect of using the narrower width is to make the condenser tabs C5 unnecessary, as it has been found that the Lecher line when cut to a total width of $1\frac{1}{4}$ -in. (as defined by the drawing) will tune into the 430 mc band without them.

Unit Type R.3515 for TV

An interesting article in the current (July) issue of our *Short Wave Listener & Television Review* discusses modifications, with a complete circuit diagram showing all values, to the R.3515 surplus unit, which is also the same as

the Unit Type 194. The second part of the article on the BC-348 conversion goes into the question of IF stage modifications, the fitting of a noise limiter, and also deals with the addition of an S-meter in three possible ways.

The amateur band DX feature “Have You Heard?” compiled by a certain long-bearded old gentleman from the gleanings of an army of keen SWL’s who miss nothing and report it all, is as full of meat as ever; furtive enquiries on our part have disclosed that the reason this feature is so popular with transmitting readers is because it gives so much up-to-the-minute information between the appearances of “DX Commentary” in the *Magazine*. Well, that’s what they say!

Short Wave Listener & Television Review costs 1s. 4d. post free (16s. by subscription) and can be ordered of the Circulation Manager, Short Wave Magazine, Ltd., 53 Victoria Street, London, S.W.1.

Anodising Aluminium

To get that professional-looking matt finish on aluminium, a solution of washing soda (sodium carbonate) can be used with safety and satisfaction. But on p. 263 in the June issue it is implied that caustic soda (sodium hydroxide) can also be used for the same purpose, which it can, the suggestion being that it is the same thing, which it certainly is not. In fact, a caustic soda solution must be treated with the utmost respect, as it attacks not only aluminium but also clothes and human flesh with extreme rapidity. So get these chemicals clearly sorted out, and *do not* monkey with *caustic* soda unless you know what you are doing.

Bedside Thanks

There is more than one amateur, stricken by some illness or infirmity preventing the full enjoyment of life, to whom Amateur Radio is both a mental tonic and an abiding solace. G3FZG, of Ward 5, Mill Lane Sanatorium, Wallasey, Cheshire, operates a CW rig on Forty from his bedside and has had about 100 contacts since getting on the air. He asks us to say how grateful he is for the kindness and consideration of those amateurs who have realised how much a word of good cheer and a prompt QSL can mean.

Keep in Touch—Read the Magazine regularly



The other man's station G6TF

THE subject of our story this month is G6TF, owned and operated by A. A. Jones at 18 Cowley View Road, Chapeltown, Sheffield, who has been busy on all bands since the resumption in 1946.

On the transmitting side, a band-switched exciter running 6V6-807-807-807 gives output at 3.5, 7, 14, 21 and 28 mc, selected entirely by switching. The PA stage consists of a pair of LS50's (German) in push-pull, with 800 volts on the plates. For telephony operation, the speech unit comprises a m/c microphone into EF39-6C5-6N7 (phase splitter)-triode 6V6's driving a pair of 807's in AB-2. For receivers, G6TF has an S.640 and an 11-valve, home-built superhet incorporating a 100-kc calibration oscillator. On Ten, this equipment is operated with a 3-element rotary beam, motor driven and with remote indication, mounted on a 30-ft. tower.

Station activities also include attention to

the VHF bands, 145 and 430 mc, G6TF having already been busy on 5 metres when we had that band. Though his interests are mainly experimental and QSO'ing as distinct from DX, the log showed 70 stations worked in six countries and 20 counties on 5 metres up to the time of the close-down, and on Ten as at December last year G6TF had worked 66 countries and 37 W States on phone. Lately, attention has been turned to TV—and TVI!—and with a VCR97 good pictures are being received from Sutton Coldfield at a distance of about 65 miles.

Auxiliary equipment at G6TF includes a crystal-checked frequency meter, phone/CW monitor, CRO, GD meter, field strength meter and a modulation level indicator. All this gear is self-built and since the station also runs home-constructed receiver and transmitter (excluding the S.640), G6TF can fairly claim that his is an entirely home-built station—in these days not a very usual distinction.

