

# The SHORT WAVE Magazine

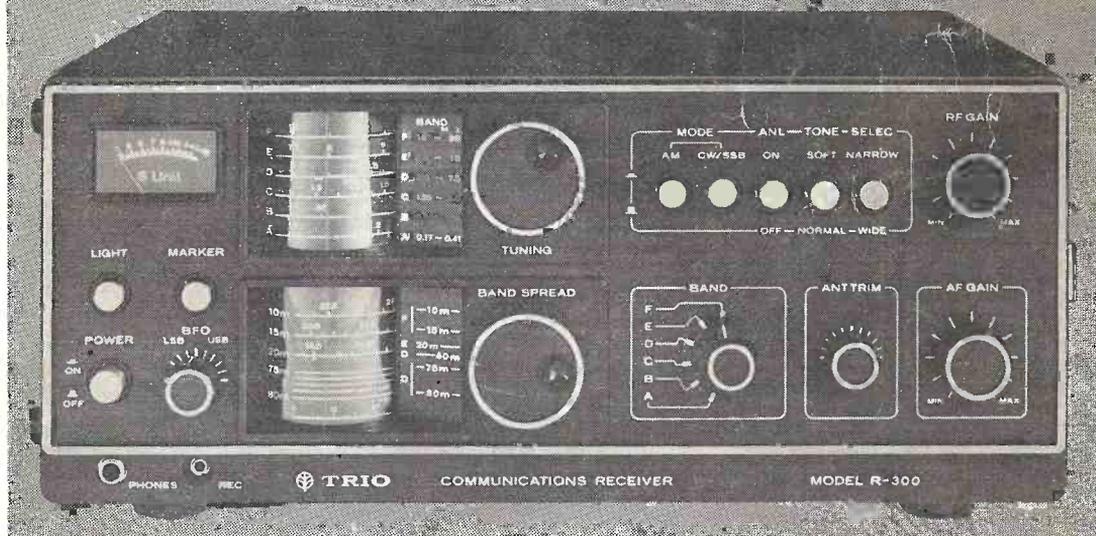
VOL. XXXIV

DECEMBER, 1976

NUMBER 10

## TRIO R-300

Eavesdrop on the world



### LISTEN TO THE WORLD

Short wave radio is by far the fastest and most convenient type of communications for spreading the news about what is going on in the world. And for this reason TRIO's R300 is the right rig for those who'd like to listen to a live report of the Indianapolis Grand Prix, to Radio Peking or to follow the progress of a Himalayan expedition. The R-300 is the invisible bridge to other countries and continents and the bridge to the home country for many journalists, engineers and technical representatives working abroad. They all want a reliable and sturdy multiband receiver for home use and travel, a receiver working from mains voltage or batteries. And just such a receiver is TRIO's new R-300.

**Six Wavebands**—LW (170-410 kHz), BC (525-1250 kHz), 4 x SW (160-10m). The four shortwave bands continuously cover the frequency range from 1.25—30 MHz with separate calibration for the commercial (75—11m.) and radio amateur bands (80—10m.) of the large drum-type main tuning and bandsread dials.

**Outstanding Input Sensitivity**—The dual-gate MOSFET front end assures excellent cross-modulation and spurious characteristics, as well as high input sensitivity. Between 18 and 30 MHz the R-300 operates as a double superhet, giving sensitivity of  $1\mu\text{V}$  for AM and  $0.5\mu\text{V}$  for SSB. For full details, contact the sole importers of the exciting TRIO range.

Sole Importers: **LOWE ELECTRONICS**  
 Cavendish Road, Matlock, Derbyshire  
 Tel.: Matlock 2817 or 2430



### TS-700G

In case you hadn't noticed, the TRIO TS-700 has a new look. Now updated and incorporating all the features which made it the most sought after transceiver on 2 metres, it now includes additional refinements which you, the keen radio amateurs, have requested.

The basic concept remains the same; a complete 2 metre station package operating from a.c. mains or 12v. d.c. supplies, providing full VFO coverage of the 2 metre band with facilities for 22 crystal controlled channels for popular repeater and net frequency working. The same TRIO design standards such as the ultra linear PA operation resulting from the use of an inverter derived 20 volt supply, are still used. The same supply is also used to feed the driver and the audio stages of the receiver. TRIO's acknowledged leadership in the quality audio field has been put to good advantage in their amateur equipment. Everyone comments on the clean crisp audio quality of the TS-700G both on transmit and receive.

The main refinements can be summarised as follows:

- ★ New improved received front end system contributes to a new standard of sensitivity;  $0.25\mu\text{V}$  for 10dB S + N/N ratio on SSB, 20dB quieting for  $0.4\mu\text{V}$  on FM. This is the best receiver on the market today.
- ★ New FM IF strip with narrower filter for European market.
- ★ New centre zero tuning meter for FM.
- ★ Automatic tone burst.

- ★ New 100 kHz calibrator with automatic disconnection of antenna to remove confusing outside signals. Automatic transmitter disable in CAL. mode.
- ★ New logarithmic S meter.
- ★ New repeater and reverse repeater operation at the turn of a panel switch. Operates on either VFO or crystal controlled channels.
- ★ New improved audio system for FM and AM transmit. The use of fully balanced mixing at all stages of frequency conversion guarantees a clean signal free from unwanted products. The power output of the transmitter is normally between 15 and 18 watts and this, in conjunction with the TRIO amplified ALC system, gives you an outstanding signal. Just listen to 2 metres and judge for yourself which rig always sounds the best.

If you are considering your once only rig for 2 metres, then the TS-700G has to be your logical choice. Backed by the largest company in Japan making amateur radio equipment, and the best service facilities in Europe at Lowe Electronics, the TS-700G SSB/FM/CW/AM transceiver has to be the all time best buy.

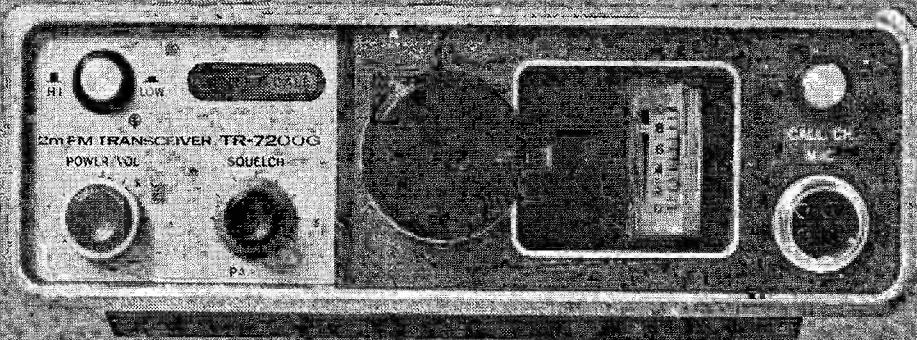
**PRICE: £398.00 exc. VAT**

Sole Importers  
**LOWE ELECTRONICS**  
 Cavendish Road  
 Matlock Derbyshire  
 Tel: Matlock 2817/2430



# WHEN ONLY THE BEST WILL SUFFICE

## TR7200G



### 2 Metre FM mobile transceiver TR7200G

The TR7200G is now the best selling two metre FM mobile transceiver in Europe. It has always been a favourite all over the world among radio amateurs who demand the very best in performance and construction. Now with a complete range of accessories, the TR7200G offers the ultimate in fixed station and mobile FM operation.

#### Performance plus

High receiver sensitivity (typical measured performance  $0.3\mu\text{V}$  for 15dB quieting) gives you a solid readable signal from long distance stations. Also it helps to combat flutter on the received signal when you are mobile in a town since the limiting threshold is superbly low. Minimum transmitter output of 10 watts (typically 14-15 when on the move) together with carefully tailored audio response and a new integrated circuit limiting amplifier gives your signal that outstanding quality that makes people listen. The matching Trio dynamic microphone supplied with the rig further adds to the signal quality and readability.

#### Repeater access tone

Generated by the Trio exclusive tuning fork controlled 1750 Hz oscillator. This is the tone generator that does not drift even when the interior of the transceiver is being cooked through sitting in a hot car on a summer's day. Stabilised amplitude output for constant deviation under all conditions. Access first time, every time.

#### Superb squelch performance

Utilising the very latest in noise signal detection techniques for a squelch sensitivity of better than  $0.5\mu\text{V}$ . This simply means that you can be sure that the weakest usable signals will open the squelch when with other rigs, you always wonder if you are missing something with the squelch in operation.

#### Switched TX output power

1 watt or 10 watts by the touch of a button. Dial illumination colour change to indicate power level in use. Fully variable PA protection which gradually reduces power input to PA with increasing SWR. This allows you to continue operating when your mobile antenna gets wet (and rain really does change the SWR on most antennas).

#### Features, features

The 22 channel dial is engraved with all R and S channel numbers so you don't have to wonder "did I put R6 in chan 11 or 12?". It also, incidentally, has channels designated A, B, C, etc. for your Raynet or local frequencies. The LED under the channel number is RF powered and only lights on the channels fitted with a receiver crystal. The "on air" lamp is also RF powered but from the transmit crystals so you know precisely what crystals you have in the rig. Best engineered mobile mount on the market gives instant slide in/slide out installation with no nasty little screws to fiddle with. Just in case someone else wants to slide out your rig, there is provision for a padlock through the mounting slide to prevent it (of course he could remove the entire dashboard complete with rig). The TR7200G case is dust tight and waterproof and reflects the Trio no compromise design approach. Public address facility. Switchable receiver sensitivity. Helical front end filter, etc., etc. It's the best mobile FM transceiver on the market.

**PRICE: £172.00 exc. VAT**

#### Sole Importers

**LOWE ELECTRONICS**  
Cavendish Road  
Matlock Derbyshire  
Tel: Matlock 2817/2430

 **TRIO**

Christmas Greetings from

**LOWE****ELECTRONICS****NR-56 FM RECEIVER**

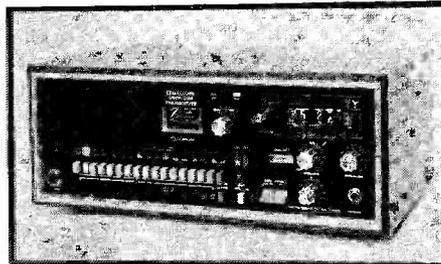
This remarkable little receiver gives the 2m FM listener everything he wants at a very reasonable price. Excellent sensitivity, stability and selectivity coupled with a built-in VFO and very effective squelch make it the ideal receiver for both beginner and keen listener. Although the built-in VFO more than covers the entire 2m band, crystal control of FM channels offers many advantages (particularly in mobile operation), so crystals, which are ex-stock, may be fitted for the popular channels and repeaters. It requires 12v. DC for operation and is thus an excellent mobile receiver for mounting in the car, boat or caravan as well as for home use.

