Stand by to receive full information on the great new all band solid state Trio communications receiver Model JR·599

Ask at your local dealer or send for full information on the JR-599 receiver £185.00 and all other Trio models including: TS-510 transceiver and PS-510 power supply £180.00 (the pair); VFO-5D (Variable Frequency Oscillator for TS-510) £25.00; 9R-59DS receiver £47.50; JR-310 receiver £77.50; SP-5D speaker £4.38 and HS-4 headphones £5.98.

exclusive United Kingdom distributors
b.h.morris and co.(radio) limited
84-88 Nelson Street, London E1 2DY. TEL: 01-790 4824
KW offers a complete range of equipment—ensure your investment in equipment pays dividends—buy KW*

*KW equipment holds its value longer—compare "trade-in" prices for 1-5 year old equipment, with other makes. Spares, for all KW equipment stocked for a minimum of 5 years—this is well worth considering.

NEW KW PRODUCTS

KW202 RECEIVER, 10-160 metres SSB/AM/CW, with Mechanical Filter, built-in "Q" Multiplier (Peak & Null), 500 kHz VFO covering all Bands. Two-Speed VFO Drive. Excellent Sig./Noise and sensitivity performance. Very attractive (similar in appearance to KW2000B). 100 kHz Crystal Calibrator price £140 carriage extra.


KW 101—Standing-Wave-Ratio meter £32.50. KW 103 SWR/Power meter 0-100 & 0-1000 watts £12.50. KW 103 with Dummy Load cox Coax Lead £20.50. KW 105 Antenna Tuning System including E-Z Match, SWR Ind., Dummy Load, Antenna Switch, 5 position, £36.00. Also KW Trap Dipole with twin feeder and 4 other types (only the original Trap from KW is good enough for you). KW E-Z Match ATV, KW Low Pass Filters, KW & HZP Baluns, etc.

KW for HY-GAIN, MOSLEY, G-WHIP, POLYQUAD, WEBSTER, HUSTLER ANTENNAS. SHURE Microphones, CDR Rotators. VIBROPLEX Keys, etc.

Write for details today

K. W. ELECTRONICS LIMITED
1 HEATH STREET, DARTFORD, KENT Telephone: Dartford 25574 Cables: Kaydublew Dartford

EASY TERMS ON EQUIPMENT AVAILABLE OVER 12, 18 OR 24 MONTHS
The Drake TR-4 is a product of years of transceiver experience and design improvements. The resulting performance makes it one of the finest transceivers available. Its operating handiness is not only evident in circuit design, but also in packaging. Compact and lightweight, it is ideal for mobile use, portable excursions, and vacations. USB, LSB, CW, or AM operation is at your finger tips with 300 watts P.E.P. of communication power.

Now available with plug-in noise blanker.

**INCLUDED FEATURES:**

1. 300 Watts P.E.P. input on SSB, 260 watts input on CW.
2. Complete Ham Band Coverage: all necessary crystals for 80 thru 10 metre ham bands.
3. Separate Sideband Filters: separate USB and LSB filters eliminate oscillator shifting and insure long term carrier vs filter alignment.
4. Nominal 1.7:1 Filter Shape Factor: These filters stand among the industry’s finest with 6 dB bandwidth of 2.1 kHz (chosen to slice thru QRM), 60 dB bandwidth of only 3.6 kHz and 100 dB ultimate rejection.
5. Diode Detector for AM reception.
6. CW Side Tone Oscillator for monitoring your CW transmission.
8. Crystal Calibrator.
9. VFO Indicator Light eliminates confusion of which main tuning knob controls the frequency when using an RV-4 remote VFO.
11. Full AGC with Drake dual time constant system confines a 60 d signal change to a 3 dB audio change.
12. Effective Transmitting AGC insures clean SSB output.
13. Solid State Permeability Tuned VFO for low drift and accurate 1 kHz divisions on all bands.
14. VOX or PTT for use on AM or SSB.
15. Receiver S-Meter automatically switches to indicate transmitting AGC on transmit.
16. Transmitter Plate Ammeter indicates Relative RF Output at the touch of a button.
17. Adjustable Pi-Network

**SPECIFICATIONS:**

- **Frequency Coverage:** Full coverage over all amateur bands 10 thru 80 meters, in seven 600 kc ranges: 13.5 to 14.1 mc, 7.0 to 7.6 mc, 13.5 to 14.3 mc, 21 to 21.5 mc, 28 to 28.6 mc, 28.5 to 29.1 mc, 29.1 to 29.7 mc. Drastic State VFO: Has linear permeability tuning. Tuned 4.9 to 5.5 mc for all ranges.
- **Dial Calibration:** 10 kc divisions on main tuning dial and 1 kc division on the tuning knob skirt. Effective length of circular dial scale is over 14 inches.
- **Frequency Stability:** High stability solid state VFO tunes same range on all bands. Drift is less than 100 cycles after warm-up, and less than 100 cycles for plus or minus 10% line voltage change.
- **Modes of Operation:** SSB Upper and Lower Sideband, CW and AM. Mixes 20 tubes including voltage regulator; two transistors; 8 diodes; 100 kc crystal calibrator built-in. Dimensions: 51" high, 108" wide, 14" deep. Weight: 16 lbs.
- **Power Supply Requirements:** Due to the 300 watt P.E.P. input rating, the TR-4 will require supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows:
  - 1. 650 volts at 300 ma average and 500 ma maximum with 10% regulation from 100 ma to 500 ma and maximum ripple of less than 1%.
  - 2. 250 volts at 175 ma with 10% regulation from 150 ma to 180 ma. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than 1%.
- **I.F. Selectivity:** 2.1 kc at 6 dB, 3.6 kc at 60 dB.
- **Sensitivity:** Less than 4 microvolt for 10 dB S/N.
- **Audio Output Power:** 2 watts. Impedance: 4 ohms.
- **Audio Response:** 400 to 2500 cycles at 6 dB.
- **Antenna Input:** Nominal 50 ohms.
- **Dimensions:** 54" high, 104" wide, 14" deep. Weight: 16 lbs.
- **Voltage and Current Requirements:**
  - 1. 650 volts at 300 ma average and 500 ma maximum with 10% regulation from 100 ma to 500 ma and maximum ripple of less than 1%.
  - 2. 250 volts at 175 ma with 10% regulation from 150 ma to 180 ma. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than 1%.
- **I.F. Selectivity:** 2.1 kc at 6 dB, 3.6 kc at 60 dB.
- **Sensitivity:** Less than 4 microvolt for 10 dB S/N.
- **Audio Output Power:** 2 watts. Impedance: 4 ohms.
- **Antenna Input:** Nominal 50 ohms.
- **Dimensions:** 54" high, 104" wide, 14" deep. Weight: 16 lbs.

**RADIO SHACK LTD.**

Just around the corner from West Hampstead Underground Station

**£299.50**
THE SHORT WAVE MAGAZINE

November, 1971

TELECOMMSS G3SDE
AMATEUR COMMUNICATIONS—ELECTRONIC COMPONENTS SALES AND SERVICE

WE ARE SOUTHERN STOCKISTS OF TRIO EQUIPMENT
TRIO TS510 transceiver with P510 power supply ... £100
TRIO JR310 SSB receiver, Ham band only ... £75-50
TRIO JR500 Communications receiver ... £90-50
TRIO RY51DS All band receiver ... £42-50
TRIO JR399 Tuner/PEF Ham band receiver ... £185
TRIO HS-4 Padded headphones ... £9-35
SP-SD Communications speaker ... £4-00

We now carry the full range of TRIO ACCESSORIES available ex-stock.
CW FILTER for TS510 ... £1-4
10AZ Mechanical filter for JR310 ... £14-67
25 kHz marker unit for JR310 (less crystal) ... £7-34
100 kHz Calibration Crystal HC16U ... £3-18
OAZ Mains Voltage Stabiliser ... £9-7
B1016/C Hand held Communication Type Mic for TRIO
TS510 transceiver ... £3-38
LESSON TV/OSA Table Standing microphone with battery
preamplifier ... £7-95
TTC MOBILE HI-IMPEDANCE DYNAMIC MICROPHONE
Hand held with p.t.t. facility especially suited to SSB use ... £3-35
plus 15p Post and Packing

(Morse) Desk Microphone
Chrome satin finish, with PTT facility. High impedance dynamic
mics, specially suited for communications purposes.
PRICE 6s plus 50p P. & P.

MORSE KEYS
New ex-govt. morse keys with jack plug and lead. Fully adjustable
contact spacing and spring tension.
PRICE 49p plus 15p P. & P.

SPECIAL OFFER ! PRINTED CIRCUIT BOARD
S.R.B.P. Copper laminate board, sizes cut to your requirements.
(max. size 4ft. by 3fc.) (PRICE £12 15p per sq. ft.)
Fibre glass laminate board
(max. size 3fc. by 21fc.) (PRICE 15p per sq. ft.)
Allow plenty of postage—excess will be refunded.

ADIMIRALTY PATTERN MORSE KEYS. Few only of these popular
"Brass Founders. Base size 6" by 3". Price 75p, post and packing 15p

NEW BOXED SIFAMETERS (Special Price)
Type M2S 0-250v. 2½ sq. ... (P.P. 12p) £1-50
Type M312 0-500v. 3½ sq. ... (P.P. 12p) £1-20
Type M303 0-100 m/3 A ½ sq. ... (P.P. 12p) £1-20
Type M305 0-250 m/3 A ½ sq. ... (P.P. 12p) £1-20
Type M306 0-50 m/3 A ½" sq. ... (P.P. 12p) £1-20

NEW ARI TRANSFORMERS (Standard mains primary)
Type 1 0-315v. at 180 m/A, 170v. at 30 m/A, 6-3v. at 3-2A.
Price 75p plus 25p post
Type 2 0-320v. at 60 m/A, 10-5-10-5v. at 3A., 6-3v. at 1A.
Price 25p plus 25p post
Type 3 370-3-370v. at 80 m/A, 3-15-0-3-15v. at 3A, 6-3v. at 1A.
Price 95p plus 25p post
Type 4 ALBION ... 0-2-15v., 16-25 volts, both at 1A.
Price 80p plus 12p post
Type 5 Reading ... 400-0-400v. at 200 m/A, 6-3v. at 3A., 6-3v. at 2A.
Price £1-50 plus 25p post
Type 6 WODEN ... 0-20-22.5-2-25-2-30-32.5v. at 15A 200v.,
at 50 m/A, 6-3v. at 2A., 6-3v. at 1A.
Price £4-60 plus 125p post
DUBJER Nitrogel capacitors (Block paper) 8 mfd. at 800v. ... 49p

WRITE NOW FOR OUR LATEST COMPONENTS LISTS
For the caller we have a comprehensive range of components at competitive prices.

Shop Hours: Mon. to Sat. 10 a.m.—7 p.m. Half day closing Thursday.
Terms: Cash with Order. Tel.: PORTSMOUTH (0705) 60036

73's From 73 TWYFORD AVENUE, STAMSHAW, PORTSMOUTH, HANTS.

G3EKX S.S.B. PRODUCTS

ATTENTION PLEASE!
ALL KINDS OF RECEIVERS AND TRANSMITTERS REQUIRED FOR IMMEDIATE CASH OR PART EXCHANGE. SEND DETAILS NOW!
S.A.E. HELPS

XTALS! XTALS! XTALS!
STATE YOUR REQUIREMENTS. Send no money just an S.A.E.

THOUSANDS ! New metal-cased XTals (not ex-Govt.) 2 to
7 mc. 50p, 12 mc. upwards £1.50 each. 26-28 mc. miniature.
We might have it at 50p plus 5p P. and P. S.A.E. pse.

* PYRAMID LINEAR KITS *
80-10m. 15" x 11" x 6". Built-in siliconised power unit. 800w.
1750 p. (unit, 3 meters. Special offer all parts, cabinet, etc. (£2) £81-00

SCABAR TX. XTAL FILTERS plus carrier atal
(circuit, etc.) all parts ... ... ... (20p) £8-50

NEW EQUIPMENT ! READY FOR DESPATCH!
EDDYSTONE EB36 Pk. 2 with V.H.F. ... £90-00
EDDYSTONE Cabinet Speaker (grey) ... £6-70
EDDYSTONE EC10 Pk. 3. The very latest ... £7-15
EDDYSTONE 924 Pack ... £7-15
TRIO Ham Receiver JR399 ... £77-50
TRIO Ham Receiver JR310 ... £180-00
TRIO Transceiver, TS510 and P5510 ... £318-00
TRIO HS4 Phones £3-97

G3EKX

COMPONENTS SALES AND SERVICE

DUBLIER Nitrogel capacitors (Block paper) 8 mfd. at 800v.
Type 6 WODEN :-0-20-22.5-2-25-2-30-32.5v. at 15A 200v.
Type 5
Type 4
Type 3
Type 2
Type 1

NEW EQUIPMENT ! READY FOR DESPATCH!
EDDYSTONE EB36 Pk. 2 with V.H.F. ... £90-00
EDDYSTONE Cabinet Speaker (grey) ... £6-70
EDDYSTONE EC10 Pk. 3. The very latest ... £7-15
EDDYSTONE 924 Pack ... £7-15
TRIO Ham Receiver JR399 ... £77-50
TRIO Ham Receiver JR310 ... £180-00
TRIO Transceiver, TS510 and P5510 ... £318-00
TRIO HS4 Phones £3-97

STAMSHAW, PORTSMOUTH, HANTS.

NEW EQUIPMENT ! READY FOR DESPATCH!
EDDYSTONE EB36 Pk. 2 with V.H.F. ... £90-00
EDDYSTONE Cabinet Speaker (grey) ... £6-70
EDDYSTONE EC10 Pk. 3. The very latest ... £7-15
EDDYSTONE 924 Pack ... £7-15
TRIO Ham Receiver JR399 ... £77-50
TRIO Ham Receiver JR310 ... £180-00
TRIO Transceiver, TS510 and P5510 ... £318-00
TRIO HS4 Phones £3-97

SPECIAL OFFER ! PRINTED CIRCUIT BOARD
S.R.B.P. Copper laminate board, sizes cut to your requirements.
(max. size 4ft. by 3fc.) (PRICE £12 15p per sq. ft.)
Fibre glass laminate board
(max. size 3fc. by 21fc.) (PRICE 15p per sq. ft.)
Allow plenty of postage—excess will be refunded.

CLASS "D" WAVEMETERS. (Untested) offered with brand
new dual axial (tested). Handbook and phono... £3-75
* or 240v. A.C. input. Fully tested. Reconditioned (75p) £10-75

FOR IMMEDIATE ATTENTION.
Send no money just an S.A.E.

EMSSAC EQUIPMENT

The TX2 two metre transmitter is becoming increasingly popular
among discerning hams who require AM, FM and CW at the flick
of a switch. Send s.a.e. for details and specifications of this and
our other lines.

We also have available a PR2 two metre pre-amp on miniature
ircuit board with positive and negative earths. It uses 2N128
and comes to you for £2-25.

In stock for immediate dispatch—HC18/U 38-666 MHz, £1-25.
Send s.a.e. for our big lists showing other crystals available in
ovetone and fundamental types.

EMSSAC CRYSTAL SERVICE

Crystals ground to your specified frequency—20 MHz fundamental
and 005% tol. HC6/U HC18/U and HC6/U sleeved to fit
FT243 socket—all one price £2-25.

Send large s.a.e. or Telephone: West Kingsdown 2344

GUARDS

G3JAR

ELECTRONIC & MECHANICAL SUB-ASSEMBLY Co. Ltd.
HIGHFIELD HOUSE, WEST KINGSDOWN,
Nr. SEVENOAKS, KENT.
Insure against distortion with Shure

Shure Model 444—controlled magnetic microphone specially designed for radio communications applications with special response characteristic giving optimum speech intelligibility.

Please send me full information on Shure Communications Microphones.
Name:
Address:

Shure Electronics Ltd.
84 Blackfriars Rd., London SE1. Tel: 01-928 3424
### North West Electrics

769, Stockport Road, Levenshulme, Manchester, 19.

Phone: 061-224 4911

**G3MAX**

**Eddystone and Trio Receivers. Diecast Boxes.**

**Jackson Capacitors and Drives.**

**Denco Coils.**

**"Radiospares" Transformers and Components.**

**'Q' Max Cutters.**

---

**24 Hour Electric Clock.** Copal 222. Very readable figures, 1" high. Front measures 5" x 2½". £3-75, P.P. 25p.

**Control Box.** 6" x 5" x 3". Contains 500ua 1½" Meter. Desyn Res 180° travel, 4 rotary sws. 500 and 1k var res. The desyn will match our indicators by using 2 to 1 radio on the drive, 87½p, P.P. 24p.

132ft. Copper Aerial Wire. 7 strand 26 swg. fitted with 4 sets Bakelite chain insulators. 10ft. insulated lead in wire, supplied on 8" cable drum, 84½p, post 35p.

**Polypropylene Rope.** 500lb. strain. 100 yd. reel, £1, post 15p.

**Modulator, Type 105.** Ex-TR 1986 series. 2-6C4 in push pull. EP92 Mic amp. EL91 driver. New, boxed with circuit, 75p, post 25p.

**Small Power Transformers.** Drop through Mts. 3" x 2½" x 2½". Above chassis, post 27½p each. 240v, 100mA, 6-3V, 2A; LT, 61-35. 180V, 40mA. 6-3V. 2A; LT, 87½p. 180v, 25mA. 6.3V. 2A LT, 70p.

**Coax Link Lead.** 8' 6" cable with 2 Burndep/Londex coax plugs, 35p each, post 15p. (50Ω impedance).

**AR88 MAINS ON/OFF C.W. SWITCHES.** New Boxed, 32½p. post 5p.

**Vibrators.** 12 volt synchronous. Type No. 12SR7. 50p each. Special offer 3 for £1, postagte 15p.

**Converter Chassis.** New spares for transistorised UHF tuner. Contains 6 gang min. var. cap. 4 tube trimmers, in screened sections, 25p, post 15p.

**Jacksons 6/36 Slow Motion Dial and Drive.** £1-55, post 15p.


**Brown Bros.** Twin lever paddle. The best for the CW enthusiast. £7-50, post paid in G.B.


---

We would be pleased to receive QSL Card for Display.

---

**CV416 (6F17) Valve.** 30p each, post 5p, or 4 for £1-20, post paid.

**5½ Desyn Indicator.** 75p, post 25p.

**3½ Desyn Indicator.** 62½p, post 20p. Compass degrees and corrector on 5½ Desyn only.

200 + 200 + 100 mfd. 350v. D.C. wkg. 4½" x 1½", 37½p each, post 12½p. 10 for £3-00 post 25p. Ideal for high voltage psu. 10 in series makes 50 mfd. 3-5 Kv.

**Mains Transformer for AR88LF.** Brand new, £3-00, post 50p.

**Tuner Unit.** 2-Roller coils, 1½" dia. 5½" long. 3-Minature D.C. motors. 3-Sangamo relays 200-0-300 micro amp movement. 6-700 ohm sealed relays. 3-170 ohm sealed relays. 1-500 uA meter. £3-00, post 65p.

**Aircraft Flasher Unit.** High quality clockwork movement, £1-50, post 25p.

**IF Strip.** Ex R3673 Rx. 7.5 mH with circuit. Less valves. 8 B7G PTFE holders. Sealed relay twin 500 ohm coil. 12-pin plug and socket, 50p, post 20p.

**Converter 20 to 90 MH.** 7-5 mH IF. Ex 3673 Rx. 2/EF91's. 1-6/6 Osc., £1-35, post 20p. Some less valves, 75p, post 20p.


**Control Unit Type 304.** This unit contains: 3½" desyn indicator. 5 mA right hand zero meter. 1½" dia. 6-var. res. with gear drive on 2½ DP push buttons. 2-1-pole 12-way, 1-8-pole 5-way. 2 bank switches. 3-62, 2-42 ohm 5W res. Excellent value, 82½p, post 27½p.

**Solarton Scope CD 643S.** Good condition, £40. Personal callers only.

---

**Business Hours:** Tues.-Fri., 9.30 a.m. to 6.30 p.m.

**Saturday:** 9 a.m.-5 p.m. OPEN ALL DAY.

**Closed all Day Monday.**

---

We welcome all enquiries however small. Stamped addressed envelope please.
R. T. & I. ELECTRONICS LTD.

where equipment is fully overhauled

EDDYSTONE 840, as new £135.00 (£11.50)
HAMMARLUND H1017-A £170.00 (£15.00)
STANDARD 300 £110.00 (£9.50)
HALLICRAFTERS HT 41, 1200 Watt Linear Amplifier £85.00 (£7.00)
EDDYSTONE 910 Mk II, as new £65.00 (£5.00)
TRIO T510 & PS510 £150.00 (£12.50)
EDDYSTONE 888A
STANDARD 240
EDDYSTONE 840
EDDYSTONE 834
HEALTHKIT "MOHICAN" £25.00 (£2.00)
HEALTHKIT "MOHICAN" £25.00 (£2.00)
HEALTHKIT "MOHICAN" £25.00 (£2.00)
LAFAYETTE H80-90 £150.00 (£12.50)
EDDYSTONE EA12 £150.00 (£12.50)
R.C.A. AMBRIL £25.00 (£2.00)
TRIO 9S-9-DE £160.00 (£13.33)
HALLICRAFTERS SX-100

WE CAN ALSO SUPPLY ANY MAKE OF NEW EQUIPMENT — and have pleasure in

ENGLIA, 2 metre converters (state I.F. required). £15.00 (30p).
AVOMETERS, Model 7, Mk. 2, £37.60 ; Model 8, Mk. 2, £25.00 ; Multimeter, Mk. 4, £13.50 ; Standard leather carrying case (Models 7, 8, 9, 40). £15.00 ; Every-Ready dicto, £7.40 ; Multimeter leather case, £3.30 ; 10KV D.C. Multiplier for Standard leather carrying case (Models 7, 8, 9, 40). £6.50 ; Model 8, Mk. 4, £40.90 ; Model 9, £57.50 ; 3P-3D Loudspeaker, £4.37 (30p) ; Headphones, HS-4, £15.97 (30p) ; NEW TR-399 TRANSMITTER (to match JR-599). £185.00 (£1.00) ; Leathered available.

SHURE MICROPHONES, £44.00 (£3.00) ; 44A, £13.50 (40p) ; A4, £6.50 (30p) ; 201, £3.40 (30p) ; Full details on request.
KEYNECTORS, piano key mains connector units, £3.75 (30p).

Terms: C.W.O., Approved Monthly Accounts, Hire Purchase
Carrige for England, Scotland and Wales shown in brackets.

At R.T. & I. we have full H.F. facilities
Part exchanges are a pleasure
We purchase for cash
We offer a first-class overhaul service for your electronic equipment, whether you are an amateur or professional user
We have EASY Parking facilities
We welcome your enquiries for specific items which, although not advertised, may very well be in stock.

"JOYMATCH" III. Aerial Tuning Unit, £13.99 (30p).

TRIO EQUIPMENT, Transceiver, TS-510 & PS-510 a.c.p.s.u., £180.00 (£2.00) ; VFO-SD for above, £25.00 (£2.50) ; Receivers, JR-599, £185.00 (£1.50) ; JR-310, £77.50 (£1.00) ; JR-399-350, £65.00 (£1.00) ; 120W-505 (50p) ; 45W-505 (50p) ; 3P-3D Loudspeaker, £4.37 (30p) ; Headphones, HS-4, £15.97 (30p) ; NEW TR-399 TRANSMITTER (to match JR-599). £185.00 (£1.00) ; Leathered available.

R. T. & I. ELECTRONICS LTD.
Ashville Old Hall, Ashville Road, London, E.11 Tel: 01-539 4986

The NEW SAMSON ETM-3 SQUEEZE - KEYER

is now available!

With SQUEEZE-KEYING you make such characters as C, Q, Y, L, AR, SK, etc. with fewer paddle movements.

Butts.

For use with double - dot dot - ratio. Weight only 2½ lbs.

This key is now available !

JUNKER PRECISION HAND KEY. Superb German straight reed relay (400v., IA contacts). Sidetone. TUNE button.

Key made for professionals afloat and ashore.

SAMSON STA Speaker/Amplifier, for ETM-2/ETM-3, £23.50.


Better even than the ETM-2 — get yours now !

£24.75 Post paid U.K.

... and still going strong —

SAMSON ETM-2 electronic keyer, £21 (£22.20 with mercury batts.).

SAMSON STA Speaker/Amplifier, for ETM-2/ETM-3, £23.50.

UNKER PRECISION HAND KEY. Superb German straight key made for professionals afloat and ashore. Free-standing — needs no fixing to desk. Hinged grey dust cover. Front and back contacts with click-stop gap adjustment. Key-click filter, £8.95.

BAUER KEYING LEVER AND PADDLE UNIT — for your own El-Bug or 1½ to suit your needs. £20.00.

BAUER KEYING LEVER AND PADDLE UNIT — for your own El-Bug or 1½ to suit your needs. £20.00.

Model TU RTTY CONVERTER/KEYER — All-in-one box instant selectable RTTY with a TX/RX and cheap surplus teleprinter, £115.

All items post-paid U.K. Catalogue EPS describes these and other RTTY, VHF, SSB kits and units.

SPACEMARK LTD. 14 PICCADILLY, MANCHESTER 1. (Tel.: 061-237 0817)

THE FABULOUS ‘222’

SHOULDN'T THERE BE ONE IN YOUR STATION ??

At only £8-25 they are exceptional value.

Made by Copal, the world’s largest manufacturers of “Page System” digital clocks, they are absolutely reliable and accurate. Mains powered (negligible consumption) in 12 or 24 hour version and five colours. Charcoal, Flame, Purple, Lime and White. For more details see October Short Wave Magazine.

We also stock many other Digital clocks including wall and alarm types, not forgetting the lovely 601 and 602 with day, date, etc.

What a steal at this price !
New solid State Receiver for the Junior S.W.L.

Transistor General Coverage Receiver SW-717

- All solid-state circuitry mounts on printed board for quick, error-free assembly.
- BFO (beat frequency oscillator) control improves code reception.
- Solid-state circuitry for stable long life, instant on-operation.
- Band selector switch lets you choose on AM and three SW overlapping bands.
- Mode control gives separate positions for AM and code reception. Has 'standby' to cut out signal while receiver stays on.
- Headset jack on front panel readily accessible for private listening.
- Bandspread dial allows maximum station separation.
- Relative signal strength meter for precise signal location.
- Built-in speaker.

An economic Introduction to Shortwave Listening: Take up the fun and fascinating hobby of shortwave listening. An interesting and absorbing project for the whole family; just follow your Heathkit manual and you assemble the SW 717 in a few hours. The Heathkit SW 717 puts local AM stations and shortwave broadcasters from around the world as near as your table or bookcase: Continuous tuning from 500 kHz to 30 MHz, divided into four bands, lets you roam the globe... listen in on foreign broadcasts from Europe, Asia and America; amateur radio operators in every country; ships at sea and weather bulletins.

Are you considering Amateur Radio? Some 400,000 persons of all ages in almost every country in the world are following a hobby that is in many ways unique. Radio amateurs with their own transmitters and receivers in their homes, communicate with fellow enthusiasts over hundreds and thousands of miles. Many expeditions have kept in contact with the rest of the world with the help of amateur radio. Amateurs have also, often helped in emergencies in conjunction with crashed aircraft or ships in distress.


Order your SW-717 4-band AM/SW Receiver today, tune in on the world through SWL.

Kit K/SW-717 £ 29.80 Carr. 60 P.
ARE YOU READY?—
WE ARE—for the DX season.
Buy Now Before The Rush

BACK BRITAIN
Manufactured 100% in England
MUSTANG
ATLAS
ELAN
TA-33 Jr.
TA-32 Jr.
TA-31 Jr.
VTD-3 Jr.
TD-3 Jr.
DI-2
SWL-7
RD-5
A-315
A-215
A-310
A-210

Mosley U.S.A. types are of course also available
Rotators, Towers, Polythene cord and rope, Coax cable, Control cable, Twin feeder.

Send for HANDBOOK/CATALOGUE containing full details and prices of Antennae and technical information, 25 pages, 15p refundable on purchase of an Antenna.

Special Offer—Weller

Every year at the RSGB Show Weller have made new friends and welcomed old friends. Because there is no Show this year we are making our usual offer to our friends—by post—to buy one of our renowned temperature controlled tools at very keen prices. These tools have been out on demonstrations, in displays and on exhibition stands and so they don’t look their best. However, THE FULL SIX MONTH GUARANTEE STILL APPLIES, so these are still first-class buys.

There is not an unlimited stock so send your order in right away to avoid disappointment. Please send your remittance with your order to avoid delay, with postage and packing.

<table>
<thead>
<tr>
<th>Product</th>
<th>UK Industrial List Price</th>
<th>Offered at</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP-1, 24v., fitted with PTCC7 and PU-1D (Power Unit 220/240v.)</td>
<td>£10.10</td>
<td>£6.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50p</td>
</tr>
<tr>
<td>Postage and packing (UK only)</td>
<td></td>
<td>£1.00</td>
</tr>
<tr>
<td>Overseas: allow for 2 kilo parcel post from UK to your address</td>
<td></td>
<td>£4.75</td>
</tr>
<tr>
<td>Tips: PTCC7, PTAA6, PTDD8</td>
<td>£1.50</td>
<td>25p</td>
</tr>
<tr>
<td>Set of three (one of each)</td>
<td></td>
<td>50p</td>
</tr>
<tr>
<td>Postage and packing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W60D Mains voltage iron (220/240) with Bench Holder BH4LL</td>
<td>£7.60</td>
<td>£4.75</td>
</tr>
<tr>
<td>Postage and packing</td>
<td></td>
<td>50p</td>
</tr>
</tbody>
</table>

Weller Electric Limited
Redkiln Way
Horsham, RH13 5QL
Sussex, England
LOWE ELECTRONICS
119 CAVENDISH ROAD, MATLOCK, DERBYSHIRE.