The Month with the Clubs

FROM REPORTS RECEIVED

Judging by the volume of mail for this feature, activity is slightly down this month and some Clubs have suspended operations for the summer period. Even so, we have reports from 35 Clubs; a number have responded to our request of last month for information about their total membership; it would be very helpful if all secretaries could let us have this figure with each report sent in, as we are most anxious to maintain accurate records covering Club activity generally.

In addition to the Club reports noted in the following pages, we have received a number of local news sheets and club magazines: *The Radio Link* (West Cornwall Radio Club); *CQ CF* (Cardiff and District Group); *Experimental Radio Derby* (Derby and District Amateur Radio Society); *News Letter* (Midland Amateur Radio Society), and *The Brighton Link* (Brighton and District Radio Club). All these publications reflect the enthusiasm of those hard-working and often unthanked officials responsible for their production.

Our next (August) issue will carry the preliminary notice of the 1950 MCC, the fifth in the *Short Wave Magazine* series of Club Contests on the Top Band.

Closing date for next month's reports will be Tuesday, July 11—this early date is necessary because the calendar says the August issue must be out on the 4th of that month. If you cannot meet this date, hold your report for the September issue, for which the closing date will be August 15. Address them all to Club Secretary, *Short Wave Magazine*, 53 Victoria Street, London, S.W.1.

Babcock and Wilcox Staff Association Radio Society.—A contest for a Receiving Trophy opens on June 1; this will be an annual award, but will be presented this year on the merits of six months' work. Participation is open to members of the Dumbuck Club Radio Section at the Dumbarton Works, and of the B. & W. Staff Association in London. Meetings are on the first and third Fridays, and a Club station is being built this summer.

Bournemouth Radio and Television Society.—Members recently visited the works of

Messrs. Aish & Co. at Poole, where they saw interesting developments in production technique and some of the latest test equipment in the servicing section. Forthcoming events include a visit to a local BBC station and an outing for the benefit of the ladies. The shack is now equipped with a Tx and two receivers. Next meetings are on July 6 and alternate Thursdays thereafter Cricketers' Arms, Windham Road, Bournemouth.

Chester and District Amateur Radio Society.—A monthly news letter made its appear-

ance last month, and should become a regular feature. Discussions, lectures and demonstrations are laid on for following months. Membership is steadily increasing but the HQ will hold many more. Queries should be addressed to the Hon. Sec. or, in person, at the Tarran Hut, YMCA Grounds, Chester, any Tuesday evening at 7.45 p.m.

Clifton Amateur Radio Society.

—A demonstration and talk on TVI was given at the May meeting, with the help of a member. A Junk Sale was held, also, and a new class on Radio Fundamentals has begun. Three more members sat for the RAE, and May broke a record for attendances. Future programme includes lectures on Radar and D-F, and an actual D-F Contest.

Edinburgh Amateur Radio Club.

—This Club is going along very well, and since its own Tx, GM3HAM, has been on the air, members have shown an increased interest. 80-metre CW is the present "beat." Meetings will be curtailed during the summer months, and will be at fortnightly intervals until the AGM on September 13. They will be held at Unity House, 4 Hillside Crescent, Edinburgh. Membership now totals 41.

Radio Society of Harrow.

—Meetings continue to be well attended, with new members joining nearly every week. Morse classes continue, and a number of members are awaiting the results of the RAE. The Club Tx goes on the air twice a month—contacts will be welcome on July 6 and 20. A Newsletter now circulates among members. On July 13, G4GB, the President, will describe the construction of a one-valve superhet. Visitors will be welcome on Thursdays, 7.30 at Eastcote Lane Primary School, South Harrow.

Hounslow and District Amateur Radio Society.

—At the May meeting four interesting "lectorettes" were given, covering the Fundamentals of Logarithms, an RF EHT Unit, a Low-Range Ohmmeter, and an electrical Pick-up for Musical Instruments.



The dinner of the Sutton and Cheam Radio Society on March 11 last was graced by the presence of the Mayor and Mayoress. (Croydon Times)

Details for the summer programme are not yet available, but will be published in this feature next month.