- ★ Double filters at 10.7 MHz and 455 kHz.
- ★ Dual conversion 10.7 MHz/455 kHz.
- ★ Narrow filter fitted for European Market.
- ★ FET RF stage for high sensitivity.
- ★ 12v. operation.
- ★ Built-in loudspeaker.
- ★ Small size 6½" x 6½" x 2"
- ★ Mobile mount and personal ear-piece supplied.
- ★ Full coverage VFO built in.
- ★ 11 crystal positions (optional crystals ex-stock).
- ★ 22 transistors 1 integrated circuit, 16 diodes.
- ★ NR-56 £54.00 incl. VAT. Postage 46p. Crystals £2.40 incl. VAT

**FS1007P**

The home station FM transceiver with everything. ★ Mains or 12v. operation ★ 16 channel scanning ★ channel skipping facility ★ priority channel with front panel crystal sockets ★ manual or auto scan ★ switched high/low power ★ switched wide/narrow deviation ★ S meter ★ RF output meter ★ centre zero tuning meter ★ RX fine tuning control ★ built-in SWR bridge ★ built-in digital clock with alarm and auto switch on ★ built-in loudspeaker ★ 10W TX ★ 0.3µV sensitivity ★ superb styling and finish.

★ STILL ON SPECIAL OFFER. WRITE OR PHONE FOR DETAILS ★

**SHINWA FILTERS**

Lowe Electronics present a range of HF and VHF filters suitable (indeed most desirable) for the discerning radio amateur. From the very wide range of filters manufactured by SHINWA, we have selected those which we feel are the most useful in this country.

All the filters are exceptionally well made in high quality housings 30 x 50 x 180mm (1110G is 160 x 310 x 55mm.) and are terminated in SO239 sockets. They are suitable for a wide range of applications, the 114028-30 MHz BPF being particularly attractive to transverter users.

The 1110G is the big daddy filter having adjustable bandwidth up to 2 MHz wide at any frequency in the range 135-165 MHz.

All filters are supplied with an individual calibration curve so that you can see exactly what you are getting and prices are most reasonable as you can see.

| Model | Frequency                         | Insertion loss | Max. att. | Max. power  | Price inc. VAT |
|-------|-----------------------------------|----------------|-----------|-------------|----------------|
| 1110  | 144-146 MHz band pass             | 1dB            | >50dB     | 20W RMS     | £13.72         |
| 1110G | 135-165MHz/2MHz band pass tunable | 1dB            | >70dB     | 100W RMS    | £47.25         |
| 1140  | 28-30 MHz band pass               | 1dB            | >60dB     | 100W P.E.P. | £13.72         |
| 1006  | 146 MHz cut off low pass          | 1dB            | >50dB     | 50W RMS     | £11.48         |
| 1005  | 30 MHz cut off low pass           | 0.7dB          | >50dB     | 300W P.e.P. | £10.80         |

**RAK ANTENNAS**

The range of RAK antennas (yes, I know it should be "antennae") represents the finest value available today. From the comprehensive range, we offer a selection for the amateur and SWL. All traps are fully encapsulated and splashproof. All hardware is in stainless steel and corrosion proofed alloy. Elements are made from hardened alloy wire (not Listener I) for strength with light weight. For the amateur radio operator who needs the ideal set-up, we would recommend (and we use) the AL48DXN which gives super performance on 80 and 40. Use it in conjunction with either a vertical or beam for 20, 15 and 10. You will get 80 metre performance approaching that of a full size dipole but in an overall length of 28 metres instead of 40!

| Model        | Coverage | Power Rating | Length    | Traps | Price inc. VAT and Postage |
|--------------|----------|--------------|-----------|-------|----------------------------|
| Midy V N     | 80-10m.  | 1kW P.E.P.   | 23 metres | 6     | £41.37                     |
| AL48DXN      | 80-40m.  | 2kW P.E.P.   | 28 metres | 2     | £26.18                     |
| ABXL         | 80m.     | 4kW P.E.P.   | 40 metres | 0     | £12.77                     |
| Listener III | 3-30 MHz | Receive only | 24 metres | 0     | £26.05                     |
| Listener I   | 3-30 MHz | Receive only | 5 metres  | 1     | £10.02                     |

Prices are subject to alteration without notice.

**HEAD OFFICE**

119 Cavendish Road, Matlock, Derbyshire. Tel. 2817 or 2430 9 a.m. to 9 p.m.

**BRANCH OFFICES**

Communications House, Wallington Square, Wallington, Surrey. Tel. 01-669 6700  
Soho House, 362-4 Soho Road, Handsworth, Birmingham. Tel. 021-554 0708  
27 Cookridge Street, Leeds. Tel. 0532 452657

**AGENTS**

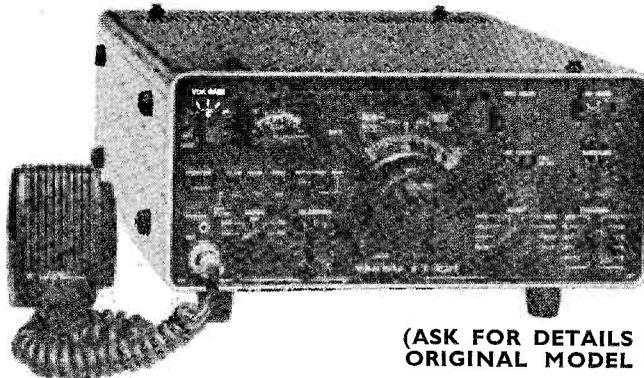
Alan GW3YSA, 35 Pen-Y-Waun, Efail-Isaf, Nr. Pontypridd. Tel. Newton Llantwit 3809  
John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel. Ringmer 812071  
Sim GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. Tel. 041-771 0364

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**AND THE  
LATEST  
SSB/FM/CW/AM  
FT-221R  
2 METRE  
TRANSCIVER**

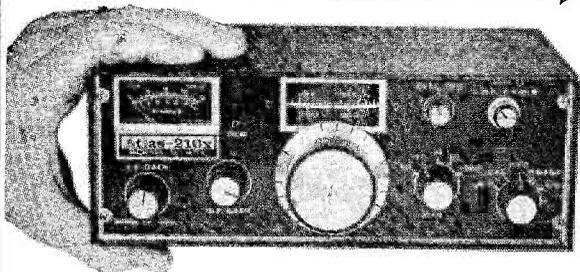


**MAIN AGENT**

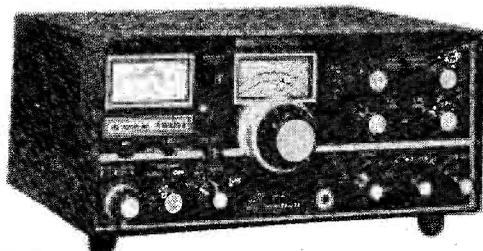
(ASK FOR DETAILS OF SPECIAL OFFER ON ORIGINAL MODEL FT-221 — LIMITED STOCKS ONLY)

WHEN YOU BUY YAESU, SWAN OR ATLAS FROM AMATEUR ELECTRONICS UK YOU HAVE THE CERTAIN KNOWLEDGE THAT YOU ARE PURCHASING YOUR EQUIPMENT FROM A FACTORY APPOINTED MAIN AGENT WITH EXTENSIVE STOCKS OF MAIN ITEMS, ACCESSORIES AND SPARES. EVERY SALE IS BACKED UP BY A FIRST CLASS SERVICE DEPARTMENT AND WARRANTY SERVICE IS SECURICOR COLLECTED AND RETURNED! NO COMPANY HAS BETTER CONNECTIONS WITH THE FACTORIES.

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**700 CX Swan's 700 Watter**

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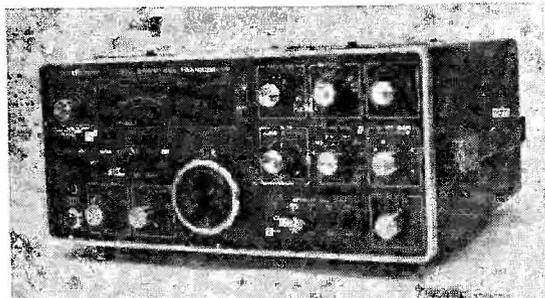


# STEPHENS-JAMES LTD.

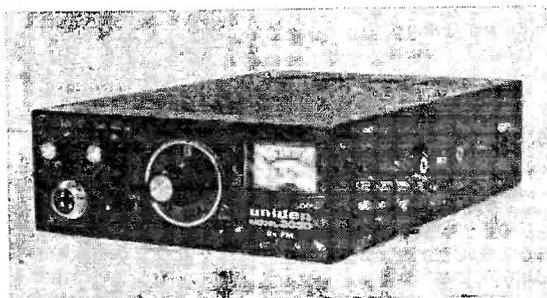
## 47 WARRINGTON ROAD, LEIGH, LANCS. WN7 3EA

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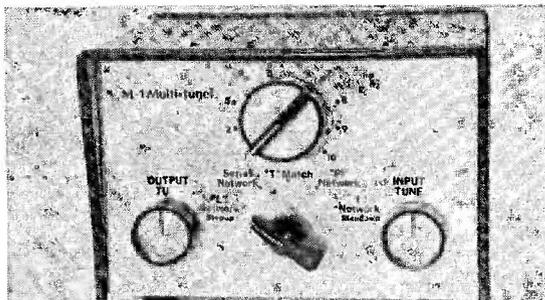
The North West's leading supplier for all your requirements. EASY ACCESS FROM THE M61-62.63—we're 5m. from M6, turn at the Greyhound Motel on the A580 (East Lancs. Road). OPEN 9.30 to 5.30, MONDAY TO SATURDAY.