Matlock 2817 (2430 evenings) Bill G3UBO Alan G3MME
AGENTS (evenings and weekends only)

John 16 Harvard Road, Ringmer, Lewes, Sussex.
G3JYG Ringmer 8071
Sim 19 Ellismuir Road, Ballylinton, Nr. Glasgow.
GM3SAN 041-771 0364

We are authorised distributors for Yaesu Musen equipment in the U.K. and stock the following:

- **FRdx400** ( Illustrated ) £160 FLdx400 ( Illustrated ) £140
- **FL-2000B linear** ... £130 FTdx600 transceiver ... £195
- **FTdx401 transceiver** ... £115 FT-200 transceiver ( less p.s.u. ) £132
- **FT-101 transceiver** ... £230 FP-200 p.s.u. ... £31
- **FT-2F transceiver** ... £80 Matching external VO's
- **Matching speakers** ... £10 for HF transceivers ... £35
- **YD846 hand mike** ... £5 YD846 table mike ... £10
- We guarantee new Yaesu equipment purchased from us for a period of 12 months both labour and materials, but excluding valves and semi-conductors.
- **Power Meter/Dummy Loads**
  - SWR meters £1110,2m.1 vertical whip £4.25.
  - Filters KVG XF-9A, B, C, D and M, Kokusai IOA7, Asahi dual meter without plug, £2.60 with stereo plug, 12 hr. digital clocks £5.80, crystal filters £10, keys £1, keyers £8.20, low impedance padded headphones £5-50 without plug, £3-50 with stereo plug, 12 hr. digital clocks £5-80, crystal filters KVG XF-9A, B, C, D and M, Kokusai 10AZ, Asahi dual meter SWR meters £6-80, 2m. vertical whips £4-25.
- **Other New Stuff**
  - YD846 hand mike £5 YD846 table mike £10
  - Inoue IC-20 2m. mobile FM transceiver. This and the Yaesu FT-2F are pretty popular for mobile and fixed station, 480.
  - Other New Stuff included the YD846 hand mike at £5, YD844 table mike at £3.50, 2w. double-quick time.
  - We supply them with no less than four TRUE mechanical filters ( not ceramic transducers ) CW, SSB, AM and FM.
  - We supply them with all crystals top band to 2m. including WWV, CB 12, 3 to 150 MHz, 430.
  - Mechanical filters (not ceramic transducers) CW, SSB, AM and FM.
  - Matching external VO's
  - Power supplies switchable 3, 6, 9 and 12V, D.C. fully smoothed and regulated to 500 mA, £3-50. **ALL PRICES POST FREE.**
- **Second-hand Gear**
  - Stock changes so rapidly that there isn't much point in listing stock at the time of writing (September), but we reckon to have the best selection of quality gear in the country, all serviced and brought up to spec., and all guaranteed. Sorry to say, however, that we find it increasingly difficult to give a meaningful guarantee with the older stuff like 19 sets, tired old IC100's and so on, so we don't sell 'em.
  - We have **fairly large stocks** of—
    - BC221's— **all in excellent fully-checked condition with correct charts and priced according to linearity and condition from £13 to £20.** For £15 you get a BC221 perfectly adequate for Amateur use and guaranteed, carriage paid.
    - Signal Generators CT212—a compact, top quality signal generator made by Airmec covering 85 kHz to 32 MHz in 7 ranges AM, CW or FM (adjustable deviation). Modulation is variable and metered and r.f. level from 100 mV down to 1 uV is also metered. The attenuator is excellent and both 240V. A.C. and 12V. D.C. power supplies are built-in. **Measures : 12" x 8" x 9" deep. Sold fully checked complete with mains lead and output lead, carriage paid, £29-50.**
    - Send us a large s.a.e. and we'll fill it with guff on all the stuff we have. Please note we can arrange H.P. with as little as 10% down on both new and second-hand gear and don't forget that our demonstration facilties are pretty good—dipole on 80, 3 element Asahi beam on 20, 15 and 10 with an Asahi trap vertical for comparison purposes.

**Service**
In order to give an even better deal to our customers, we have appointed the following part-time ( evenings and weekends ) Regional Service Representatives:

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dave Dryden</td>
<td>G3KBQ 205 Main Street, Thornton, Leics.</td>
</tr>
<tr>
<td>Alan Bartlett</td>
<td>GW3YSA 35 Pen-y-Waun, Efail Issaf, Pontypridd, Glam.</td>
</tr>
<tr>
<td>Peter Ward</td>
<td>G3XWX 47 Radstock Avenue, Ward End, Birmingham</td>
</tr>
<tr>
<td>Alan G3MME</td>
<td>47 Radstock Avenue, Ward End, Birmingham</td>
</tr>
</tbody>
</table>

Naturally, if you can get your gear to Matlock we would be delighted to see you and of course our Northern and Southern Agents, Sim and John are very adept at fixing gear in a hurry, but possibly there is an authorised Regional Service Rep. nearer to you who can sort out your problems in double-quick time. In which case, it may pay you to take your gear to him for prompt attention at low cost.

**Hours :** Tuesday to Saturday 9-5.30 (closed for lunch 1-2 and all day Monday).

73 de Bill and Alan

**November, 1971**
RADIO COMMUNICATION HANDBOOK
Price £3.15
(+ post and packing 35p.)
Available from stock
Order from
PUBLICATIONS DEPT.
SHORT WAVE MAGAZINE LTD.,
55 VICTORIA STREET, LONDON, S.W.I

GUIDE TO BROADCASTING STATIONS
16th Edition
Hill & Son Ltd. 164 pages 58p (inclusive of p. & p.)

CONTENTS

Available from stock:
PUBLICATIONS DEPT.
SHORT WAVE MAGAZINE
55 VICTORIA STREET, LONDON, S.W.I

TRANSISTOR POCKET BOOK
This addition to Newnes series of technical pocket books provides a comprehensive guide on the characteristics and use of the various types of transistor that have come into use in recent years. It is based on the junction transistor, fully taking into account the latest varieties including the epitaxial planar, field effect, metal-oxide silicon and thin film types.

Earlier chapters describe the principles of operation, transistor characteristics, equivalent circuits and parameters and establishing suitable D.C. operating conditions. A chapter is included on the manufacture of transistors, so that the effect of the basic methods of fabrication and types of junction on transistor characteristics is clearly understood. The operation and characteristics of associated semiconductor devices used in conjunction with transistors, such as the junction rectifier, silicon controlled rectifier, zener diode, tunnel diode, varactor diode and phototransistor are also described. Low level, high power and high frequency amplification; oscillator, switch and D.C. amplifier circuits; radio receivers and power supply arrangements are all covered in separate chapters, practical circuits complete with transistor types and component values being included for these various applications. The book also includes notes on handling and testing transistors, and a chapter on solid state circuit techniques.

£1.55, post free
from:
SHORT WAVE MAGAZINE
55 VICTORIA STREET, LONDON, S.W.I

Calibrators from Hamgear Electronics
Get acquainted with our calibrators:
P.M.IV. 1 mc/s. with 1,000 c/s modulation.
P.M.V. 1 mc/s and 100 kc/s. with 1,000 c/s modulation.
P.M.VIII. 1 mc/s, 100 kc/s and 10 kc/s, with 1,000 c/s modulation. This one has the ability to be tuned zero beat to a frequency standard such as M.S.F.
Both and P.M.V. and P.M.VIII have integrated decade counters, nothing to go out of adjustment.
All the units are battery powered and as such are quite portable. All give beats up to at least 30 mc/s.
Send for leaflets on these and the rest of our range of equipment.
29 CARLYLE ROAD, NORWICH.
NOW AVAILABLE U.K. MARKET — PARTRIDGE EXPORT RANGE

Size: 6" x 2½" x 4½"
Wt.: 2 lb.

Finish: Gold stove enamel with fascia off white on maroon.

ILUSTRATED: The new "JOYMATCH III" A.T.U. for RECEIVING ONLY tunes the "JOYSTICK" V.F.A. and many other antennae from 500 kHz through 30 MHz plus.

NOT ILLUSTRATED: • Styled similar to the "JOYMATCH III"—the new "JOYMATCH LO-Z 500".
• Tunes the "JOYSTICK" V.F.A. on 160m. through 10m. bands.
• Will also tune conventional antennae with feeder termination at LOW IMPEDANCE.
• Built in RF meter.
• Handles 500 watts P.E.P. input to P.A.

ALSO: • The new improved "JOYSTICK" V.F.A. in black, and gold stove enamel.
• Rigid, tough and weatherproof when elements are screwed together in seconds.
• Weights 1 lb. 8 oz. Measures : 7' 6" (2.28 metres) in length.

The new "JOYSTICK" V.F.A. incorporates the advantages of standard types such as Marconi, Hertz, Zepp, Dipole, etc., but in greatly reduced physical size and with six band capability. A high radiation resistance in compact form — outperforms many beam antennae in practice because of its low reflected power factor and absence of harmonics.

AVAILABLE FROM DEALERS OR DIRECT FROM:

PARTRIDGE GROUNOSTRING LTD.
PROTECTED BY WORLD PATENTS AND TRADE MARKS

3 WAYS of obtaining components quickly & easily

1 CALL AT No. 240
London Rd., Mitcham

If you live within easy reach of Mitcham do call on us. We are almost opposite Mitcham Baths. We open 9 a.m. every weekday. On Wednesdays we close 1 p.m. and other days, including Saturdays, 5.30 p.m. On Saturdays we have extra staff to deal with queries. We carry a vast stock of components, and 999 times out of a 1,000 we can immediately lay our hands on the particular item required.

2 JOIN OUR CREDIT ACCOUNT SERVICE

We began our Credit Account Service 18 months ago and it has proved extremely popular. Little wonder! Our customers find it a very simple, convenient way of purchasing their radio and electronic needs. We supply pre-paid envelopes and order forms and no matter how many orders you send you make only one payment per month. There are several other advantages with our Credit Account Service. Write or phone for details.

3 and ORDER BY MAIL OR TELEPHONE

Although we are kept busy selling "over the counter" we supply even more by Mail Order. You can telephone any time of day or night, Sundays included. If you ring out of office hours a recording machine takes your message for us to deal with as soon as we open shop again. Our number is 01-648 8422. If you wish to order by post our address is in the coupon below. We deal with all orders promptly.

WHICHEVER WAY YOU CHOOSE you need the Home Radio Catalogue. In its 315 pages are listed over 8,000 components, over 1,500 of them illustrated. Each copy contains 10 Vouchers, each worth 5p when used as instructed. Free Supplements are supplied regularly to keep you up-to-date. The Catalogue costs 50p over the counter, or 70p including postage and packing.

POST THIS COUPON with cheque or PO for 70 pence

ADDRESS: HOME RADIO (Components) LTD.,
Dept. SW, 234-240 London Rd., Mitcham, CR43HD

Please use block capitals
Name ........................................
Address ......................................
ALL ABOUT CUBICAL QUAD ANTENNAS by William I. Orr, W6SAI
This wonderful new book, which has become a classic in its field, discusses the theory, design, construction and operation of Cubical Quad antennas. It covers the Quad's history, operating characteristics; multi-element and concentric Quads; the X-Q Quad with 3 dB gain over normal design; the new Tri-Gamma match; new, improved feed systems; new, sturdier construction; true angle of radiation; antenna tuning and maintenance. Contains data never before published! All you need know about Quads! 196 pages £1.78 post free

BEAM ANTENNA HANDBOOK by William I. Orr, W6SAI - 3rd edition
This completely revised 3rd edition of Bill Orr's popular book covers beam antenna theory, design, construction, installation, and adjustment. Includes ionosphere theory; transmission lines; matching devices; new Inducto-match system; parasitic beams; all-metal array; multiband beams; wire beams; 20 and 40 meter compact beams; design charts and SWR curves for beams—six different beam meters, 11 tables; how to make and use different types of installation. A "must" for the serious DXer whether he buys or builds his beam. 200 pages £1.78 post free

Taurus Electrical Services

- CREED 7B's SMALL VARIABLE CONDENSERS.
- TRANS CALL UNITS (mains intercoms).
- NEW 80 WATT POWER TRANSISTORS 2G221 Post paid £2.08 post free
- 200 pages how to use them; different types of installation. compact beams; matching devices; the new Inducto-match system; and adjustment.
- by William I. Orr, W6SAI; 3rd edition true angle of radiation; antenna tuning and maintenance. Contains discusses the theory, design, construction and operation of Cubical Quad antennas. It covers the Quad's history, operating characteristics; multi-element and concentric Quads; the X-Q Quad with 3 dB gain over normal design; the new Tri-Gamma match; new, improved feed systems; new, sturdier construction; true angle of radiation; antenna tuning and maintenance. Contains data never before published! All you need know about Quads! 196 pages £1.78 post free

- CREED 7SR Printing Reperforators, £18.00.
- CREED 7TR R.p.rerforators, £8.50.
- MARGIN DISTORTION TEST SETS.
- COMPLETE WITH
- ALL ABOUT CUBICAL QUAD ANTENNAS by William I. Orr, W6SAI
- This wonderful new book, which has become a classic in its field, discusses the theory, design, construction and operation of Cubical Quad antennas. It covers the Quad's history, operating characteristics; multi-element and concentric Quads; the X-Q Quad with 3 dB gain over normal design; the new Tri-Gamma match; new, improved feed systems; new, sturdier construction; true angle of radiation; antenna tuning and maintenance. Contains data never before published! All you need know about Quads! 196 pages £1.78 post free

- CREED 80 WATT POWER TRANSISTORS 2G221 Post paid
- NEW 80 WATT POWER TRANSISTORS 2G221 Post paid £2.08 post free
- 200 pages how to use them; different types of installation. compact beams; matching devices; the new Inducto-match system; and adjustment.
- by William I. Orr, W6SAI; 3rd edition true angle of radiation; antenna tuning and maintenance. Contains discusses the theory, design, construction and operation of Cubical Quad antennas. It covers the Quad's history, operating characteristics; multi-element and concentric Quads; the X-Q Quad with 3 dB gain over normal design; the new Tri-Gamma match; new, improved feed systems; new, sturdier construction; true angle of radiation; antenna tuning and maintenance. Contains data never before published! All you need know about Quads! 196 pages £1.78 post free

- MIREX VHF AERIAL CHANGE OVER RELAY. Tested £1.70 post paid
- SEND YOUR ORDER TO:
- MAIL ORDER DEPT. SWM, 28 Hillcrest Avenue, Scarborough, Yorks.
- OUR RETAIL COUNTER (same address) is open Monday-Saturday (9am-5.30pm) and Sunday (10am-4.30pm) under the auspices of GIIL (Dick) who will be pleased to see you.
Technical Books and Manuals

(ENGLISH AND AMERICAN)

AERIAL INFORMATION
ABC of Antennas .......................... 88p
Aerials (By D. Sjobbema) ................. 67p
Aerial Handbook (Briggs) .................. 85p
Amateur Radio Antennas (Hooton) ........ £1.85
Antenna Handbook, Volume 1 ............. £1.75
Antenna Round-Up, Volume 1 .............. £1.45
Antenna Round-Up, Volume 2 .............. £1.75
Beam Antenna Handbook .................... £2.08
Ham Antenna Construction Projects ....... £1.45
Quad Antennae ................................ £1.38
S9 Signals ................................... 85p

HANDBOOKS AND MANUALS
Amateur Radio DX Handbook ............... £2.15
Electronic Circuit Handbook, Vol. 1 ...... £1.40
Mobile Handbook, CQ ..................... £1.38
Mobile Manual, ARRL ..................... £1.38
New RTTY Handbook ....................... £1.78
New Sideband Handbook, CQ .............. £1.43
Novice Handbook Tx & Rx ................. O/P
Radio Amateur Handbook 1971 (ARRL) .... £2.80
Radio Amateur Handbook 1971 (ARRL)
(Hard Cover) ................................ £3.60
Radio Communication Handbook (RSGB)  .. £3.50
Radio Handbook, W.I. Orr (18th) ......... O/P
Rtty A-Z (CQ Tech. Series) ............... £2.23
Surplus Conversion Handbook .......... £1.35
Transistor Substitution Handbook ....... 98p

USEFUL REFERENCE BOOKS
Amateur Radio SSB Guide ................. £1.57
Amateur Radio Techniques (N/E) .......... £1.13
Amateur Radio Construction Projects ... £1.10
Amateur Radio Circuit Book ............... 70p
Elements of Radio Engineering .......... O/P
Guide to Amateur Radio ................. 47p
Hams' Interpreter ......................... 55p
Hints & Kinks, Vol. 6 (ARRL) .......... 160p
Radio Amateur Examination Manual ...... 31p
Operating an Amateur Radio Stat. ...... 16p
Radio Amateur Operator's Handbook ...... O/P
Radio Data Reference Book (2nd Edition).75p
Radio, Valve and Transistor Data (Ilfife)
9th Edition ................................ 87p
Radio Engineer's Pocket Book .......... O/P
Service Valve & Semiconductors Eqiva-
Toents ................................ 29p
Single Sideband for the Radio Amateur
(ARRL) 4th Edition ....................... £1.35
Single Sideband for the Radio Amateur
(ARRL) 5th Edition ....................... £1.65
Single Sideband (Theory & Practice)
by H. D. Hooton .......................... £3.45
Sun, Earth & Radio by J. A. Ratcliffe .... £1.20
Surplus Schematics (CQ) ................. £1.20
Transistor Pocket Book .................... £1.55
Q & A on Audio ................................ £52p
Q & A on Electronics ..................... 52p
Q & A on Transistors (3rd Edit.) ......... 57p

VHF PUBLICATIONS
VHF Handbook, Wm. I. Orr ............... £1.77
VHF Manual (ARRL) ...................... £1.35
VHF/UHF Manual (RSGB) N/E ............ £1.75

BOOKS FOR THE BEGINNER
Amateur Radio (Rayer) ............ £1.35
Basic Mathematics for Radio and
Electronics ................................ O/P
Beginners Guide to Radio (7th Edit.) ... £1.10
Beginners Guide to Electronics (N.E.) . £1.08
Beginners Guide to Transistors ....... 83p
Beginners Guide to Colour TV ........... 80p
Better Short Wave Reception .......... £1.78
Course In Radio Fundamentals ......... 60p
Dictionary of Electronics ............... O/P
Foundations of Wireless (N.E.) ....... £2.00
Guide to Amateur Radio ................. 47p
How to Become a Radio Amateur ...... 57p
Morse Code for the Radio Amateur .... 14p
Learning the RT Code .................... 25p
Novice Handbook, Tx & Rx .......... £1.80
Radio, by D. Gibson .................. 70p
Radio Amateur Examination Manual ... 31p
Short Wave Listening ................... O/P
Short Wave Listener's Guide (N.E.) ... O/P
Simple Short Wave Receivers (Data) ... 67p
Understanding Amateur Radio ......... £1.35

AMERICAN)

GENERAL
Easibinder .................................. 88p
Eliminating Engine Interference ....... O/P
Guide to Broadcasting Stations (16th Edit.) 58p
How to Listen to the World 1971—Edit. £1.35
Introduction to Valves .................... O/P
Radio Experiments (Rayer) .......... 88p
RCA Power Circuits ...................... £1.55
RCA Receiving Tubes Manual .......... £1.55
RCA Transistor Manual (N.E.) .......... £1.55
RCA Transmitting Tubes .................. £1.25
Radio Astronomy for Amateurs ....... O/P
Shop & Shack Shortcuts ................. £1.75
Television Explained Vol. I .......... £1.35
Television Explained Vol. II .......... £1.35
World Radio & TV Handbook ......... £2.25

29p

November, 1971

The above prices include increased postage rates and packing. Delivery is from stock.

Available from

SHORT WAVE MAGAZINE

Publications Dept., 55 Victoria St., London S.W.1 01-222 5341

(Counter Service. 9.30-5.15. Mon. to Fri.)

(GIRO A/C. No. 547 6151)
TRIO TS 510 AMATEUR TRANSCIEVER with speaker and microphone. £11.50.

TRIO JR310 AMATEUR BAND 10-50 Meter Receiver. £77.50.

ADMIRALTY 62B RECEIVERS

CURRENTS : TMK Model TW200C, 60mA/300mA/600mA, Excellent condition, £4.474. Carr.

DUMMY LOAD RESISTORS Carbon 30Q 35W., 37p each. P.P. 7ip.

CRYSTAL CALIBRATOR No. 10

MULTI-METERS
Model TE-300. 30,000 O.P.V. Mirror scale, overload protection. 0/1/3/25/200/500v, D.O. 0/10/ 120/600/1000v, 200v, A.C. 0/30v/60mA/60mA/60mA. £75. £9.50.

Model TE-90. 50,000 O.P.V. Mirror scale, overload protection. 0/1/3/25/200/500v, D.O. 0/10/ 120/600/1000v, 200v, A.C. 0/60/60mA. D.C. 16/160kv/1416000v, 200v. £97.50 P.P. 15p.

TMK Model TW200C. Features resetting overload button. Sensitivity : 20K1/10 volt D.C. 5x1 volt A.C. 200mA. 5x10, 50, 100, 1000. A.C. 200mA. 0-2.5, 5, 10, 50, 500mA. 0-2.5, 5, 10, 50, 500mA. 0-1, 0.5, 5, 50, 500mA. 10 amp. Resistance : 0-5K 50K, 0-500K, 5 MEG. Decibels 20 to +52dB. £11.50 P.P. 17ip.

LAFAYETTE HA.800 SOLID STATE AMATEUR RECEIVER SIX BANDS 3.5-4, 7-7.3, 14-14.35, 21-21.45, 28-29-7, 30-34 Mc.£11.50 each.


UNR-30. 4 BAND COMMUNICATION RECEIVER


EDDYSTONE VPN RECEIVERS Model 770K. 15-165 Mc. Excellent condition. £159.90

B.C.111 FREQUENCY METERS
New release 126 khz-20 Mhz, £37-95 each. P.P. 13ip. PL259 plugs to suit 37ip each.


JOYSTICK AERIALS Full range of Aerials and Tuners in stock.

CLEAR PLASTIC PANEL METERS

G.W.SMITH & CO. (RADIO) LTD
27 TOTTENHAM CT., LONDON, W.1
TEL: 01-722 5371
LITTLE STREET, LONDON, W.1
TELL: 01-837 3057
31 EDGWARE ROAD, LONDON, W.2
TELL: 01-437 9155
OPEN 9-9 SUNDAY TO SATURDAY
## FOULSHAM-SAMS BOOKS FOR YOUR LIST

<table>
<thead>
<tr>
<th>Title</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC of Electronics (by Farl J. Waters)</td>
<td>£1·18</td>
</tr>
<tr>
<td>ABC’S of Short Wave Listening</td>
<td>£1·00</td>
</tr>
<tr>
<td>ABC of Transistors</td>
<td>£1·08</td>
</tr>
<tr>
<td>Amateur Radio Mobile Handbook (W6NJV)</td>
<td>O/P</td>
</tr>
<tr>
<td>Building Your Amateur Radio Novice Station (by W7OE)</td>
<td>£1·55</td>
</tr>
<tr>
<td>Electronic Transistor Circuits</td>
<td>O/P</td>
</tr>
<tr>
<td>FET Principles, Experiments and Projects</td>
<td>£2·13</td>
</tr>
<tr>
<td>Know Your Oscilloscope (by Paul C. Smith)</td>
<td>£1·29</td>
</tr>
<tr>
<td>Practical Ham Radio Projects (by W6NJV)</td>
<td>£1·13</td>
</tr>
<tr>
<td>Practical Transistor Theory</td>
<td>£1·08</td>
</tr>
<tr>
<td>Single Sideband: Theory &amp; Practice (by H. D. Hooton)</td>
<td>£3·45</td>
</tr>
<tr>
<td>SWL Antenna Construction Projects</td>
<td>£1·38</td>
</tr>
<tr>
<td>Transistor Fundamentals: Basic Semi-Conductor and Circuit Principles</td>
<td></td>
</tr>
<tr>
<td>Vol. 1</td>
<td>£1·90</td>
</tr>
<tr>
<td>Transistor Fundamentals: Basic Transistor Circuits Vol. 2</td>
<td>£1·90</td>
</tr>
<tr>
<td>Transistor Fundamentals: Electrical Equipment. Circuits Vol. 3</td>
<td>£1·90</td>
</tr>
<tr>
<td>Transistor Fundamentals: Student’s Workbook</td>
<td>£1·90</td>
</tr>
<tr>
<td>Transistor Substitution Handbook, No. 10</td>
<td>£1·10</td>
</tr>
<tr>
<td>Using 'Scopes in Transistor Circuits</td>
<td>£1·75</td>
</tr>
<tr>
<td>73 Vertical, Beam &amp; Triangle Antennas (by E. M. Noll)</td>
<td>£2·40</td>
</tr>
<tr>
<td>73 Dipole and Long-Wire Antennas (by E. M. Noll)</td>
<td>£2·20</td>
</tr>
</tbody>
</table>

## OTHER ITEMS

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARRL. Calculator. Type A</td>
<td>90p</td>
</tr>
<tr>
<td>ARRL. Calculator. Type B</td>
<td>70p</td>
</tr>
<tr>
<td>Easibinder (to keep your copies of Short Wave Magazine together)</td>
<td>88p</td>
</tr>
<tr>
<td><strong>Practical Integrated Circuits</strong> (Newnes-Butterworth)</td>
<td>99p</td>
</tr>
<tr>
<td>110 Semi-Conductors Projects for the Home Constructor (Iliffe)</td>
<td>£1·35</td>
</tr>
</tbody>
</table>

These prices include new rates of postage and packing. Delivery is from stock.

Many of these Titles are American in origin.

Available from **SHORT WAVE MAGAZINE**

Publications Dept., 55 Victoria Street, London, S.W.1 01-222 5341/2

(Counter Service, 9.30-5.15, Mon. to Fri.) (Nearest Station: St. James’s Park)

(GIRO A/c. No. 547 6151)
Vol. XXIX NOVEMBER, 1971 No. 337

CONTENTS

Editorial ... ... ... ... ... ... ... 529
Communication and DX News, by E. P. Essery, G3KFE... ... ... ... 530
Personal Portable for Two Metres, Part II, ... ... ... ... ... ... 537
by J. R. Hey, M.S.E.R.T., G3TDZ ... ... ... ... ... ... ... ... ... ... ... 537
Measurement of P.E.P., by E. T. Howell, G3GUP ... ... ... ... 539
VXO for Two Metres, by D. J. Rumens, G8EBV ... ... ... ... 540
Crystal Tester Calibrator, by P. J. Starling, G8EBX ... ... ... 541
Build-Up of a Transmitting Layout, Part II, by P. J. Patrick, G3TWG ... ... ... ... ... ... ... 543
Transistor Class-A Audio Amplifier ... ... ... ... ... ... ... ... ... 550
The G3BEW Club Project ... ... ... ... ... ... ... ... 551
VHF Bands, by A. H. Dormer, G3DAH ... ... ... ... ... ... ... 554
"SWL"—Listener Feature ... ... ... ... ... ... ... ... ... ... ... ... ... 558
HPX Rules ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... 560
The Month with The Clubs—From Reports ... ... ... ... ... ... 562
Supplementary List, MCC Identifications ... ... ... ... ... ... ... ... ... 563
New QTH's... ... ... ... ... ... ... ... ... ... ... ... ... ... ... 566
Christmas is Coming! ... ... ... ... ... ... ... ... ... ... ... ... ... 566

Managing Editor: AUSTIN FORSYTH, O.B.E. (G6FO/G3SWM)
Advertising: Maria Greenwood

Published at 55 Victoria Street, London, SW1H-OHF, on the last Friday of the month, dated the month following. Telephone: 01-222 5341 & 5342
Annual Subscription: Home: £2.50 (£2.75 first class) post paid Overseas: £2-50 ($7.00 U.S.), post free surface mail

Editorial Address: Short Wave Magazine, BUCKINGHAM, England

AUTHORS' MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention—see any issue. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

© Short Wave Magazine Ltd.
WESTERN ELECTRONICS

You are assured of courtesy service from us for your YAESU MUSEN equipment together with manufacturers 100% backing—

**PLUS SECURITY OF GUARANTEE (12 months)** SERVICE FACILITIES SPARES (full stock as supplied by YAESU) EECURICOR 24 hour DELIVERY.

**PLUS (again I) FREE LABOUR ON WARRANTY WORK.**

Without doubt, you'll do yourself a favour (as well as us of course I) when you buy from us as we provide the finest service in the U.K.

This special delivery costs only £1 per parcel and applies to TRANSCEIVERS, ROTATORS and certain AERIALS, etc., subject to the goods remaining unsold when we receive your order. (Check with us first by 'phone if you like).

**HIRE PURCHASE—10% DEPOSIT ONLY and the best rates available.**

**YAESU/SOMMERKAMP 12 months Guarantee Backed by full Service and Spares.**

- **Transceivers:**
  - FT10/277 Transceiver £30.00
  - FT10/276 Transceiver £30.00
  - FT10/275 Transceiver £30.00
  - FT10/274 Transceiver £30.00
  - FT10/273 Transceiver £30.00

- **Transmitters:**
  - FT10/277 Transmitter £110.00
  - FT10/276 Transmitter £110.00
  - FT10/275 Transmitter £110.00
  - FT10/274 Transmitter £110.00
  - FT10/273 Transmitter £110.00

- **VFOs:**
  - FT10/277 Remote VFO £36.00
  - FT10/276 Remote VFO £36.00
  - FT10/275 Remote VFO £36.00
  - FT10/274 Remote VFO £36.00
  - FT10/273 Remote VFO £36.00

- **Transceivers:**
  - FT2000Transceiver £120.00
  - FT2000 Transceiver £120.00
  - FT2000 Transceiver £120.00
  - FT2000 Transceiver £120.00
  - FT2000 Transceiver £120.00

- **Transmitters:**
  - FT2000 Transmitter £110.00
  - FT2000 Transmitter £110.00
  - FT2000 Transmitter £110.00
  - FT2000 Transmitter £110.00
  - FT2000 Transmitter £110.00

- **Speakers:**
  - FT2000 Remote VFO £110.00
  - FT2000 Remote VFO £110.00
  - FT2000 Remote VFO £110.00
  - FT2000 Remote VFO £110.00
  - FT2000 Remote VFO £110.00

**KW ELECTRONICS.**

- **Transceivers:**
  - KW2008 Transceiver £240.00
  - KW2008 Transceiver £240.00

- **Transmitters:**
  - KW2008 Transmitter £160.00
  - KW2008 Transmitter £160.00

- **VFOs:**
  - FT560/21 Transmitter £160.00
  - FT560/21 Transmitter £160.00
  - FT560/21 Transmitter £160.00

**FR500 Receiver.**

- **New:**
  - Trio 9R59DS £35.00
  - FR500 Receiver £115.00
  - FT10/277 Transceiver £36.00

**FM RECEIVERS.**

- **New:**
  - DIGITAL 500 £250.00
  - E-ZEE Match £13.50
  - E-ZEE Match £13.50

**AERIALS.**

- **Verticals:**
  - TA331nr. £31.50

- **Base Mounts:**
  - FT2000 Base £100.00

**HIRE PURCHASE—10% DEPOSIT ONLY and the best rates available.**

**OSBORNE ROAD, TOTTON, SOUTHAMPTON, SO4 4DN, ENGLAND.**

**CABLES: 'AERIAL' SOUTHAMPTON.**

**WESSEX DISTRIBUTOR**

**EAESU MUSEN DISTRIBUTOR**

**THE SHORT WAVE MAGAZINE**

**November, 1971**

**Western Electronics (U.K.) Ltd.**

**London Agent—Roger Wilkins.**

**Tel.: 01-845 6290 After 6.9 p.m.**

**Hours of business Mon.—Fri., 9-1 p.m. 2-3.30 p.m. Saturday by appointment.**

**Your "one stop" single source of towers mast antennas etc.**

**Money saving "package deal" on purchase of mast, rotator and antenna.**

**Large range in the U.K.**
Trend

It is an interesting fact that though our licences are now issued as for communication purposes—rather than experimental, as they used to be—there is more purely experimental work going on in Amateur Radio circles than ever before. This is not only because we now have a far greater number of licensed stations, but also because of the widening scope for amateur experiment in the radio field.

Much of this “amateur effort” is, of course, not amateur at all in the strict sense, but semi-professional. It is true to say that some very large proportion—probably not less than one half—of licensed amateurs are dependent upon the radio industry for a living. Many are in positions of great responsibility as radio engineers or executives, and thereby are fortunate in having at their disposal resources (in terms of equipment, or design and constructional facilities) far beyond those of the average “non-professional amateur.” There is nothing whatever to be said against this; indeed, it is a very good thing, if only for the reason that it helps to keep up standards and also contributes materially to progress.

Then there are also those amateurs who, not professionally engaged in radio at all, are leaders in other fields of industry and commerce. Theirs, too, is very often purely an experimental interest, by way of relaxation.

These remarks are inspired by the (somewhat surprising) results of a survey recently of the professional interests of a group of 20 readers of SHORT WAVE MAGAZINE, selected at random: Eight were in senior positions in the radio industry, either in research organisations or as directors or managers of nationally-known concerns; two, both personalities well in the public eye, were professional entertainers, one on stage and screen, and the other on the racetrack; three were radio dealers; and the remaining seven were the sort of people one would expect to find at any radio club meeting.