Lewes and District Model Engineering Club.—This Club continues to meet in Southover Grange every Friday at 7.30 p.m., and a welcome awaits prospective members. Work on the Club Tx continues, and a start has also been made on a 14- and 28-mc converter. If anyone can help with details of the US Navy Receiver Type CIH 46159A, the club would be very grateful!

Mansfield District Radio Society.—The monthly meeting last month took place at the Swan Hotel (May 26). Club night continues, every Tuesday evening at the Westfield Folkhouse, and the next regular meetings are at the Swan Hotel on July 2 and August 13 at 3 p.m. The station now holds the call G3GQC.

Midland Amateur Radio Society.—An interesting lec-

ture was recently given by Dr. Summer on "Human Vision and Television." Dr. Summer is well known in television circles and has a wonderful knowledge of the subject. His lecture, with slides, aroused the admiration of the members. Monthly meetings are on the third Tuesday, Imperial Hotel, Birmingham.

South Manchester Radio Club—After a very successful month, May activity concluded with the D-F Contest on the 27th. The Club station operated in portable form, and the first receiving team arrived in one hour and ten minutes. This was headed by G2AUC; a second team under G3ESK arrived 19 minutes later, but the others had to open their sealed envelopes to locate the tea! The two winners were due to address the members at the June meeting on the subject of the gear used. Next meetings, to which prospective members are invited, are on July 7 and 21—Church Schools, Northenden, at 7.30 p.m.

Spn Valley Radio and Television Society.—Interest in TV is stepping up, and a series of five lectures is under way. The Club recently visited Cranwell and joined the local Radio Society in the Lincolnshire Hamfest. Another outing is planned for September, when it is hoped to visit an airport. Spn Valley also collaborated with local Rotarians at their Handicraft Exhibition in Cleckheaton Town Hall; they demonstrated home-built gear and operated a station (G6PL/A). Two ingenious members also built a "Nickelodeon" of the electronic variety which "played" when pennies were inserted! This became a useful identification signal for the station on the stand.

Swanton Morley Amateur Radio Club.—This Club has just been formed at Swanton Morley RAF Station (East Dereham, Norfolk); it owns the call G3GLJ; and among the members are G3CPQ, G3FNX, G3DKQ, G3GGY, ex-G3FNL and ex-GW3CKB. Further information will be

passed on as Club activities increase.

Wakefield and District Amateur Radio Society.—Having made a successful start, membership now totals 34. During the summer the meetings will be informal and fortnightly (July 12 and 26 for a start), at Carr Lodge Café, Horbury. Visits to the BBC and a few manufacturers are proposed, also a Field Day and a social outing to Knaresborough. Slow Morse is transmitted on 1850 kc at 7.30 p.m. most weekdays, operators being G2AQN, 2AVK, 3DMP and 3ESP.

Warrington and District Radio Society.—During June, talks were given on Decibels (G3EXG) and 3-cm. Communication (G3LZ). An Inter-Club Contest on Top Band phone has been arranged for the last Sunday in September among the neighbouring clubs. A cup will be awarded to the winner and there will also be a listening contest.

West Kent Radio Society.—Last month's debate entitled "Television—For or Against" brought forth the verdict as "Against"! This month has seen much activity, chiefly connected with Field Day, and some excellent visits have now been arranged. A Radio Model Control lecture and demonstration is also booked for the future. New members will be cordially welcomed.

West Somerset Radio Society.—Activity continues at a high level both in Minehead and Taunton, and it is now hoped to open up some organised activity in the Bridgwater area. Taunton did some portable work on June 4, and a visit to the GPO station at Burnham was arranged for June 11.

Wirral Amateur Radio Society.—G2YS, from Chester, was a recent visitor, and he gave an interesting talk on Amateur Radio in the Midlands. A D-F Contest is scheduled as a future event. July meetings will be on the 5th and 19th, both at YMCA, Whetstone Lane, Birkenhead—7.30 p.m.