**UNIDEN 2020.** AC/DC power supplies. CW filter. Noise blander. Blower. Digital and analogue display give direct readout; 2-6146B in PA 80-10 metres. Receiver is pre-mixed single conversion using phase lock loop oscillator circuit. Separate filters for USB/LSB. Price £495-00



**UNIDEN 2030.** 144-146 MHz FM Transceiver. 12 channels. 12v. DC operation. 10 watt or 1 watt output. Antenna impedance 50 ohm. Complete with microphone and mounting bracket. Price £174-00



**Mk. I MULTI TUNER.** Designed and manufactured by us. 50 tunable switched positions for antenna lengths over 5 metres in the 2-30 MHz range. Five different circuits to give an excellent match between your receiver and antenna. Now in use in over 35 countries. Price £17-00

### YAESU

|        |                   |     |     |     |     |         |
|--------|-------------------|-----|-----|-----|-----|---------|
| FT101E | Transceiver       | ... | ... | ... | ... | £482-50 |
| FT200  | Transceiver       | ... | ... | ... | ... | £326-00 |
| FT401  | Transceiver       | ... | ... | ... | ... | £412-00 |
| FR101S | Receiver          | ... | ... | ... | ... | £336-37 |
| FR101D | Receiver          | ... | ... | ... | ... | £438-75 |
| FR101D | Digital Receiver  | ... | ... | ... | ... | £540-00 |
| YC355D | Frequency Counter | ... | ... | ... | ... | £160-00 |
| FRG7-7 | Receiver          | ... | ... | ... | ... | £167-00 |
| FT401B | Transceiver       | ... | ... | ... | ... | £426-00 |

### ATLAS

|      |             |     |     |     |     |         |
|------|-------------|-----|-----|-----|-----|---------|
| 210X | Transceiver | ... | ... | ... | ... | £482-50 |
| 215X | Transceiver | ... | ... | ... | ... | £482-50 |

### PLANET

|      |                        |     |     |     |     |         |
|------|------------------------|-----|-----|-----|-----|---------|
| 2ML  | 2m. Linear Amplifier   | ... | ... | ... | ... | £112-50 |
| TV2A | 28/144 MHz Transverter | ... | ... | ... | ... | £112-50 |
| PS12 | 12v. DC 3 amp PSU      | ... | ... | ... | ... | £37-00  |

### BARLOW WADLEY

WE ARE PLEASED TO ANNOUNCE WE HAVE BEEN APPOINTED SOLE DISTRIBUTORS FOR THE BARLOW WADLEY RECEIVERS FOR THE MIDLANDS AND NORTH-WEST. BADLOW WADLEY XCR-30 EX-STOCK AT £145 INC. VAT. WITH FM £170-00

#### Accessories

|  |                 |        |
|--|-----------------|--------|
| Single Meter SWR Bridges   | (post 45p)      | £8-50  |
| Twin Meter SWR Bridge  | (post 50p)      | £12-20 |
| Auto-Cq-Sender   | ... (post free) | £41-11 |
| Eddystone 898 Dial Assembly  | (post 75p)      | £15-00 |
| Drake Low Pass Filter  | (post 50p)      | £15-00 |
| Omega TE-701 Antenna Noise Bridge  | (post 25p)      | £21-00 |
| Omega TE-702 Antenna Noise Bridge  | (post 25p)      | £24-00 |
| Whip antenna gutter bracket  | (post 25p)      | £2-81  |
| UR43 Co-ax 18p metre ; UR76 45p metre, post 2p metre ; 75 and 300 ohm twin feeder 10p metre, post 1p metre ; Heavy duty 75 ohm twin feeder 20p metre. FL269 46p SO239 46p, Cable reducers 15p. |                 |        |

We carry a substantial range of equipment by :-

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| DECCA                |         |
| G-WHIPS              | JAYBEAM |
| MICROWAVE MODULES    | UNIDEN  |
| OMEGA                | C.D.R.  |
| TECHNICAL ASSOCIATES | DRAKE   |
| BELCOM               | HY-GAIN |
| BANTEX               | SWAN    |

Send us a large S.A.E. or 10p in stamps and we will forward you all the latest details and prices. All our prices include VAT at the current rate at the time of going to Press.

INSTANT H.P. AND CREDIT TERMS ARRANGED. PART EXCHANGES WELCOME OR WE WILL SELL YOUR EQUIPMENT ON SMALL COMMISSION. ACCESS AND BARCLAYCARD FACILITIES, JUST PHONE YOUR NUMBER THROUGH.

### SECONDHAND EQUIPMENT

|                           |     |         |
|---------------------------|-----|---------|
| FR101D Receiver           | ... | £375-00 |
| Trio GR59D5 Receiver      | ... | £50-00  |
| Barlow Wadley Receiver    | ... | £100-00 |
| Trio JR310 Receiver       | ... | £80-00  |
| Yaesu FRDX400 Receiver    | ... | £185-00 |
| Yaesu FRSDX Receiver      | ... | £180-00 |
| Yaesu FTDX400 Transceiver | ... | £275-00 |
| KW202 Receiver            | ... | £185-00 |
| Yaesu FR101D Receiver     | ... | £350-00 |
| Liner 2 Transceiver       | ... | £120-00 |

We can supply most items from stock. All equipment is sold from the above premises. We do not supply any agents or agents of agents who work from home in their spare time. All equipment is air tested and carries normal guarantee. YL's and XYL's please note . . . We know you wish to buy the OHM a nice Xmas present but please don't ring us up on the 23rd December and expect his new transceiver to arrive Xmas morning. . . .

To all our readers and customers may I wish you all

A MERRY XMAS

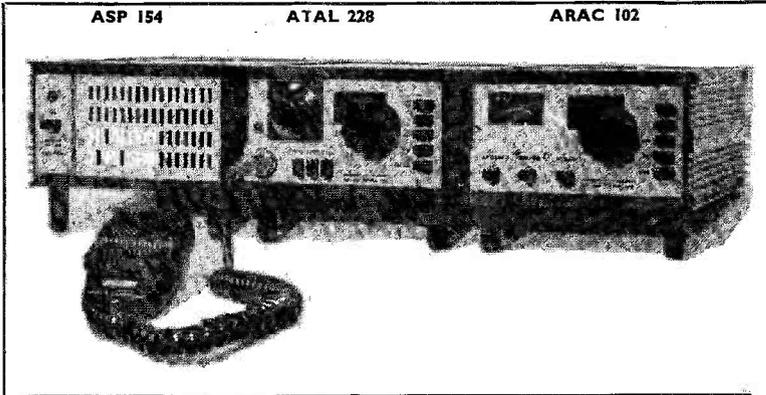
de G3MCM

# S.T.E. MILAN VHF EQUIPMENT

During the last two years the popularity of the range of equipment by S.T.E. has been growing. The ARAC 102 receiver has been a "Best Seller" (have you seen any second-hand?). Later in the year the Atal Transmitter came into stock and all reports have been good. Now we are offering the complete range of modules for the D.I.Y. enthusiasts. Transmitters, receivers, etc. The construction of these modules are first class — the P.C.B.'s are the finest we have ever seen.

Price List (includes postage)

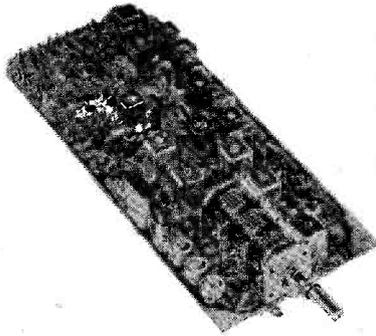
- ARAC 102 Receiver ... £100.00
- Atal 228 Transmitter ... £126.00
- ASAP 154 AC PSU with speaker £35.50
- AR10 Receiver Module ... £37.50
- AA1 Audio Amplifier ... £4.10
- AD4 FM Discriminator ... £5.00
- AL8 Linear Amplifier ... £27.00
- AT22 Transmitter ... £50.00
- AR20 C.C. Receiver ... £50.00
- AT23 C.C. Transmitter ... £36.00
- AS 15 Stabilised psu D.C. ... £10.00
- AG 10 Tone Generator ... £4.50
- AC2A Converter 28-30 MHz £20.00



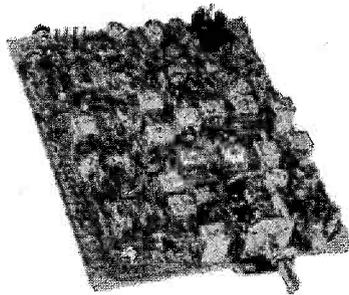
**SPEAKER**  
AC POWER SUPPLY UNIT

144 - 146 MHz  
**AM FM TRANSMITTER**  
with Microphone

28-30 MHz 144-146 MHz  
**AM-FM-SSB RECEIVER**



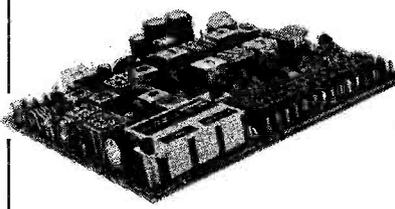
**AR10** Mosfet receiver. 28-30 MHz Double conversion superhet. RF and amplifiers stages are gate protected mosfets for good sensitivity and low intermodulation. Noise limiter and squelch circuit. AM, SSB and CW reception. 12v. DC.



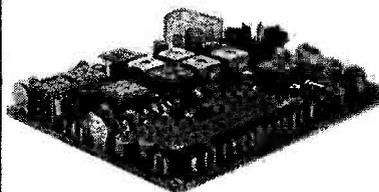
**AT 222.** A complete transmitter exciter unit for 144-146 MHz on AM or FM. VFO controlled or fixed channel operation. Complete with microphone pre-amp., speech processor including active audio filter. 1 watt output. FM, .25 watt AM. Output impedance 50-75 ohm adjustable. Frequency deviation 3-10 kHz adjustable.



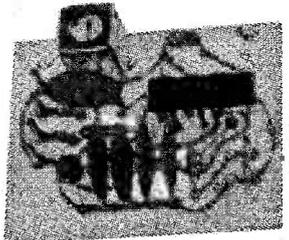
**AK20, STE.** Latest model from the famous STE Milan range of equipment. 12 channel operation in the 144-146 MHz range. 11-15v. DC operation. 3 watt output. Sensitivity 0.2 uv R.I.T. tone burst. Complete with microphone. Price £174.00



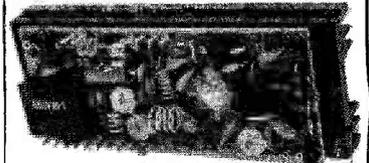
**AR20.** 12 channel FM receiver 144-146 MHz. Input impedance 50-75 ohm. AM-FM modes. Sensitivity 0.2uV AF output 3 watts. 12v. DC operation.



**AT23.** 12 Channel FM Transmitter. 3 watts. 144-146 MHz. Frequency deviation 3-10 kHz adjustable. 12v. DC operated AF input sensitivity 2mV adjustable to 50 mV.



**455 kHz FM Discriminator Amplifier.** Limiting threshold 100uV. Amplitude modulation rejection 40dB. Audio output voltage at 1 kHz 200-300mV frequency deviation + or - 3 kHz.



**Linear Amplifier.** Frequency 144-146 MHz output 10 watts FM, 8 watt PEP SSB, 8 watt AM. Input power 1 watt FM, .25 watt AM-SSB. Input impedance 50 ohm output impedance 50-75 ohm. 12v. DC.