It does not necessarily follow that a random selection made in this way is truly representative of all. But the interesting thing is that not one of these 20 licensed amateurs is either a QRO tycoon or in the category of top-flight DX operator. However, they all have one factor in common—in every case they said their main interest in Amateur Radio is experimental.
BEFORE getting into the meat of the article this month, your conductor must first of all thank all those who sent their good wishes during his recent illness; at the time of writing he can, after ten weeks, begin to see the possibility of getting back to "real" work within a week or so.

Your conductor has been, for most of the time, off the air, either in bed, in hospital, chasing nurses round the wards, or suffering from an o/c aerial feeder; but enough time was left to demonstrate that the forecast of autumnal improved conditions was justified—flutterings of life on Ten, Fifteen doing nicely, Twenty going (and sometimes sounding) life a bomb, plus all the fun of the fair on the LF Bands. So... let's see what the 'chasers have to say about it all.

Ten Metres

G3NOF (Yeovil) found the Africans there most mornings, and again in the afternoons, not to mention the odd few very weak (S3 at best) East Coast W's, and in the early evenings quite strong South Americans. SSB contacts were made with G3MUL/CE3, K251F, LU4VL, VP8MM, W4KET, ZC4ACB, ZD8KO, ZS1KZ, ZS3AK, 5H3LV, 4X4HF, 7Q7AD, 7Q7LZ, 9J2DT, 9G1DY, 9Q5LH, 9Q5T, VK6SA, UK9AT, VA2UN, SL2AV, HK3BAE, UD6AR and assorted W's.

Fifteen Metres

G3DCS (Ipswich) seems to have had a predominantly CW month, as far as the operating side goes; on the aerial front the Quad is still not yet up, owing to space problems, albeit the rectangle à la G6LX is popular with one each for 3-5, 7, 14, and 21 MHz, which should be enough to shut out plenty of sunlight! Perhaps the prize signal was the CW one heard on 21026 kHz, claiming to be the "planet Mars trying to get in contact with planet Earth". Enver, one gathers was not amused, and instead keyed with ZD8JK, JA3LVT, JA2TQS, JH1WKS, JA3AJQ, JR1FYL, J24EOU, JH1WDN, JA1HZN, JA1CSL, JA1CRT/MM, UI8AP, PY7VON, UA0YT, VK6SA, UK9AT, VA2UN, SL2AV, HK3BAE, UD6AR and assorted W's.

Nice to hear again from G3VLX (Chislehurst) who seemed to be lost after his move; luckily it was only a matter of raising the trap dipole again. It is now up to 40ft. and seems to be producing the goods. A session on September 12 yielded SSB contacts with UK9CAE, WA2BVU/P/4X, U99WR, VK9DM, UK9ANN, YA1OS, 4Z4GV, CR6LX, 9E3USA, WB2RLK/P/VE1 and 9Q5LH, who gave him a report of R5S2, and

Six-Band DX Table

(All-Time Post War)

<table>
<thead>
<tr>
<th>Station</th>
<th>Countries</th>
<th>28 MHz</th>
<th>21 MHz</th>
<th>14 MHz</th>
<th>7 MHz</th>
<th>3.5 MHz</th>
<th>1.8 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6AM</td>
<td>350</td>
<td>151</td>
<td>163</td>
<td>350</td>
<td>146</td>
<td>120</td>
<td>7</td>
</tr>
<tr>
<td>G3DO</td>
<td>340</td>
<td>216</td>
<td>253</td>
<td>333</td>
<td>90</td>
<td>83</td>
<td>9</td>
</tr>
<tr>
<td>G2DC</td>
<td>339</td>
<td>181</td>
<td>312</td>
<td>330</td>
<td>170</td>
<td>116</td>
<td>20</td>
</tr>
<tr>
<td>G3NOF</td>
<td>322</td>
<td>207</td>
<td>234</td>
<td>313</td>
<td>38</td>
<td>67</td>
<td>4</td>
</tr>
<tr>
<td>ZL3GQ</td>
<td>285</td>
<td>146</td>
<td>164</td>
<td>245</td>
<td>178</td>
<td>127</td>
<td>5</td>
</tr>
<tr>
<td>G3LZQ</td>
<td>265</td>
<td>140</td>
<td>156</td>
<td>215</td>
<td>72</td>
<td>38</td>
<td>8</td>
</tr>
<tr>
<td>G3KMA</td>
<td>262</td>
<td>210</td>
<td>209</td>
<td>193</td>
<td>146</td>
<td>64</td>
<td>11</td>
</tr>
<tr>
<td>G3IGW</td>
<td>212</td>
<td>129</td>
<td>153</td>
<td>169</td>
<td>136</td>
<td>107</td>
<td>50</td>
</tr>
<tr>
<td>9H1BL</td>
<td>202</td>
<td>117</td>
<td>129</td>
<td>143</td>
<td>74</td>
<td>57</td>
<td>8</td>
</tr>
<tr>
<td>G3RJB</td>
<td>180</td>
<td>80</td>
<td>58</td>
<td>169</td>
<td>60</td>
<td>37</td>
<td>8</td>
</tr>
<tr>
<td>G3PFQ</td>
<td>175</td>
<td>119</td>
<td>53</td>
<td>107</td>
<td>85</td>
<td>56</td>
<td>13</td>
</tr>
<tr>
<td>G3YDX</td>
<td>148</td>
<td>85</td>
<td>83</td>
<td>72</td>
<td>81</td>
<td>76</td>
<td>17</td>
</tr>
<tr>
<td>G3IDG</td>
<td>131</td>
<td>77</td>
<td>97</td>
<td>55</td>
<td>27</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>G3DNC</td>
<td>131</td>
<td>66</td>
<td>89</td>
<td>95</td>
<td>42</td>
<td>33</td>
<td>2</td>
</tr>
<tr>
<td>G3XAP</td>
<td>122</td>
<td>44</td>
<td>75</td>
<td>53</td>
<td>77</td>
<td>31</td>
<td>13</td>
</tr>
<tr>
<td>G3ZEM</td>
<td>110</td>
<td>—</td>
<td>—</td>
<td>108</td>
<td>28</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td>GC3YIZ</td>
<td>82</td>
<td>48</td>
<td>14</td>
<td>38</td>
<td>16</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>G3VLX</td>
<td>67</td>
<td>7</td>
<td>14</td>
<td>34</td>
<td>20</td>
<td>33</td>
<td>19</td>
</tr>
</tbody>
</table>

(Failure to report for three months entails deletion from this Table. Claims may be made at any time. Six months of "Nil" reports will also result in deletion. Placings this month are based on "Countries Worked".)
proved it by hearing every word Deryck said—obviously a station who gives out S-meter readings as his reports!

Definitely perking up, seems to sum up G3NOF’s views of Fifteen; Don found it open in the mornings to JA, VS6, VU and YA, while the afternoons were good for S.E. Asia, and early evenings to Africa, but again Don found a dearth of decent signals from the North American continent. Heard but not worked were KC6RS, ST2SA, VS6DO and YK1AA. However, he was consoled by contacts on Sideband with CR6LX, DU1FH, EQ2BQ, EQ2TW, ET3DS, JA4KDT, JA5BHA, JA7HWC, JE1GWP, JH1XYB, JY8BI, MP4BUI, MP4MBB, MP4TDA, SV0WXX, UA9BE, UA9QO, UK9AAN, VS9MB, VS9MT, VU2HLU, WA2BVU/4X4, YA1OS, YB0AAO, ZE1DC, 3B8CR, 4X4WP, 4Z4GV, 5X5NA, 9E3USA, 9M2DQ, 9V10B and 9V1QU.

Now to G2DC, who found that the VK’s would peak about 1130z, while he could raise Africans from 0630 to around 1830z. Jack used both CW and Sideband, the former coming up with HS1ABD, all JA, VK2-8, VK9RY, all W call areas, ZS1-6, ZL1-4, and 9M2LN. On the SSB front appeared TU2ACY, ZS1-3, 9J2’s, 5Z4, VK2-7, ZL1-4 and all W call areas again.

For W4WFL/1 (West Hartford, Conn., U.S.A.) activity has been a bit limited, with Fifteen yielding three new countries in GC3YIZ, KG4EQ and LX2CQ, the only contact of note (for him) being with HV3SJ. On the gotaway front, ET3ZU/A and HK0AA both caused wailing and gnashing of teeth in the W4WFL/1 shack.

Radio room of the 24,000-ton container ship “Atlantic Causeway”, signing GZML on the commercial frequencies. She is fitted with the most modern and sophisticated radio equipment supplied by the Marine Division of Redifon, Ltd. The main Tx can be set up on any of 195 channels in all marine bands, and it can put 1.2 kW into the ship’s antennae on any of these frequencies. With the Redifon R-408 receiver this guarantees virtually world-wide communication. In charge of Redifon Marine training is A. F. Ward, G3HSP.

Twenty

As usual, this is where the action, and the QRM, is at a maximum. Your conductor, to relieve the boredom of illness, spent some time going through his logs and noting the surprisingly large number of European countries unworked. It then seemed good to do something about it, and the resulting activity on SSB covered CT1OF, 9H1BW, 4Z4DS, EA3OF, ZB2A, VP8MM, PY4KL, VE1EI, PY2ERS, VO1BT, UK9CAI, YV1EJ, 6Y5GB, ET3DS and VP9BY, with 5Z4KL as the prize gotaway of the month, thanks to an evilly-timed telephone call which called your scribe from the shack after 5Z4KL had taken the proffered bait.

G2HKU (Minster) has been pretty busy outside the shack, not to mention having PA0PN and his XYL staying with him, plus his own
holiday, all falling into the period under review, but withal a few contacts were made, to ZL1VN on CW, and on SSB, ZL1VN again plus ZL3FO and ZL3SE, although there were some mornings when 0700s sked-time was virtually impossible to ZL-land.

CW in the main was the preferred G3DCs exercise, and it came up with W1-2-3-4-8-9, Europeans, VE1ATJ, VE3BHZ, VE2ZD, VE1IG, VE3BKP, VO1HP, IA5VNC, PY5AVV, VP9BY, YV5CRK—the one SSB contact mentioned was a lone W2.

Now to G3ZFP (Dudley), who runs a Yaesu FT-DX560 into a dipole for 14 MHz at the immense height of fifteen feet above a site which in itself is about 700 feet above sea level. David remarks on the odd conditions prevailing just after 1800z on September 12, when signals seemed to be coming in from just about everywhere, so that in half an hour G3ZPF booked in YB0, 9E3, ZC4, GM5(!), V9MB and IG5. Taking the overall picture, 275 operating hours in the last couple of months have yielded 90 countries, mainly at weekends and all at reasonable hours—not nocturnal sessions. SSB first, for UV2, DF0, 7Z3, 9K2AM, CN8, SV0, CT1, CT2, 9M2, HB0/M, ET3ZU/A (on his recent DX-pedition), MP4B, 9H1, 4X4, EQ2, 9Q5, IA5, JX3, M1D, 4U1ITU, OM2, OM0, HS3, VK2, JY8, IS0, CR7, HZ1, and the usual assortment of W's and whatever. CW produced some not-very-DX'y but enjoyable contacts with HA7KPE, SP3EZV, OK1DAW, UK6AP, SM7CUU and IOBAH.

"Getting out" from the new place, Morgan remarks on the odd conditions by and large much improved, although it was noticeable that the morning openings to the Central Pacific seemed to be best on the days when the VK path was worst, and, moreover, it seemed to change from long-path to short-path from day to day. A couple of contacts were made with VR1AA, who is ex-G3HCL—Danny has only a lowish dipole at the moment but there are indications of a tri-band beam in the offing. CW contacts were made with DU1VM, KG6DH/K56, KS6CY, KS6CG, KG6JAK, KG6AB, OA02ZS, UA0FAM, VK9RV, VR1AA, ZL5AX, 9M2LN, VK2-8, ZL1-4 and all W call areas. SSB rang the bell with YJ9DK, KS6CY, VK9RY, YA2AG, VK2-8, ZL1-4, also all W call areas again.

Now to G3ZPF (Dudley), who runs a Yaesu FT-DX560 into a dipole for 14 MHz at the immense height of fifteen feet above a site which in itself is about 700 feet above sea level. David remarks on the odd conditions prevailing just after 1800z on September 12, when signals seemed to be coming in from just about everywhere, so that in half an hour G3ZPF booked in YB0, 9E3, ZC4, GM5(!), V9MB and IG5. Taking the overall picture, 275 operating hours in the last couple of months have yielded 90 countries, mainly at weekends and all at reasonable hours—not nocturnal sessions. SSB first, for UV2, DF0, 7Z3, 9K2AM, CN8, SV0, CT1, CT2, 9M2, HB0/M, ET3ZU/A (on his recent DX-pedition), MP4B, 9H1, 4X4, EQ2, 9Q5, IA5, JX3, M1D, 4U1ITU, OM2, OM0, HS3, VK2, JY8, IS0, CR7, HZ1, and the usual assortment of W's and whatever. CW produced some not-very-DX'y but enjoyable contacts with HA7KPE, SP3EZV, OK1DAW, UK6AP, SM7CUU and IOBAH.

Not a bad start to operations on Twenty!

W4WFL/1, as related elsewhere, found time at a premium, but Morgan did at least make four QSO's, all for new countries, in KS4DX, K3RIZ/TF, G13OQR and SZ0GA, with his SSB signal.

### Pasteboard—How To Get It

Through the Bureau system is the **sane** answer—but for so many it seems to be necessary to QSL direct or through managers to raise a card. Here, then, is another selection.

The first list is a king-sized one from Morgan, W4WFL/1. W4FLS is **not** QSL manager for all AC3PT contacts, only those which he himself made from there, between December '69 and February '70, all of which have been despatched. The correct form for AC3PT is to the address as given in the current *Call Book*. HS2AFY cards after August 3 are to W4AEV; GM51AW to W43RHQ; ZD8CW, to W2MUM, and not W3MUM, as previously quoted; HR2GK, HQ2GK, and WA8VRB/HR2 to W48VRB/1, Box 11331, Newington, Connecticut 06111, U.S.A.; CP1GN has returned to the States, but anyone still needing a card for their collection may contact him—Capt. Howard M. Mills, WA3EVE7, Box 4242, Huachuca, Arizona 85616, U.S.A. HC1WZ is K9ULX, and cards should go to him, Walter I. Funk, 1003 Eighth Avenue North, St. Cloud, Minnesota 56301 U.S.A. HS1ADX, to W4VFP, and the W4 bureau; VR1AA, via K3RLY; K2LOQ/TF's address is Box 10, Naval Station, FPO New York, 09371, U.S.A. A final comment is that the Ryeham club, VE3RIT, Toronto, lost several cases of QSL cards and awards in a recent move to a new location, and Morgan is sure they would appreciate it if stations would let them have duplicates of the lost ones.

G2KA writes in to let us know that after nearly twenty years off the air, he was moved to make a come-back, which involved passing
writing KY4CD is on, from Georgia floating about of late; at the time of worked VP8LE, to know just what to hear from any station who has more, G3NOF would very much like with QSL's for VP8LE. of him, and certainly cannot assist G3NOF—but Don knows nothing and talks giving G3NOF as his QSL manager, Adelaide Is. one to offer; according to the latest To finish off, Don has a negative national OK2RZ; and HM1BK to 9X5AA to W1 YRC; OMORZ to ZL2AFZ; 925EA to Box 30; Butare; VS6DO to W2GHK; ZL3PO/C to all XV's to HS bureau; VR2CM to VK9XK, to W2GHK; JY6AAM and FYONA to REF, but G's to G3TIK; 4Z4GV, to WB2WOU; ZS3AK, to Box 1218, Seoul. interesting photograph at the Royal Palace, Amman, showing left to right, standing: JY4IA, JY1B, 9K2AM, 7Z3AB, JY1 and SU1MA, with ST2A seated front. This was a meeting of the "Arabian Nights" net taken in King Hussein's shack on July 20 last.

Prefixes

There have been a few odd ones floating about of late; at the time of writing KY4CD is on, from Georgia Southern College ARC, and till December 31 VBI1MSA is on from Newfoundland, commemorating the 70th anniversary of Marconi's experiments—from December 6 to 12 there will be round the clock operation from the Signal Hill site in Cabot Tower.

XX6FL is on from Launda International Fair, and extremely active on SSB, CW and RTTY at the time of writing—his QSL address is via CR6LA.

Eighty and Forty

Sadly neglected by most people, in terms of their DX potential, either CW or phone, which really is a shame, as both can produce the goods when worked through carefully. However, it seems as though the affluent society has taken the edge off the competitive spirit of all but a few G stations, for the vast majority seem to spend their time nattering across town on Top Band or Two, and either disregarding and DX manifestations on "my frequency" or diving smartly for the big switch. A pity, because it doesn't take a lot to become a capable operator who can go after DX with at least a sporting chance in the pile-up.

G3YMH (Staines) has returned to Cambridge for another year's stint, and reports that at the time of writing, the University Club station, G6UW is without a permanent home, as the lease on the hut has run out, but it is believed they are now back in business as your conductor has the theme on Forty is again the theme at GM3JDR (Wick). Don's SSB list comprises KZ5JF, UK9CAE, 4Z4GV, WA2BVU/4X, ZL4JF/A, YV5DMM, VK5PB and 4X4BS, while CW resulted in PY7AZQ, F0PJ/F/C, UL7NG, JA2CG, JA9YBA, JA1HOV, JA3NOJ, JA1KSO, JH1PZW, HBOXC, 9H1CH, FP9BG, 4X4NJ, VP2LAM, JX4RI, GC5AWQ, GC5ATJ (both on Sark!!), 4Z4GH, CM2OF, VP9BK, UL7CA, ZL2CH, UD6CN, JA8SI/MM (when near Greece), 4X4XL, PY1DVG, ZL4OB, OX3MQ, UL7JE, ZL1BHZ, UD6DGV, UF6WAB, VK3MR, VK3XB, VK3APN, VK30P, VK2BM/2, VK7LZ, VK3FC, VK2EO, YV11D and VK7KB. Now who says Forty is not a DX band?

ZD8KO is otherwise G3TTG, and is on Ascension Island at the behest of his employers for a year or 18 months. Keith has a KW-2000B and a trap vertical for 14-21-28 MHz but hopes soon to improve on this and to put up aerials of some effectiveness for the other bands. QSL's to go either by way of the
Bureau, or ZD8KO will send direct if a couple of IRC's are enclosed, the address being K. M. Orchard, ZD8KO, c/o B.B.C., Ascension Island, South Atlantic.

It is not often we hear from GC2CNC (Jersey) but Monty was a little startled on September 11, when he was working G8VG, to have the latter disappear and be replaced by F6AMM, the G8VG signal going in a flash from S9 to nothing. Around 1800 on September 12 VK3MR was working G's, and GC2CNC was called by a VK, at S7. Then, suddenly the VK's were replaced by a G3 and an EI at S9, the former calling CQ and finding no takers. Then, suddenly again, the G3 and EI signals went down to S3, the VK's disappearing, and the usual bunch of commercial noises came back to life. In each case the change was rapid. To complicate things a little, on the 11th, an F6 gave GC2CNC a T7 report, and this although the signal sounded clean enough and, indeed was so reported by G8VG when GC2CNC checked with Bill on the land-line. Odd phenomena altogether, and close in time, if not frequency, with the conditions already mentioned for Twenty by G3ZPF. Anyone any explanation to offer as to what happened, please?

On the Maritime front, we haven't had much news from the seagoing side for a while now, although G2NJ (Peterborough) keeps on digging more of them up; this time he offers YV4NB/MM and JA8SI/MM, the latter being in the region of Corsica at the time.

GW3UUZ (Holyhead) has his place of duty on the Lighthouse, as ever, but now he is out at sea, on the Skerries, with an FT-250 and 5RV aerial at one hundred feet. Andy wonders if he qualifies as a new one for the IOTA award? Although there is still the DX-100 at the home QTH in Anglesey, there are only 28 days there after 56 on the lighthouse, which means that catching-up on the jobs tends to curtail activity on the air.

Reports on both Eighty and Forty comes in from G2DGC, who, talking of Forty, says the morning W6, W7 and VE7 signals have more or less gone, but to counter this conditions to the East have improved. During the evening, 1830-1930z, VK and JA have been there, although the clottery and QRM usually prevent a finish to a QSO. CW was the preferred method, and came up with JAIJEE, JAIKIF, JA2BYY, PY1CPC, VK2EO, VK3FC, VK3MR, ZL1BJH, ZL1BLR, ZL3BI, ZL3GQ, VE1-A and W1-O. Clottery and plain bad mannered operating was the bane of G2DC's month on Eighty, it being often possible to begin a QSO, at DX, but seldom if ever to finish it, thanks to the attentions of the breakers. However, in the morning the New Zealand gang are there again, although few in numbers. For G2DC, 80m. yielded CW with ZL3FZ, ZL4HE, WI-5 and W8-O, also VE1-3. G3DCS stuck to CW on Forty, which gave him contacts with 8RIJ, W1DF, W2DJC, K3JH, PY7VON and sundry Europeans. Eighty CW did for DJ, DL, UR2, UB5, DM, YU, OH, SM and LA, while SSB offered all varieties of ON—home, /M, /P, and even /A—plus F and SM.

Our last reporter on these two is G2HKU, who used Forty for H18FED, YV5AMP, PJ2CC, ZL4JF/A, all on Sideband, plus a CW contact with HK2DP. As for Eighty, there was just one, namely OY7JD.

Here and There

ZC4PE was G3XMQ in U.K., and also MP4BHVF—Pete gets round! At the moment the arrangements are not too satisfactory, as to reach the shack he has to get on a bus for half and hour, a rickety old thing at that, and there are also considerations posed by working shifts. A pity, this, because the home place is ideal, with room for a dipole up aloft and a straight take-off out to sea, so hopes are cherished for the resumption of 5B4 licensing. There are other diversions, too, with Farnagusta beach in sight from the window and a temperature up in the mid-eighties at the time of writing. To date, therefore, practically the only activity has been by way of sked contacts with his father, G3TXG, which have not been too successful so far.

On the Awards front, we have details of a new one, called the "City of Gwelo" award, which basically is for working five stations in Gwelo. Same station on different bands count as separate QSO's for this purpose, as does an SWL report from a Gwelo listener. All the details from M. G. Hardy, Box 605, Gwelo, Rhodesia.

From G3IRM we have a note of the Tops CW Contest. Last year's effort showed 127 entries, plus 15 shack logs, out of which only five were G's—just shows how competitive we are, doesn't it? For 1971, the contest dates are from 1800z December 4 to 1800z December 5, between 3.5 and 3.6 MHz, CW only. Details from—and logs to, not later than January 11, 1972—Peter Lumb, G3IRM, 22 Hervey Road, Bur St. Edmunds, Suffolk.

Another event we are asked to mention (via G3YRR, Grimsby) is a sort of contest during Nov. 28-Dec. 4 to work 8P6BC/T—yes, that's the call—apparently a Club station, QTH Box 814E, Bridgetown, Barbados. Better get in touch there for details—what we can tell you is that there is some monumental number of IRC's called for when sending in an entry.

Now The Top Band

A band the popularity of which in the U.K. is quite amazing, and which seems to carry the business of nearly all-but-inactive station in the country! By now, 5Z5RS will be in the past, having been there on October 23, with 150 watts. At weekends, KL7HEE is on 1805 kHz at 1000z, and VS6DO on 1804 kHz at 1200; ZD8AY has been heard at 449 on 1803 at 2329z, and 8P6DR is on 1802 kHz, weekends only, from 0100 to 0600, listening for U.S. stations 1822-1825 kHz, and for Europe from 1825 kHz up.

Now is as good a time as any to remind you about the Tests this year. Trans-Atlantics first, the dates being November 28, December 6, January 9 and 23, and February 13. Times 0500 to 0730z, details as p.467 last month.

Pacific tests next, Saturdays, 1330z to 1600z on November 6, November 20, December 4, December 18, January 1 and 15, and February 5 and 19. Again, these were dealt with by A.J.D. last time. And with that little lot, one would think there would be enough to interest the most rabid DX Top Band operator.

Another one for the prefix-hunters on 160m. will be PA9LY,
whose QSL indicates he is G3TMQ at home, but working at the moment for the ESRO organisation. He has a long-wire up at 30 metres, six watts in the PA to an EL85, and a Trio JR-599 custom special. Skeds with pleasure—write to R. J. Harrison, PA9LY, Laan Van Ouderzorg 54, Leiderdorp, Holland.

W1BB says it is just wonderful to have the aerial at his /1 place back up in the air—no wonder, when said antenna is in fact an inverted-Vee with the apex at 265 feet and sited over a salt water ground, looking out over a sea take-off at that! But it makes a monumental difference—one could wish that Stew could organise two receivers of similar sensitivity, one at each of his QTH's, home and /1, to record the signal-strength put in by a specified station at each, simultaneously; it could well be put around the U.K. as a lesson and a moral to the characters who are always bleating about “over-power” whenever they hear a big signal, such as the one GW3UUZ used to put out from Nash Point.

G2HKU found GM3PFQ and EI9BG on CW, plus a hearing, very weakly, of ZD8AY at 2359z; SSB provided PA6PN and PA6INA as log entries. As for G3DCS, he almost damns the band by faint praise, mentioning but one QSO as worth thinking about, on CW with DJ3VC.

We have mentioned GD4AMZ already, and at this point it is worth mentioning that he is open to requests for skeds—Paul Leach, Walters House, King William’s College, Castletown, I.o.M., will reach him OK.

Slipped in among all the other items of interest in W4WFL/1’s letter is a note to the effect that KG4EQ says he will be putting up an aerial for Top Band soon, and will be quite active. It is understood that although he has 150 watts at this time, a kilowatt final is on the stocks and should be available in the near future. Looks like KG4 is going to be entered into some Top Band logs this season! G3YMH is still an avid Top-Bander, but was rather mortified to find that the summer doldrums persisted, as far as he was concerned, until almost the day he was to return to Cambridge and so be disconnected from affairs other than by way of operating G6UW occasionally. Ron was pleased to hear MP4BJI during the slack period.

The W1BB “bulletin” of September 20 contains one king-sized hot potato. Stew is suggesting that as people are getting to have more know-how, better receivers, better aerials, and so on, it is becoming easier to work the DX—is it therefore a good thing to drop the Tests, with their five-minute calling periods, for the 1972/1973 seasons? Personally, G3KFE is in favour of continuation, thinking of the tiddlers—such as G3KFE, for example!—who would not have the know-how or the ability, especially when they first try for DX, to make QSO’s without the help of the Tests. Comments please, both to CDXN and to W1BB (36 Pleasant Street, Winthrop, Mass., 02152, U.S.A.) on this one. Incidentally, if you are a keen DX-er, W1BB’s bulletin is a “must,” and may be obtained by sending some s.a.e.’s, stamped with sixteen cents each, to the above address.

Finale

And so we come to the end of another DX travelogue; for next time, G3KFE should be fully with it—he’s only half there this month!—and waiting for the letters covering the fine DX conditions the G3KFE crystal ball visualises. Deadline is November 8, addressed as always to “CDXN,” SHORT WAVE MAGAZINE, BUCKINGHAM. 73, es tnx.

Late Flash: Just as the script for this piece had been completed, the post brought us the results of the CQ Worldwide DX Contests for 1970. Looking at the Phone side first, we see no G’s in the single operator multi-band or the multi-operator section top scorers. In
Station of G3VUC, W. M. Clarke, 66 Fillace Park, Horrabridge, Yelverton, Devon, who over the last few years has done so much for CHARN, the radio amateur effort for the Cheshire Homes. Many £100's have been raised, the work being entirely voluntary. G3VUC's location is on the edge of Dartmoor, down in a valley and not too good for getting out to DX.

the single-operator single-band category, the winner of the Top Band section was GM3YCB. The total entry of G stations in the Phone leg, of all categories was fourteen, plus five GM's.

Turning to the CW section, G3HCT placed third in the 21 MHz and GM3YCB second to DL1CF in the Top Band sections. Again, the total entry from the British Isles was low, twenty G's, four GM's (two of whom were in the Top Band section) and a lone GW.

What it comes to is that out of a total of 3143 logs entered worldwide, the G representation is lost. However, one wonders how many more did come on for at least part of the time but did not bother to put in a log. However, our congratulations to those who did enter and particularly to those who were placed, G3HCT and GM3YCB—good show.

DATA DISTRIBUTION BY SATELLITE

Study by Marconi Communication Systems, Ltd.

There is at present no data-only communication system in existence, and the systems which operate throughout Europe are based on the use of national and international telephone networks. These have a number of disadvantages in terms of cost and efficiency. In particular the variability of the line selection from one call to another restricts the user to relatively low data rates. The problem could be overcome by some form of equalisation equipment, but this would be expensive in terms either of capital or operator cost. The other alternative, practicable only for very large concerns, is sole-user line facilities. But unless these can be employed about 24 hours a day they are likely to be under-used and thus inefficient in terms of return on capital.

A number of proposals have been put forward for data-only systems in which improvements in utilisation efficiency have been effected by time multiplexing and by store-and-forward operation. The basis for the current proposal is that a satellite could form an ideal mode for a data distribution system which would have a number of economic and operational advantages. Ideally, each data user would have a small antenna, probably a 2-3 metre dish, situated not more than 100 metres or so from his terminal equipment, so there would be no need for connection via the existing public telephony network. It is, however, considered likely that some categories of data would be more suited to transmission over normal telephony links, and the two systems would require some interconnection. The boost to traffic envisaged by the introduction of the satellite system would also therefore be of benefit to established Posts and Telegraph authorities in the various countries covered.

DECEMBER SMALLS

Those wishing to get For Sale-Exchange-Wanted notices into our Small Advertisement columns for the December issue of SHORT WAVE MAGAZINE—always heavily booked—are advised to send their advertisements in right away. Cost is 24p per word, minimum charge 50p, with remittance, to: Small Advertisement Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-OHF. We cannot guarantee appearance of any advertisement.

Neat solder-feed attachment, for almost any iron, by Anextra, Ltd., Chiltern Works, Chiltern View Road, Uxbridge, Middlesex. Basically, the fitting enables reel solder, of anything from 18 to 22g., to be fed on to the job as required. The mechanism is quite simple and the reels accommodated are standard 1 oz. in the usual cored solders.
PERSONAL PORTABLE FOR TWO METRES

GENERAL CONSTRUCTION — AND SOME

CONCLUDING POINTS

Part II

J. R. HEY, M.S.E.R.T. (G3TDZ)

The first part of this article appeared in our October issue, which should be read for continuity.—Editor.

TAKING up the theme from p.486, October, winding a modulation transformer is easier than it sounds—especially on the “TDZ Mk. 1 D-I-Y winding machine” of two chunks of wood with a ½in. shaft between, bent to form a handle.

An old line-blocking transformer was extracted from a TV shop junk box and stripped down. Four lengths of 30g. enamel were run off down the workshop and held with a half brisk. All four ends were then attached to the bobbin, brick removed and winding begun. The winding goes on, all four at once until the spool is full to the brim, about 120 turns, then the surplus cut off. The completed spool was insulated with brown gum paper and the laminations re-assembled. The old rusty clamp was replaced by a new aluminium one to make the finished job look a bit neater.

There are now four separate windings on the transformer; after sorting out, three are connected in series to form the secondary, the remaining winding being the primary.

Values of coupling and by-pass capacitors are chosen to produce a desirable speech characteristic.

Construction

At the onset of these scribblings it was considered hardly likely that many constructors would wish to make a “Chinese copy” of this complete transmitter-receiver—the thought being that the various circuit ideas could be used separately or all together in one form or another, as a 12v. supply is a good start for portable, mobile, or fixed use. No actual printed board layout is therefore shown as this depends absolutely upon dimensions of available components.