Weymouth Radio and Television Club.—This Club is now in a permanent HQ and its station, G3GNU, is installed. Monthly meetings are held on the last Thursday at 7.30 p.m. A News Sheet is published, Morse classes are running, and a weekly series of television lectures has been very successful.

Wolverhampton Amateur Radio Society.—A varied programme is maintaining a high level of interest. Activities included an Annual Dinner in May and a local Camp and Field Day in June. Station visits will be held on July 3 and the AGM on July 24, with a carefully arranged mixture of lectures and demonstrations. A stand, with transmitting station, is being organised at the Floral Fete in West Park on July 14 and 15.

Worthing and District Amateur Radio Club.—Meetings continue on the second Monday of the month, 7.30 p.m., at the Adult Education Centre, Worthing.

Brighton and District Radio Club.—The summer programme is well under way; Mr. Atkinson, who gave an interesting demonstration on "Radiesthesia," has promised a further talk on the subject. In July Mr. F. How will talk on his own 7-valve Superhet and the Viewers' Association on Locating TVI. Two evenings are set aside for informal ragchews, and the Club Tx will be on the air those evenings.

Grafton Radio Society.—Grafton scored a WAC during their Field Day outing and thoroughly enjoyed the event. The Committee are, therefore, organising two further weekends in July, during which G3AFT/P and G3RX/P will be looking both for DX and for other Clubs.

Kingston and District Amateur Radio Society.—Recent events have included a lecture by G6AT on Electronic Computing, and a "Try-out Field Day" on which some very useful experience was gathered. Future lectures include one on Recording. The

new Shack is getting along and meetings are well attended. July gatherings are on the 5th and 19th, Penrhyn House, at 7.45 p.m.

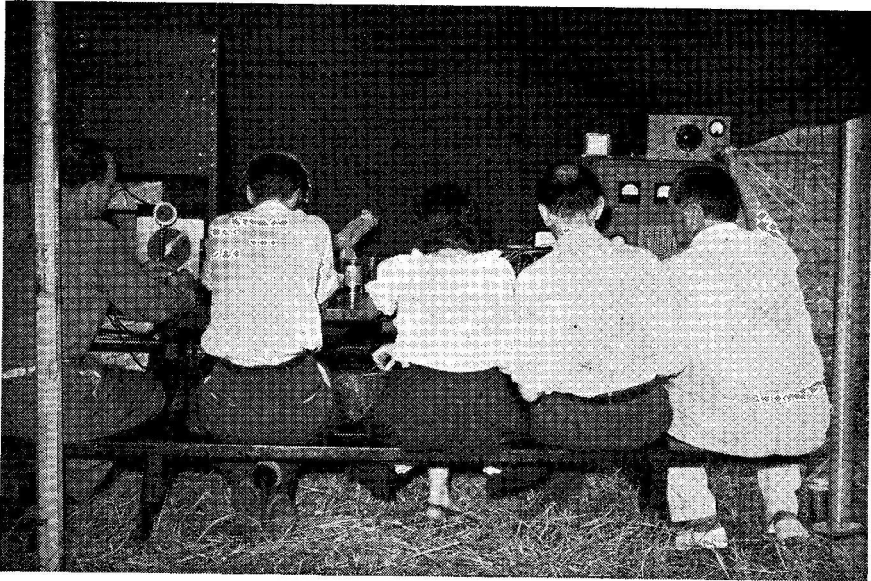
Leeds and District Amateur Radio Society.—A Social Evening was held in June to conclude a very successful season, and the Club will reopen about the third week in September. A Field Day is scheduled for July 8 and 9, using the Club Tx G3BEW/P. Members are asked to attend a meeting on the 7th to discuss final details.

Newbury and District Amateur Radio Society.—At a recent business meeting the rules were drawn up and it was decided that present officers remain in office until the AGM. A general committee of five is now in being. Morse classes will begin at the June meeting, and all interested persons are invited on the last Thursday of the month to the Railway Hotel, Greenham Road, Newbury.

Romford and District Amateur Radio Society.—The Field Day crew enjoyed the contest immensely and worked about 200 stations. A member has offered to design and build a new Tx for the Club Shack, and it is hoped that this will be under way shortly. On July 25 Mr. Erskine gives his fourth lecture on TV (in a series of twelve!) and it is hoped that members will turn out in force.