## STEPHENS-JAMES LTD.

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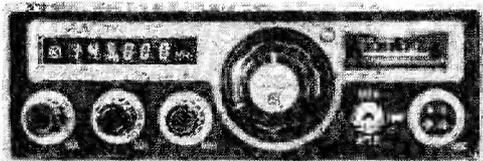
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# South Midlands

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### DIGITAL II now with SCANNER



ONLY £225, CRYSTAL TB £10, SCANNER £

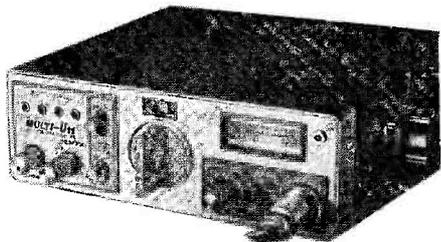
The Digital II offers complete 5 kHz step coverage across 2 metres and now with the Scanner 33, 25 kHz channels from 145 MHz upwards covered in around 10 seconds. It offers full lock and lockout on all channels. The scanner stops on a required channel for 10 seconds, then unless locked moves on. The bright digital readout comes from 6 seven segment LEDs. Selectable 10 or 1 watt output for simplex or duplex (up and down shifts), across 144-146 (rx to 149 MHz) from a tiny 6 1/2" x 2" x 7 1/2". Easily underdash mounted with the supplied mounting bracket, or slipped in place of the broadcast wireless. For strong handling, and low noise the R.F. mixer, first IF (16.9 MHz) second mixer (and LO) are all FET's. The front end is tuned by varicaps by the DC output of the P.L.L. with superb selectivity provided by a 15 pole (±8 kHz at -6dB ±15 kHz at -70dB) Ceramic filter. LED lamps indicate if the P.L.L. is unlocked or the squelch open. The V.C.O. is directly modulated (for exceedingly linear deviation). Unitary 6 circuit block construction (for serviceability and screening). Selective calling socket (mic/LS/PTT etc.) on rear panel.

### THE MULTI U II A NEW DIMENSION IN SEVENTY CMS

The Multi U II provides a unique combination of frequency control by either 23 switchable or 4 instantly selectable auto scanning channels or an external VFO. The main dial is channel numbered (e.g. 16—433.4, 20—433.5 etc.) and is illuminated only when a channel is crystallized up. Two R.F. stages in the receiver provide great sensitivity 0.5uV for 30dB NQ). The use of a band pass first IF (CF 45 MHz) gives high image immunity and low channel crystal drift. Further conversions to 10.7 and 455 prevent IF image whilst providing good pass and skirt selectivity. The transmitter of crystal stable 10/1W output draws only 2.5 or 1.3A (0.6 or 0.3A Rx) and has a netting of new crystal facility. Both the Tx deviation and the Rx bandwidth are switchable for 50 or 25 kHz spacing. Other features include, diode RF switching, R.I.T. "on the air" lamp, PO meter, S meter, AFP, reverse polarity protection, etc., etc.

With 8 Channels from —SU (0, 8, 12, 16, 18 20) and RU (0, 2, 4, 6, 10, 14).

INTRODUCTORY PRICE ONLY £200 + VAT Ex Stock



The handheld KP202 with its 2W of RF and 1/2W of audio immunity to image and IF break-through, offers performance to rival all walkie talkies and many mobile 10W sets. The KP202 is supplied with telescopic whip, leather handle/whip case and F type plug. Accessories include automatic (R channels only) crystal tone burst (£10.00), flexi stubby antenna (£5.75), leather case (£4.75), base charger KCP 2 (£11.25), set of 10 ni cads (£8.50), F to UHF adaptors (£1.45) F plugs, spare whips, spare hods, etc.

SIX CHANNELS fitted S20 and S22 and any 4 of S0, S21, S23, S24, R3, R4, R5, R6, R7. ONLY £104.75 (+ VAT).

## KP202

## SOLID STATE MOBILE LINEARS (VHF & UHF) FROM KLM & AMPERE

2 metre, SSB/CW/FM, RF sensing with manual override, "microstripline" 12v. D.C. 10W drive. 2" x 6.5" x 10" (1 1/2") (VAT & 12 1/2%). (Over 15 different models—S.A.E. details). PA144/160/BL1 145 MHz 160W. output £155



2 or 70 superb R.F. sensing, excellent bias arrangements, c/w mounting bracket, 12v. D.C. 10W drive. 2.5" x 5.2" x 7.5" (8.5") (VAT & 12 1/2%)

APB82A 145 MHz 80W output £95.00  
APB57A 433 MHz 45W output £95.00

## ROTATORS

Ex-Stock in Totton for fast delivery. VAT—Rotators 12 1/2%. Cable and deliv. 8%. Carriage (BRS or post) FREE. Securicor delivery £1 extra (mainland). All rotators supplied complete with appropriate control box and instrs.

### CDE ROTORS

AR30 Light VHF/UHF £37.50  
AR40 VHF and Light HF £43.50  
AR33 De luxe control AR40 £49.75  
CD44 Medium duty £89.00  
Ham II Heavy duty £119.00



RZ100

### STOLLE ROTORS

2010/220 Automatic £41.25

### BEARINGS

CD562 CDE £4.25  
RZ100 Stolle (ballrace) £10.00

### MOUNTING KIT

AK121 CDE to Versa-tower £3.60

### CABLE

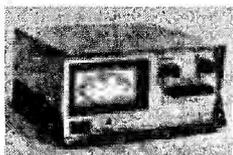
5 core AR30/40/33/2010 yd. 20p  
8 core CD44/Ham II yd. 32p

2010/220 and Cont. Box STOLLE

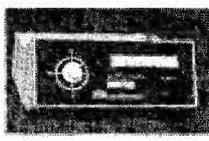


KP202

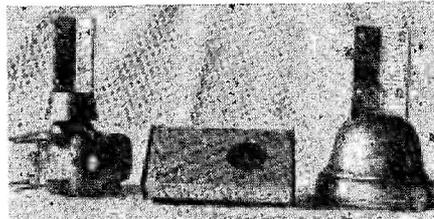
KCPI2



CD44/HAM II



AR33] CDE



AR30

AR 0/40

AR30/43

PLEASE NOTE THESE PRICES DO NOT INCLUDE VAT (8% or 12 1/2%)

Terms:—Cash with order or credit card holders just 'phone in for, if possible, same day despatch. Immediate H.P. available for card owners for amounts up to £225. Holders of current U.K. callsigns (where references have been provided) can be speedily cleared or normal H.P. at competitive rates is available.



# Communications Ltd

YEARS OF PROFESSIONAL EXPERIENCE

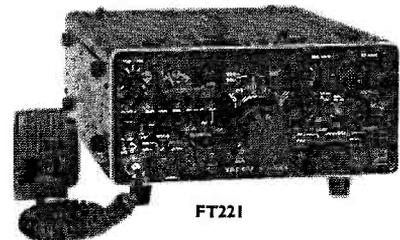
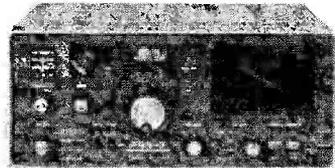
## YAESU MUSEN 2-YEAR GUARANTEE 24-HOUR SECURICOR SERVICE



### The FRG7, general coverage receiver—Ex Stock

The FRG7 is a general coverage solid state receiver with specifications unparalleled in its price range. It uses a Barlow-Wadley triple mix drift cancelling loop for continuous, spin-tuned, inclusive coverage of 0.5 to 30 MHz with calibration accuracy better than 5 kHz. Frequency selection is accomplished by setting the RF (pre-selector and range switch), dialling up the required number of megahertz, then tuning the VFO knob as normal.

The receiver is sensitive (0.5uV for 10dB, S + NN (SSB)) and stable (within 500Hz for any 30 minutes after warm up) with AM, SSB and CW modes catered for, A 3 position audio filter, RF attenuator, dial lamp conservation switch, recorder and phone sockets are fitted. It is mains powered but should the supply fail, or portable operation be required, 8 dry cells are automatically switched in.



FT221

### The FT221, complete 2m. station—Ex Stock

The FT221. The multimode USB, LSB, AM, FM, CW (with semi-break in aid side tone), 2m. transceiver offering the choice of phase locked VFO or 44 crystal channels, simplex or repeater (600Hz up and down shifts), with unique "double push" auto tone burst, mains or 12v. (3A) operation, excellent selectivity 55B 2.4 kHz (1.7 : S.F.) or FM 12 kHz. Front panel adjustable VOX and mic gain, a calibrator (1 MHz ± 10), 1 kHz readout and linearity, sensitive squelch, clarifier with IRT and IRT with ITT (makes F.S.K. easy), swichable "S" and centre zero tuning meter, noise blanker, serviceable plug in boards all contained in 11½" (14") x 5" x 11½", 22 lb rigid package. 600 kHz and possible 1.6 MHz shifts over 4 MHz.

### The FT101E complete HF station

### FT101E (EE-EX)—Ex Stock



FT101E

The FT-101E a complete mains or 12v. DC station contained in a compact 30 lb. package, 260W. P.I.P. of 5SW (with in-built R.F. speech processor) 180W., CW and 80W. of AM 10 to 160m. (incl. 10 MHz RX). The sensitive and selective (permeability tuned RF stages and 8 pole crystal filter) receiver offers: threshold adjustable noise blanker, swichable 25 and 100 kHz calibrator, ± 5k clarifier (with separate on/off switch), etc., etc.

The VFO is stable and linear (readout to 1 kHz) external VFO or crystal control can be selected with LED indicators illuminated accordingly. Carrier level is adjustable for: tune up, AM and for CW operation, whose performance with the semi break in keying, with side tone, and the optional filter installed is of a high order. Linear and transverter provisions are made with sockets for: relay contacts, ALC output, all internal HT supplies, low level RF heater links and switches, etc., etc.