The following notes on how the little rig was thrown together might be of use: A single double-sided printed board is used for the whole unit but would-be constructors might be advised to build all the main sections separately, linking them together when each is tested and faultless.

The receiver 3-gang has a built in 3 : 1 reduction gear but a further slow motion drive using a ½in. drum was necessary. The tuning scale is printed on a paper disc glued to the end of the drive drum and shows through a window in the chassis side.

A change-over single-pole micro-switch mounted into the microphone case acts as T/R switch, simply swinging the HT between receiver and transmitter. When the microphone is unplugged from its 5-pin DIN socket, all power is removed and the set is quite dead; no other on/off switch is necessary.

On the “receive” side the aerial switch consists of two diodes BA141 connected in such a way that when the receiver HT is applied to R1, the diodes conduct through RFC1 and L1, opening the gate. On “transmit,” the diodes being unbiased and connected back-to-back, offer a high resistance, preventing transmitter power from reaching the receiver input.

The transmitter crystal oscillator feedback tap must be no greater than one turn from the cold end otherwise odd things happen, the oscillator going off at numerous frequencies all at once.

The pre-set RV2 in the modulator is set so that the centre line voltages at C49 positive tag is half the HT value—that is, 6 volts. If an oscilloscope and audio generator are handy, the preset should be adjusted for equal clipping top and bottom.

When tuning both receiver and transmitter oscillator chains, a two-turn loop was fitted to the VVM RF probe, giving an excellent indication of when each coil came into resonance. There is no special comment necessary regarding the alignment of the receiver as this is much the same as any other once the crystal oscillator and doubler are tuned up.

However, the transmitter requires just a little care and a 75-ohm dummy load. Connect this load to the aerial socket and if a bridge is handy, set C13 to 8-7 pF and C14 to 28-5 pF; failing this, a shrewd guess must be made. Switch to “transmit” and place probe loop over oscillator coil L9. Slowly adjust slug until oscillator breaks into life, which it should do with a sudden plop. Now move probe to doubler L10 and adjust for maximum reading, retuning the oscillator again for greatest doubler output.

If the loop coil is now removed from the probe and the point refitted, placing this on the hot terminal of the aerial outlet should indicate a small reading already present. Coils L11 to L13 should now be adjusted for maximum reading on the VVM. As RF power transistors capacitances change dramatically at different drive levels, it is necessary to go back over the adjustments once or twice until no further increase is obtainable, rechecking the oscillator and doubler as some pulling is possible. Finally, either by applying an audio generator or whistling a constant note into the microphone, C13 and C14 are adjusted for maximum output under modulation conditions.

Conclusions

At the time of writing, 107 different stations have been worked, the greatest range whilst portable using simple aerials being 70 miles between central Yorkshire and the West Coast in Cumberland across a mountainous route. A telescopic dipole, a quarter-wave whip and a simple Turnstyle have all been tried with this unit whilst out/P, giving most gratifying results.

Power consumption is about 35 mA on “receive” and some 400-500 mA on “transmit”—which means dry batteries are a bit uneconomical; 1AH± Deac.
batteries would be better for field use, with a 12v. regulated mains pack when at the home QTH.

There is no doubt about the feeling of “one-up-manship” when carrying this little station around, as most other /P stations seem happy to hump car loads of iron work with them and think themselves to be “portable”. G3TDZ hopes these notes will send a few /P D-D-Y types scrambling for their soldering irons before the dustman takes away the old clunker.

Another photograph to show the general layout in the 6 x 4in. chassis. Control knobs for RF and AF gains and tuning are to the right. The compact construction is made possible by the now generally-available miniaturised components.

PAYMENT BY BANKER’S ORDER

We have many hundreds of subscribers who pay by Banker’s Order—a handy and civilised arrangement for all concerned. But a certain few of them are asked (a) When starting a B/O sub, for the first time, to note that the form we supply should in the first instance be sent to us and not to their Bank—this is simply to ensure that the transaction can be recorded at our end; we then send the form on to the Bank, after which action is automatic. And then (b): Readers already paying by B/O who have been notified about amending it to the new rate (£2·50, or £2·75 first-class posting) are asked to be careful to cancel any existing order when instructing their Bank to pay at the new rate.

All this, which may seem obvious to anyone who operates a local Bank A/c in the ordinary way, is to minimise the office work-load by cutting down unnecessary correspondence. You would hardly believe it, but we have subscribers whose Banks are paying at both the old and the new rates and, in one extraordinary instance, the subscriber’s Bank is paying his annual sub. monthly—though he and his Bank have been written to three times pointing out the error, the monthly credits keep coming in! It is altogether too embarrassing!

From now on, all credits incoming, either through the Bank or by Giro, will be accepted without query. Anyone with a doubt about what is being paid on their account to the credit of Short Wave Magazine, Ltd., National Westminster Bank, Victoria Street, or Giro A/c No. 547 6151 should write in, with an s.a.e., giving dates and references.
MEASUREMENT OF P.E.P.
USING THE MINIMUM OF TEST GEAR

E. T. HOWELL (G3GUP)

One text book definition describes peak envelope power (p.e.p.) as the RF power at the peak of the modulating audio cycle, equivalent to the average power in a CW signal where the amplitude is equal to the peak of the modulated RF signal.

Stated thus it seems quite straightforward, but how can the average amateur determine whether his off-the-shelf equipment meets the manufacturer's claims, or measure the p.e.p. of his home-built exciter or linear amplifier?

Well, to start with, the definition given above is incomplete. Peak envelope power should be related to a specific level of intermodulation distortion. It is possible to push up the p.e.p. by increasing the audio level (providing the PA valve(s) and power supply will handle the extra load) but the level of intermodulation distortion also increases, resulting in a radiated signal unlikely to make one popular with other operators on the band.

The international regulatory organisation (CCIR) recommends modulating the transmitter with two tones to produce sidebands of equal amplitude. The amplitude of these tones is adjusted until the intermodulation distortion just reaches a specified level. One tone is removed and the output power is noted. The p.e.p. will then be equal to four times the single-tone power.

Current engineering practice recommends an intermodulation distortion level of -30 dB for third-order products and most commercial equipment specifications claim this level or better.

To carry out this test you need a two-tone test oscillator, an accurate RF power meter and a frequency analyser. While the construction of the first item is well within the capabilities of most amateurs it is doubtful if many of us can lay our hands on a frequency analyser, and the accurate calibration of a home-made power meter raises problems. So we must do the next best thing, which is to use an oscilloscope to check the linearity of our two-tone test pattern and to derive our power level.

An oscilloscope is a "must" for the serious SSB operator. It need not be a complex unit; simple circuits have been published in many journals and the leading kit manufacturers market low-cost items which can readily be adapted for RF monitoring by providing direct access to the vertical deflection plates.

To use an oscilloscope to check the linearity of our two-tone test pattern and to derive our power level.

Measurements

Once we have a good clean signal with no flat topping we can start our measuring procedure. With the two-tone test signal displayed on the oscilloscope the p.e.p. can be calculated from the formula:

\[
P_{\text{e.p.}} = \frac{(0.707 \times E_p)^2}{R}
\]

where \(E_p\) is the peak voltage shown in Fig. 2(a) and \(R\) is the load resistance in ohms.

But unless we know the coupling factor of the pick-up loop and have an accurately scaled oscilloscope how do we measure \(E_p\)? The easiest method is first to set up the transmitter for CW, noting the reading of the RF ammeter and the height of the oscilloscope display \(E_{cw}\), as in Fig. 2(b). The latter can be measured in any convenient units; if the oscilloscope has a graticule scale this will do fine. (Note that it is easier to measure the peak-to-peak amplitude and divide by 2 to obtain \(E_{cw}\).) Again, if you are using TV sweep valves—keep it brief! Next, apply the two-tone signal and measure \(E_p\) using the same units as for CW. The p.e.p. is then given by:

\[
P_{\text{e.p.}} = \frac{E_p^2}{E_{cw}^2} = P_{cw}
\]

where \(E_p\) is the peak amplitude shown in Fig. 2(a) \(E_{cw}\) is the peak amplitude of the CW signal, Fig. 2(b) \(P_{cw}\) is the CW output power \(I^2R\), derived.
THE SHORT WAVE MAGAZINE

November, 1971

VXO FOR TWO METRES

A PRACTICAL CIRCUIT

D. J. RUMENS (G8EBV)

THE purpose of the VXO described in this article is to provide a flexible and inexpensive yet stable means of varying one's frequency about the two-metre band.

The VXO was built in a completely screened box, with the supply voltage fed via a screened lead and thoroughly decoupled to prevent RF getting into or out of the box.

L1 consisted of 23 turns of 22g. wire wound on a 3 in. former with dust core. The extent of "pull" can be set to a given value by adjusting the dust core to suit. Alternatively, for greater stability the dust-core can be removed and the number of turns adjusted to suit the pull required—in the writer's case 30 turns were wound on the coil and the turns taken off until the required pull was found. The coil should then be coated with epoxy resin and rigidly mounted. As the tuning capacitor C1A/C1B had to be insulated from the chassis it was mounted on a 3 in. paxolin and fixed firmly to the chassis.

Mechanical coupling for tuning was made through an insulated coupler to the dial mounted on the front of the box. Before fitting, the capacitor was washed in silver-cleaning fluid.

In the interests of stability, the wiring of the oscillator section was made as rigid as possible. This is very important for the final result. On the prototype the crystal was made plug-in, to a screened lead on the face of the VXO case, for ease of crystal changing. There is no reason why a set of crystals, to be switched in and out of circuit for the required frequency range, could not be an integral part of the screened box containing the rest of the circuitry.

The buffer Tr2 was mounted as far away as possible from the oscillator stage and connected by screened lead to prevent inter-action between the two.

It should be remembered that although the unit is crystal-controlled it is still a Variable Frequency Oscillator and should be constructed accordingly.

Circuit Description

The crystal used is a 12 MHz HC-6U, frequency variation being achieved by C1A/C1B and L1. With the capacitor at minimum capacity the crystal realises only the required frequency range, could not be an integral part of the screened box containing the rest of the circuitry.

The buffer Tr2 was mounted as far away as possible from the oscillator stage and connected by screened

in series with the HT return line, calibrating the oscilloscope with the transmitter on CW and deriving the current using Ohms Law. The input p.e.p. is then given by:

\[ \text{P.e.p. (input)} = \text{Ea} \times \text{Ip} \]

where \( \text{Ea} \) is the PA anode voltage and \( \text{Ip} \) is the peak anode current in amps.

When screen-grid valves are used an element of error exists using this method as the screen current also flows through the resistor in the HT return line.

For Class-AB amplifiers condition (2) does not apply because in this class of operation a small quiescent anode current exists with no modulation. In this case, with the other conditions met, the input p.e.p. is given by:

\[ \text{P.e.p. (input)} = (1.57 \times \text{Ea} \times \text{Ia}) - (0.57 \times \text{Ea} \times \text{Iq}) \]

where \( \text{Iq} \) is the quiescent anode current in amps and \( \text{Ea}, \text{Ia} \) are as before.

The efficiency of the amplifier is then given by:

\[ \text{Efficiency(\%)} = \frac{\text{P.e.p. (output)}}{\text{P.e.p. (input)}} \times 100 \]

Table of Values

<table>
<thead>
<tr>
<th>Circuit of the VXO</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1A</td>
</tr>
<tr>
<td>C1B</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>C3</td>
</tr>
<tr>
<td>C4</td>
</tr>
<tr>
<td>C5</td>
</tr>
<tr>
<td>C6</td>
</tr>
<tr>
<td>C7</td>
</tr>
<tr>
<td>C8</td>
</tr>
<tr>
<td>C9</td>
</tr>
<tr>
<td>R1</td>
</tr>
<tr>
<td>R2</td>
</tr>
<tr>
<td>R3</td>
</tr>
<tr>
<td>R4</td>
</tr>
<tr>
<td>R5</td>
</tr>
<tr>
<td>R6</td>
</tr>
<tr>
<td>R7</td>
</tr>
<tr>
<td>R8</td>
</tr>
<tr>
<td>D1</td>
</tr>
<tr>
<td>L1</td>
</tr>
<tr>
<td>L2</td>
</tr>
<tr>
<td>Tr1</td>
</tr>
</tbody>
</table>

...
at 7 volts by a zener diode and the whole unit run from a stabilised 9-volt supply.

**Results**

Mainly, the swing was to the LF side of the crystal and is non-linear. There was a small HF swing of 50 kHz or so due to series capacity. All figures quoted here are the total swing including the small HF component.

For ultimate stability the swing should be restricted to 250 kHz. Much above this, drift will occur. At a 300 kHz pull, the drift after 10 hours was 2 kHz. At a 500 kHz pull there was an initial drift of two kilocycles in the first five minutes and the VXO would rapidly settle down and the drift measured after 10 hours was 6 kHz.

The output was sufficient to drive the normal Colpitts oscillator stage of the transmitter.

Other points noted were that a pentode crystal oscillator gave superior results to a triode. The pulling of the buffer was less and the output greater.

---

**CRYSTAL TESTER CALIBRATOR**

**USEFUL OSCILLATOR CIRCUIT**

P. J. STARLING (G8EBX)

The circuit described here has been found useful for checking the activity, or lack of it, of quartz crystals in the frequency range 1-20 MHz in the parallel-resonant mode of oscillation. If the RF output is coupled to a calibrated receiver, or a frequency meter such as a BC-221, then the frequency of the crystal may be determined. It has proved especially helpful in sorting out a bulk-buy of surplus crystals of frequencies in the region of 6 and 8 MHz for use in two-metre equipment.

**Circuit (p.542)**

The circuit consists of a Pierce oscillator using an EF91 valve. The 100 µA meter is arranged to read the grid current which flows when the crystal is oscillating, the amplitude of which is controlled by VR1. The input capacity is governed by C2. In the prototype, this was adjusted to give a capacitance of 30 µµF, as described later, since quartz crystals of the parallel—resonant type are usually manufactured to this value of C. The output of the oscillator is then coupled to the buffer amplifier, V2, another EF91.

The power supply voltages required are 150v. at less than 10 mA for the oscillator section, 200v. at 10 mA for the buffer amplifier and 6-3v. at 0-6 LT. Although these modest requirements could easily have been taken from the receiver PSU, it was decided to make the crystal-tester a complete self-contained unit and a small "converter" type mains transformer was used, this having an HT winding of 200v. at 25 mA and an LT winding of 6-3v. 1A.

**Construction**

Construction is not too critical as long as the grid and anode leads in the oscillator section are kept short, direct and rigid. An aluminium chassis of 6 × 4 × 2ørin. was found suitable and this was fitted inside an instrument case purchased from G. W. Smith and Co. The crystal sockets fitted depend on what type of crystals are likely to be checked. The most common ones seem to be the FT-243, 10X and HC-6/U. All the sockets should be wired in parallel, using rigid tinned-copper wire.

**Testing and Use**

If it is desired to check the frequency of the crystal under test very accurately, then C2 needs to be set to 30 µµF exactly. The best way to do this is to obtain a crystal which has been manufactured to this specification and of which the frequency is known. Many amateurs will probably have a suitable one megacycle bar or similar crystal in a receiver calibrator. In fact, if a constructor does not have such a crystal, he could do worse than purchase one because the crystal-tester may easily be used as a marker for receiver calibration. The prototype was adjusted using a Cathodeon 5 MHz (cont’d p.542)

---

**ALWAYS IDENTIFY IN ENGLISH**

While Clause 9(2) of the normal AT-station licence may be construed as being a shade ambiguous as to the language to be used (if one wished to strain a point), U.K. phone station operators are in fact expected to identify in English on the change-over—even if they are speaking Esperanto or Hindustani in the course of the QSO exchanges. The requirement to sign over and back in plain English is entirely reasonable (of course, you can give your c/s in the other chap’s language as well if you like), the whole point being that you must always be identifiable as a British amateur station, even if you do speak Russian fluently.
crystal, which plugs into an HC-6/U socket. The drive level was set to give a reading of about a third of F.S.D. on the grid-current meter. The MSF transmission on 5 MHz was then tuned in on the station Rx and C2 was adjusted for zero-beat. The input capacitance was then considered set accurately to 30 µµF. However, if such a crystal is not available, C2 may be set to about two-thirds of maximum and the error will be quite small.

The relative activity of crystals having frequencies which are fairly close together may be compared by observing the meter deflection. Plug in one of the crystals and adjust the drive control to give a convenient reading on the meter, which should be noted. Now remove the crystal and plug in the next one. If it is of greater activity, the meter reading will be higher, and vice versa.

**Table of Values**

<table>
<thead>
<tr>
<th>Circuit of the Crystal Tester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 = 0.01 µF mica</td>
<td>R8 = 47,000 ohms</td>
</tr>
<tr>
<td>C2 = 75 + 75 µµF</td>
<td>R9 = 1,500 ohms, wire-wound, 3 watts</td>
</tr>
<tr>
<td>C3, C4, C7, C9, C10 = 0.05 µF</td>
<td>VR1 = 50,000 ohms, wire-wound, 3 watts</td>
</tr>
<tr>
<td>C5, C8 = 10 µµF</td>
<td>V1, V2 = EF91 (6AM6)</td>
</tr>
<tr>
<td>C6 = 0.01 µF</td>
<td>V3 = OA2</td>
</tr>
<tr>
<td>C11 = 32 µF</td>
<td>DI = BY100 or equivalent 800 p.i.v. silicon diode</td>
</tr>
<tr>
<td>C12 = 16 µF</td>
<td></td>
</tr>
<tr>
<td>R1 = 100,000 ohms</td>
<td>L1 = 2.5 mH RF choke</td>
</tr>
<tr>
<td>R2 = 22,000 ohms</td>
<td>R1 = 100 µA FSD meter</td>
</tr>
<tr>
<td>R3 = 6,800 ohms</td>
<td>T1 = Mains transformer, Secondary:—</td>
</tr>
<tr>
<td>R4 = 47,000 ohms</td>
<td>200v. 25 mA +</td>
</tr>
<tr>
<td>R5 = 1,000 ohms</td>
<td>6-3v. 1a.</td>
</tr>
<tr>
<td>R6 = 5,100 ohms, wire-wound 3 watts</td>
<td></td>
</tr>
<tr>
<td>R7 = 4,700 ohms 1 watt</td>
<td></td>
</tr>
</tbody>
</table>

**POINTS OF INTEREST**

Worcester & District Amateur Radio Club are first away with the date for their next year's Mobile Rally—July 16, at Upton-on-Severn, Worcs.

When writing to us, please use block letters for the address and also for your name under the signature. More and more people seem to have fancier and less decipherable signatures. In certain contexts, it can be awkward or disagreeable if we get a name wrong—though it is practically never our fault if we do!

There is a possibility that the Cornish Radio Amateur Club may be running a station, signing GB3MSA, during the period December 11-16 and located at Poldhu, Cornwall, to commemorate the 70th anniversary of Marconi's first signal success across the Atlantic. Of course, this sort of thing has been done before, on other Marconi anniversary occasions, and there are signs that interest in the exercise is beginning to wear a bit thin, e.g., we understand that the Marconi Company itself has declined an invitation to co-operate on this occasion.

GB2WGS will be a commemorative station on the air during November 13-21 for the 380th anniversary of the Queen Elizabeth Grammar School, Wakefield. All bands 15-160m., CW/SSB, will be worked; skeds welcomed with other schools, and visitors invited. For sked details or QSL's direct write, with s.a.e., to P. N. Butterfield, G4AAQ, 33 Grime Lane, Sharlston Common, Nr. Wakefield, Yorkshire (Tel. Crofton 353).

We are informed by LST Electronic Components, Ltd., that, being distributors for Marston Excelsior heat sinks which have applications to amateur-built equipment, they can supply in one-off quantities.

**RECIPROCITY IN UGANDA**

Short duration holiday licences can be obtained for Uganda, 5X5, on a reciprocal basis on application to: E-in-C, R.C. Section, E.A. Posts and Tels. Corp., Box 7129, Kampala, Uganda, East Africa. Requirements are at least three months notice of intention; a photostat of the home-station licence and Morse Code pass slip; and two character references.
BUILD-UP OF A TRANSMITTING LAYOUT

THE RF UNITS FOR THE HF BANDS AND TWO METRES

Part II

P. J. PATRICK (G3TWG)
Lt.Cdr., R.N.

The first part of this article appeared in our September issue and dealt with the PSU, the modulator and the general layout for the complete assembly.—Editor.

The previous article (September issue SHORT WAVE MAGAZINE) described the reasons for choosing to build a rig comprising one power pack and modulator to feed a number of switchable RF units of similar power output. This article goes on to describe the RF units, of which there are three incorporated in the transmitter, covering 160/80 metres, two metres and 10-40 metres respectively. In addition a four-metre unit has been built separately but draws power and modulation from this rig and uses its transmit/receive switching.

The LF band unit does not require detailed description as it is very similar to the G3OGR design, of which several variants have been described in the Magazine. However, it does include a key jack in the PA cathode, suitably bypassed for RF and with a 1 μF capacitor to reduce key clicks. The above-chassis partition between the VFO and later stages is not really needed for screening but is very handy for the unit to rest on when working on the under side. The under chassis screening is essential for stability, so that the VFO is not “pulled” by later stages when tuned or keyed. A can round the VFO coil helped to eliminate the last trace of pulling.

The two-metre Tx (Fig. 3, p.545) shares a box with the LF band rig. It started life as a copy of the 15-watt transmitter described in the Radio Communication Handbook but has in its time been adapted for both four and six metres with the valve line-up changed to EF184-EL91-5763, retaining the split-stator PA tuning to provide a ready means of neutralising. When a separate unit was built for four metres it was decided to put the two-metre Tx back to its former state but retaining the EF184 harmonic oscillator, which had proved to be much less critical in its choice of crystals than the original overtone oscillator. Space was found for an EL91 as first multiplier in place of the pentode section of the ECL80 at one side of the chassis. The revised circuit works well with all of the writer’s 8 MHz crystals.

The HF Band Unit (pp.546-547)

Circuity here is rather more unusual and will therefore be described in greater detail. It uses a mixer VFO. The tunable oscillator covers from 5 to 5.55 MHz, and its output is mixed with that of a switched crystal oscillator to give the required output frequency. For 28 MHz two crystals are provided so that 1100 kHz of the band can be covered. The advantage of a mixer VFO is that it makes it easy to obtain good frequency stability on 21 and 28 MHz. This can be a difficult and frustrating business with a straight VFO, and a listen to the CW portion of these two bands will reveal a number of transmissions which show excessive drift. By using a mixer VFO the problem is reduced to that of obtaining adequate stability on 5 MHz, a much easier task. The VFO circuit used is the Seiler, a modified Colpitts, which the writer has found very satisfactory. Nowadays there are several good VFO circuits to choose from, and it is worth remembering that careful selection of components and good constructional technique are at least as important as choice of circuit. Some points worth remembering are:

1) Build the VFO in a rigid totally enclosed...
FIG. 2: 160/80M RF UNIT

box,

(2) Use a tuning capacitor with bearings at front and rear, with a flexible coupler between it and the slow motion drive,

(3) Use good quality silver mica capacitors in the tuned circuit, with one temperature compensating ceramic if needed,

(4) Dust cores vary widely in their temperature coefficient—use an air-cored coil or be prepared to experiment with cores,

(5) A ceramic coil former will have the lowest expansion with temperature rise. Keep the wire really tight when winding the coil,

(6) A small inductance tuned with a large capacitance is generally better than the other way round; some published Clapp circuits use too high an L/C ratio,

(7) Run the oscillator at low power. Now that FET's are cheap consider using an FET rather than a valve with a buffer stage to amplify its output and provide isolation,

(8) Place the oscillator in a cool part of the layout; if necessary provide more ventilation,

(9) Secure all components rigidly and use stiff

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C21</td>
<td>50 µµF, var.</td>
</tr>
<tr>
<td>C22</td>
<td>50 µµF, trimmer</td>
</tr>
<tr>
<td>C23</td>
<td>50 µµF, 1kV</td>
</tr>
<tr>
<td>C24, C25</td>
<td>±0.01 µF, 1kV</td>
</tr>
<tr>
<td>C26, C27, C28</td>
<td>±0.01 µF, 1kV</td>
</tr>
<tr>
<td>C29, C33, C30</td>
<td>±0.01 µF, 1kV</td>
</tr>
<tr>
<td>C31</td>
<td>±0.01 µF, 1kV</td>
</tr>
<tr>
<td>L1</td>
<td>80 turns, 38g., close-wound on 3in. former</td>
</tr>
<tr>
<td>L2</td>
<td>Layered winding in 30g. enam. on 3/4in. Aladdin former, one layer full length and second layer one-third of length</td>
</tr>
<tr>
<td>L3</td>
<td>60 turns on 1-in diameter former 2in. long, in 26g., tapped 35 turns from valve end (or Codar Coil Type 43226).</td>
</tr>
</tbody>
</table>

Notes: Chassis for this unit can be 71 x 61 x 11in. The meter should read 0-100 mA. Switch S1 is 2-pole 3-way, and S2 4p. 3w. Jack should be single pole close-circuit.
FIG. 3  TWO METRE RF UNIT

wire, 18g. recommended,

(10) Test for drift against a crystal oscillator before and after embodiment in the rig. Better still, check it against a standard frequency transmission.

It is possible to build a VFO for 160 or 80 metres without incorporating all these points, but it is better to include them, and they are all necessary for any VFO for the HF bands. It is far easier to build a good VFO than to endeavour to put right the faults in a poorly-constructed instrument.

The crystal oscillator is the familiar Colpitts "harmonic" circuit which gives good output on the fundamental and second or third harmonics and is stable and easy to get going. Its output and that from the VFO are mixed in a twin-triode circuit which partly balances out the two input frequencies. Either a 12AU7 or a 12AT7 is suitable.

It would be very easy to include 80m. in this rig if desired as it represents the difference between the VFO frequency range and the 9 MHz crystal used to give 14 MHz coverage.

The "wide band couplers" used between mixer, driver and PA give sufficient bandwidth to cover the appropriate band but cut off quite sharply outside it. For ten metres it proved necessary to use separate couplers between driver and PA for each segment covered—this was not required between mixer and driver.

**Table of Values**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C51</td>
<td>25 µµF</td>
</tr>
<tr>
<td>C52</td>
<td>100 µµF</td>
</tr>
<tr>
<td>C53</td>
<td>10 µµF</td>
</tr>
<tr>
<td>C54, C55</td>
<td>0.01 µF</td>
</tr>
<tr>
<td>C56, C60</td>
<td>47 µµF</td>
</tr>
<tr>
<td>C57, C59, C61, C62, C64, C66, C67, C68</td>
<td>= 10 µµF</td>
</tr>
<tr>
<td>R51</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R52</td>
<td>10,000 ohms, jw.</td>
</tr>
<tr>
<td>R53</td>
<td>18,000 ohms</td>
</tr>
<tr>
<td>R54, R56</td>
<td>47,000 ohms</td>
</tr>
<tr>
<td>R55</td>
<td>1,500 ohms</td>
</tr>
<tr>
<td>R57</td>
<td>33,000 ohms</td>
</tr>
<tr>
<td>R58</td>
<td>2,500 ohms</td>
</tr>
<tr>
<td>R59</td>
<td>22,000 ohms</td>
</tr>
<tr>
<td>R60</td>
<td>27,000 ohms, jw.</td>
</tr>
<tr>
<td>R61</td>
<td>39 ohms</td>
</tr>
<tr>
<td>R62</td>
<td>39,000 ohms</td>
</tr>
<tr>
<td>C58</td>
<td>25 µµF, var.</td>
</tr>
<tr>
<td>R63</td>
<td>2.5 mH</td>
</tr>
<tr>
<td>C65</td>
<td>8 µµF, var.</td>
</tr>
<tr>
<td>C69</td>
<td>10 + 10 µµF</td>
</tr>
<tr>
<td>C67, C68</td>
<td>= 8 MHz xtals for appropriate zone</td>
</tr>
<tr>
<td>L4</td>
<td>15 turns 24g. enam. close-wound on 0.2in. slugged former in can.</td>
</tr>
<tr>
<td>L5</td>
<td>6 turns 20g., slightly spaced at 0.01 in. diameter.</td>
</tr>
<tr>
<td>L6</td>
<td>Two turns 20g., spaced wire diameter, to 0.4in.</td>
</tr>
<tr>
<td>L7</td>
<td>Four turns 20g. 0.4in. dia., centre tapped, with spacing to accommodate L6.</td>
</tr>
<tr>
<td>L8</td>
<td>Four turns 18g. 0.1in. dia., with gap for L9.</td>
</tr>
<tr>
<td>R51</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R52</td>
<td>18,000 ohms</td>
</tr>
<tr>
<td>X1, X2</td>
<td>= EF184</td>
</tr>
<tr>
<td>X1, X2</td>
<td>= EF184</td>
</tr>
<tr>
<td>V13</td>
<td>EL91</td>
</tr>
<tr>
<td>V14, V15</td>
<td>QQV03</td>
</tr>
</tbody>
</table>

**TABLE OF COIL DATA**

<table>
<thead>
<tr>
<th>Coil</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L4</td>
<td>15 turns 24g. enam. close-wound on 0.2in. slugged former in can.</td>
</tr>
<tr>
<td>L5</td>
<td>6 turns 20g., slightly spaced at 0.01 in. diameter.</td>
</tr>
<tr>
<td>L6</td>
<td>Two turns 20g., spaced wire diameter, to 0.4in.</td>
</tr>
<tr>
<td>L7</td>
<td>Four turns 20g. 0.4in. dia., centre tapped, with spacing to accommodate L6.</td>
</tr>
<tr>
<td>L8</td>
<td>Four turns 18g. 0.1in. dia., with gap for L9.</td>
</tr>
<tr>
<td>R51</td>
<td>100,000 ohms</td>
</tr>
<tr>
<td>R52</td>
<td>18,000 ohms</td>
</tr>
</tbody>
</table>

Wide-band couplers not "live" may resonate at a frequency within the band in use. In the writer's case the driver anode circuit for 21 MHz resonated at 28 MHz when not in circuit and "sucked out" about a third of the
Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C71</td>
<td>75 µµF, var.</td>
</tr>
<tr>
<td>C72</td>
<td>25 µµF, neg. temp. coefficient</td>
</tr>
<tr>
<td>C73, C93,</td>
<td>25 µµF trimmer</td>
</tr>
<tr>
<td>C74</td>
<td>560 µµF, mica</td>
</tr>
<tr>
<td>C75, C76</td>
<td>680 µµF, s/m</td>
</tr>
<tr>
<td>C77, C79,</td>
<td></td>
</tr>
<tr>
<td>C81, C101,</td>
<td></td>
</tr>
<tr>
<td>C102, C111</td>
<td></td>
</tr>
<tr>
<td>C121</td>
<td>0.01 µF</td>
</tr>
<tr>
<td>C78, C80,</td>
<td>100 µµF</td>
</tr>
<tr>
<td>C100, C110</td>
<td>25 µµF, s/m</td>
</tr>
<tr>
<td>C82</td>
<td>100 µµF, s/m</td>
</tr>
<tr>
<td>C84, C88,</td>
<td>6.8 µµF</td>
</tr>
<tr>
<td>C103, C104</td>
<td></td>
</tr>
<tr>
<td>C85, C86,</td>
<td></td>
</tr>
<tr>
<td>C87, C89,</td>
<td></td>
</tr>
<tr>
<td>C90, C91,</td>
<td></td>
</tr>
<tr>
<td>C105, C106</td>
<td></td>
</tr>
<tr>
<td>C107, C109</td>
<td></td>
</tr>
<tr>
<td>C92</td>
<td>20 µµF</td>
</tr>
<tr>
<td>C95</td>
<td>47 µµF</td>
</tr>
<tr>
<td>C96, C98</td>
<td>330 µµF</td>
</tr>
<tr>
<td>C99</td>
<td></td>
</tr>
<tr>
<td>C112, C113</td>
<td></td>
</tr>
</tbody>
</table>

C7: 1500 µµF, wide-spaced var.
C11: 1500 µµF, wide-spaced var.
C119: 1500 µµF, wide-spaced var.
C120: 1500 µµF, wide-spaced var.
C121: 1500 µµF, wide-spaced var.
C122: 1500 µµF, wide-spaced var.
C123: 1500 µµF, wide-spaced var.