Surrey Radio Contact Club (Croydon).—On July 11, G6DH is travelling from Clacton to lecture on The Design of Modern Communications Receivers, with special reference to the DCR 19. A "Club Night on the Air" is being discussed, at enable all members to become better known to each other. Their views on this will be welcomed. The nominal roll of 109 members is under review to check activity.

Sutton and Cheam Radio Society.—Two transmitters were specially built by members for Field Day working, and one of these will be installed in the Club Shack for



Study in concentration. A Trans-Atlantic /P event, this being the Two-Metre tent manned by the Westchester group for an ARRL VHF Field Day. The operator on the right is swinging the 16-element beam, and the Tx in the right background ran 30 watts input. During the 24-hour period, 104 different two-metre stations were worked, though conditions are reported as being fair only.

use with the call G3FGA. The recent 420-mc demonstration was highly successful, and an efficiency of 70 per cent. was claimed for the equipment. Next meetings are on July 4 and 18.

Wanstead and Woodford Radio Society.—This Club was in attendance at a local Fête, as usual; the forthcoming highlight is a Field Day on July 16, when other Clubs are asked to look out for G3BRX on the Top Band. Morse classes and Beginners' Periods are held at every Tuesday meeting at Wanstead House. Active members total approximately 20.

Watford and District Radio and Television Society.—Meetings continue at the Cookery Nook, The Parade, Watford, on the first and third Tuesdays. On July 18 there will be a lecture by Mr. G. P. Anderson, G2QY. An advertising campaign has brought membership up to 62 despite the summer weather, and attendances

average 25 to 30. Most of the active transmitters in the district are members, and Study Groups are being formed to enable those with similar interests to get together.

Yeovil Amateur Radio Club.—The Wednesday meetings at Grove House, Preston Road, are regularly supported, and the Clubroom has proved an ideal location for transmitting. Meetings are spent mostly in ragchewing and operating the Club Tx, G3CMH; members have built a modulation indicator and a phone monitor, and a two-element beam for 28 mc is almost complete. Membership numbers only 14, and more members are sought from among the known enthusiasts in the neighbourhood.

Worcester and District Amateur Radio Club.—Members and "prospectives" are urgently asked to attend an important meeting on July 6. Every effort

will now be made to complete the Club Tx, and a Top Band Net is being formed for ragchews and Morse practice. A recent acquisition of surplus gear has included scores of two-pin sockets (10A/11290); the plugs (female) for these are sought, and Clubs interested in a "swop" are asked to get in touch with the Hon. Sec.

Tees-side Amateur Radio Society.—Owing to members' holidays, it has been decided to close down from June 8 until September. The Field Day event went off (almost) without a hitch, and the Club think they have improved on last year's scores.

Reading Radio Society.—At the meeting at the end of May, Mr. Benbough talked on the various VFO circuits, and demonstrated the constructional points to watch with a demonstration of equipment. Future programmes have not yet been settled, but details will be given later. Membership now stands at 60.

NAMES AND ADDRESSES OF CLUB SECRETARIES :

BABCOCK & WILCOX : L. E. J. Manders, G2CRD, B. & W. Staff Assn. Radio Society, Babcock House, Farringdon Street, London, E.C.4.

BOURNEMOUTH : P. R. Lockwood, 1149a Christchurch Road, Boscombe.

BRIGHTON : L. Hobden, 17 Hartington Road, Brighton.

CHESTER : R. Windsor, 17 Hough Green, Chester.

CLIFTON (S.E. LONDON) : W. A. Martin, G3FVG, 21 Brixton Hill, S.W.2.

EDINBURGH : D. A. E. Samson, GM3EQY, 56 Elm Row, Edinburgh, 7.

GRAFTON (N. LONDON) : W. H. C. Jennings, G2AHB, Grafton L.C.C. School, Eburne Road, London, N.7.

HARROW : S. C. J. Phillips, 131 Belmont Road, Harrow Weald.