### CUSHCRAFT VHF OMNI (Carriage 95p) VAT 12½%

**RINGO RANGER ARX** 6dB gain (over ¼) ultra low angle radiation, excellent 50 ohm match uses 3 x ¼ in phase and ¼ stub. 145 MHz version approx. 9" 6" (1½ lbs.) 432 MHz approx. 3" 6" (illustrated).

|                           |        |                             |        |
|---------------------------|--------|-----------------------------|--------|
| ARX2 Ringo Ranger 145 MHz | £21-50 | ARX450 Ringo Ranger 432 MHz | £21-50 |
| AR2 3 dB Ringo Vert.      | £12-75 | ABW144 2m. Big Wheel        | £14-50 |
| AR25 CRQ ARX              | £15-00 | ABW125 ABW harness          | £7-30  |
| CX1000 29 MHz Ringo       | £25-75 | ASQ1 2m. Squalo             | £11-75 |

### JAYBEAM 70 (4m), 144 (2m), 432 (70) (Carr. £1 VAT 12½%)

|                          |        |                          |        |
|--------------------------|--------|--------------------------|--------|
| D5/2M 5 over 5 slot feed | £9-90  | PMB14/2M 14 ele. Para    | £21-00 |
| D5/2M over 8 slot feed   | £13-40 | D8/70 8 over 8 slot feed | £11-75 |
| 5XY/2M 5 ele. crossed    | £10-30 | PBM18/70 18 ele. Para    | £13-30 |
| 8XY/2M 8 ele. crossed    | £12-90 | PBM48/70 48 ele. Para    | £15-20 |
| 10X/2M 10 ele. crossed   | £17-75 | MBM88/70 88 ele. Multi   | £20-25 |
| 5Y/2M 5 ele. yagi        | £5-40  | 12X/70 12 ele. crossed   | £20-90 |
| 8Y/2M 8 element yagi     | £7-00  | 4Y/4M 4 ele. yagi        | £8-50  |
| 10Y/2M 10 ele. long yagi | £13-80 | PMH2/70 2 way harness    | £4-15  |
| 14Y/2M 14 ele. long yagi | £17-85 | PMH2/4m. 2 way harness   | £6-60  |
| Q4/2M 4 ele. quad        | £10-50 | PNH2/circ. phasing       | £3-60  |
| Q6/2M 6 ele. quad        | £14-00 | PMH2/2M 2 way harness    | £4-95  |
| PBM10/2M 10 ele. Para    | £16-40 | JBL15/59 2" Joint sleeve | £3-37  |

### SMC TRAPPED DIPOLES (Post 45p) VAT 12½%

|                     |        |                            |         |
|---------------------|--------|----------------------------|---------|
| S500W P.I.P. 14 SWG | £19-60 | P500W P.I.P. Cu/Terylene   | £238-00 |
| HP 1K P.I.P. 14 SWG | £21-75 | braid c/w 75' feeder, etc. | £21-75  |

### MOSLEY TRI-BAND BEAMS (Carriage £2-50) VAT 12½%

|                         |        |                       |        |
|-------------------------|--------|-----------------------|--------|
| TA33 3 ele. 200W R.M.S. | £64-00 | TA32 2 ele. 300W A.M. | £44-00 |
| MUSTANG 3 ele.          | £82-50 | MUSTANG 2 ele.        | £66-00 |

### GEM QUAD FIBREGLASS (Carriage £2) VAT 12½%

|                |         |                        |         |
|----------------|---------|------------------------|---------|
| GQ2E 2 element | £119-90 | GQ4E 4 element         | £238-00 |
| GQ3E 3 element | £178-00 | CK1Q 1 ele. Conv. kit. | £60-00  |

### G WHIP HF MOBILE (Carriage 90p) VAT 12½%

|                         |        |                           |       |
|-------------------------|--------|---------------------------|-------|
| Tribander 10-20m. (+LF) | £14-61 | LF40, 80 or 160           | £4-87 |
| Multimobile 10/20 +HM   | £18-06 | MF40, 80 or 160           | £4-87 |
| Flexiwhip 10m. (+FF)    | £12-42 | EF15, 20, 40, 80 or 160   | £5-04 |
| Basemount ½" hole mount | £2-20  | Telescopic whip for coils | £1-50 |



### HY GAIN HF RANGE (Carr. £1-£2-50) VAT 12½%

|                          |         |                            |         |
|--------------------------|---------|----------------------------|---------|
| BN86 1 : 1 ferrite Balun | £12-00  | TH2MK111 10-20m. 2 ele.    | £94-00  |
| 103BA 10m. 3 element     | £43-50  | TH31NR 10-20m. 3 ele.      | £96-00  |
| 153BA 15m. 3 element     | £54-50  | TH3MK111 10-20m. 3 ele.    | £137-00 |
| 203BA 20m. 4 element     | £103-40 | TH6DXX 10-20m. 6 ele.      | £164-50 |
| 402BA 40m. 2 element     | £146-00 | HY QUAD 10-20m. 2 ele.     | £151-80 |
| 18V 10-80 Load Vert.     | £24-50  | DB1015A 10-15m. 3 ele.     | £99-00  |
| 12AVQ 10-20m. Trap Vert. | £33-50  | LA1 Lightning arrestor gas | £20-30  |
| 14AVQ 10-40m. Trap Vert. | £47-50  | LA2 Lightning arrestor     | £3-30   |
| 18AVT/WB 10-80m. Vert.   | £64-50  | HY TOWER Vert.             | £162-80 |

### BANTEX VHF WHIPS (Carriage 90p) VAT 12½%

|                        |       |                         |       |
|------------------------|-------|-------------------------|-------|
| 70½" 70 MHz Fibreglass | £4-00 | BGA SC 2m. s/less steel | £8-50 |
| 144½" 145 MHz FG or SS | £3-50 | UCL Mid loaded          | £8-00 |
| B5 145 MHz FG          | £6-35 | TLM Trunk lip mount     | £5-25 |
| BGA FG 2m. fibreglass  | £8-75 | MB Magnetic base        | £8-50 |
|                        |       | Unwanted base deduct    | 50p   |

### ROPES (Carriage Extra) VAT 8%

|               |         |                          |        |
|---------------|---------|--------------------------|--------|
| 3mm. HT steel | yd. 13p | X150 Rustproof 150m.     | £10-85 |
| 3mm. HT steel | yd. 20p | 7 x 1/8. Galvanised 100' | £2-20  |

### AERIAL INSULATORS (Post Extra) VAT 12½%

|                         |     |                          |     |
|-------------------------|-----|--------------------------|-----|
| 2½ Polyprop ribbed      | 14p | SMCP1 8" carbon polyprop | 85p |
| NTI 4½" polyprop ribbed | 45p | 3" porcelain ribbed      | 33p |

### AERIAL WIRE (Carriage Extra) VAT 8%

|                      |         |                       |         |
|----------------------|---------|-----------------------|---------|
| 14 SWG hard drawn Cu | yd. 10p | 7/036 cad cu standard | yd. 13p |
| Cu terylene braid    | yd. 13p | 7/044 cad cu standard | yd. 17p |

### COAX PLUGS (Post and Packing Extra) VAT 8%

|                         |     |                     |       |
|-------------------------|-----|---------------------|-------|
| PL259 Standard UHF plug | 45p | SO239 Socket 2 hole | 37p   |
| PL259 P.T.F.E. UHF plug | 58p | "T" adaptor         | £1-20 |
| UG175 Reducers          | 12p | Right angle adaptor | 90p   |
| 258 back to back        | 80p | Phone plug/SO239    | 55p   |

### CABLES

|                    |         |                          |         |
|--------------------|---------|--------------------------|---------|
| RG8/U 50 ohm heavy | yd. 35p | UR39 75 ohm medium       | yd. 24p |
| UR57 75 ohm heavy  | yd. 36p | T3278 ohm distribution   | yd. 30p |
| 75 ohm flat twin   | yd. 8p  | UR43 50 ohm solid cent.  | yd. 15p |
| 300 ohm ribbon     | yd. 9p  | UR76 50 ohm strand cent. | yd. 14p |

Brian Kennedy, G3ZUL  
 Drogheda (09057) 4510  
 A Ian McKechnie, G8BDO, A  
 G Bridge of Allan (07868X) 3223 L  
 E Peter Avill, G3TPX, L  
 N Darton (022 678) 2517 G  
 T Howarth Jones, GW3TMP, T  
 S Penybodin (035 287) 846 H  
 S Mervyn Anderson, G13WVY, R  
 Tandragee (0762) 840654

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# South Midlands Communications Ltd.

## YOUR SINGLE STOP SOURCE FOR:— VERSATOWERS

The telescopic, 20ft. section, with full tilt over facility permits easy antenna adjustments. The low unit weight and superior design of solid ground post allows easy and cheap installation often without resort to concrete. Beware of false comparisons with other brands. Before buying a mast, we advise you to contact us giving full details. With 18 years experience in the design and manufacture of commercial masts and antennas, which are used from the frozen wastes of Antarctica to the deserts of the Middle East, supplied to Nato, the U.N., the Red Cross, the British Antarctic Survey, H.M. Government and to all continents, in fact, to over 100 countries.

We stock the largest range of masts and antennas in the U.K. from the Versatower (copied but not equalled) to the products of Belgium, England and Australia detailed below.

### ALIMASTS

**TELESCOPIC LIGHTWEIGHT**  
3, 2 or 1.5m. Quick lock sections. Many versions 6 to 21 metres. Rigging extra. Carriage £2 VAT 8%  
7 x 2m. £38.75 6 x 3m. £42.50  
4 x 3m. £28.50 7 x 3m. £55.75

### HAMTOWERS

**SELF-SUPPORTING**  
Galvanised lattice 10' sections Freestanding with climbing steps. Carriage £3.50 Ex-Stock 8% VAT.  
30' c/w base grillage ... £164.60  
40' c/w base grillage ... P.O.A.

### TELOMASTS

**TELESCOPIC GALVANISED**  
10' steel sections c/w guy rings, etc. Carriage £2 Ex-Stock VAT 8%  
30' £22.85 or £41.75 c/w rigging  
40' £29.75 or £53.75  
50' £37.95 or £69.95

### TELETOWERS

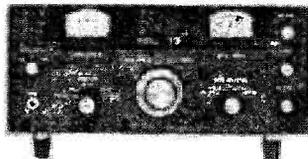
Telescopic Galvanised Lattice and Tube Section. Carriage + 8% extra  
42' £121.00 (Rigging Kit £28)  
57' £174.00 (Rigging Kit £28)  
79' £224.00 (Rigging Kit £48)  
101' £303.00 (Rigging Kit £76)



### The SMC73 New General Coverage Receiver

The SMC73 is an all Solid State, Mains and 12v., communications receiver covering 550 kHz to 30 MHz in four overlapping ranges. Frequency readout is by two illuminated dials tuned by coaxial spun aluminium knobs, the larger for general coverage, the inner for amateur band (10-80m.) band spread (set by use of internal 3.5 MHz crystal calibrator).

FET's are employed in the R.F. Amplifier, mixer, VFO and BFO (these latter two stages being fed from independent stabilised supplies) ensuring good sensitivity, stability electrical and mechanical), dynamic range, (helped by adjustable RF attenuator), and marked freedom from "pulling" of both the local and beat frequency oscillators. An internal loudspeaker (but with jacks for phones and external speaker), illuminated signal meter, SO239 (UHF) coax socket and binding posts for antenna, switchable envelope (AM) and product detectors (SSB/CW) (provision on switch for possible fitting of FM demodulator), are all features of this exciting new low price receiver.



SMC 73  
Ex-Stock ONLY £105 (+ VAT)

### Microwave Modules Transverters

From Ten, Six or Two metres (a '101 etc., a '620B or a '221R).  
10W output, balanced T.X. mixers, low spurious content, high sensitivity with dynamic range. (VAT + 12%) (full converter range stocked S.A.E. details).  
MMT 144/28 or 50 2 metres £76.00  
MMT432/28 or 50 70 centimetres £84.00  
MMT432/144 Double conversion £112.00



MMT 432

### Yaesu Clock

Analog clock with automatic advancing 24 hour time zone hour disc giving, at a glance, time in principal cities or time zone. Battery powered, self starting, shock resistant.