Table 4: RF Unit to cover 10-40 Metres

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C101</td>
<td>7833, or 11750 kHz</td>
</tr>
<tr>
<td>C102</td>
<td>4700 kHz</td>
</tr>
<tr>
<td>C103</td>
<td>11500 kHz</td>
</tr>
<tr>
<td>C104</td>
<td>8000 kHz</td>
</tr>
</tbody>
</table>

Notes: Crystals should be FT-243, HC6-U or other small-mounting types. Switch S1 is 5-wafer, each 2-pole 3-way; S2 is 3-pole 3-way, centre posn. not used; S3 is single pole 4-way ceramic. Valves are: V17, V20, EF91; V18, OA2; V21, 12AU7 or 12AT7; V22, 6146— their equivalents would be equally suitable. The main chassis is 8 x 6 x 2 in., the VFO box 4 x 4 x 3 in., and the VFO sub-chassis 6 x 1 x 1 inch. For S1 wiring study circuit diagram carefully, because the spare (unused) section can be wired to short out-of-band couplers (see text). Switch S3 should be a good heavy-duty RF type.

As built the transmitter runs 18 watts PA input with 250 volts HT. It could be run at considerably higher power but would require a larger driver valve than the present EF80, which gives only 1½ mA on 28 MHz. This is plenty for the PA when running 18 watts, but would need to be doubled if 50 watts were required. If a more drive at 28 MHz! If this occurs use a spare switch wafer to short out the offending coil.
powerful driver were fitted some of the wide-band couplers might require modification to resonate with the different (probably greater) inter-electrode capacitances of the valve substituted.

Like the Top Band and VHF units, this transmitter uses PA cathode keying, which is perfectly satisfactory for low power use for all frequencies up to and including the two-metre band provided that the cathode is adequately grounded to RF by ceramic capacitors with really short leads. With PA cathode keying there is no need for fixed protective bias or a damper. This transmitter includes an LCR click filter which is arranged so that it is automatically short-circuited at the keying jack when the key is unplugged.

Alignment

There is virtually nothing to it when setting up the Top Band/80m. unit. Adjust the VFO to cover 1.75 to 2 MHz. With the wave-change switch set to 80 metres and the VFO at 1875 kHz peak the driver anode coil for maximum grid current at 3750 kHz. Then switch to 160m., and do the same for 1900 kHz. Tune the PA by the usual routine of "dip and draw". PA grid current should be at least 1½ mA on both ranges.

When setting up the two-metre unit one must take care that one picks the right harmonic in each multiplier. This is particularly important when multiplying all the way up from 8 MHz, and the writer has known of one instance where a transmitter was set up on 8-32-64-128 MHz instead of 8-24-72-144 MHz! This should not occur with this design if the coil winding

**WBC DATA**

Note: Windings associated with C84-C88 to C107-C109 are the wide-band couplers referred to in the text. They are numbered WBC1 (C84-C85) to WBC4 (C87-C91) and WBC5 (C103) to WBC9 (C107-C109). Values for the windings are given in the Table on p.548.
10 to 40 Metre RF Unit

Wide-Band Coupler Table (see p.547)

<table>
<thead>
<tr>
<th>Band</th>
<th>Reference Coupler</th>
<th>Wire SWG</th>
<th>Primary Turns</th>
<th>Capacitance pF</th>
<th>Secondary Turns</th>
<th>Capacitance pF</th>
<th>Hot or cold ends adjacent</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 M.</td>
<td>WBC 1, WBC 5 &amp; 6</td>
<td>28</td>
<td>14</td>
<td>6.8</td>
<td>14</td>
<td>12</td>
<td>hot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28</td>
<td>14</td>
<td>6.8</td>
<td></td>
<td></td>
<td>hot</td>
</tr>
<tr>
<td>15 M.</td>
<td>WBC 2, WBC 7</td>
<td>28</td>
<td>18</td>
<td>10</td>
<td>18</td>
<td>10</td>
<td>cold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28</td>
<td>20</td>
<td>6.8</td>
<td>20</td>
<td></td>
<td>hot</td>
</tr>
<tr>
<td>20 M.</td>
<td>WBC 3, WBC 8</td>
<td>32</td>
<td>30</td>
<td>10</td>
<td>30</td>
<td>10</td>
<td>cold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32</td>
<td>30</td>
<td>10</td>
<td>27</td>
<td></td>
<td>cold</td>
</tr>
<tr>
<td>40 M.</td>
<td>WBC 4, WBC 9</td>
<td>38</td>
<td>57</td>
<td>10</td>
<td>57</td>
<td>10</td>
<td>cold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38</td>
<td>57</td>
<td>10</td>
<td>57</td>
<td></td>
<td>cold</td>
</tr>
</tbody>
</table>

All couplers on 0.3in. diameter 24in. long formers enclosed in cans. Short cores used throughout. Spacing between windings 1/4in. in all cases. A small improvement could probably be made by winding WBC2 as for WBC7 but with a 5 pF capacitor across the secondary. The primary is the lower winding in all cases. Use of these wide-band couplers with valves other than those specified may require different values of capacitor.

Instructions are followed exactly. The writer obtained 1.1 mA grid drive to the final multiplier and 1.5 mA to the PA. The first two tuned circuits simply require peaking for maximum output on the correct frequency with an absorption wavemeter or RF40. The driver anode and PA grid circuits will require positioning for optimum coupling as indicated by maximum PA grid current. This should be done initially with PA HT off but will require adjustment with the PA HT on and the PA tuned and on load. To avoid damage HT should not be applied to the later valves in this transmitter until the preceding stages are functioning correctly.

Aligning the HF band unit is rather more complicated. A general-coverage receiver and absorption wavemeter are needed and a GDO is highly desirable to enable the job to be done quickly. First, set the VFO to cover the right range, adjusting the slug at the LF end and the trimmer at the HF end of the tuning range. Then set up the crystal oscillator. Switch to the highest frequency range and adjust the slug in L4 for maximum output on 23.5 MHz. Then in turn adjust the trimmers on the other ranges of the oscillator anode circuit for maximum. If one of the lower frequency ranges does not peak within the coverage of the trimmer it may be necessary to alter the fixed capacitance for that range.

If you have a GDO the next step is to set each winding of each wide-band coupler to the centre of the band covered. This should be done with the valves plugged...
Under-chassis construction of the 10-40m Tx. The little compartment lower left is for mounting the feed-through capacitors.

in but HT off and the bandswitch set to the range being aligned. If you have no GDO set the VFO to correspond with mid-band, e.g., 5-175 MHz for 14-175 MHz. Listen on 14-175 and peak the cores for maximum beat in the receiver. (Aerial off Rx.) Peak the PA grid circuit for maximum grid current. There should be no problems provided that the WBC's follow the instructions in the table precisely. But if you've used a different gauge of wire and cannot find a peak, you'll have to beg or borrow a GDO. Peak the PA grid winding initially with no HT on the PA, i.e., with the transmit/receive switch to "net". Quickly re-peak with PA HT on and make final adjustment with the PA tuned and loaded. As the PA is not neutralised, tuning the PA output will have an effect on grid current, but not so great as to make the stage unstable. Grid current should be about $1\frac{1}{4}$ mA on 10 metres with the drive control at full, increasing to over double that value on 40 metres. For the lower frequencies the PA drive control should be progressively retarded to keep the drive at $1\frac{1}{4}$ mA. It will be noticed that plugging in the key produces a slight drop in both grid and anode current. This is due to the resistance of the click filter choke. Normal CW operating conditions are as follows with 250 volts HT: Anode current 72 mA, screen current 8 mA and grid current 1.3 mA.

The three RF units described in this article give some idea of the range of equipment that can be used with the one power supply, modulator and switching arrangements. There are many other possible combinations. Some people may want to include 4 metres, or the dyed-in-the-wool VHF man may go for 4 metres, 2 metres and 70 cm. If one gets the urge for high power, a linear amplifier could be built for the bands of one's choice. Whatever selection one may make, the scheme will allow progress in easy stages as one's time or financial resources permit.

### TRANSMIT/RECEIVE/NET SWITCH CONNECTIONS

<table>
<thead>
<tr>
<th>Switch Wafer</th>
<th>Connection from</th>
<th>Position 1 “Net”</th>
<th>Position 2 “Receive”</th>
<th>Position 3 “Transmit”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>Tx Power Pack</td>
<td>Tx Exciter stages</td>
<td>—</td>
<td>Tx Exciter stages</td>
</tr>
<tr>
<td></td>
<td>Tx Power Pack</td>
<td>—</td>
<td>—</td>
<td>SI B and Modulation</td>
</tr>
<tr>
<td></td>
<td>Mod. Power Pack</td>
<td>—</td>
<td>—</td>
<td>Transformer secondary</td>
</tr>
<tr>
<td></td>
<td>Spare</td>
<td>—</td>
<td>—</td>
<td>Mod. Transformer</td>
</tr>
<tr>
<td></td>
<td>Ae 1</td>
<td>—</td>
<td>—</td>
<td>Primary</td>
</tr>
<tr>
<td>Middle</td>
<td>Rx 1</td>
<td>—</td>
<td>Rx 1</td>
<td>Tx 1 Chassis</td>
</tr>
<tr>
<td></td>
<td>Rx muting in</td>
<td>Rx muting out</td>
<td>—</td>
<td>Chassis</td>
</tr>
<tr>
<td></td>
<td>Spare</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Rear</td>
<td>Ae 2</td>
<td>—</td>
<td>Rx 2</td>
<td>Tx 2 Chassis</td>
</tr>
<tr>
<td></td>
<td>Rx 2</td>
<td>—</td>
<td>Rx 3</td>
<td>Chassis</td>
</tr>
<tr>
<td></td>
<td>Ae 3</td>
<td>—</td>
<td>—</td>
<td>Tx 3</td>
</tr>
<tr>
<td></td>
<td>Rx 3</td>
<td>—</td>
<td>—</td>
<td>Chassis</td>
</tr>
</tbody>
</table>

**Plug and Socket Connections**

The prototype used Painton Multicon 8-pin sockets on the rear of the two lower units with plugs connected to the unit above. Connections as follows:

1. 6.3 volts live, 2. Earth, 3. Rx mute in (lower plug only), 4. Rx mute out (lower plug only), 5. HT+ for exciter stages, 6. Spare, 7. PA HT+ (via meter) top plug only if needed for additional RF units, 8. PA HT+. 
TRANSISTOR CLASS-A AUDIO AMPLIFIER

CAPABLE OF 15-20 WATTS OUTPUT—BUILT FROM STANDARD PARTS

This article is from a paper published originally by Mullard, Ltd., in one of their recent "Technical Communications", which over the years have disseminated a great deal of useful practical information.—Editor.

This high-quality audio amplifier is designed to operate in Class-A into an 8-ohm load, giving an output power of 15 watts. With a 4-ohm load, however, the circuit will operate in Class-AB to give 20 watt output power.

The transistors are all silicon and, except for the output pair, are plastic-encapsulated. The output transistors, a matched pair of BD181 devices, are driven by BC338's which are preceded by a phase-splitting stage, using two BC147 transistors, and a pre-amplifier stage, a BC158.

The total harmonic distortion is less than 0.1% at full output. The amplifier will withstand normal overdrive conditions and does not require protection against short-circuit situations.

Pre-amplifier Stage Tr1

A high-gain transistor is used in this stage to allow high values of AC and DC feedback to be applied, giving an

Table of Values

<table>
<thead>
<tr>
<th>Circuit of the Class-A Amplifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C15 = 0.22 µF, metallised film</td>
</tr>
<tr>
<td>C2 = 0.0068 µF, polyester</td>
</tr>
<tr>
<td>C3 = 50 µF, 40v. elect.</td>
</tr>
<tr>
<td>C4 = 250 µF, 25v. elect.</td>
</tr>
<tr>
<td>C5 = 0.0033 µF, polyester</td>
</tr>
<tr>
<td>C6 = 160 µF, 40v. elect.</td>
</tr>
<tr>
<td>C7, C9 = 0.001 µF</td>
</tr>
<tr>
<td>C8 = 200 µF, 6-4v. elect.</td>
</tr>
<tr>
<td>C10 = 320 µF, 6-4v. elect.</td>
</tr>
<tr>
<td>C11, C12 = 160 µF, 25v. elect.</td>
</tr>
<tr>
<td>C13 = 2,200 µF, 6-4v. elect.</td>
</tr>
<tr>
<td>C14 = 2,200 µF, 40v. elect.</td>
</tr>
<tr>
<td>C16 = 1,000 µF, 40v. elect.</td>
</tr>
<tr>
<td>C17 = 2,200 µF, 63v. elect.</td>
</tr>
<tr>
<td>R1 = 100K potmeter, pre-set</td>
</tr>
<tr>
<td>R2 = 150,000 ohms</td>
</tr>
<tr>
<td>R3 = 220,000 ohms</td>
</tr>
<tr>
<td>R4 = 68,000 ohms</td>
</tr>
<tr>
<td>R5 = 56,000 ohms</td>
</tr>
<tr>
<td>R6, R16 = 390 ohms</td>
</tr>
<tr>
<td>R7, R13 = 2,200 ohms</td>
</tr>
<tr>
<td>R8, R15 = 270 ohms</td>
</tr>
<tr>
<td>R9 = 10,000 ohms</td>
</tr>
<tr>
<td>R10, R14 = 2,700 ohms</td>
</tr>
<tr>
<td>R11, R20 = 150 ohms</td>
</tr>
<tr>
<td>R12 = 220 ohms</td>
</tr>
<tr>
<td>R14 = 4.7 ohms, 12w.</td>
</tr>
<tr>
<td>Tr1 = BC158</td>
</tr>
<tr>
<td>Tr2, Tr3 = BC147</td>
</tr>
<tr>
<td>Tr4, Tr5 = BC338</td>
</tr>
<tr>
<td>Tr6, Tr7 = BD181 matched pair</td>
</tr>
</tbody>
</table>

Notes: All components are standard Mullard types. Resistor ratings (4 watt except as stated). For optimum performance the specified transistors should be used. Tolerances of +/- 10% are acceptable in other components.
THE G3BEW CLUB PROJECT

DESIGN AND CONSTRUCTION OF PORTABLE EQUIPMENT

J. R. HEY (G3TDZ)

This article will be of particular interest to all Club groups looking for a new outlet for members' energies and interests. It shows what can be done—and how satisfying results can be—when the decision for a constructional project is taken and pushed through to finality.

JOINT club construction projects have the unfortunate habit of dragging on for years, their completion being frustrated by members forgetting to bring along vital bits, together with a long summer recess producing the discontinuity guaranteed to curb active interest. A simple Top Band Tx took three years to complete and is rarely used due to no one having a receiver light enough to carry to Club meetings!

For two seasons it has been agreed that portable equipment should be constructed so that field events could take place—especially at weekends and during the summer break—to keep the Club together and promote further interest.

Club nets have not enjoyed much success as there has rarely been more than two members with equipment in the same band. It was obvious also that the permanent installations of most amateurs are all too permanent, being heavy and not easily moved around.

The proposed equipment has to be truly portable as only a few have cars; 12v. operation is ideal as dry batteries, rechargeable cells and vehicle batteries may all be used and a mains power supply can easily be fitted for indoor use.

Choice of band was dictated by the hope that SWL's in the area would hear our callsign and with other amateurs be induced to take an interest in the Club. Although fascinating the DX bands are unsuitable, leaving 80/160m. or VHF. The G8/3 upsurge was the influencing factor and two metres chosen for the project.

It was decided that instead of only one unit being built, a few could be put together by separate individuals using the Club as a pool of information.

Making a Start

Talks on receiver design and transmitter circuitry were held at regular meetings for a number of weeks. Discussions over size, shape, switching circuits, availability of components and many other problems broke out spontaneously during these talks.

Each week as an extra, the Club callsign G3BEW was put on the air using mains equipment hastily thrown together by two of the members, with a four-element beam constructed on the spot in the Clubroom. The idea was to whet the appetite of the more tired members; indeed, some of the fixed LF and HF operators showed surprise at the liveliness of the 2m. band. We always got a contact or two to enter in the log, with encouraging signal reports.

A few showed willing to make a start, with three members getting to work at once. At the regular meetings circuit problems were thrashed out and sometimes just argued over on the blackboard.

Inevitably total agreement could never be realised so two different approaches were adopted by the early constructors. Dual conversion using ceramic filters at 465 kHz was one whilst single conversion with a 10-7 MHz IF was the other, crystal filters being favoured.

On the Tx side, an output of two watts was considered the most one dare hope to maintain from dry batteries for any sensibly sustained period. Both VFO and crystal circuits were explored with only one intrepid member going VFO with a phase-lock loop. The remainder decided from the start to go for a 72 MHz crystal, not wishing for a repetition of earlier experiences when angry neighbours came pounding on the door about TVI.

A circuit must be seen to work before the less experienced constructors are persuaded to have a go—also, amateur circuit design is decided as much by component...
The younger end whilst expressing keen interest could hardly be expected to turn out a project of this complexity, with their limited experience and pocket. A high performance super-regen, costing only shillings was more to their liking and indeed proved popular; at least as SWL's they could listen to what the rest were up to.

It is one thing to scribble circuits on the blackboard but another to make them work. Birds' nest lashups of each part of the circuit were tried one by one, then linked together. Snags were again discussed at the Wednesday meetings, members turning up with little boxes and even paper bags containing their prototype circuits. Size and battery consumption became the big problems.

**Development Progresses**

As soon as different sections showed signs of being workable, printed circuit layouts were planned and copied. Coil winding was demonstrated on the home-built winder to show how easy it was. It seems many amateurs actually buy coils ready made as they distrust their own efforts. This was shown to be both uneconomic and pointless as 5 turns of wire, for example, are all the same whether wound by hand or in some remote factory.

Not everyone has adequate facilities, therefore allocation of expertise and equipment was a "must." One might have chassis punches whilst another might be good at circuit board etching. "There's twenty coils in this thing so you, you and you get winding."

Once actual chassis construction commenced, we felt it necessary to photograph the parts and circuit boards for the benefit of those who came after. The slowest job was ordering and awaiting parts to arrive. Seemingly commonplace items were the most difficult to obtain. Aluminium stockists were all closed on Saturdays and not every tool shop keeps No. 60 drills for the printed boards.

Of course the exhibitionists raced ahead, which meant they hit the snags the hardest. The slower chaps took advantage of the latest gen as it was unearthed. One, while still at the birds' nest stage, found his best new IC gone queer; another saw his cunning solid-state aerial switch go up in a cloud of smoke when faced with a few watts of RF.

The first receiver to emerge just went put-put-put, and another howled like a banshee. A neat Tx gave plenty of output, with or without the crystal, all over every hand.

One by one all the problems were solved; tins of paint and aerosols replacing the soldering irons. Tuning scales were covered with an impressive display of Letraset figures.

**Great Day Arrives**

The first working model was proudly shown off to the gathered onlookers. "Wait until mine is ready next week—well maybe the week after."

Eventually two and then three fully working models were displayed for all to see. Last minute modifications diminished the newness of some but a bit more paint would soon put that right.

Someone suggested bringing in the aerial. This is one of our less impressive monuments and falls to pieces each time it is tilted to pass through the door. However, after the traditional ceremony of slotting back the elements into the badly fitting saddles on the wooden boom, the contraption was pointed West and the coax plugged into the first unit.

The excited cheering and jumping up and down by the flock as the "S" meter hit the backstop prevented anyone from copying the callsign of the obviously local station pounding in. At last he signed with the other station who was 90° to our beam heading; with impressive optimism the switch was pushed over. A short snappy call followed by an awful silence. Another not quite so snappy call. As our own callsign chattered out of that tiny 2½in. speaker a further burst of wild enthusiasm drowned our report and his callsign. It was another local Club (there are five in Leeds) who gave us our first battery-powered contact. Although perhaps only two or three miles away, the very fair report produced an atmosphere which was positively euphoric.

The fun having died down, more serious testing of the other units went ahead and a field test was planned. That unsightly aerial had to go; one could hardly fly the Club flag from a dubious contraption like that.

A much lighter five-element was cadged and the first weekend truly-portable expedition decided upon. A high point near to main roads and bus routes was chosen with general agreement; would it rain or snow? Three completed units were taken to the site, as these again had to be tried on their own whip aerials as well as on the beam.

We are proud to say the results were as sunny as the weather with contacts from many points of the compass.

**Conclusions**

As more members have now been encouraged to reach for their soldering irons, a new project is already
being considered.

It is hoped the actual circuits will be published in due course, with constructional notes provided for the benefit of those wishing to follow our lead. We do not claim originality in our circuitry but hope to show how a practical approach can be copied and improved upon by the sufficiently interested. Our blundering and eventual success may stir other groups into similar ventures. May they obtain the same satisfaction we have shared, helping to enrich the “build-it-yourself” belief of true amateurs. When you hear or work G3BEW on two metres you will know it is all our own Club effort.

**MCC—“MAGAZINE CLUB CONTEST”**

This annual Top Band event, the 26th in our series, no less, takes place over the weekend November 6/7. Though it is essentially a Club contest, individual stations (non-entrants) caring to take part may be worked to add to the score, as Rule 4. Full details covering this year’s MCC appeared in the October issue of SHORT WAVE MAGAZINE—Rules on p.497, with MCC Identification Codes and scoring procedures on pp.500-501. Any Top Band CW operator who fancies himself on the key is invited to join in and see how many Clubs he can work. Check logs will also be greatly appreciated (“MCC”, SHORT WAVE MAGAZINE, BUCKINGHAM).
**VHF BANDS**

A. H. DORMER, G3DAH

SEPTEMBER saw a spasmodic but reasonable amount of DX activity after the VHF/NFD peak. One outstanding piece of DX for example, which unfortunately did not produce a two-way QSO, was that reported by G6CW in Nottingham, who heard 9A1CT in San Marino at 1215Z on September 5, calling CQ on CW near the two-metre SSB calling channel. The path to and from GM was particularly good between September 6 and 8th, with GB3ANG at 45 dB above noise during the evenings, stronger even than the Durham beacon in the South, although, apart from GM3BRM/P, few Scottish stations were heard South of the Midlands. This North/South path continued to produce DX results for the next week or so, with the night of 17th/18th favourable for 200-mile contacts with some ease. LA, SM and OZ were all being worked from the Midlands on September 7, but were poor copy in the South. G2DSP/P, in Rutland for the weekend September 17/19, seemed to be putting his 5-watt signal over a fair distance on all headings, and the Northern French stations were also coming in well at that time.

The French balloon test, Sonde 4, was launched on Sunday morning, September 19. For those who may have looked for it at the scheduled launch time without result, it may be noted that the ascent was delayed nearly two hours by a broken cable! French speakers may have got wind of this if they were listening on 145.7 MHz, where F1HL/P in Lille was relaying up-to-date information from F1H/P in Nancy, where the launch was being made.

The transponder—the up-frequency was on 70 cm. and the down-frequency on 2m.—was designed by FISA, who was heard making good use of it himself. Conditions were not very good at this time, and it was only those stations almost vertically below the balloon who seemed to be completing many DX contacts via the device, and of those logged here, most were known to be operating on high power. One British station who appeared to be having a ball was G3LQR in Woodbridge, Suffolk, but then he doesn’t run a transistor in the PA either! Last signals were heard at about 1720Z. In conversation with French stations after the event, ‘it was suggested that there should be a broadcast in English to keep us in touch with progress, and a promise was made to examine this possibility.

The evening of September 19 produced some good EU/DX on both 2m. and 70 cm., mostly to the East. ON4HN was heard at 5 & 9 contacting British stations up into the Midlands, and some of the PA0 on 70 cm. were like locals in the South. Incidentally, ON4HN really is striving to get the last milliwatt out of his Tx. You may have noticed that he has a long change-over between transmissions, and this is due to the fact that he found that the antenna change-over relay was costing him half-a-watt, so he has removed it and now performs the operation manually! The lift persisted Eastwards through to September 22 on both bands, with Germany, DK6KX in particular, being worked on 70 cm. at good strength on the last night.

And so into October, and at last the long looked-for Autumnal lift. A study of the contemporary weather and pressure charts showed the build-up of the high pressure system and its slow progress to the South-East, and this brought good propagation to Scandinavia on October 1, but it was the steady anti-cyclonic conditions, with a “high” centred over France and Germany, which really produced the goods for days on end from October 5 onwards. Contacts were made between the U.K. and LA, SM, OZ, PA, ON, F, DL, OK, OE, DM, LX, HB9 and SL on 2m., and although not quite such spectacular results were achieved on 70 cm., the nearer Continentals, OZ9FR and OZ9SW, and GC2FZC in Guernsey, were all worked from this country at good signal strengths. G3COJ and others had a QSO with H89AMH on October 8. OZ9IGY on 145-976 MHz and DL0PR on 145-971 MHz near the Danish border were fantastically strong in the early hours of October 7, and as GB3DM and PA0DSW were also operating around these frequencies, there was some unusual QRM! Inter-G QSO’s at 200+ miles were commonplace, and one expects some fairly hefty claims for new counties and countries worked for the Annual VHF Tables.

By October 8, the situation had reverted to normal as the centre moved away, and in spite of some highish temperatures for the time of the year in this country, and the appearance of fog at times, comparatively short-haul contacts are once again the order of the day.

**VHF Repeaters**

It was announced at the Scottish VHF Convention recently that consideration was being given to the establishment of a series of VHF repeater stations, on the lines of those in the U.S.A., Canada and certain Continental countries.

The decision on the form which such a network should take will obviously be the subject of much discussion, and it would seem unlikely that there will be any hardware in actual operation for a year or so. Questions to be resolved must include the choice of modulation system—AM or FM, restricted or general access, sitting, frequency—single band or crossband, radiation polarity, and the type of user, whether mobiles only or free-for-all. Tom Douglas, G3BA, had some experience with the operation of these devices when he was in LX recently, successfully completing QSO’s via the Aachen repeater, and from all accounts this was a very effective way of making DX con-
contacts, but a great deal of self-discipline is required, particularly from those running high power, if the system is not to be monopolised by the few. Admittedly, one can incorporate time-limiting circuits in the design, but if anything other than a linear repeater is envisaged, the Tx and Rx frequencies will be on discrete channels and the QRM and possible blocking of the transponder are likely to raise problems.

Then there is the question of who owns them. In the U.S. particularly, a number of repeaters have been set up by Clubs and Groups who try to arrange that they be for the exclusive use of their members. This has led to a lot of ill feeling, and any attempt to duplicate this procedure in a small country such as ours, with consequent attempts at monopolisation of a particular frequency, would probably have a similar result. Public, as opposed to private, operation would seem most desirable.

Whichever way one looks at it, the whole project is beset with difficulties and imponderables, to which, one hopes, a speedy and satisfactory solution will be found, since amateur opinion, as so far consulted, would appear to favour the scheme. Even if permission for the operation of active devices is withheld, it might still be possible to set up a system of passive re-radiators to do a similar sort of job.

VHFCC Awards

Four Awards this month, the first, No. 113, going to G3YSB, Don Hood of Hastings. Operations commenced on Top Band and the HF bands in September, 1969, and 2m. activity followed in August 1970. Initially, the rig was QRP with about one watt output to a dipole and a super-regen Rx, but this has now been replaced with a QPV06-40A PA modulated by 807’s in A81, an 8-ellipse Yagi and a dual-gate mosfet converter feeding into an AR88. The site at 420ft. a.s.l. gives a clear take-off in all directions except to the West and North-West, where there is considerable screening. It took 380 QSO’s to produce 100 QSL’s.

Certificate No. 114 goes to David Hemmingway, G8EEG (Hindhead, Surrey) and is again for operations on 2m. The gear, nearly all home-built, consists of a QPV03-10 PA with EL84 modulators running at 13 watts input, a dual-gate mosfet converter tuning 4-6 MHz into an HRO, and a 5-ellipse beam at 30ft. David can receive on 70 cm. at present, and has a Tx under construction. The QTH at 730ft. a.s.l. should enable him to put out a fair signal on any of the VHF/UHF bands! QSL return rate is about average—30% or so—and EEG notes in particular how poor the return is from stations worked during contests!