HOUNSLOW : A. H. Pottle, B.Sc., 11 Abinger Gardens, Isleworth, Middx.

KINGSTON : R. Babbs, 28 Grove Lane, Kingston, Surrey.

LEEDS : L. H. King, G3CML, 14 Clarence Street, Bramley, Leeds.

LEWES : C. H. E. Moore 2 Old Station House, Friars Walk, Lewes.

MANSFIELD : F. Knowles, G3DBF, 8 Victory Drive, Forest Town, Mansfield, Notts.

MIDLAND : A. W. Rhodes, 135 Woolmore Road, Birmingham, 23.

NEWBURY : A. W. Grimdale, G3CJU, 164 London Road, Newbury.

READING : L. Hensford, G2BHS, 30 Boston Avenue, Reading.

ROMFORD : D. L. K. Coppendale, G3BNI, 9 Morden Road, Chadwell Heath.

SOUTH MANCHESTER : M. I. Wilks, G3FSW, 57 Longley Lane, Northenden, Manchester.

SPEN VALLEY : N. Pride, 100 Raikes Lane, Birstall, nr. Leeds.

SURREY (CROYDON) : S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.

SUTTON AND CHEAM { J. Harris, 143 Collingwood Road, Sutton.
R. I. Clews, 1 Hurstcourt Road, Sutton.

SWANTON MORLEY : F/Lt. A. E. White, S.M.A.R.C., R.A.F., Swanton Morley, East Dereham, Norfolk

TEES SIDE : J. H. Davies, 85 Cobden Street, Thornaby-on-Tees.

WAKEFIELD : W. Farrar, G3ESP, Holmcroft, Durkar, Wakefield.

WANSTEAD : R. J. C. Broadbent, G3AAJ, Wanstead House, The Green, E.11.

WARRINGTON : J. Speakman, Davyhulme Cottage, Dark Lane, Whitley, nr. Warrington.

WATFORD : R. W. Bailey, G2QB, 32 Cassiobury Drive, Watford.

WEST KENT : A. C. Pollard, 28 Greentrees Avenue, Tonbridge.

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WEYMOUTH : J. Hubbard, 74 Franchise Street, Weymouth.

WIRRAL : R. A. Browning, 24 Norbury Avenue, Bebington, Cheshire.

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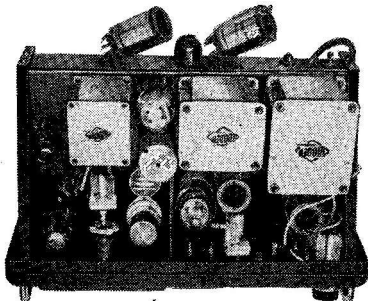
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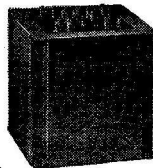
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H.S.30.	Input 200/250v. Output 300/0/300v. 80 m/a		17/6
H.S.3.	Input 200/250v. Output 350/0/350v. 80 m/a		17/6
H.S.2X.	Input 200/250v. Output 250/0/250v. 100 m/a		19/6
H.S.30X.	Input 200/250v. Output 300/0/300v. 100 m/a		19/6
H.S.3X.	Input 200/250v. Output 350/0/350v. 100 m/a		19/6
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F.S.2.	Input 200/250v. Output 250/0/250v. 80 m/a		19/6
F.S.30.	Input 200/250v. Output 300/0/300v. 80 m/a		19/6
F.S.3.	Input 200/250v. Output 350/0/350v. 80 m/a		19/6
F.S.2X.	Input 200/250v. Output 250/0/250v. 100 m/a		21/6
F.S.30X.	Input 200/250v. Output 300/0/300v. 100 m/a		21/6
F.S.3X.	Input 200/250v. Output 350/0/350v. 100 m/a		21/6
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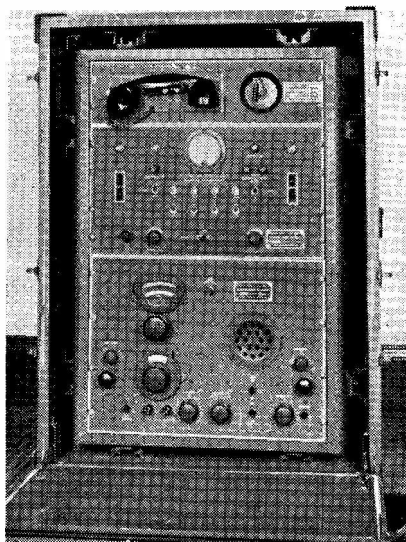
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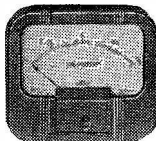
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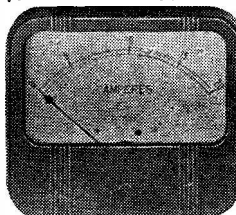
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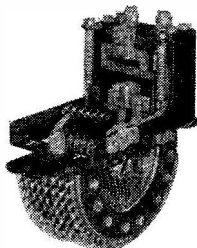
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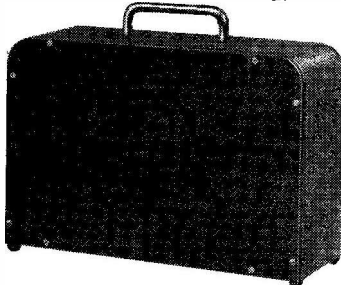
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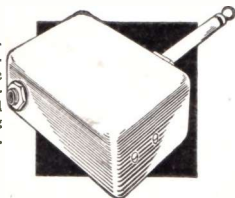
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Valves include : 3/6C5, 2/807 and 2/AV1 FW4/5/800). Controls are located on the steel front panel. Unit complete in varnished wooden cabinet with carrying handles.