QTR24 only £13.00 (VAT + 8%)

### Coax Relays

12v. DC 50 ohm, Silver plate, Ex-Stock P. & P. 30p + VAT 8%  
Power crosstalk (at 500 MHz)  
CX120 50W 35dB Cable entry £8.50  
CX230 300W 40dB BNC sockets £18.25  
CX600N 600W 40dB N sockets £21.75



### Coax Slide Switches



Up to: 1kW, 1-5 GHz, 0.3dB loss, 1:2:1 VSWR, 50dB isolation, 50 ohm "N" or "PL" fittings. Ex-Stock P. & P. 30p (VAT 8%)  
TWS 120 1 in 2 out Nickel SO239 £4.90  
TWS 120G 1 in 2 out Gold SO239 £5.90  
TWS 150G 1 in 5 out Gold SO239 £10.45

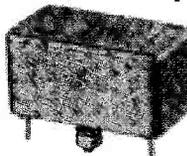
### AEC Meters

SWR, Power (Pr), Field Strength (F.S.) P. & P. 40p (VAT + 8%)

Unless stated:— SWR (±10%), 1.5 to 160 MHz, 50/75 ohm)

- SWR10 (TLH) single meter horizontal type ... £8.15
- SWR20 (BLH) 50 ohm F.S., Pr. 10 and 100W FSD (±10%) £9.90
- SWR40 (Centre) single meter Vert. type with F.S. ... £7.80
- SWR50A (TRH) SWR (±5%) 3.5 MHz up, Pr. to 1KW (±20%) £9.60
- SWR50 (BRH) as SWR50A (300KA) but 100µA meters ... £11.20

### Low Price Crystal Filters and Crystals (£3.75 pair or £2.00 singles) P. & P. 20p VAT 12½%



YF30F350 350Hz F(T)101 CW £18.00  
YF30F600 600Hz F(T)101 CW £18.00  
XF30C 600Hz F(T)101 CWW £18.75  
XF30A 6 kHz F(R)101 AM £18.75  
YF30F12 12 kHz F(R)101 ... £18.00  
YF107M600 600Hz 10.7 MHz ... £16.00  
YF107M2.4 2.4 kHz 10.7 MHz ... £16.00  
YF107M12 12 kHz 10.7 MHz ... £16.00  
YF90F1600 600Hz 9 MHz CW £16.00  
YF90F12 12 kHz 9 MHz FW £16.00  
10.7 Carrier crystals HC18U ea. £2.00

### YAESU

FT2F, FT2FB, FT2 AUTO, FT224 (6, 18 MHz Tx and 14, 52 MHz Rx)  
SIMPLEX SO 12, 16, 19, 20-24  
DUPLX RO -R9.  
FT200 (B), FT301 (S), FT101 Ex, FT75 (B) ... £2.20

### OTHERS

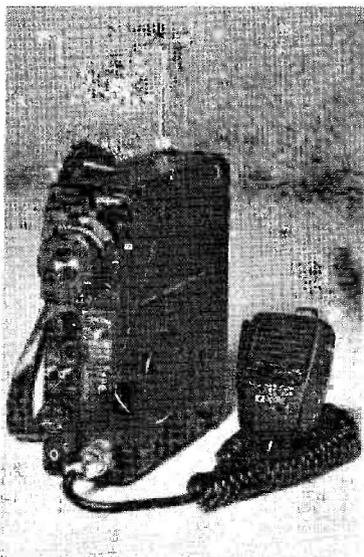
TR220 (G), C146A, C826 MB. (12 MHz Tx and inc. 44 MHz Rx)  
SIMPLEX SO, 20-24  
DUPLX R3 - R7  
Selection of inverse receive  
CONVERTER CRYSTALS ... £2.20  
38-666 (2m.), 42 (4m.), 50.5 (70 cm.)

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S Mervyn Anderson, G13WVWY, H Pantdragee (0762) 840656  
R



## IC215 HANDY FM PORTABLE 15 channels 3 watts

ICOM are pleased to introduce their first FM portable and a careful look at the features will soon show how popular it's going to be. You can use it ANYWHERE. Change vehicles, use it in the shack or take it for a walk to the local high spot and you have the high quality FM communication, for which ICOM are so famous, available all the time. The batteries are larger than those of its competitors, thus giving considerably longer life. The 3 watt output and high sensitivity receiver makes it a useful main station set, where it can be operated from an external power supply and a good antenna system. Thus the IC-215 can be a good starting point for the man who has just obtained his licence and wants to get on the air without having to spend too much money.

### LOOK AT THE MAIN FEATURES :

**Aluminium Die-cast Frame** The IC-215 chassis and main frame are integrated into an aluminium die-casting rendering it light but resistant to vibration or shock when carried.

**15 Channels** The unit incorporates 15 channels to select from: 12 by the main channel selector and a further 3 by the function switch. All crystals are plug-in-type HC-25/U and are the same as the crystals used in the popular IC-22A. Being fundamental crystals, they are tunable over a reasonably wide range and a separate trimmer is supplied for each crystal making accurate frequency adjustment possible. This is very important for optimum results with minimum interference.

**Dual Power Mode** The output power can be switched to 3W on HI for long distance work or 0.5W on LOW for short distance contacts or working a nearby repeater. Battery consumption is minimised in the LOW power mode.

**Dial Illumination** The dial can be illuminated to facilitate night operation. This is controlled by a selector switch on the front panel.

**Power Pilot Lamp** If the power voltage falls below the required value a red LED power indicator goes out as an indication that the batteries are almost exhausted or the external power is inadequate.

**External Power and Antenna Sockets** Sockets for external power and antenna are provided on the rear. The antenna socket takes a standard PL259 plug.

**Whip Antenna** A fully collapsible antenna is built into the top of the rig. This can be unscrewed and removed to provide a screw socket for a flexible helical antenna. We have had an Antenna Specialist flexible antenna specially made and tuned to suit the IC-215.

**Meter** The meter indicates receive signal strength during reception and relative output level during transmission.

**Squelch** A sensitive squelch control is fitted rendering the set silent when no signal is being received.

**External Speaker Jack** An external jack is fitted to the front panel for a larger speaker or an earpiece. The internal speaker is muted when this is used.

**Discriminator Meter Jack** By removing a rubber grommet on the side of the transceiver a jack socket is available for connection of a 50 microamp centre-zero meter. This is very useful when tuning extra receive crystals.

**Tone Burst** A 1750Hz tone burst is fitted for opening UK repeaters.

**Shoulder Belt** A shoulder belt is supplied and is fixed to clips on the top of the rig. There is also a microphone hook. The side panels of the set itself are covered in leather simulated vinyl.

**Excellent FM Audio Tailoring and Clipping** This feature, already well known from the excellent quality produced by the IC-22A, ensures clear optimum talk power without over deviation. This makes the IC-215 a far better rig for use with repeaters and gives an optimum range, for the power used, on simplex contacts.

### ACCESSORIES INCLUDED :

Dynamic microphone  
Microphone Case  
Shoulder strap  
Power supply plug  
Comprehensive English handbook

External Speaker plug  
Discriminator socket plug  
Earphone  
9 x Dry cells type C (U11)

### OPTIONAL EXTRAS :

C-3P5 Power supply which doubles as a holder for the IC-20L linear and supplies power for both the 215 and the linear.  
IC-20L 10 watt linear amplifier  
IC-SM2 Desk type condenser microphone with built-in amplifier.  
Ni-Cad Batteries.  
Charger for charging the Ni-Cads in situ.  
Helical stub antenna.

### HIRE PURCHASE TERMS AVAILABLE

See ICOM at your nearest agents by telephoned appointments :-

**LONDON—Terry, G8BAN**  
01 556 9366

**WALES—Tony, GW3FKO**  
0222 702982

**NORTH—Peter, G3TPX**  
022678 2517

**SCOTLAND—Jan, GM3DOX**  
079693 3223

**MIDLANDS—Tony, G8AVH**  
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**AUTHORISED IMPORTER OF ICOM AMATEUR RADIO EQUIPMENT IN THE UNITED KINGDOM**  
**FREE SECURICOR DELIVERY ON ALL TRANSCEIVERS**  
**NOTE OUR CHANGED ADDRESS**

## THANET ELECTRONICS

143 Reculver Road, Beltinge, Herne Bay, Kent  
(02273) 63859 — 2 lines  
Direct Ansafone line 63850

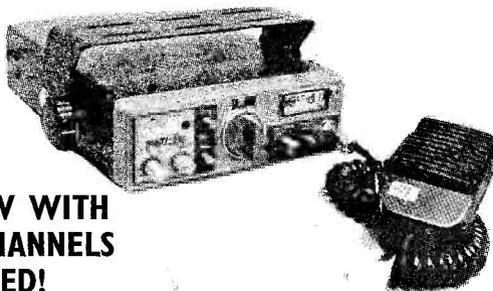


# WATERS & STANTON

**FDK**

## MOVE TO 432MHz !

**AUTOMATIC  
TONE-BURST  
FITTED**



**NOW WITH  
9 CHANNELS  
FITTED!**

The transceiver with a specification far in excess of its competitors at a price you can afford! Fitted every U.K. repeater channel plus 4 simplex, £449, including VAT.

REMEMBER—auto scan means safer driving.

## 2-Way channel scan

plus 23 fixed channels  
**MULTI-UII**

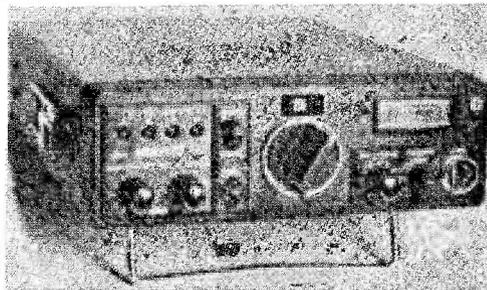
- All solid-state . . . no tubes.
- Triple conversion receiver.
- Two stage crystal filter.
- Two RF stages w/dual gate MOS FET.
- Fractional microvolt sensitivity.
- Sensitive squelch w/0.5uV threshold.
- RIT for receiver  $\pm 5$  kHz.
- Multi-function metering: "Power out"/"S" units. Also switchable to FM centering.
- Auto or manual scan (Four channels), transmitter and receiver.
- NBFM, 10W output (switchable to 1W)
- Protective circuit for output transistor.
- Available solid-state amplifiers boost output 70-160 watts.
- Tone osc. w/sw. For test, control, etc.
- 13.5 DC negative ground.
- Compact: 2.2" (56mm.) H., 6.41" (163mm.) W., 9" (230mm.) D. Wgt. approx. 4.4 lbs. (2KG).