G8CPG is Eddie Chambers of Sheffield, and he gains Award No. 115 for his 2m. activity from a 720ft. a.s.l. site on the Yorks./Derbysh. border, which he claims is the most southerly station location in Yorkshire. Take-off is good in nearly all directions, although to the West, a 2000ft. mass of Derbyshire mill-

<table>
<thead>
<tr>
<th>Station</th>
<th>FOUR METRES Countries</th>
<th>TWO METRES Countries</th>
<th>70 CENTIMETRES Countries</th>
<th>TOTAL pts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3OHH</td>
<td>51 7</td>
<td>63 7</td>
<td>33 4</td>
<td>156</td>
</tr>
<tr>
<td>G3COJ</td>
<td>37 5</td>
<td>64 16</td>
<td>30 7</td>
<td>159</td>
</tr>
<tr>
<td>G3ZTC</td>
<td>45 5</td>
<td>37 8</td>
<td>46 10</td>
<td>151</td>
</tr>
<tr>
<td>G3DAH</td>
<td>34 3</td>
<td>59 13</td>
<td>30 7</td>
<td>146</td>
</tr>
<tr>
<td>G3DF</td>
<td>21 2</td>
<td>55 12</td>
<td>31 6</td>
<td>127</td>
</tr>
<tr>
<td>G2DHDZ</td>
<td>28 4</td>
<td>54 9</td>
<td>24 4</td>
<td>123</td>
</tr>
<tr>
<td>G2ATS</td>
<td>— —</td>
<td>48 10</td>
<td>41 8</td>
<td>107</td>
</tr>
<tr>
<td>G8BCA</td>
<td>— —</td>
<td>50 6</td>
<td>35 6</td>
<td>97</td>
</tr>
<tr>
<td>G3JXN</td>
<td>27 2</td>
<td>57 9</td>
<td>— —</td>
<td>95</td>
</tr>
<tr>
<td>G3ZPZ</td>
<td>— —</td>
<td>78 13</td>
<td>— —</td>
<td>91</td>
</tr>
<tr>
<td>G2AXI</td>
<td>24 3</td>
<td>39 4</td>
<td>8 2</td>
<td>80</td>
</tr>
<tr>
<td>G3EKP</td>
<td>27 6</td>
<td>24 7</td>
<td>8 6</td>
<td>78</td>
</tr>
<tr>
<td>G3FIJ</td>
<td>4 1</td>
<td>45 9</td>
<td>12 4</td>
<td>74</td>
</tr>
<tr>
<td>G2JF</td>
<td>— —</td>
<td>53 19</td>
<td>— —</td>
<td>72</td>
</tr>
<tr>
<td>G8BKR</td>
<td>— —</td>
<td>46 5</td>
<td>14 2</td>
<td>67</td>
</tr>
<tr>
<td>G3AR</td>
<td>31 3</td>
<td>21 4</td>
<td>— —</td>
<td>59</td>
</tr>
<tr>
<td>E16AS</td>
<td>15 5</td>
<td>30 6</td>
<td>1 1</td>
<td>58</td>
</tr>
<tr>
<td>G8ECK</td>
<td>— —</td>
<td>46 9</td>
<td>— —</td>
<td>55</td>
</tr>
<tr>
<td>G8BWW</td>
<td>— —</td>
<td>32 5</td>
<td>6 4</td>
<td>47</td>
</tr>
<tr>
<td>G8CU</td>
<td>— —</td>
<td>36 5</td>
<td>3 1</td>
<td>45</td>
</tr>
<tr>
<td>G8EMS</td>
<td>— —</td>
<td>35 8</td>
<td>— —</td>
<td>43</td>
</tr>
<tr>
<td>G8AUN</td>
<td>— —</td>
<td>31 6</td>
<td>3 3</td>
<td>43</td>
</tr>
<tr>
<td>G4ALN</td>
<td>— —</td>
<td>33 8</td>
<td>— —</td>
<td>41</td>
</tr>
<tr>
<td>G8CYN</td>
<td>— —</td>
<td>32 9</td>
<td>— —</td>
<td>41</td>
</tr>
<tr>
<td>G8APZ</td>
<td>— —</td>
<td>— —</td>
<td>33 6</td>
<td>39</td>
</tr>
<tr>
<td>G8CVD</td>
<td>— —</td>
<td>32 5</td>
<td>— —</td>
<td>37</td>
</tr>
<tr>
<td>G8MEOJ</td>
<td>— —</td>
<td>18 10</td>
<td>3 1</td>
<td>32</td>
</tr>
<tr>
<td>G8CXC</td>
<td>— —</td>
<td>24 8</td>
<td>— —</td>
<td>32</td>
</tr>
<tr>
<td>PAHLY</td>
<td>(G7TMQ)</td>
<td>13 6</td>
<td>— —</td>
<td>19</td>
</tr>
</tbody>
</table>

Three Band Annual VHF Table
January to December, 1971

Just a reminder that the Tables go through to December 31, 1971. The Three Band Annual Tables show claims to date for the year commencing January 1, 1971. Claims should be sent to “VHF Bands,” SHORT WAVE MAGAZINE, Buckingham.
The Scottish Scene

The event rousing the most interest in GM this month must surely be the VHF Convention held in Edinburgh on Sunday, October 3. Attendance was better than ever with over 120 visitors for the Convention itself, and 73, an appropriate number, attending the subsequent dinner. Organised by the Lothians Radio Society, the occasion included talks by G3BA on VFO operation on 2m., by G3FZL on repeaters and by Paul Widger, GM3APU on his recent mammoth DX-expedition to the rarer Scottish counties. In an after-dinner speech, Vic Stewart, GM3OWU, referred once again to the annual invasion of the better VHF sites in Southern Scotland by Sassenach hordes during summer contests! This influx, with its attendant QRM problems for the local groups, has now reached such proportions that it must be brought under some sort of control, and while not wishing to exclude such visitors entirely, steps are being taken to protect these sites. This Column has indicated several times in the past that it is only common courtesy to check with the locals in any situation before occupying a site and operating /P; for Southern Scotland the approach should be made to GM3OWU, QTHR. The Jock Kyle Trophy was awarded this year to George Burt, GM30XX, that indefatigable bicyclist, whose /P efforts from the summits of various eminences have given pleasure, and DX, to so many. George was an RAF apprentice at Cosford and Melksham during the seven years he spent in the Service, and after working for several years as the Head Technician in the cardiograph section of the Edinburgh Royal Infirmary, he joined the electronic research laboratories of one of Edinburgh's leading hospitals for mental diseases, where he commands the high respect of the surgeons and staff.

A slightly nostalgic note was struck in conversation with GM6XI of Edinburgh, when the topic of five-metre operation was broached, and it was realised that he and GM2DL of Wishaw still hold the Short Wave Magazine 5m. record for countries worked on that band. Altogether, a very enjoyable and successful occasion, to be repeated next year under the auspices of the Glasgow groups.

Beacons

The GB3DM 70 cm. beacon Tx has now been delivered and by the time these notes appear may be audible on 432-7 MHz from nearly 1000 ft. up near Burnhope, Co. Durham. This is a solid-state device with some 5 watts output feeding into two 8/8 slots, one beaming South and the other towards GM. It is planned to have a 23 cm. beacon operating from the same site by the end of 1971. This also will be a solid-state Tx with two varactors and high-Q breaks and will beam South. All of which is likely to keep Bill Burton, G8ANQ, the beacon minder, busier than ever. Our thanks must go to him, and indeed to all the beacon keepers, who ensure so admirably this service. Please send reception reports on the 70 cm. beacon to G8ANQ, QTHR.

GB3ANG is temporarily out of service, but GB3GEC has made a welcome reappearance. PA0VD is on intermittent operation. There is hope that the 2m. Thurso beacon, GB3GM, may radiate to the North-East as well as to the South, and this will give a useful pointer to the possibility of Auroral activity.

It is reported that a beacon with the callsign F3FHP has been heard in operation on 144-002 MHz.
Activity

G3LTF and G3LQR had a contact on 23 cm. with ON4HN on September 29 at 1930z. F1AOY/P from Calais is now on 70 cm. and has had several contacts with British stations, although he is only running 4 watt! QSO's are being made with Scandinavia on SSB on the first Tuesday in each month, as this is their activity night. G3ZUD (Welwyn Garden City) worked HB9IN on low power on the morning of Friday, October 8. QRA is EH55h. G3JF contacted OK, OZ, PA, DL, DM, LX, OE, and F over the recent opening, and also had a QSO with F9NL in the Pyrenees at 5 & 9 both ways on October 3. This gives Jim 82 new stations worked between October 1 and October 10, and brings his total of countries worked on two metres this year up to 19! G3ZYG got GC2FZC at 5 & 9+ on October 6 on 70 cm. He found 23 cm. unusable on that day due to strong radar-type QRM over the whole band; he also made it at last with G8ATK on 70 cm., in spite of high obstructions on the path. EI6AS had 2m. contacts with several PAO on October 1, and also a 70 cm. QSO with PA0EZ for good measure. G3COJ made it on October 6 with OK1KSO/P, in QRA GK46c, on 2m. for his first OK contact after trying for years, to dodge the QRM on 2m. He then transferred his attentions to 70 cm. and promptly worked OZ9SW and OZ9FR! G3COJ also raised LX1DT on 2m. on October 7. G3LQR worked a DM on 70 cm. the same day, and also OK1KSO/P. Radio Gdansk was S9+ on 70-31 MHz on October 7 but there was little 4m. activity—presumably everyone was having a ball on 2m! The G3ZYG/G3QA 70 cm. sked on Monday and Friday evenings is proving some 90% successful. GC3YIZ made it with GD2HDZ on 2m., to give the I.o.M. station his first GC.

We referred earlier in this piece to the fine signal put into the South by GM8BRM/P. It is now learned that between September 6 and 8th, he worked 93 G, four GM, 10 OZ, 20 PA0, seven DL, two ON and two F. The rig is a Pye "Ranger" and DL65W converter to an Eddy-stone EC-10, with an 8-ele beam. The QTH was again Cairnorrie, 40 km. north of Aberdeen.

General

In a letter from the beacon keeper of F3THF, a request is made for reports of sporadic-E contacts made by G operators during the opening on May 24 last. These should be sent to Monsieur S. Canivene, F8SH, 6 rue de Pont-Hélé, 22 Perros-Guirec, France, who is correlating them as a member of the REF Scientific Council. For example, he would like further information on the contacts made within FR, such as those between that country and G5ZT and G5FZ. He reports also that the French beacon is now nearing 25,000 hours of continuous and successful operation, and that the only changes envisaged at the present time are modifications to the keying circuits to incorporate IC's. For those who may not have a record, the frequency of F3THF is 144.007 MHz.

G8COG (Birmingham) now has a 6/6 slot and an Fet converter to go with the "Two-er." He is another sufferer who complains of grossly over-modulated signals during contests! G8CXC of Portsmouth will shortly be running high power on 2m. with a 100/150 watt Tx for AM and NBFM. Although he has worked into Lancs. and Yorks. with the HW-17A and a 14-ele Parabame, he finds the going a little tough from a QTH at zero ft. a.s.l.! He also has plans for 70 cm. operation. G8BKR is now QRV on 23 cm., transmit only at present, from Bristol and has had crossband contacts with G8AII, G8AII/A and GW3FNQ/M. It would be interesting to know how many other operators have reception facilities for 23 cm. in a car?! G3ZYG is looking for 70 cm. skeds with GM any night between now and the end of the year. As he is not yet in the callbook, his QTH is: Farm Close, Pentrich, Derbyshire, DE5 3RR.

G13HN in Co. Antrim will soon be operating portable with an FT-2F and a 6-ele beam. Such operation is really forced upon him since the home QTH is at zero ft. a.s.l. and the surrounding hills are at 1500+ft. He would like information on how to calculate the basic xtal frequencies for the FT-2F. Can anyone help? Steve Ruff, G18EWM is now on 2m. most evenings from just north of Belfast. He runs a QVQ0-10 with EL84 modulators on 145-8 MHz to an 8-ele beam, and plans to have SSB shortly.

GD2HDZ has got 2m. SSB and so joins GD3FOC. G8DZYX is now at Mildenhall, Suffolk, and is active on 2m; he is looking for details of a D-1-Y counter at a reasonable price. Although he now runs 150 watts on 2m. from the home QTH in Swindon, G8DMY does not always find this power essential for DX contacts; he had a QSO with F9YR/P at 800 km. on one watt into a halo from the Cardiff University site. G8CGK is now G4AEF. Another father and son combination is G8EEQ and offspring G8EES, both of Baildon, Yorks. G6NB near Aylesbury had a very nasty experience recently when he had a lightning strike on the shack. Much of the gear was badly damaged, but he is back on the 2m. air, and is taking advantage of the occurrence to do a bit of a rebuild.

An amusing comment, heard recently—"... some of these supposedly NBFM signals sound like badly modulated spark!" A sentiment with which many of us will regretfully agree.

Goodbye

A sad loss to the U.K. Amateur fraternity will become apparent shortly when Arnold Mynett, G3HBW, leaves this country to take up an appointment with Racal Ltd. in South Africa. He started his VHF career as an SWL in the days of our Short Wave Listener (November 1946-March 1953), then became a regular correspondent to "VHF Bands" and also an occasional contributor to Short Wave Magazine. We wish him the best of luck in his new venture.

Deadline

Deadline for the next issue is November 6, and the address for news, views, claims and comment is: "VHF Bands", Short Wave Magazine, Buckingham. Cheers for now and 73 de G3DAH.
NEWCOMERS, AND SWL’s RECENTLY LICENSED

—NEWS, VIEWS AND COMMENT

—THE LADDERS, AND HPX RULES

ONE of the sadder facts of life in the Amateur Radio context is the large proportion of new licensees, both “A” and “B” categories, who come to their ticket with absolutely no experience of short-wave listening, either on the band they start on or indeed any other. Almost all of these chaps end up unable to radiate signals much beyond the local area but quite satisfied with the results they do obtain, simply because they know no better.

Fine, if that is how they like it, who are we to complain? However, when these chaps set themselves up to prescribe for a keen SWL what he needs to use and where he can economise—as by saying that a commercial trap vertical is “too good an aerial for SWL’ing”, for instance—then we must join issue. Nothing is ever too good for an SWL station, any more than for the lad with the callsign. This is not saying, of course, that the keen type must buy all his gear—obviously, only home-constructed gear built by and designed by an expert for the task in hand can be anywhere near perfect, since all the commercial equipment is of necessity a compromise to please the majority of potential customers. A prize example of this is the fact that many amateurs still do not trust transistors, which means that all the SSB transceivers available on the U.S. or U.K. market, with one exception, are fully valved—the one exception being, of course, a hybrid using valves, transistors, and IC’s. The number of transmitters and linear’s on the market which use colour-TV line timebase valves of European or American origin rather than, say, the old 813, is a very eloquent testimony to the instinctive fear of voltages measured in four figures—even though the lower-voltage, higher-current supplies are probably more likely to be killers than the 2.5 kV on the anode of an 813!

As for a better-than-average aerial system, let it just be remembered that the chap with the bit of wire—best, as compared with the chap under, say, a tri-band beam up in the clear, a prisoner of both the skip and the conditions. To the chap with the wire, the bands open later and close earlier—and, worse, it has to be a good opening before he even notices it! Against this, the chap with a good aerial in the clear will be logging stuff inaudible to the wire-bound man, and if his aerial is rotatable, chances are he will learn to use the directive properties of his beam as a QRM-reducer, thus improving his chances still more.

The Correspondence

Our opening letter is from P. Goff (Towcester), and his theme the lack of response to his QSL’s, which were sent complete with IRC’s. The root cause of this lack of response is probably that the Goff offerings do not provide the incentive to respond. An SWL report on a DX station, for instance, should cover a series of QSO’s, give relative strengths of other stations from the same part of the world, and probably indicate how the signal strength and quality held up during the period of the report. In addition, such data as the SWL station equipment, receiver, aerial, ancillaries, and so on is appropriate; and to this can be added notes on any other data which may be of interest, and perhaps a few personal comments including special reasons why the sender wants a QSL, plus even a photograph. It all helps to make a communication the chap will want to answer.

A fine example of the sort of thing we have in mind is sent in for interest’s sake by G3ADZ, he having received it from SWL Nick Bainbridge. This includes a graph of signal strength and another of readability plotted against the time covered by the SWL report; plus a half-page of carefully-written notes, a brief description of the weather conditions at the receiving end, and so on. Quite an expenditure of time and effort, but your conductor is ready to bet SWL Bainbridge has a very good record of return QSL cards.

S. Cole, of Newport, seems to spend much of his time raking over the 3.5/7 MHz bands, and, indeed, the hearing of ET3ZU/A on Eighty brought up the score for that band to 127 countries. To help things along, a new receiver, probably an FR-DX500, and a Hy-Gain vertical 18-AVT/WB are in the offing as part of Stephen’s serious preparation for the day when he gets on the air with his own ticket.

New Entries

An interesting first list is put in by J. Iredale (Llandudno) but, alas, there is no mention of the gear used to winklen them all out.

It is not usual to get a first entry in the CW-only list from a member of the younger set, but R. Mortimore (Cardiff) makes his bow this way. He first started on the G3HSC Morse Course about four months ago, and has used his time to such good effect that he is already up to the 20’s, and digging-up the DX to be found at the low end of Twenty. The receiver is a Trio 9R-59DS, coupled either to an end-fed or a 14 MHz dipole.

J. Gravell (Burry Park, Carmns.) has for long been a listener to the short-wave BC bands, but of late has “found” the amateur bands, and now has his 640 receiver tuned to them for most of his listening. For aerial, Jeffrey has a forty-metre dipole.

Another long-time listener is M. J. Wayland, who is an architectural student at Leicester Polytechnic—an
occupational tendencies to hold down his listener hours, particularly when one considers he is also booked-in at the local R.A.E. class. On the receiving side there is a Heathkit HR-10B for 10-80, and a TCS-12 does duty for Top Band.

Talking of old-timers, L. Tagliaferro (Eastbourne) must be nearly the "daddy of 'em all," with his start back in 1925—and he still has a couple of bright-emitter valves and a slider-tuned inductor to prove it! Top Band.

Heathkit HR-10B for 10-80, and a TCS-12 does duty for the local R.A.E. class. Particularly when one considers he is also booked-in at occupation that tends to hold down his listener hours, SWL's, and wonders whether there are, in fact, any other SWL's in GI-land! (Of course there are!—Editor.)

After reading our comments on the desirability of joining a Club, I. Brown (Newtownabbey) went to Belfast YMCA—but regrettably, GI6YW has had to suspend service, so that he can turn his full attention to the B.40 in the shack!

After reading our comments on the desirability of joining a Club, I. Brown (Newtownabbey) went to Belfast YMCA—but regrettably, GI6YW has had to suspend service, so that he can turn his full attention to the B.40 in the shack!

The New Licensees

To all of these, our regret at losing them is tempered by the pleasure of knowing they have achieved their ambitions—so congratulations!

T. George (Penzance) has G4AMT, and is active on all bands 10-80, using his Viceroy transmitter and a Trio 9R-59DE receiver. Reports, G4AMT says, are welcomed, particularly on the CW signal he puts out on 3.5 and 7 MHz; Terry promises he will QSL any correct reports.

S. Rawlings (Reading) is, as G4ALT, going great guns on Top Band and Eighty; operations have been enormously helped by feeding his end-fed 132-footer against an earth entirely divorced from the mains earth; enormously helped by feeding his end-on 132-footer against an earth entirely divorced from the mains earth; harmonics which so plagued him before.

Talking of examination results, Z. Parmigniani (Whaley Bridge) passes over his crop of O-Levels with the comment that "now we can concentrate on more important things!" Zorro is hanging on to his long-wire and its vertical aerials for the moment, but plans are in hand for rotatable dipoles for 14-21-28 MHz. On a different line, one of Zorro's exam. passes was in Spanish, but he admits to finding the South American stations speak too fast for him to translate easily. Yet another point he makes concerns the current trend, particularly on the part of SM and W stations, of sending, not a QSL in reply to a card with s.a.e. but a chain-letter, of all things.

After all the gripes about studying getting in the way of DX listening, it is a bit of a surprise to hear of someone—H. Goodwin (Streetley)—who says that as he has now started work the "lazy years of studentship are over!"

The main interest for E. Parker (Hove) of late has been the contrast between the performance of his end-fed against a resonant dipole on 21 MHz, both being compared on that band, of course. Incidentally, Ernie has a caustic wit—"nothing more to say, so (unlike the characters who haunt Eighty) I will refrain from saying it!"

At the time this is being written, J. R. Cowan (Rochford) will be settling in to the first few days of his two-year training course to be a radio officer in the Merchant Navy.

S. Wessely (Sheffield) has received some interesting QSL's, among them 5W1AU, CR4BS and FR7AJ. Indicently the last two arrived OK even though the address was only given as "Simon Wessely, S7-1NZ." Maybe that postal code does serve a useful purpose, after all.

A longer-than-usual letter from J. Fitzgerald (Gl. Missenden), who has got his receiver back in service. John seems quite startled at the number of people who still believe that to put a gain preselector in front of a good modern receiver is a way of finding more DX; but with his Trio 9R-59, John feels a preselector of low gain might be a help in reducing image troubles on the HF bands with a receiver which is of the "classic" old style of single-conversion design with 465 kHz IF.

R. Philpot (Sheffield) wonders where FG7XF is located, Robin having found two islands named Guadeloupe. The one you want is that in the Caribbean area, and is spelt as above—if you look carefully, the one off...
An unusual activity for an SWL is mobile operation, but this is what is keeping P. L. King (*Isle of Wight*) amused—he has a Codar T28 in the car, and a G-whip on the rear wing. A long trip recently was all the way up the coast of W6, or rather XE, is spelt without an "o" after the "i," and is Mexican territory.

An interesting case is postulated by R. Carter of Blackburn, who wants to know whether one should report the hearing of a distress call that was apparently going unanswered. Surely—to the local Coastguard if one is near the sea, or to the police if one is located inland. Incidentally, at the time of writing, your J.C. has just been listening to the TV discussions about the risk of an exceptionally high tide around October 5, and people on TV remembering the 1953 floods; it all recalls that there was at that time just such a case, due, if memory serves aright, to a Coast station having its landlines to the transmitter-house out of action, where an amateur was able to render considerable help—it was all written up in the columns of the *Magazine* at the time.

A nice new KW-202 receiver has replaced the Trio at the shack of D. A. Shepherd (*Kingswinford*), and is compared by its proud owner to the KW-2000B in its performance. Additionally a change of aerial has been made, and a "kinky" 132-foot now adorns the garden and shuts out the sunlight, in accordance with the old proverb which says "the less the sunlight that can get into the garden, the better the DX worked!"

Tony Judge (Bishops Stortford) has some private jokes with your J.C. about the sudden activity of an amateur of our mutual acquaintance, who we claim has filled one page only of a logbook since he was first licensed about four years ago! Practically, Tony is building the Prinsset valve two-metre converter, and has a dipole prepared for the band, thanks to G8BTK's encouragement and assistance.

For those interested, M. Marsden (*Ilford*) mentions the W/MM's that are often to be heard at the height of Twenty, handling what the Americans euphemistically call "traffic"—meaning third-party messages put through phone-patches on to the landline network in the States. This sort of message-handling is confined to a very few countries, mostly U.S. and her colonies, luckily; no one minds third-party traffic of the sort taken by RAEN or its equivalent in other countries, but this handling of messages whose priority is so low that they do not justify the originator in writing a letter or using the telephone network in the normal (chargeable) manner, is a rank waste of our over-crowded amateur bands.

For M. Williams (*Sleaford*) the great news is that attempts are being made to form a Club in Grantham on the one hand, and that an R.A.E. class is in fact being started at St. Hugh's School, Dysart Road, on the other, the latter having been mentioned in our list on p.430 of the September issue. This means that Maurice is now able to tackle the theory and the practice of transmitting, the latter by watching the locals on the air, which SWL Williams considers, rightly, as quite as important as pure theoretical knowledge, not to mention also getting some help with the business of learning his Morse.

It's all happening, as the younger generation say, to K. Webb (*Reading*), who has now settled in his new place there, albeit the aerials have still to be planned and put up in the nice long garden available for the purpose. However, that does not exhaust the problems by any means—before much serious listening can be done there is a small matter of some accountancy exams. to be dealt with to the satisfaction of all concerned.
to the Derby Rally, with G3XF, equipped for mobile working on Top Band, Four and Two metres to keep in touch on the journey.

This chap Mercer, Alan Mercer of Wigan, doesn’t miss much of the action on Top Band. Since he got his ARRSF, Alan has heard two W’s, one K14, one M9, one ZD8 and a PY, not to mention Europeans. Since the MP4 was in Asia, that means Alan only needs to find a VK or ZL to be able to say he has “heard all continents on Top Band.” Since the VK activity is sure to be there this season it seems a foregone conclusion that he will complete the set this winter.

H. M. Graham (Harefield) is one of the correspondents who provide so much of the “background” information to build up our picture of what happens around the bands. This time Maurice takes as his theme the old-timers on the band—the result of hearing CX2CO on Twenty, as this laddie was the first CX he ever heard, ‘way back in 1936. Another one is W1JFG, Willard, always a big signal, and CT1AY. Then there was W22C of Little Silver, N.J., who always sported a signal, like the present-day, W2ONV, the size of a BC station. Maurice heard UK9CAT and wonders where he is—answer is Sverdlovsk area in Zone 17. Looking at the Graham all-band report confirms your conductor’s view that for the run-of-the-mill SWL without a beam, the band to be on over the recent period was undoubtedly 14 MHz, with 21 MHz as second choice for the chap who could be on at the right time.

For P. Scrugg (Stockport) much of the new prefix list came to hand by way of the odd listen round the LF bands and hence the filling in of blanks in the prefixes available locally, such as G2DNH/M. Phil also noted DF0IFA, a Radio and TV exhibition station in Berlin.

S. Proud (Letterston) doesn’t write long letters as a rule, but he packs some queries into his few lines! First off comes TB6NX, asking for QSL’s via TA1NX and claiming to be on an island 40 miles off the TA coast—a doubtful one as far as J.C. is concerned. EQ2 for EP2 is quite OK, and has been around quite a bit. ET3ZU/A’s DXCC status next, and as far as your scribe is aware, unless ARRL say otherwise, it is a country as far as DXCC is concerned.

Having heard what he believes to be the only real PA1 station extant, PAIGRE on Twenty, August 3, D. Lowe (Manchester) sent off his first QSL card to the chap, and to the SM he was working as a second. Both came across with a card, so Dave is now on the way to a “collection of wallpaper.”

P. Harris (Surbiton) commences by correcting an error in J.C.’s records and his HPX listing, and goes on to say that he has found conditions quite good for the few days after his holiday and before the deadline, as a pleasant change to the situation before he went away. For arials there are a single-element quad for 21 MHz, and a slightly bent 28 MHz dipole, both of which live indoors and are now—a great improvement—fed with real coax instead of the gash stuff used previously.

It’s odd how one can go for months without a new country and then suddenly pick up a couple in a few minutes; this in fact happened to H. Alford (Burnham-on-Sea) with ST2 and TY1, both on Fifteen. .

** * **

### NEW HPX LADDER

(Starting January 1, 1971)

<table>
<thead>
<tr>
<th>SWL</th>
<th>PREFIXES</th>
<th>SWL</th>
<th>PREFIXES</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHONE ONLY</td>
<td>PHONE ONLY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P. Harris (Surbiton)</td>
<td>469</td>
<td>J. Iredale (Llandudno)</td>
<td>340</td>
</tr>
<tr>
<td>W. B. Taunton (Meopham)</td>
<td>441</td>
<td>M. Marsden (Ilford)</td>
<td>334</td>
</tr>
<tr>
<td>D. A. Shephard</td>
<td>435</td>
<td>J. W. Jarvis</td>
<td>328</td>
</tr>
<tr>
<td>(Brietley Hill)</td>
<td></td>
<td>(Rickmansworth)</td>
<td>310</td>
</tr>
<tr>
<td>P. Goff (Towcester)</td>
<td>432</td>
<td>T. Thornton (Wargrave)</td>
<td>295</td>
</tr>
<tr>
<td>Rev. L. Turner (Dudley)</td>
<td>428</td>
<td>K. A. Hastie (Jedburgh)</td>
<td>265</td>
</tr>
<tr>
<td>J. Woods (Woodbridge)</td>
<td>418</td>
<td>Z. Parmigniani (Stockport)</td>
<td>255</td>
</tr>
<tr>
<td>K. Plumridge</td>
<td>(Southampton)</td>
<td>416</td>
<td>R. Philpot (Sheffield)</td>
</tr>
<tr>
<td>J. V. Parker</td>
<td>(Newcastle-on-Tyne)</td>
<td>400</td>
<td>P. Reeves (Barton-on-Trent)</td>
</tr>
<tr>
<td>S. Rawlings (Twyford)</td>
<td>386</td>
<td>R. Impey (Brentwood)</td>
<td>252</td>
</tr>
<tr>
<td>H. R. Goodwin (Streethy)</td>
<td>356</td>
<td>W. M. Bell (Bristol)</td>
<td>249</td>
</tr>
<tr>
<td>Miss L. Hyde</td>
<td>(Southampton)</td>
<td>353</td>
<td>M. J. Wayland (Leicester)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J. Gravel (Barry Port)</td>
</tr>
</tbody>
</table>

Lists include only recent claims. Starting score 200. Rules as for HPX. Zone Map and latest Prefix List, 85p post free from Publications Dept., Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

Although he had a very pleasant business trip to the States recently, and met a couple of the W4’s, the pressure of work in the Akron and Baltimore areas was so much that pre-arranged visits had to be cancelled, reports K. Keyzor (Perivale); but nonetheless the return home enabled him to put in a nice long list of prefixes as the Table shows.

V. Lindgren is at present in Cardiff, although in December he will be returning to his home in Hull. Vic used to be a contributor to “SWL” around the time when your conductor first took over the piece, but since then he has been serving in the R.A.F. as a wireless operator, which means that, while R.A.E. needs studying for, Morse will be no problem. In Cardiff, Vic has a Tri-Band-59DS fed by twenty feet of wire draped around the floor of his room, a combination which has yielded W’s on Top Band and such as VK on Forty CW. For a final comment, Vic notes the decline in manners on the bands, both on CW and SSB. Agreed, and while we could wish for people to exercise a bit more self-control on the air, we can’t blame them for the sad fact that in most cases they were just not taught good manners by their parents. However, there are strong signs that the present crop are setting a fashion by decrying the ill-manners and rebellion of their immediate predecessors as being no longer “in fashion.”

Quite a long time since last we heard from John Singleton (Hull) and his XYL Sheflag; however all seems well with them and they have been doing much decorating in preparation for the latest addition to the family, all of which has reduced their time on the rig.

**Conclusion**

Once again, that’s the lot. For all those pleasant letters, your scribe’s thanks; and he looks forward to the next crop, as much for the private wisecracks as the publishable parts. The deadline for next time is first post on November 22, addressed “SWL,” SHORT WAVE MAGAZINE, BUCKINGHAM. And since this is his last chance, J.C. snatches this opportunity to wish all a very Merry Christmas and a Happy New Year.
THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for December issue: November 5)

(Please address all reports for this feature to "Club Secretary," SHORT WAVE MAGAZINE, Buckingham.)

WITH MCC upon us, it is time for settling those last-minute details. The rig, of course, goes without saying, as does the aerial. But don't forget the ruled log sheets (Rule 6) or— it has been done!— the key. Or unplugging the microphone from the transceiver. We hope the Contest will be the usual hard-fought but sporting battle it always has been, and above all we hope this year we don't have to disqualify anyone for infringements—least of all for over-driving transceivers. Since several Clubs are entering more than one station, and there are also newcomers in our midst, a Supplementary List of Ident. Codes appears on p. 563 opposite.

But it's time now to look at the reports once again, so here we go—

No Home Ground

WAMRAC's founder-secretary, G3NGF writes to say his address has changed yet again, and he is now settling in at Tebay—the address is in the Panel—although he can no longer join the net on Sundays as a service falls exactly on sked time. As an alternative, WAMRAC members should note that G3NGF will be on 3665 kHz, at 0930 to 1000, and 2030 onwards, every Wednesday, looking out for WAMRAC people.

Now to RAIBC, who also have their meetings by way of nets; they are somewhere between 3650 and 3700 kHz, depending on the QRM situation, 1000 on Tuesdays, 1400 Wednesdays, both clock time, and of course the excellent Radial brings more news of members doings each month.

Nets and Newsletter provide the contact for all the members of the Royal Navy group—and there seems to be quite strong activity on those nets too, as we note that at least one session produced no less than 21 for the log. For B.A.R.T.G., which cares for the interests of the RTTY wallahs, the event of the month is definitely the AGM; this is being taken in London and a large attendance is expected.

A final entry in this category is the one from the Nigerian A.R.S., their NARS News being as always a nice blend of personal chat and matters of general interest, the latter being this month in the form of a note of the WWV broadcast format changes.

The North

Every Thursday evening the Nottingham lads get together at the Sherwood Community Centre, Mansfield Road, at 7.30. A Junk Sale comes up on November 4, and Films are down for the 11th. On November 18, they will have a natter and some will fire up G3EKW, which leaves November 25 for G3YCT and G8CXK to talk about their recent expedition to Scotland.

The Bolton chaps are probably by now just beginning to see the comic side of their exhibition-station and its problems, at St. James Church, Brightmet, where they had been installed for the gala day inside the church, with the aerial up the tower—but as it happened the tower, like so many church towers, contained sufficient lead cladding to make sure the aerial wouldn't radiate! So it has to be taken down and slung to a nearby tree. For November 3 they have a Junk Sale at Hq., the Recreation Club, Kensington Place.

November 9 is the date for Bury and Rossendale, and G3NOM the speaker, the theme being Aerial Matching Techniques. Looking forward a little, they are coming up to a 25th anniversary soon, and a dinner dance is planned for January 29—December 14 is also important, being the AGM. Normal meetings are at the George Hotel, Market Street, Bury.

Always a model of brevity is the York hon. sec—"Every Thursday, in the British Legion, 61 Micklegate, York."

One has heard of Junk Sales being given "prestige" titles—it happens every month—but the Northern Heights description of their effort on November 24 is a new one. They call it a Flea Market! November 10 is their other date. Both events are at the Peat Pits Inn, Ogden, four miles north of Halifax Town Centre.