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ASB8 RECEIVER CAY46ACE

12-valve double superhet operating on 516 mcs.

Containing an R.F. stage 446A lighthouse triode in a precision machined silver-plated cavity.

955 1st oscillator 460 mcs.

955 Mixer.

2/6AC7 1st and 2nd I.F. 55 mcs.

615 2nd oscillator 39 mcs.

6AC8 Mixer.

2/6AC7 1st and 2nd I.F. 15 mcs.

6H6 Dicde detector.

6AC7 Video amplifier.

6AC7 Cathode follower, 230 ohm. output.

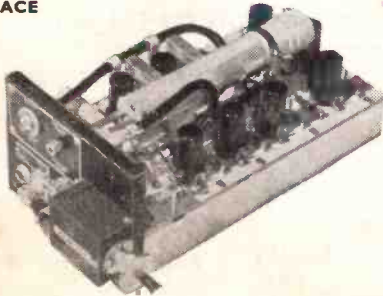
By recalibrating, this set can be tuned to the 425 mcs. band.

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of Ex-Service Equipment. Send 6d. to cover distribution cost. Please Print name and address.

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A 6-valve superhet suitable for shipping, with frequency coverage of 195 to 9,050 kc/s in four switched bands.

I.F. stages 900 kc/s and 125 kc/s, 1/R.F. 3/1.F. and output stage constitutes the general line-up, the third I.F. provides C.W. oscillations.

Valves are : 4/12SF7, 1/12SA7, 1/12A6, and 1/991 stabilizer.

HT power from dynamotor, 28v, 1·5 amps input, 260v at 70 m/a output, mounted sub-chassis, valves wired in series/parallel, giving 24v heater circuit.

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Clydesdale's
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Printed in Great Britain by Lochend Printing Co., Ltd., London, S.W.9, for the Proprietors and Publishers The Short Wave Magazine, Ltd., 53 Victoria Street, London, S.W.1. The Short Wave Magazine is obtainable abroad through the following : Continental Publishers & Distributors, Ltd., William Dawson & Son, Ltd., CANADA—Imperial News Co., of Canada ; AUSTRALIA AND NEW ZEALAND—Gordon & Gotch, Ltd. ; AMERICA—International News Company, 131 Varick Street, New York. Registered for transmission to Canada and Newfoundland by Magazine Post. July, 1950.