**70cms-A COMPLETELY NEW CHALLENGE  
... FOR YOU AND "FDK"**

Anybody monitoring 70 cms. since the new repeater band plan was agreed cannot have failed to notice the new 70 cms. repeaters now appearing on the band. There are now as many repeaters on 70 cms. as there are on 2 metres and there are more to come! The new FDK Multi-UII is packed with features to allow you to explore the UHF spectrum. Already voted the best 70 cm. transceiver in Japan, the powerful 10 watts transmitter matched by the extremely sensitive receiver ensures peak performance. Its smart appearance and compact size make it ideal as either base station or mobile rig. For those not familiar with 70 cms. it is worth remembering that 100 Hz error at 12 MHz produces 3-6 KHz error at 70 cms.! All FDK Multi-UII are carefully adjusted and maintain a very high stability but other rigs may not be quite so stable, that is why **INCREMENTAL RECEIVER TUNING IS ESSENTIAL** if QSO's are not to be lost and ignition noise kept to a low level—don't consider any transceiver not fitted with this control. For full specification details send S.A.E. today.

**FDK**

**MULTI-II 2M FM  
IN STOCK NOW**



THE NEW TOP PERFORMER FOR 2M FM MOBILE  
Fitted all U.K. Repeaters + SO and S20 £199.68

**FDK**

**MULTI-II**

If you thought that all 2 metre fm transceivers were much the same you are in for a surprise when you take a look at FDK's Multi-II. Packed with a host of state of the art features similar to the 70 cms. transceiver above, the 4 auto-scan channels ensure safe driving—programme it for your favourite channels and sit back and wait for the signals to appear.

**FDK**

**NEW MODEL  
IN STOCK**

**MULTI-2700.** All mode 230v./12v. D.C. Digital 2m. transceiver including "OSCAR" facility. £449 inc. VAT.

**NEW MODEL  
IN STOCK**

**AC PSU FOR FM MOBILES.** Comprehensive psu to match Multi-II/UII plus switched voltage outputs for laboratory use. £63.50 inc. VAT.

**NEW MODEL  
IN STOCK**

**REMOTE VPO FOR MULTI-II.** Complete coverage 144-146 MHz plus 600 kHz repeater shifc. £89.00 inc. VAT.

# ELECTRONICS

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**BY PHONE** Simply telephone your Barclaycard or Access No. for immediate despatch.  
**BY POST** State clearly your requirements enclosing cheque or postal order.  
**CALLERS** You are always welcome to come and inspect the equipment at our show-rooms.

**FOR ALL ENQUIRIES PLEASE ENCLOSE STAMPED ADDRESS ENVELOPE.**

**FRIENDLY ADVICE — HONEST SERVICE — RETAIL SHOWROOMS**

**NEW THIS MONTH—**

**EL40X.** De luxe 80/40 dipole including balun and inverted "V" kit plus corrosion-proof copper aerial wire and all fittings—79ft. long ... **£27.00** (n/c)

**Q-TRAP.** Economy version of the above dipole without balun, inverted "V" kit and fitted standard copper wire ... **£14.62** (£1.00)

**MFJ.** The superb audio filter boards with 3 stages of selectivity down to 80 Hz complete with all hardware to mount into rx or cabinet ... **£14.62** (50p)

**MICROWAVE MODULES.** New transverters for 2 metres and 70 cms.  
 28 MHz in 144 MHz out ... **£85.50**  
 28 MHz in 432 MHz out ... **£94.50**  
 144 MHz in 432 MHz out all modes ... **£126.00**

**TESTED TRADE-INS**  
 KW77 rx + spkr. 160-10m. ... **£125.00**  
 KW2000 cvcr. + AC/DC psu 160-10m. ... **£145.00**  
 Eddystone 730/4rx 5-30 MHz ... **£125.00**  
 Eddystone 888A rx 160-10m. ... **£125.00**  
 Eddystone 750 rx 5-30 MHz ... **£65.00**  
 FT2FB 2m. fm 9 ch. + AC psu and rechargeable batts. ... **£159.00**  
 Limer-11 2m. ssb ... **£130.00**  
 Trio JR310 ... **£95.00**  
 Icom IC21A ... **£159.00**  
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**MICROWAVE MODULES**  
 MMC 2m. conv. IF 2-4 4-6 28-30 ... **£18.00** (36p)  
 MMC 70 MHz conv. 28-30 ... **£18.00** (36p)  
 MMC 70 MHz conv. 28-30 + local osc. ... **£19.80** (36p)  
 MMC 2m. conv. 28-30 + local osc. ... **£19.80** (36p)  
 MMC 70cm. conv. 28-30 or 144-146 ... **£19.80** (36p)  
 MMC 1296/144 or 28-30 ... **£24.30** (36p)  
 MMD0 50.50 MHz counter ... **£66.00** (36p)  
 MMD 500P 500 MHz pre-scaler ... **£27.00** (36p)  
 MMT 432/28 70cm. transverter ... **£94.50** (36p)

**LF ANTENNA SYSTEMS**  
 EL40X compact 80/40 dipole de luxe with balun, hardware, inv. "V" brackets special protected copper wire etc. ... **£27.00** (n.c.)  
 Q-Trap compact 80/40 dipole kit 79ft. ... **£14.62** (£1.00)  
 Q-Trap coils only ... **£7.98** (50p)

**STATION ACCESSORIES**

MFJ audio filter boards 80/110/180 Hz ... **£14.62** (50p)  
 Shure 444 table microphone ... **£21.95** (£1.00)  
 Shure 201 hand microphone ... **£9.95** (50p)  
 Drake low-pass 1kW filter 80dB ... **£14.75** (75p)  
 SWR single meter ... **£9.85** (50p)  
 SWR dual meter ... **£12.65** (50p)  
 Telegraph key ... **£9.75** (50p)  
 Drake low pass filter ... **£14.65** (75p)  
 ferrite rings 1 1/2" for a.f. ... **30p** (8p)  
 HPSA high pass tv filters ... **£2.53** (15p)  
 Set of 9 HP11 ni-cads ... **£9.75** (50p)  
 Set of 9 HP11 ni-cads ... **£16.20** (£1.00)  
 Balun insulator 50 ohm (beams or dipole) ... **£8.43** (50p)

**YAESU MUSEN EQUIPMENT**

FT101E transceiver. 160-10m. 230/12v. ... **£482.62** (n.c.)  
 SP101B matching speaker console ... **£17.43** (£1.25)  
 FV101B matching remote vfo FT200B transceiver 80-10m. 250w. ... **£264.37** (n.c.)  
 FP200B matching AC p.s.u. ... **£80.75** (n.c.)  
 FL101 transmitter 260w. 160-10m. ... **£365.62** (n.c.)  
 FR101S receiver standard 160-10m. ... **£336.37** (n.c.)  
 FR101D receiver de-luxe 160-2m. plus short wave broadcast ... **£438.75** (n.c.)  
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 FL2100B linear 1200w. input ... **£279.00** (n.c.)  
 YP150 dummy load/watmeter ... **£47.52** (£1.00)  
 Yo100 monitor 'scope ... **£127.44** (£1.50)  
 YC355D 200 MHz counter ... **£150.12** (n.c.)  
 FT221 2m. ssb/cw/fm/am transceiver ... **£403.87** (n.c.)  
 YD844 table microphone ... **£20.25** (75p)  
 YD846 hand microphone ... **£8.43** (75p)

**SOLID STATE MODULES**

2m. or 4m. Europa transverter 200w. pip ... **£109.15** (n.c.)  
 2 or 4m. converters IF 2-4/4-6/28-30 ... **£18.00** (n.c.)  
 70cm. converter IF 144-146 ... **£18.00** (n.c.)  
 2m. boxed pre-amp ... **£9.72** (n.c.)  
 PA3 2m. miniature pre-amp board ... **£6.27** (n.c.)

**WATERS**

Stable tone-burst modules 1750 Hz ... **£3.93** (25p)

**VHF ANTENNAS BY JAYBEAM**

4Y/4M 4 element yagi ... **£9.56** (£1.75)  
 5Y/5M 5 element yagi ... **£6.07** (£1.00)  
 8Y/8M 8 element yagi ... **£7.87** (£1.00)  
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 10Y/2M 10 element yagi ... **£18.45** (£1.50)  
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 D5/2M 5 ele. slot fed ... **£11.13** (£1.25)  
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 SVMK/2M mounting kit for vertical pol. for 2 slot feds. ... **£3.09** (75p)

**NIHON DENGYO**

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 New R.300 General coverage receiver in stock ... **£184.50** (£2.50)

**UHF ANTENNAS BY JAYBEAM**

D8/70cm. 8 ele. slot fed ... **£12.71** (£1.25)  
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 MBM48/70cm. 48 ele. multibeam ... **£17.10** (£1.50)  
 MBM88/70cm. 88 ele. multibeam ... **£22.89** (£1.75)  
 12X/70cm. 12 ele. crossed yagi ... **£23.51** (£1.50)  
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TAS 2m. 5/8th glass fibre whip with 4m. of cable ... **£9.45** (£1.00)  
 U5 70 cm. colinear 5-6dB gain and 4m. of cable ... **£15.19** (£1.00)

**MINI-PRODUCTS**

HQ-1 10-20m. compact 1-2kW yagi ... **£79.50** (£2.00)  
 C4 10-20m. compact 1-2kW vertical ... **£38.25** (£1.50)

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AR30 antenna rotator ... **£42.18** (£1.50)  
 AR40 antenna rotator ... **£48.93** (£1.50)  
 CD44 antenna rotator ... **£100.00** (£1.75)  
 Ham II antenna rotator ... **£133.00** (£2.00)  
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 Scolle 2010 antenna rotator ... **£46.50** (£1.50)  
 Scolle 2030 antenna rotator ... **£51.50** (£1.50)  
 Scolle alignment bearing ... **£11.25** (50p)

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12AVO 10-20m. vertical 2kW. ... **£36.62** (£1.50)  
 14AVO 10-40m. vertical 2kW. ... **£51.97** (£1.50)  
 18AVT/VWB 10-80m. vertical 2kW. ... **£72.45** (£2.00)  
 TH3 UNR 10-20m. yagi 600W. ... **£108.00** (£2.00)  
 TH3 Mk3 10-20m. yagi 2kW ... **£154.12** (£2.50)  
 BN86 balun 2kW. ... **£13.50** (50p)

**MAIL ORDER & HEAD OFFICE : Hockley Audio, 31 Spa Road, Hockley, Essex. Tel.: 03-704 6835 (2 lines)**

**ALL PRICES INCLUDE VAT at 12 1/2% CARRIAGE CHARGE IN BRACKETS**

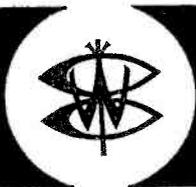
**AGENTS : G3XTX J.R. Electronics, 198 Collier Row Lane, Romford, Essex. Tel.: Romford (0708) 68956**

**G3OQT Bredhurst Electronics, Willowbrook, School Lane, Bunbury, Cheshire. Tel.: (Bunbury) 0829 260708**

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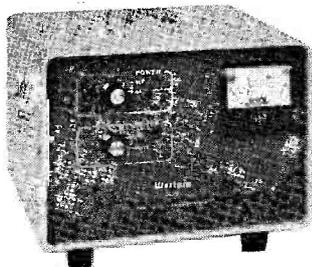




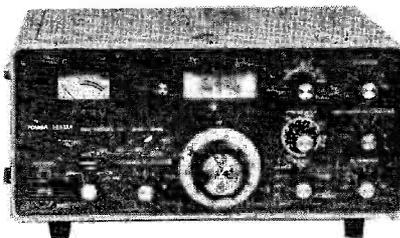
# Western

**NEW!** THE WORLD'S FIRST.....(we believe!).....  
MATCHING 160m — 70cm. STATION.....

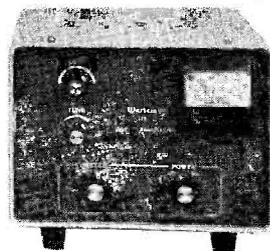
**Western 70TV**  
432 MHz. TRANSVERTER.