On to Spen Valley, whose Hq. is at the Grammar School, High Street, Heckmondwike. For November 10, there is a visit to Batley and Spenborough Observatory, Batley Park, and on November 18 the meeting is open, nothing being down on the programme. However, on November 25, G3DAR will be showing his Transistorised SSB Transceiver.

With an XYL as Secretary, for Hull it just had to happen—November 5 is down for "Make Do and Mend!" November 12 sees G3MVO explaining how to make a start on Top Band with valves, and on the 19th—the SWL's night—there is a local D/F event. That leaves November 26 for G3PQY, who continues the Top Band theme but with transistors.

A recent highlight for Otley members was the

MCC—November 6/7

Construction Contest, for the Peter Fox Memorial Trophy, won by Keith Pickard with a digital clock. For the latest details on the Club doings, and how to get to their Hq., we must refer you to their Secretary at the address in the Panel, p.564.

The Midlands

Wolverhampton had their AGM in October, but have still an organised programme for November. The 1st is down for both a film Show and showing of members' slides. Nattertites takes up both November 8 and 29, with the 22nd as a committee evening. That leaves November 15, when the informal session will discuss the evaluation of contest results by computer.

While many clubs are meeting on November 5, only one marks the occasion in their programme—Coventry, who have a Bonfire Night Social. Nights on the air, with the club KW-2000, take up November 12 and 26, leaving November 19, when G3UOL talks about his recent VE holiday. For all these, the venue is the Coventry Scout Hq., 121 St. Nicholas Street, Radford Road.

Now to Midland, who have a Surplus Equipment Sale down for November 16, but are no doubt looking forward even more to December 21, when they are having the presentation of cups and awards, and old-timers Night, with the ladies present also, all rolled into one big Christmas Party event. Sounds great! The Club Hq., incidentally is the Midland Institute in Margaret Street, Birmingham.

South Birmingham have their place at Hampstead House, Fair Fox Road, West Heath, where they may be found on the first Thursday in each month; we understand that a representative of the Post Office will be coming along to the November session to lecture on Interference and its Suppression.

Sollhull run their formal meetings at the Manor House, High Street, and have November 16 booked for films to be shown having radio interest. Of late they have also run an informal natter, which comes this time on November 2, in the rear bar of the Malt Shovel hard by Hq., at 2100 clock.

At Worcester the whole way of life seems to have changed with the move of Hq. to the Crown Hotel, Broad Street. However, the Newsletter which is currently on file does not cover the programme as far as November, except for the Annual Dinner on November 27; so it is necessary for any intending visitors or potential new members to contact G3WU1—see Panel—for all the latest information.

The Peterborough Secretary is so pleased with his first stab at their Mobile Rally since being in his office, that he completely forgot to tell us the programme details for November! However, from his account and from that of others who attended, it seems to have been a pleasant and enjoyable event, with G3HF being presented with the G2NJ cup by a 17-year-old YL, G8FDE, the daughter of G8EBI near Ely. As G3HF came from near Scarborough, one gets some idea of the distance over which it was "pulling the crowds." For all the details on this club, contact the secretary, address as Panel, p.564.

Over to Hereford, where the next date, to note is November 5, for a Film Show—but check with the hon. sec. as there are thoughts about moving it to November 4, to clear Firework Night for the Dads. November 19 is a firm date, informal at the time of writing but with a hint that there may be something fixed up later.

Heading northwards now, we come to Mid-Cheshire, in their Hq. at Winsford Verdon Comprehensive School, Grange Lane, Winsford, where they are available to receive visitors or new members on any Wednesday evening. This crowd have compromised over the question of practical work, by making the period between 1900 and 2000 free for Morse, constructional activities, and operating the Club station, leaving 2000 to 2130 open for the main activity, such as a talk or films or whatever. Sounds a good idea.

Next to Plymouth, who have their meetings on the first and third Tuesday, at Virginia House, Breinton; and this month there is an extra, in the form of the annual dinner at the Davie Hall, Plymouth.

Our only GW customer at the moment of writing is Conway Valley, where GW3JGA has November 14 to talk about "The Digits." This one is at the Parade

CLUBS IN MCC

SUPPLEMENTARY IDENTIFICATION LIST

<table>
<thead>
<tr>
<th>Club</th>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durham</td>
<td>Horsham “B”</td>
</tr>
<tr>
<td>Club</td>
<td>L86</td>
</tr>
<tr>
<td>Northumbria</td>
<td>Adur Contest</td>
</tr>
<tr>
<td>Contest Group</td>
<td>(Sussex)</td>
</tr>
<tr>
<td>Catterick</td>
<td>Purley “B”</td>
</tr>
<tr>
<td>East Riding Group</td>
<td>Purley “C”</td>
</tr>
<tr>
<td>Leyland Hundred “B”</td>
<td>Echelford “B”</td>
</tr>
<tr>
<td>Manchester</td>
<td>Isle of Purbeck</td>
</tr>
<tr>
<td>Contest Group</td>
<td>L91</td>
</tr>
<tr>
<td></td>
<td>L92</td>
</tr>
<tr>
<td></td>
<td>L93</td>
</tr>
</tbody>
</table>

Above identifications are additional to those appearing on pp.500-501, October. Though further identifications may be issued on request before Contest date, of course they cannot now be published.
Hotel, Llandudno, with December 9 at the Colwyn Bay Hotel, Colwyn Bay. November 18 falls to the London dormitory area as does, is nearly always the largest group, and this time is quite definitely written tongue-in-cheek.

Southern England

This, taking in the London dormitory area as it does, is nearly always the largest group, and this time is no exception.

Bedford have a place at the Dolphin, Broadway, where they are to be found weekly on Thursdays. November 4 is a demonstration of the KW Atlanta, where they are to be found weekly on Thursdays. November 5, this is really firework night, at the Colwyn Bay Hotel, Colwyn Bay.

November in Cornwall, the Cornish group have a G3PPT to talk about Electronic Computers, and also a junk sale. The annual dinner is on December 17, at the Colwyn Bay Hotel, Llandudno, with December 9 at the same place and a page of notes as well.

Echelford Newsletter this month amused your crew, whose Hq. is at Wolverton and New Bradwell Youth club, on the second and fourth Wednesdays in every month. It is not at the time of writing known just what the programme is, which is not very surprising as the current Newsletter reports the AGM and the committee meeting then called to discuss the coming year’s activities and doings.

Cray Valley is a club that always makes sure we “get the message” by way of a copy of the Newsletter and a page of notes as well. Thus, we see they have a 25th anniversary celebration set up for November 4, at the Congregational Church Hall, Court Road, Eltham. This is also the venue for the other November session, a Natter Nite on the 18th.

Another crowd who believe in publicity is the Verulam group centred on St. Albans. November 17 is their booked date, at St. Albans Town Hall, Council Chamber, for K.W. Electronics to come along and demonstrate their range of products to the lads. Visitors, of course, very welcome.

The Echelford Newsletter this month amused your scribe no end, starting with G3BIA and his description of a Panda Cub, new in 1956 and apparently under almost continuous modification ever since and continuing with the “Introduction to Transistors” which was quite definitely written tongue-in-cheek. However, it forward to by the membership.

Stony Stratford is the home town of the North Bucks. crew, whose Hq. is at Wolverton and New Bradwell Youth club, on the second and fourth Wednesdays in every month. It is not at the time of writing known just what the programme is, which is not very surprising as the current Newsletter reports the AGM and the committee meeting then called to discuss the coming year’s activities and doings.

Nearby, at Northampton, is the Echelford Newsletter group. They have a page of notes as well. Thus, we see they have a 25th anniversary celebration set up for November 4, at the Congregational Church Hall, Court Road, Eltham. This is also the venue for the other November session, a Natter Nite on the 18th.

Another crowd who believe in publicity is the Verulam group centred on St. Albans. November 17 is their booked date, at St. Albans Town Hall, Council Chamber, for K.W. Electronics to come along and demonstrate their range of products to the lads. Visitors, of course, very welcome.

The Echelford Newsletter this month amused your scribe no end, starting with G3BIA and his description of a Panda Cub, new in 1956 and apparently under almost continuous modification ever since and continuing with the “Introduction to Transistors” which was quite definitely written tongue-in-cheek. However, it
The mobile rig operated by Harald Schreiber, DK3RJ, who signs GM5AVT/M on a reciprocal licence. He is well known to members of the Inverness club. The car is an Opel Rekord and the gear a Heathkit HW-100 transceiver, working into a tuned whip with interchangeable coils.

gives no detail of the November meeting, except that it will, as usual, be at St. Martins Court, Kingston Crescent, Ashford, Middx.

Mid-Herts. have the Welwyn Civic Centre for their regular meetings, which are always on the second Thursday in the month. For November they have booked a winner, particularly as the Club is very VHF minded—G6JP, George Jessop, is coming along, and will be taking a VHF subject.

Talking of winners, Bishops Stortford have one provisionally booked for November 15, when Lou Schnirr, G5AAN, will be making a return visit to the Club, which should guarantee a large attendance to see what magic G5AAN can wave over the intricacies of “Noise” to make his subject crystal clear even to the non-technical.

Oxford get together on the second and fourth Wednesdays in the month at the Cherwell Hotel clubroom, Watereaton Road, and apart from any set subject time is always given over to a period of questions and answers for those intending to take the R.A.E.

At Acton (Brentford and Chiswick) on November 16, at Chiswick Trades and Social Club, 66 High Road, Chiswick, the entertainment for the evening will be a Film Show.

Now to Shefford, where we note G2DPQ starts the month with a talk on Safety in the Station, a subject which is rarely covered if our correspondence is any guide, but which is a natural for a lecture. Then, on November 11, G3TDW will explain how to go about “Sounding the Ionosphere.” Frequency checking is next to be tackled, by G3VMI and G3EUS on the 18th, and on the 25th the lads have two things; first to sort out the final details for the annual dinner, and second to find the winner of the home-construction competition.

Basingstoke have just passed their tenth AGM; they are one of the few Clubs who meet on Saturdays; the first and third ones in each month are booked at Chineham House, Shakespeare Road, Popley, with a start at 1900 clock. November 6 sees them using the station and also practising their Morse, while November 20 is for G3CBU, who will be lecturing on “Oscillators.” Harrow are another of the weekly addicts; they have theirs at Harrow County School for Boys, Shepcote Road, with practical nights on both November 5 and 19th, the latter also making room for a bring-and-buy sale. This leaves November 12 for G3NNG, who comes to talk about his VHF Receiver, and November 26, when G3RPE and G3HWR join forces to explain what its all about where the 3 cm. band is concerned—and who better, indeed?

There are dates for Greenford on November 12 and 26th, at the Community Centre, Oldfield Lane, but since the AGM is only just past, at the time of writing both these dates are “open.”

Maidenhead have to report a change of Secretary, as G3FVC finds his professional commitments getting too heavy; he has been secretary for as long as your scribe can recall. The new incumbent is G3ZPK, whose address appears in the Panel, and he tells us the meetings are on the first Monday and the third Tuesday in each month, the first one being the natter, the Tuesday one being set aside for the formal programme; November 19 is for films of the club VHF NFD activity and a talk about the gear used.

Brighton Technical College made a good start to the season on October 4; the November 1 date is the ragchew night when they also put the Club station on the air. November 15 should be a very good one, as G3FXB will be coming along to try and pass on some of his own expertise in the field of DX and Contest operating at which he is an acknowledged dab-hand. He will be illustrating his talk with some slides taken during his tour of the States.

No November date appears in the North Kent News Letter this month, although it is understood the meetings fall on the second and fourth Tuesdays at the Congregational Church Hall, Bexleyheath.

Signing

That, good folk, is The Lot for another time. The deadline for December is November 5 latest, with your December dates, plus any important ones in January, as the space normally given over to Clubs will in January be filled, as in previous years, with the MCC report and results.

So, there it is. 73,
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 U.K. section 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.

GM3UA, S. Fairman (ex-GM3OQY), 5 Warwick, Calderwood, East Kilbride, Glasgow. (re-issue).
G4ADM, A. D. Maish, 48 The Crescent, Belmont, Sutton, Surrey. (Tel. 01-642 1976).
G4ADS, J. C. Chisman (ex-G8EBL), 5 Shirley Avenue, Ramsgate, Kent. (Tel. Thanet 355177).
G4AGT, H. P. Thoennissen, Horsepool, Stockland, Honiton, Devon. (Tel. Devonport 22072).
G4AHI, F. Weetman, 23 Kenmore Road, Sale, Cheshire. (Tel. 061-962 1904).
G4AJD, B. E. Dunkley, 33 Kitchener Road, Amesbury, Wilts. (Tel. 09842 3254).
G4AJL, Amateur Radio Club, St. Lawrence's Hospital, Bodmin, Cornwall.
G4AIC, J. B. Balls, Kateshill, Park Lane, North Walsham, Norfolk.
G4ALV, J. M. Cow, 24 Oaklands Road, Bromley, Kent.
G4ALY, R. Bird, 119 Plymstock Road, Oreston, Plymouth, Devon.
G4AMF, J. Cresswell, 4 Hall Street, Hoyland, Barnsley, Yorkshire. (Tel. Barnsley 743414).
G4AMJ, D. R. Evans, Sunlea, Wheel Speed, Carbis Bay, St. Ives, Cornwall.
G4AMT, T. R. George, Fernleigh, Penberth, St. Buryan, Penzance, Cornwall.
G4ANA, S. P. Cook, 104 Bagnall Road, Basford, Nottingham, NG6 0LB.
G4ANC, J. E. Hills (VK2AHJ), 5 Clewborough Drive, Camberley, Surrey.
G4ANO, B. Smith, Chim Farm, Abersoch, Caernarvonshire. (Tel. Abersoch 2415).
G4IH, C. L. S. Cooper, 52 Marine Parade West, Lee-on-the-Solent, Hants. (re-issue). (Tel. Lee-on-the-Solent 79954).
G8EDN, T. J. Gallagher, 24 Sunnybank Avenue, Whiteley, Coventry, Warms.
G8EOC, R. Barnett, 25 Downhills Park Road, Tottenham, London, N.17. (Tel. 808 6702).
G8EVG, M. A. Hickman, 53 Larkhill Lane, Liverpool, L13 9BL.
G8EWS, T. H. Shaw, 3 Langford Gardens, Bicester, Oxfordshire, OX6 8NA.
G8EZF, M. J. V. Rollins, South Park Hostel, Papworth Everard, Cambs., CB3 8QF.
G8FAS, S. M. Hotham, 208 The Avenue, Tottenham, London, N17 6JN. (Tel. 808 6824).
G8FBP, P. J. Robinson, 2 Thornley Road, Ashmore Park, Wednesfield, Wolverhampton, Staffs. (Tel. Wolverhampton 734367).
G8FBF, S. W. G. Hall, 4 Redhill Court, Palace Road, London, SW2 3NP.
G8FCA, R. Payne, 18 William Road, Hitchin, Herts. (Tel. Hitchin 50519).
G8FCO, G. R. Onions, 2 Sqn. 8 Signal Regt., Caterick Camp, Yorkshire.
G8FDT, G. W. Felton, 15 Rochester Avenue, Chase Terrace, Walsall, Staffs., WS7 8EN. (Tel. Burntwood 2824).
G8FDM, E. H. Morton, 23 Collum Avenue, Sunthorpe, Lincs.
G8FDP, D. G. Simmons, 17 Berry Road, Stafford, Staffs. (Tel. Stafford 55191.)
G8FED, J. Argyle, 23 Edward Road, Kennington, Oxford, OX1 5LH.
G8FEN, R. G. Harris, 6 Chestnut Avenue, Lutterworth, Rugby, Warls. (Tel. Lutterworth 2284.)
G8FFE, H. J. Morris, Dwellys Drive, House North End, Creech St. Michael, Taunton, Somerset.
G8FJQ, K. Bull, 4 The Spinney, Finchfield, Wolverhampton, Staffs., WV3 9ER. (Tel. Wolverhampton 62194).
G8FHB, E. S. Silvester, 60 Dean Road, Erdington, Birmingham, B23 6QF.
G8FHQ, H. Leach, 81 Dransfield Road, Fleetwood, Lancs., FY7 7BN.
G8WFIG, C. J. Cole, 12 Calthorpe Drive, Woodlands Park, Prestatyn, Flintshire. (Tel. Prestatyn 4460.)

CHANGE OF ADDRESS

G3FHG, K. S. Martin, 5 Englefield Close, Rectory Road, Hawkwell, Essex. (Tel. Hockley 3904.)
G3ISD, E. J. Hatch, 22/24 London Road, Maidstone, Kent. (Tel. Maidstone 58778.)
G3KND, J. S. P. Hardy, 49 Highfield Gardens, Aldershot, Hants. (Tel. Aldershot 22072.)
G3VAD, R. A. Sinclair, Redcurrants, Hatfield Heath, Bishops Stortford, Herts.
G3VNP, P. Dowles, 45 Tyrells Way, Penrice, Prestatyn, Denbighshire. (Tel. Prestatyn 4460.)
G3VWN, D. L. F. Standley, 35 Normanshire Drive, Chingford, London, E4 9HE.

This is the time of year when thoughts begin to turn to present-giving, or getting. For the keen radio amateur, over many years now a subscription to Short Wave Magazine itself (£2.50, post free by surface mail, anywhere in the world) has been regarded as a very acceptable gift—this is not what we say, but what we are told by many recipients!

Apart from that, we have an exceptional range of book titles to offer and here is a suggested selection from which to choose. All prices are post free and delivery is from stock.

From 'way beyond the aerial, so to speak, Sun
Earth and Radio (89p), reviewed on p.472 of our October issue, is an obvious choice. As regards antennae, the ARRL Antenna Book, 12th Edn. (£1.38) would be a very sound and popular choice—but we have several other good aerial titles, as the current advertising on p.524 shows.

An important buy—or a present greatly appreciated—would be a standard handbook covering the techniques, practices and constructional and design principles of amateur-band equipment—receivers, transmitters, power supplies, VHF and mobile gear, and all the rest. In this context we recommend the latest (1971) ARRL Radio Amateur’s Handbook (£2.80), a thick volume, copiously illustrated, now in its 48th edition and of which over the years 100’s of thousands of copies have been sold all over the world. (The current edn. was reviewed on p.216 of the June issue.) The British version of the same, the Radio Communication Handbook (£3.50) is a well-produced compilation in hard covers.

Other important titles for discerning buyers include the new edition of the RSGB VHF/UHF Manual (£1.75), reviewed on p.400, September issue Magazine and, for the /M operator, the Mobile Handbook (CQ publn.) at £1.38, covering the practicalities of mobile operation, construction and installation. In the SSB interest, we can suggest Single Sideband for the Radio Amateur, 5th Edn. (£1.65) and we have a few copies left of the 4th edition at £1.35 (if they are not gone by the time this appears).

Somewhat off the strictly radio amateur beat, we can now offer the latest (8th) edition of the famous Foundations of Wireless & Electronics (£2.00) by one of the most successful writers on radio, Marcus Scroggie—his book has run to many printings, has been regularly revised, and at the last count had sold something like 250,000 copies. The title exactly describes its contents and it should be regarded as an ‘Everybody’s general reference book on radio’. A great deal can also be learnt from the latest editions of books like the current issue of Radio Valve and Transistor Data (87p) now in its 9th edition.

For those with a positive interest in BC listening we have the incomparable World Radio & TV Handbook (£2.25), the standard guide to the BC stations of the world—LW, MW, SW, FM, VHF and TV—giving details such as frequency, power, geographical location, identification signal, main programme schedule, hours of operation and other relevant data, also including articles and information on BC listening. This book is used not only by keen BC listeners, but also by Govt. monitoring stations and the broadcast authorities’ own monitor services, in many countries.

We aim to give same-day service on all book orders. What is considered to be reasonable stocks are held of all titles listed. Books are carefully packed in protective corrugated-cardboard sleeves, designed for the purpose. When ordering, you need only name the title in full, enclose correct remittance with your name and address, and send to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-OHF. (If you would like to be specially helpful, send a sticky label with your name and address on it in block letters.)

**SOLID STATE MODULES**

WE ARE NOW STOCKING 27-29.7 MHz FOR THOSE AMATEUR BAND RECEIVERS THAT STOP AT 29.7 MHz

THE SENTINEL DUAL GATE MOSFET 2 METRE CONVERTER

Low noise figure of 26dB. Gain 30dB.

Excellent overload and cross modulation performance.

Dut gate MOSFET R.F. amplifier and mixer.

Compact 3½" x 3" x 3½" 

IP's stocked : 4.6 MHz, 9-11 MHz, 14-16 MHz, 18-20 MHz, 23-25 MHz, 24-26 MHz, 28-30 MHz, 27-29.7 MHz

Price £13.75.

THE SENTINEL DUAL GATE MOSFET 4 METRE CONVERTER

Same specification as the 2 metre converter.

IP's stocked : 25-25.7 MHz, 28-28.7 MHz.

Price £13.75.

SM 70 70cms. CONVERTER

Low noise figure 3-5db.

IC output 144-146 MHz for connection into a 2 metre converter. This arrangement means that we can produce a high performance 70cms. unit for only £13.75.

THE SENTINEL LOW NOISE FET 2 METRE PRE AMPLIFIER

FET and components selected for a low noise figure of 1dB.

Same size and appearance as the transmitters.

Gain of 16dB.

Price £8.50.

THE SPITFIRE 3 METRE A.M. TRANSMITTER

5 watts input. At least 2 watts output.

12 volts operation.

Modulation wave shaping gives good, clean 100% audio.

Audio modulation monitoring point for headphones.

Size : 4½" x 2½", front panel 5" deep.

Price £22.90.

THE SPITFIRE MODULATOR

Same size and appearance as the transmitter.

Price £11.00.

KV5 9 MHz CRYSTAL FILTERS

X4RA 55-8 kHz, £1.00. X4RD AM 5 kHz, £15.00.

X4PB 2.2 kHz, £16.00. X3RH CW/5 kHz, £11.00.

X4PC AM 27-35 kHz, £15.00. Carrier crystals, £1-50 each.

Despite our ever increasing orders—and more contract work—we are still keeping all this equipment ex-stock. If you want confirmation of stock position or more information, you can always ring.

SOLID, LOCKWOOD, HUDDERFIELD.

Tel. 23991

**DECADE COUNTER KITS!**

Comprises:

(a) Plug-in etched and drilled fibreglass PC board printed with component layout (70p).

(b) Neon Numeral Indicator Tube (£1.30).

(c) Decade Counter IC, type 7490 (75p).

(d) Decoder/Driver IC, type 7441 (95p).

(e) Fully descriptive application leaflet (3p in stamps).

All items sold separately—see prices in brackets

KIT PRICE £3.50

(20p p. & p.)

(4 or more post free)

Also available: TTL ICs — type 7400 ... 20p ea.

7473 ... 40p ea.

ALL ABOVE ITEMS SUITABLE FOR USE IN RECENTLY PUBLISHED FREQUENCY COUNTER DESIGNS

Toggle Switches : Bulgin S/P on/off, high quality 15p Mains Transformers : 20v. at approx. 2A (few only) 60p FETS—type 2N3823—brand new with data sheet ...

New Range—Carbon film resistors 1/8 watt E12 series—values 10Ω to 1MΩ :

1p ea.; 10p doz.; 80p per 100

Tubular ceramic capacitors (500v.) 22p:

1000pF; 4700pF ...

... ... ... 1p ea.

P. & P. 15p per order unless otherwise noted.

** PLEASE NOTE OUR CHANGE OF ADDRESS **

IAN S. PARTRIDGE - G3PRR

71 ESKDALE AVENUE, CHESHAM, BUCKINGHAMSHIRE
WORLD RADIO/TV
HANDBOOK 1971
(From Stock)
The World's only complete reference guide to International Radio & Television Broadcasting Stations. It includes: Frequencies, time schedules, announcements, personnel, slogans, interval signals and much more.
Lists all International short-wave stations, including frequencies, for each country; foreign broadcasts, long and medium wave stations (AM broadcast Band), TV stations and domestic programmes. Long recognised as the established authority by broadcasters and listeners. It is the only publication that enables you to identify BC stations quickly and easily. Enables you to fill more pages in your log book on the SW BC bands and helps you add more BC-station QSL cards to your collection.

£2.25
(The above prices include increased postal rates and packing).

from:
SHORT WAVE MAGAZINE
55 Victoria Street, London, S.W.1

CALL BOOKS
INTERNATIONAL:
RADIO AMATEUR CALL BOOK
("Fall" Edition) £3.10
"U.S. Listings" £4.10
The two together, covering the World £6.80
"G's" only 1972 57p

MAPS
AMATEUR RADIO MAP OF WORLD
DX ZONE MAP (GREAT CIRCLE)
In colour with Country/Prefix Supplement Revised to Dec. 1970 85p
RADIO AMATEUR MAP OF THE U.S.A. AND NORTH AMERICA
State boundaries and prefixes, size 24" by 30", paper 60p
RADIO AMATEUR'S WORLD ATLAS
In booklet form, Mercator projection, for desk use. Gives Zones and Prefixes 85p

LOG BOOKS
Standard Log (New Glossy Cover) 56p
Log and VHF Contest Log 40p
Receiving Station Log 43p
ARRL. Log (Spiral) 70p
(The above prices include increased postage rates and packing).

MORSE COURSES
G3HSC Rhythm Method of Morse Tuition £4.50
*Complete Course with three 3 speed L.P. records with books
*Beginner's Course with two 3 speed L.P. records with book £3.30
Single 12" L.P. Beginner's with book £2.75
Single, 12" L.P. Advanced with book £2.75
Three speed simulated GPO test. 7" d.s. E.P. record 85p
Ex.Gov. Heavy Duty Morse Keys 95p
Prices include postage, packing and insurance in U.K. only. Overseas orders + £1.00.

Available from
SHORT WAVE MAGAZINE
Publications Dept., 55 Victoria Street, London, S.W.1 01-222 5341
(Counter Service, 9.30-5.15, Mon. to Fri.)
(Nearest Station: St. James's Park)
(GIRO A/C No. 547 6151)
THE SENATOR CRYSTAL BANK

Phone: 01-769 1639

CRYSTALS FROM STOCK AT KEEN PRICES

You'll find the above frequencies may be suitable for your PYE Cambridge, Ranger, Vanguard and other makes of ex-commercial RT gear for the well-used mobile call channels. Check up with crystal multiplication data and crystal spec. in equipment manuals for suitability.

For 10M walkie-talkies wish I.F. of 455 kHz to transceive on 28-500 MHz, we have in STOCK in HC25/U 28-500 MHz (TX) and 28-045 MHz (RX), at £1.60 each.

AVAILABLE SOON:
44-666 MHz for 2M converter.
110-000 MHz for 2M converter: GIVING I.F. 28-30 MHz. THUS DISPENSING WITH NEED FOR OSC. MULTIPLICATION CHAIN.
72-875 MHz for 2M TX.

CLUB and other GROUP projects: If your club or group is contemplating a constructional project requiring crystals, we can offer real keen prices for quantity orders.

Most crystals for GZDAF and other designs, and crystals for every amateur band, always in stock. There are so many 1,000's more useful frequencies in the bank that to list them all would take too long.

Why not telephone or write your enquiry to us? Experience proves that we are sure to have something very close to—if not spot-on—the frequency you require from 50 kHz thru 132 MHz in stock.

Should you require crystals made to order—no problem. We can supply as follows: (PLEASE NOTE however, our crystals can only be as accurate as your specification.

3rd, 5th and 7th OVERTONE to an adjustment tolerance of ± .005%, (will hold 50 ppm from -20 to + 70°C). Available in HC6/U, 18/U and 25/U:

175 MHz to 200-0 MHz £12-00
140 MHz to 174-9 MHz £8-75
110 MHz to 139-9 MHz £7-00

FUNDAMENTAL MODE to an adjustment tolerance of ± .005%, available in HC6/U, HC18/U and 25/U:
4 MHz to 20-0 MHz £3-50

The following in HC6/U only, ± .005% tolerance:
1-4 MHz to 3-9 MHz £3-00
1-0 MHz to 1-39 MHz £3-20

The following to ± .01% tolerance:
500 kHz to 999 kHz in HC6/U £4-50
150 kHz to 449 kHz in HC18/U £3-30
450 kHz to 500 kHz in HC18/U £3-50
100 kHz to 149 kHz in HC18/U £4-60

Below 50 kHz and to closer tolerances, by quote.

Types available: Flexural Mode; NT Elements; Plate ,D proved Elements.

SENATOR can supply crystal units to British and U.S.A. Defence specs. SENATOR know-how and 55,000 units actually in stock, practically assures your satisfaction.

Mail Order SENATOR CRYSTALS Dept. S.W.
36 VALLEYFELD ROAD, SW16 2HR
Morse Practice Oscillators
Consisting of Integrated Circuits, Loud-Speakers, and battery fully wired, 85p.
available from:

The Amateur Radio Shop (G4MH)
13 Chapel Hill, Huddersfield. Tel: 20774

OPPORTUNITY

ENQUIRIES Invited from keen radio amateurs interested in making a career in the profession of Amateur Radio journalism. Basic requirements are: Ability to write (and speak in public) fluently and coherently in the English language; possession of a current and active all-band AT-station licence; an understanding of the current literature; and the capability of working independently, at home, within a broad directive without day-to-day supervision. Some practical knowledge of the actual processes of print production would be desirable.

Age limits for a suitable applicant would be about 28-38, preferably married and “established,” with a good medical record.

Applicants should, in the first instance, write a letter taking in fully the foregoing requirements, with references to any published work in the Amateur Radio context, giving also educational details.

All applications will be acknowledged and treated as confidential. Applicants invited for discussion will have attendance expenses paid and will be required to give personal references. Write Box X100, Short Wave Magazine, Buckingham.

SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

5p per word, minimum charge £1.00. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50% for Bold Face (Heavy Type.) Box Numbers 12p extra. No responsibility accepted for transcription errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, S.W.1.

CERAMIC Resonators for selectivity. Brush Cleive Vernitron Transformers: 455 kHz types, T04-442 for do-it-yourself IF filters, add only fixed capacitors to set bandwidths 2-12 kHz. Set of four, with data, £1-50, U.K. postage 5p. Special types for SSB shaping filters available, also normal Transformers and 10-7 MHz types for VHF/FM. Amatronix Ltd., 396 Selsdon Road, South Croydon, Surrey.

THINKING of Buying a Trio? TS-510, JR-310, 9R-59DS, etc., on demonstration. Send large s.a.e. for Test Report on JR-310, with your Top Band conversion. Borrow a manual for seven days, deposit £2. Hire-purchase, part exchange, photo/hi-fi equipment. —Holdings, 39-41 Mincing Lane, Blackburn, BB2-2AF, Lanes. (Tel: Blackburn 59595/6.)

QSL Cards. Two-colour, attractive design, variable features, from £3-15 per 1,000 (inclusive). Send foolscap s.a.e. for samples.—ARA Press, 46 Moat Avenue, Green Lane, Coventry.


QSL Cards and Log Books, GPO approved, cheapest and best. Prompt delivery.—Samples from Atkinson Bros., Printers, Loos, Cornwall.

TRIO EQUIPMENT: All models and accessories in stock for immediate delivery. No-deposit credit can be arranged, with payment spread over two years. Cameras and such taken in part-exchange. We also stock Codar equipment, Joystick antennae and G-W. Sips for superior Mobile performance. Good commercial amateur-band gear taken in exchange for Cameras or Hi-Fi stereo apparatus.—York Photo-Audio Centre, Fossagate, York. (Tel: 56176.)


QSL Cards for Tx and SWL, Send s.a.e. for samples stating which type required.—Beaumont, G5YV, 8 Ashfield Avenue, Huyton, Leeds. LS27-0QD.

QSL Cards: For Tx, G8 or SWL. One to four-colour designs; large s.a.e. for samples; good selection. —Red Rose Publicity (Pennington), 34 Aqueduct Street, Preston, Lancs.

MAINS MOTORS: Small, ideal for fans, blowers, heaters, etc., snap at 30p each, postage 15p for one, 10p each thereafter; no guarantee. Bumper pack offered consisting two P.C. boards with resistors, transistors, electrolytics, plus wire and plug, £1 per pack plus 15p post/packing. Jack, 25 St. Ronan’s Drive, Shawlands, Glasgow, Scotland.

READERS ADVERTISEMENTS

25p per word, minimum charge 50p payable with order. Add 25% for Bold Face (Heavy Type). Please write clearly, use full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 12p extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, S.W.1.


WANTED: HRO Senior, not working, also CR-100 ditto, two of each.—153 Riverside Place, Ayr, Ayrshire, Scotland.

FOR SALE: Codar CR-70 receiver with matched speaker, price £18, buyer collects. (London area).—Box No. 5040, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Trio 9R-59DE receiver, with matching speaker, in mint condition, price £38.—Walsh, 21 Aeguil Avenue, Thundersley, Benfleet, Essex. (Callers after 6.00 p.m., please).

SELLING: Trio 9R-59DE receiver, condition as new, price £28-50 or near offer.—Puttow, Bay Tree Cottage, St. Margaret’s Bay (3243), Dover, Kent.

For more information, please visit our website at www.shortwavemagazine.com.
S.W.L. Clearing Out: Marconi Wavemeter, coverage 100 kHz to 28 MHz, with PSU, £2-50. Monitor 'scope Type 101, with PSU, working but CRT poor, £4-00. Bendix TA-12D Tx, with 807's, etc. but no mod./PSU, £1-50. Two-metre Tx, 829 PA, no mod./ PSU, belleville working, £4-00. Advance PSU, 48V, at 1 amp., smoothed and stabilised, £2-00. Defunct R.107, 50p. Will accept any near offers, or £12 The Lot, buyer collects.—Ring Dungan, 01-467 2144 (South London), evenings.

WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


WANTED: K.W. E-Z Match; Medco low-pass filter, 50 or 75 ohms; also handbook on National HRQ-MX.—Cassidy, E18AJ, 64 College Park, Limerick, E.12.


SELLING: Star SR-200 receiver, all amateur bands and WWV for calibration; in perfect condition, price £33 or nearest.—Bean, 9 Groombridge Close, Welling, Kent.

OFFERING: Morse practice tapes, 600ft, 50p each, post free; s.a.e. for details.—Verrall, 9 Levet Close, Isle of Grain, Rochester, Kent.

SALE: In good working order, B-40C receiver, with headphones and manual, £20. R.209 Rx, 6-volt type, with manual, £7.—Halden, Park Farm, Baldwins Gate, Newcastle, Staffs., ST5-SET. (Tel: Whitchmore 237.)

WANTED: Bendix RA-1B receiver and Command Rx BC-45AB, 3-0 to 6-0 MHz. SELLING: National SW-54 receiver, coverage 500 khz to 30 MHz, in perfect order, with built-in speaker and PSU, for £100. Av but with auto-transformer, price £10 o/n offer.—Ballance, G3KNB, QTHR, or ring Stafford 62105.

EXCHANGE or SELL: For Transceiver in any condition, a Sphinx AM/CW/SSB transmitter, coverage 20-40-160m. with spare valves, p.t.-t- micro. phone, Ae./CO muting unit, circuit diagram, etc., plus a 200-watt linear with PSU, £55 or near offer. R.C.A. AR88D, with spare valves, S-meter, re-aligned, cabinet and headphones, £30. R.107A with spares, manual, phones, realigned, internal AC/DC PSU, £12-50 or offer. All with solid-state PSU’s. Delivery no problem.—Leach, GDAMZ, Hallers House, King William’s College, Castletown, Isle of Man.

SALE: Collins TCS-12 receiver and mains PSU, £8. RF-24 Unit, crystal-controlled for 10-15-20 metres, £1. Fidelity 4-track tape recorder, £10. Buyers collect.—Clark, Hillside, Butchers Hill, Shorentt, Nr. Gravesend, Kent, DA12-3EB.

SELLING: New in June, Heathkit GR-78 solid-state general coverage portable receiver, maker checked to full specification, price £45.—Ring Pegg, Leeds 654339.

WANTED: R.1475 receiver, with or without PSU, top price paid if in good condition.—Harrison, 43 Dorset Road, Palace Bks., Holywood, Northern Ireland.

SALE: Heathkit DX-100U AM/CW transmitter, ir excellent condition and perfect order, with Ae. c/o, spare valves and manual, price £42-50 or near offer.—Standley, G3XSA, 35 Normanshire Drive, Chingford, London, E.4., or ring 01-529 2952.

SELLING: Hallcrafters £100 receiver, with slide-rule type bandspreading across all amateur bands, excellent condition and appearance, £35; prefer buyer inspects and collects, or forward carriage extra. Also Geloso VFO-2 complete, £32-5.—Wright, GW3FEJ, 31 Terrace Road, Mount Pleasant, Swansea, Glam.

WANTED: Telequipment Type 520 Oscilloscope, 5in. flat-face tube, 5 MHz bandwidth, in full working order, with spare CR tube and maker’s manual; price £12, buyer to collect.—Harris, G3CCM, QTHR.

FOR SALE: No. 62 Set Tx/Rx, covers Top Band also 80-40m., AM/CW, in good condition, with internal 12v. transistor inverter, and in working order, price £10-50. (Midlands Office No. 5044, She-Box, QST Mag., Ingleby, 50 Victoria Street, London, S.W.1.)

FOR SALE: Marconi TF-390F RF signal generator, £12-50. VHF receivers R.1392 £6, and R.1132 £3. PSUs. Type R.294, £5. Preselector, matchets Hallcrafters SX-24, £2. Carriage extra on all items. Various copies “QST” 1938-1952, offers.—Haseldin, G8EBM, 31 Ellesmere Road, West Bridgford, Nottingham, NG2-7DC. (Tel: Nottingham 29-1933.)

WANTED: Complete set of IF transformers for CR-150 receiver; will pay £1 each if undamaged. Non-working Rx considered. All letters answered.—Austin, 21 Queen’s Crescent, Putnoe, Bedford.

WANTED: National HRO-50 or -60 receiver, with manual.—Snowden, 1 Leslie’s Avenue, Subway Street, Hull, Yorkshire.

WANTED: Heathkit HW-17A in good working order—any reasonable price gladly paid.—Elsworth, 18 Bay Road, Dovercourt, Essex, CO12-3JZ

SAFE: Eddystone EC-10 Mk. I, with mains and battery PSU, external S-meter, as new, also S.S.M. Mosfet two-metre converter, IF 4-0 to 6-9 MHz, price £50 or would split. (East Anglia).—Box No. 5045, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

SHACK Clearance: Creed Type 7B teleprinter with D.C. PSU, also motor supply, £15. No. 19 Set, with variometer. 12v. supply, mounting board, etc.: £c. Pye “base station” Tx/Rx, blue cabinet, £15. BC-640 modulator, push-pull 811’s £4. Pulse generator, Test Set Type 219, £5. Oscillator Type 217, £2 to 80 MHz, £4. B.44, £5-50. Wavemeter W.1649, £3-50. Loran receiver APN-4, £3-50. TR.1985, 100 to 124 MHz, £4. Pye base receiver, low band, £5. Pye base Tx, low band, £5. All items heavy so prefer buyers collect.—Heeley, G3SWU, 34 Worlaby Road, Scartho, Grimsby (77591), Lincs.

SELLING: Heathkit HW-17A, late model, as new, £250. DC/PSU, £65. Two-metre 165-element Yagi J-Beam, unused, £5. KW-2000A, £150. All Items “or near offer.”—Wilkinson, G3TXA, QTHR, or ring Royston 43941.

WANTED: Marine radiotelephone—Pye, Hamble, Ajax, etc. Also modern low-band FM radiotelephone.—Austen, 1 Valebridge Road, Burgess Hill (3409), Sussex.


FOR SALE: Complete 52 Set ground station, comprising receiver, PSU and transmitter—these three units contained within a steel carrier; converted to mains input; coverage 1-75 to 16 MHz in three bands; Tx output 100/120 watts, AM/CW: in as-new condition, all working, complete with all ancillary gear, including spare valves, price £50. R.C.A. AR88LF receiver, good performer, £32. No. 19 Set mains PSU, built into 19 in. rack panel unit, constructed to supply both a 19 Set Rx/Tx and its associated high-power unit. £7. Also a mains PSU, giving 0-1200v. D.C. at up to 500 mA (Variac controlled) with 6-3v. tappings, built into 19 in. rack panel unit with voltage/current meters on front panel, high-power modulator also contained within unit, complete and in ventilated case, weight 120 lbs., price £20. Modulator, 25-watt, with PSU for 24 v. input, £2. Pye marine-type PSU, mains input, supplying voltages for Pye Tx/Rx, overhauled 1960, weight 140 lbs., bargain at £10. An 813, brand new and unused, £3. Three VHF aerials, 50p each. All items carried extra.—Birrington, Di Cottage, Julian Road, Bristol, 9. (Tel: Bristol 628345.)

DISPOSING: K.W. Vespa Mk. II, 6LQ6 PA, In perfect condition, price £85; delivery 100 miles. Going VHF.—Dennam, GSMEW, 24 Ascot Road, Copnor, Portsmouth, Hants.

WANTED: Two cowl-gill motors in working order.—Foley, Hibernian Bank House, Keady, Co. Armagh, Northern Ireland.
**S. MAY (Leicester) LTD.**

**12/14 CHURCHGATE, CITY CENTRE, LEICESTER.**

**Tel. Leicester 58662**

**“DX ZONE MAP”**

In four colours, on durable paper for wall mounting, 35in. wide by 35in. deep. Giving essential DX information—bearing and distance of all parts of the world relative to the U.K., the 40 Zone areas into which the world is divided for Amateur Radio purposes, with major prefixes listed separately. Distance scale in miles and kilometres. Time scale in GMT. Marking of Lat./Long. close enough for accurate plotting. Hundreds of place names, mainly the usual ones, and most of the rare islands.

With new revised Prefix List

Price 85p

including postage and special packing in postal tube to avoid damage in transit.

**Graham Newbery**

**(REG WARD G2BSW)**

We are officially appointed K.W. Agents for the South West (Somerset, Dorset, Devon, Cornwall!)

- **KW Atlants with p.s.w.** £200-00
- **Remote VFO** £24-00
- **KW 2000B with p.s.w.** £240-00
- **Remote VFO** £26-00
- **KW 202 Receiver** £140-00
- **Matchless Speaker** £8-00
- **KW 204 Transmitter** £142-00
- **KW 100** £130-00
- **KW 101 VSWR Meter (52 or 75 ohm)** £39-25
- **KW 103 VSWR Meter and Combined Power Meter** £112-50
- **KW E-Z Match** £100-00
- **KW 105 Combined E-Z Match, VSWR Indicator, Dummy Load and Antenna Switch for 4 Outlets** £136-00
- **KW Trap Dipole 70' 75 ohm Twin Feeder** £12-00
- **KW Trap Dipole 97' Coaxial Feeder** £12-75

**Eddystone Receivers**

- **EC10 Mk. II** £79-00
- **EA12** £105-00

We are the distributors of Eddystone Professional Receivers for the South West.

**Triov Equipment Model 9R59DS £47.50. HS 4 Headphones £5.50**

**Shure Microphones**

- **Model 444** £14-40
- **Model 201** £8-00
- **Model 202** £6-40

R.C.A. VALVES for KW and Heathkit equipment. 6146, 6146B, 611F5, 6LQ6, 6G5E, 6EA8, 6GW8, 6G6C, 6CM6, 6CL6, 6CB6, 6NB8, 61156, 6EV6, 12BA6, 12BE6, 12826, etc. and many other types.

Trade ins with pleasure. Our stock of good second hand equipment changes daily — let us know your requirements.

We stock r.s.g.b. publications, log books, etc.

**AXMINSTER — DEVON**

**Telephone:** 3163

**WANTED:** Collins accessory filters for 75S-2B, state bandwidth. Any Collins spares, quote all part numbers. Also Hy-Gain HT-18 hinged base assembly. Modern valve tester, brand new preferred.

- **Box No. 5046, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.**

**WANTED:** Transistorised two-metre transmitter, also Rx, preferably commercial but FB home-built considered; also wanted good quality portable tape recorder. (North-West).—Box No. 5047, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**SALE:** Trio 9R-59DE receiver, as new, with SP5D speaker, voltage stabiliser and Xtal calibrator, price £32 or near offer.—Balantine, G3KNB, QTHR or ring Stafford 62105.

**SALE:** Eddystone 750 receiver, in very good condition, with speaker, headphones and manual, price £35 or near offer. Ring Lance, Birmingham 706 0857.

**FOR SALE:** Hammarlund SP-600UX receiver in good condition, coverage 540 kHz to 54 MHz in six bands, price £70, buyer to collect.—Cave, 14 Clinton Way, Hutton, Brentwood, Essex.

**SELLING:** Heathkit Two 'er transceiver, with auto-transformer for 250v. operation, £18. Also R.209. £8.—Lincoln, GBDFX, 155 Green Lanes, Palmers Green, London, N.13. Tel. 01-889 6777.

**STILL REQUIRED:** Hallcrafters Sky Champion or Sky Buddy receiver, original condition preferred.—Litherland, GCBF, 11 Birch Grove, Chippenham, Wiltshire.

**WANTED:** The mains transformer for a Minimitter Mercury transmitter, Selling marine band crystals, two at 2182 kHz (safety frequency).—Mariner, G3UVE, QTHR, or ring Lanne 3053.

**SALE:** FT-150 transceiver, with microphone and speaker, year old, perfect, original packing, price £160, h.p. available.—Jackson, G3CDE, QTHR, or ring Guildford 75236.

**WANTED:** Receiver EC-10, HA-500 or Mohican, in excellent condition. Full details, please.—Price, GPFIH, 32 Bourndale Road, Cheltenham, Glos.

**WANTED:** VH-F Rx tuning about 30 to 140 MHz, or more. SELLING: Almost new, mint and unmodified, JR-310 amateur band Rx, with original packing, £65 or near offer.—Johnson, G13HC, 6 Beechdene Drive, Lisburn (2473), Co. Antrim, Northern Ireland.

**WANTED:** Trio JR-500SE or Eddystone EC-10, Mk. 1 or Mk. II, with mains and battery units; must be in good condition. OFFERING: R.107 and R.208 receivers, interior condition good, in good order—offers?—Holland, 4 Gilbert Road, Malvern, Worcs.

**SALE:** Signal generator Type CT.212, 85 kHz to 30 MHz, AM/FM, as new, with leads, manual, etc., £27-50. B40, in excellent condition, with manual, £28, FR-100B, £90; AR-8516L, £105; both these items in mint condition and with manuals. Buyers collect.

**WANTED:** Labgear LG.300 or similar Tx. (North-West area).—Box No. 5050, ShortWave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**SELLING:** Communications receiver £16-50; VHF Rx, VHF converter £15, BC-221, £10, Type ZM-1/U. Ohmmeter, 0-200 megohm, £8-50. Marconi ATU. £2-50. Collins broadband amplifier, 1 to 32 MHz. £2-50. Meters, RF, 20 microamp, 54 mV, £1 each. HRO PSU, 3-watt amplifier, £3-50. Two Panelscope AF/RF, £25, AN/URM-45, 45 to 11,000 MHz. Carriage extra, s.a.e. enquiries.—Wright, 249 Sandy Lane, Hindley, Wigan (35948), Lancs.


**WANTED:** Eddystone EC-10 receiver, Mk. II.—Hodges, French Mill, Claphill Lane, Rushwick, Worcestershire.
FOR SALE: Trio JR-500 amateur-band communications receiver, in excellent condition; bargain at £5. Would deliver in West Yorkshire area.—Box No. 699, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Receivers CR-100 and R.1155—offers?—Childs, 4 Elan Road, Llandudno, Caernarvonshire.

WANTED: SB-640 LMO for Heathkit SB-101. Also wanted, SB-600 LMO in good order and price as asked.—Savage, G3GDC, 53 The Broadway, Plymstock, Plymouth, Devon.

sale: Ham gear. PM-1 preselector, self-powered, with 16th Minstrel PAR-D, receiver and speaker, complete. £20.—Wilson, Orchard House, Sutton Green, Guildford (75763), Surrey.

EXCHANGE: Eumig S.709 sound projector, Bolex M, Leica camera, screen, stand, viewer and splicer, as new, FOR KW-2000B with mobile PSU.—Allen, 42 Quantock Road, Bedminster, Bristol, S.

WANTED: Eddyystone EA-12 receiver, Panadaptor for EA-12 and Wobbulator for 400-500 kHz.—Sturdy, 73 Rawcliffe Lane, York (27123), Y03 6SJ.


J BEAM AERIALS: 2/10Y 10 el. Yagi... £48; 70/16 double 8 70 cm.... £230; 8/14P 14 el. Parabeam... £70; 2/8Y 8 el. Yagi... £130; 70/16 double six... £65; 10/16 double B 70 cm... £55; 2/12 double six... £65; 70/18 18 el. Parabeam... £65.

Rotators 1970... £24.50 CDR2; £25.00.

TAVASU MOBILE AERIALS AS PREVIOUSLY ADVERTISED... £950.00.

FOR SALE: Heathkit DX-100U, in FB condition, price £40—would deliver in London area.—Ring Bean, G3TJOQ, 01-97-1227 evenings. QTHR.

TELEPRINTERS: Model 7B, £15; Model 75, £25, by Creed. Teletype 15, or TG7A, £15. All machines run off 230v. AC and are in fine order.—Phillips, 15A, Franklanks Village, Haywards Heath (50265), Sussex.


Selling: Geloso-209 Rx, 12 new valves but does need trimmimg, £15. Two-metre valve converter, well built, IF 26 to 28 MHz, £8. PSUs, £35. Primer of Cintel 15A, £6.50. Wideband amplifier, 5 to 10 MHz, £3. RP Units, Type 26/27, £5 per each. A 4 channel, transmit, £15. Teletype 1B; page printer, transmitter-distributor table, complete. £85. Oscilloscope, 14in. screen, Cintel 15A, £35. Wide-band amplifier, 5 to 10 MHz, £2. RP Units, Type 26/27, £1 each. Teletype 1B; page printer, transmitter-distributor, £15. Wavemeter, complete. £185. Tuning 1310, 155 to 230 MHz, £5 each. CR tubes: VCR-97, £0.50; VCR-131, £1.25; VCR-4, £1.50. Ribbed Insulators PLS £1, 5p.

FOR SALE: Heathkit DX-100U, in FB condition, price £40—would deliver in London area.—Ring Bean, G3TJOQ, 01-97-1227 evenings. QTHR.

FOR SALE: Heathkit DX-100U, in FB condition, price £40—would deliver in London area.—Ring Bean, G3TJOQ, 01-97-1227 evenings. QTHR.

FOR SALE: Heathkit DX-100U, in FB condition, price £40—would deliver in London area.—Ring Bean, G3TJOQ, 01-97-1227 evenings. QTHR.

FOR SALE: Heathkit DX-100U, in FB condition, price £40—would deliver in London area.—Ring Bean, G3TJOQ, 01-97-1227 evenings. QTHR.

FOR SALE: Heathkit DX-100U, in FB condition, price £40—would deliver in London area.—Ring Bean, G3TJOQ, 01-97-1227 evenings. QTHR.

FOR SALE: Heathkit DX-100U, in FB condition, price £40—would deliver in London area.—Ring Bean, G3TJOQ, 01-97-1227 evenings. QTHR.
WANTED: Pye F27AM, Cambridge, Bantams, Westminister, Motophone. Also wanted, working and unmodified Walkie-Talkies on either 27 or 28.5 MHz.—Rates, G3UHS, QTHR, Caterham (Surrey) 46692.

WANTED: Joystick Aerial, complete with precision built variometer.—Leighton, Tangley Cottage, Wonersh, Guildford (666543), Surrey.

TRIO

See Trade Classified—Holdings Photo-Audio Centre, 39/41 Mincing Lane, Blackburn, BB2-2AF, Lancs. Tel: 59595/6

CITY OF BIRMINGHAM Police Department WIRELESS TECHNICIAN

Salary: Technical Grades 2/3 £1,059—£1,416 per annum according to ability, experience and qualifications.

Wireless Technician required for the repair and maintenance of mobile and personal radio sets used by Birmingham Police, Fire and Ambulance and other Departments.

Applicants should be familiar with principles of transmitter and receiver design and experienced in fault-finding techniques. Interesting and worthwhile work with a 37½ hour week.

Applications should be received within 14 days addressed to: STAFF APPOINTMENTS, P.O. BOX 29, Council House, Birmingham, B1 1BB.

Please state reference number 43/WT/1/9 on letter and envelope

V 9339

CALL-PIN

(in Solid gold or silver) with your call-sign, in black enamel, 19 x 8 mm

9355 Silver Cost £1.15p
14 Kt Solid Gold Cost £3.00p

Please send me your order with a Bank Cheque or a Post Money Order.

Write to:
LA1GM,
Pep Rasch-Olsen, 1312 Slepended, Norway.

MORSE MADE EASY !!!

FACT NOT FICTION. If you start RIGHT you will be reading amateur and commercial Morse within a month. (Normal progress to be expected.)

Using scientifically prepared 3-speed records you automatically learn to recognise the code RHYTHM without translating. You can't help it, it's as easy as learning a tune. 16-W.P.M. in 6 weeks guaranteed. For Complete Course 3 Records & Books send £4-30

Call for further details of course Ring 01-660 2890/01-668 3255 or send 4p stamp for explanatory booklet to—

OJHSC (Box 14) 45 GREEN LANE, PURLEY, SURREY.
 Volume XXIX  THE SHORT WAVE MAGAZINE

TRIO

Communications
Accessories

The following accessories are available for use with Trio Communications Equipment...

Recommended
Price

CW Filter for TSS10 ... ... ... £14.00
10AZ Mechanical Filter for JR310 ... ... ... £14.67
25kHz Marker Unit for JR310 (less crystal) ... ... ... £7.34
100kHz Calibration crystal ... ... ... £3.18
0AZ Mains Voltage Stabiliser ... ... ... 67p
B1016/L Hand Held Communication Microphone for TSS10 ... ... ... £3.38
Leson TW205A Table Standing Microphone with battery pre-amplifier ... ... ... £7.95
HS-4 Communication H/Phones ... ... ... £5.98
SP-5D Communications speaker matches all Trio receivers ... ... ... £4.38

STEPSHENS-JAMES LTD.
70 PRIORY ROAD . LIVERPOOL . L4 2RZ

Official KW Agents
KV222. Receiver ... ... ... £140
KV204. Transmitter ... ... ... £142
KV200. Receiver ... ... ... £135
KV Atlanta Transceiver ... ... ... £220
KV Atlanta VFO, Tribander ... ... ... £200
KV E-Z Match ... ... ... £135
KV107. Matching unit ... ... ... £40.00
KV300. Transmitter ... ... ... £175
KV Antenna Traps pair ... ... ... £64.00
KV Dummy Load ... ... ... £7.00
KV Low Pass Filter ... ... ... £5.65
KV Balun ... ... ... £1.75
Yaeu/Sommerkamp
FT101. Transceiver ... ... ... £230
FT200. Transceiver ... ... ... £180
FT20. 2m. Transceiver ... ... ... £80.00
FL500. Transmitter ... ... ... £140
FR300. Receiver ... ... ... £120.00
IVY400. Remote VFO ... ... ... £38.00
SP400. Loudspeaker ... ... ... £10.00
FL20008. Linear ... ... ... £130

Trio
TS510. Transceiver ... ... ... £180
TX599. Transceiver ... ... ... £185
JR599. Receiver ... ... ... £185
JR310 Receiver ... ... ... £175
9R59OS. Receiver ... ... ... £47.50
SP5D. Loudspeaker ... ... ... £48.30
HS4. Headphones ... ... ... £4.00
Lafayette
HA600A. Receiver ... ... ... £45.00
Edystone
EC 10 Mk2. Receiver ... ... ... £79.00
A.C. Power Unit ... ... ... £73.75

H.P. and Credit terms can be arranged on all orders over £35. Part exchanges. After sales service.

Telephone 051-263 7829
Partridge Electronics ... ... ... £13.30
New Lightweight VFA ... ... ... £13.30
TX Tuner ... ... ... £10.00
RX Tuner ... ... ... £10.00
Antenna Range ... ... ... £23.00
W.E. Quad ... ... ... £65.00
GEM Quad ... ... ... £27.00
Poly Quad ... ... ... £27.00
Secondhand Equipment
Sommerkamp PL500 Tx. ... ... ... £105
Eddystone 680X ... ... ... £70.00
Lafayette KT320 ... ... ... £36.00
Swan 500 ... ... ... £23.00
Cedar PR30X ... ... ... £6.00
Ten Tech PM32 ... ... ... £32.00
Eddystone 840A ... ... ... £30.00
BRT400 ... ... ... £60.00
AR2BD ... ... ... £45.00
AR2BL ... ... ... £37.00
Panda Cub Tx ... ... ... £28.00
Triod 9R59DE ... ... ... £37.00
Trios 5500 plus VFO ... ... ... £33.00
Eddystone 670A ... ... ... £38.00
Eddystone 85OA ... ... ... £30.00

All RSGB Publications stocked.

G3MCN

WRISTO}

Communications
Accessories

The following accessories are available for use with Trio Communications Equipment...

Recommended
Price

CW Filter for TSS10 ... ... ... £14.00
10AZ Mechanical Filter for JR310 ... ... ... £14.67
25kHz Marker Unit for JR310 (less crystal) ... ... ... £7.34
100kHz Calibration crystal ... ... ... £3.18
0AZ Mains Voltage Stabiliser ... ... ... 67p
B1016/L Hand Held Communication Microphone for TSS10 ... ... ... £3.38
Leson TW205A Table Standing Microphone with battery pre-amplifier ... ... ... £7.95
HS-4 Communication H/Phones ... ... ... £5.98
SP-5D Communications speaker matches all Trio receivers ... ... ... £4.38

STEPSHENS-JAMES LTD.
70 PRIORY ROAD . LIVERPOOL . L4 2RZ

Official KW Agents
KV222. Receiver ... ... ... £140
KV204. Transmitter ... ... ... £142
KV200. Receiver ... ... ... £135
KV Atlanta Transceiver ... ... ... £220
KV Atlanta VFO, Tribander ... ... ... £200
KV E-Z Match ... ... ... £135
KV107. Matching unit ... ... ... £40.00
KV300. Transmitter ... ... ... £175
KV Antenna Traps pair ... ... ... £64.00
KV Dummy Load ... ... ... £7.00
KV Low Pass Filter ... ... ... £5.65
KV Balun ... ... ... £1.75
Yaeu/Sommerkamp
FT101. Transceiver ... ... ... £230
FT560. Transceiver ... ... ... £195
FT200. Transceiver ... ... ... £180
FT2F. 2m. Transceiver ... ... ... £80.00
FL500. Transmitter ... ... ... £140
FR300. Receiver ... ... ... £120.00
IVY400. Remote VFO ... ... ... £38.00
SP400. Loudspeaker ... ... ... £10.00
FL20008. Linear ... ... ... £130

Trio
TS510. Transceiver ... ... ... £180
TX599. Transceiver ... ... ... £185
JR599. Receiver ... ... ... £185
JR310 Receiver ... ... ... £175
9R59OS. Receiver ... ... ... £47.50
SP5D. Loudspeaker ... ... ... £48.30
HS4. Headphones ... ... ... £4.00
Lafayette
HA600A. Receiver ... ... ... £45.00
Edystone
EC 10 Mk2. Receiver ... ... ... £79.00
A.C. Power Unit ... ... ... £73.75

H.P. and Credit terms can be arranged on all orders over £35. Part exchanges. After sales service.

Telephone 051-263 7829
Partridge Electronics ... ... ... £13.30
New Lightweight VFA ... ... ... £13.30
TX Tuner ... ... ... £10.00
RX Tuner ... ... ... £10.00
Antenna Range ... ... ... £23.00
W.E. Quad ... ... ... £65.00
GEM Quad ... ... ... £27.00
Poly Quad ... ... ... £27.00
Secondhand Equipment
Sommerkamp PL500 Tx. ... ... ... £105
Eddystone 680X ... ... ... £70.00
Lafayette KT320 ... ... ... £36.00
Swan 500 ... ... ... £23.00
Cedar PR30X ... ... ... £6.00
Ten Tech PM32 ... ... ... £32.00
Eddystone 840A ... ... ... £30.00
BRT400 ... ... ... £60.00
AR2BD ... ... ... £45.00
AR2BL ... ... ... £37.00
Panda Cub Tx ... ... ... £28.00
Triod 9R59DE ... ... ... £37.00
Trios 5500 plus VFO ... ... ... £33.00
Eddystone 670A ... ... ... £38.00
Eddystone 85OA ... ... ... £30.00

All RSGB Publications stocked.

G3MCN

WRISTO
CREATE YOUR OWN REFERENCE LIBRARY

The "EASIBINDER" is designed to bind 12 copies of the Magazine as you receive them month by month, eventually providing a handsomely bound volume for the bookshelf.

No need to wait until twelve copies are assembled. As each copy is received, it is quickly and simply inserted into the binder. Whether partially or completely filled, the binder is equally effective, giving the appearance of a book, with each page opening flat.

Strongly made with stiff covers and attractively bound in maroon Leathercloth and Milskin, the binders have only the title gold blocked on the spine.

Price 88p. post free.

PUBLICATIONS DEPARTMENT
SHORT WAVE MAGAZINE
55 VICTORIA STREET
LONDON, S.W.1

Advertising in "Short Wave Magazine" guarantees the largest and most effective coverage of the U.K. radio amateur interest

AMATEUR ELECTRONICS
BIRMINGHAM 021-327 1497 021-327 6313

AN APOLOGY

We regret that this month we have departed from our usual practice of advertising current stocks of quality used equipment, but at the time of going to press many items expected have not come to hand and other items in stock are tentatively sold. As regular readers will perhaps realise, we have the largest turnover of used equipment in the United Kingdom and our stock literally changes daily, consequently, at the time that this appears in print, we expect to have a varied selection of equipment including such famous names as Collins, Drake, Heath, National, Hammarlund and Eddystone etc., etc., and a stamped addressed envelope will bring a prompt reply with our latest stock list.

Such is our turnover in reliable and good condition second-hand equipment, our requirements for this are almost insatiable, with the result that we have a continuing demand for equipment of every conceivable class, provided that this is in top grade physical and electrical condition. We attach particular importance to that section of our clientele whose interests lie in general coverage short wave listening and our aim is to maintain, whenever possible, stocks of general coverage Receivers, extending to the most sophisticated types available.

To those readers currently considering the disposal of redundant equipment we would offer an on the spot cash settlement with collection wherever possible and are able to undertake complete shack clearances. Similarly, against the purchase of items offered, we are glad to accept equipment in part exchange at all times, provided it is to manufacturers' original specification and is in top grade condition.

Excellent stocks of all new equipment and accessories in the TRIO, KW ranges with YAESU MUSEN to specific order.

STOP PRESS: The new KW 107 Antenna Tuning System now available from stock.

ELECTRON HOUSE, 518-520 ALUM ROCK ROAD, BIRMINGHAM 8