**YAESU FT-101**  
160—10m.



**Western 2TV**  
144 MHz. TRANSVERTER.



### BRIEF SPECIFICATIONS

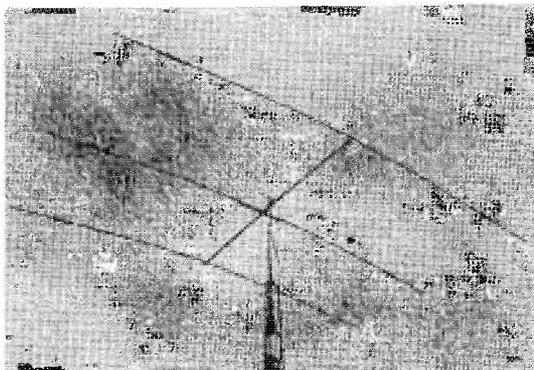
The 2TV is powered from the FT-101 and is all solid state except for the PA which is a QQVO6—40A. Price £156.37 inc. VAT.

The 70TV is powered by 12VDC or 110/240VAC and is entirely solid state giving a conservative 10 watt RMS output. Price £178.87.

JUST TWO MORE **Western** QUALITY PRODUCTS .....

OR **Radiate...** ..... with Western Antennas

THE FIRST OF A NEW PENETRATING RANGE OF ANTENNAS !



The

**WESTERN "PENETRATOR"**

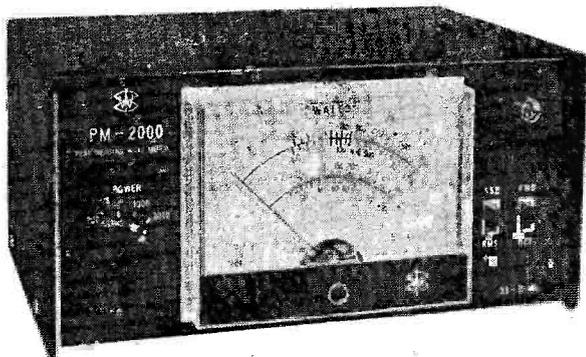
**DX-33 for 10-15-20m.**

(illustrated left) **£73.12** (inc. VAT and Carr.)

- ★ 3 elements on each band.
- ★ Heavy duty 2 kW. rated.
- ★ Gain up to 8dB.
- ★ Broadband operation.
- ★ Stainless steel hardware.
- ★ SWR less than 1.3 : 1

# Electronics (UK) Ltd

## SSB OPERATORS REJOICE!....at last ...it's UNIQUE....it's our PM-2000.... a true PEAK READING WATTMETER



- ★ MEASURES ACCURATELY
- ★ PEAK ENVELOPE POWER ON SSB
- ★ RMS WATTS ON AM/CW
- ★ S.W.R.

Gone are the days of oscilloscopes, calculations or embarrassment when the Home Office man asks what power you run!

INTRODUCTORY PRICE:  
£48-60 (inc. VAT)

The PM-2000 is a precision built in-line wattmeter providing P.E.P. and R.M.S. power indication. This new design (Pat. applied for) employs a flat frequency response directional coupler which enables forward and reflected power also to be measured from 3.5-30 MHz. With a SSB Transmitter the output power occurs only sporadically during voice transmission and has no direct relationship between the peak and average power. The ratio of peak to average power varies widely with voices of different characteristics. The power contained in the signal at the maximum peak is the basic transmitter rating and is the peak envelope power (usually called p.e.p.). This makes the peak reading wattmeter essential for SSB. General power meters indicate average or R.M.S. values and are calibrated using a continuous sine-wave signal which a voice modulated signal definitely is not. Such a power meter is meaningless in terms of "p.e.p." The PM-2000 indicates accurately the p.e.p. which is four times the single-tone level.

**SPECIFICATION:** Power range: 0-200, 500, 1000 and 2kW; Impedance: 50 ohms; Frequency range: 3.5-30 MHz; Measuring Accuracy: 7%; Power source (SSB ONLY): 100/117/234v. A.C. Overseas enquiries invited.

### YET ANOTHER 'Western' PRODUCT WITH QUALITY UP AND PRICE DOWN.

#### NEW 5-WAY ANTENNA SWITCH MODEL ASW-1

- ★ Handles 1-2 kW.
- ★ Earths antennas not in use.
- ★ Fitted YAESU style knob.
- ★ Mounting holes for wall or equipment.

£8-85 (incl. VAT/P. & P)



#### NEW WESTERN PRODUCTS INCLUDE:

- TRAPPED DIPOLES
- BALUNS
- INSULATORS

AND MORE ITEMS ARE ON THE WAY  
OVERSEAS TRADE ENQUIRIES INVITED

## Western Electronics (UK) Ltd

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LEICESTER: MAY'S HI-FI, CHURCHGATE, Tel 58662. Open

MON. SAT. 9-6 p.m., CLOSED THURS

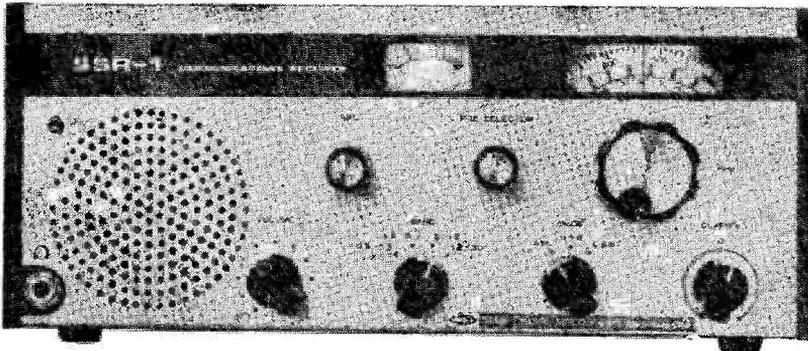


**DRAKE**

®

**Radio Shack Ltd**

# SSR-1 COMMUNICATIONS RECEIVER



## ● Built-in Telescopic Antenna

- Synthesized    ● General Coverage    ● Low Cost
- All Solid State    ● Built-in AC Power Supply
- Selectable    ● Sidebands    Excellent Performance

TRIED AND TESTED WITH MANY THOUSANDS ALREADY IN USE. (SAE FOR DETAILS). £184.50 inc. SECURICOR DELIVERY

### DRAKE SSR-I SPECIFICATIONS

#### I-f Rejection :

Greater than 50 dB at fd below 20 MHz.  
Greater than 40 dB at fd above 20 MHz.

**Antenna :** Self contained telescopic whip antenna. External connection to terminal strip. 75 ohm input impedance—unbalanced.)

**Frequency Coverage :** 0.5 to 30 MHz in 30 ranges each tunable over 1 MHz range with a dial having 10 kHz graduations.

**Reception Modes :** Cw, usb, lsb, a-m.

**Sensitivity :** At least 10 dB S + N/N under the following conditions:

| Mode | Freq.     | Input Level* |
|------|-----------|--------------|
| Ssb  | 0.5-2 MHz | 1.0µV        |
|      | 2-30 MHz  | 0.3µV        |
| A-m  | 0.5-2 MHz | 3.0µV        |
|      | 2-30 MHz  | 1.0µV        |

(A-m : 1000 Hz at 30% modulation.)

**Output :** Capable of 200mV output on ssb at 2 MHz with input signal of 0.5µV and 2 watts output with 5µV input.

**Audio Distortion :** Less than 5% at 2 watts.

**Calibration Accuracy :** Within 5 kHz at all frequencies.

#### Selectivity

| Mode | Bandwidth | dB   |
|------|-----------|------|
| Ssb  | 3 kHz     | ±25% |
| A-m  | 5.5 kHz   | ±25% |

**Image Rejection :** Greater than 50 dB.

**Audio Output Provisions :** Internal 8 ohm speaker and phone jack on front panel that disables speaker when plugged in.

**Muting Provisions :** External mute jack (RCA type) that provides normal reception with closed circuit and mute with open circuit connections.

**Power Supply :** 8 type "D" (1.5v.) dry cell batteries (not included). Tapped transformer to provide operation from 117v. ±15% or 240v. ±10%-20%. 50-60 Hz source with automatic switch over to batteries when AC line is disconnected.

**Current Consumption :** Less than 100 mA quiescent at 12v. DC.

**Dial Lights :** Momentary push button to light when on battery operation. Always on for AC operation.

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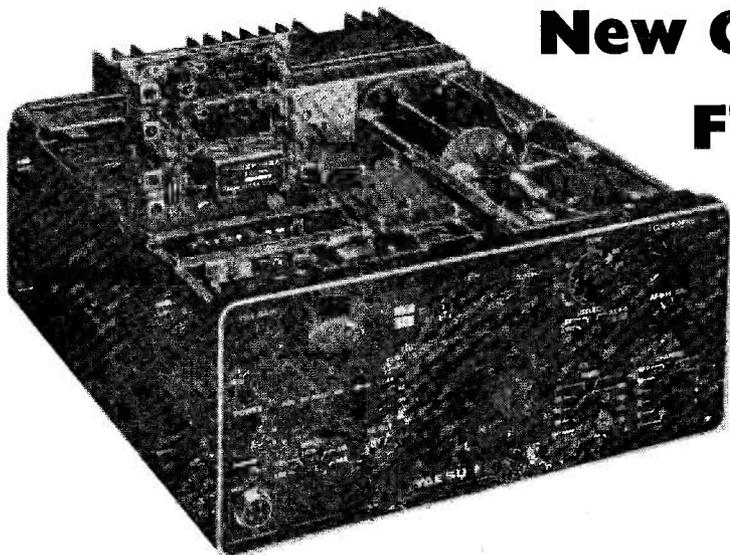
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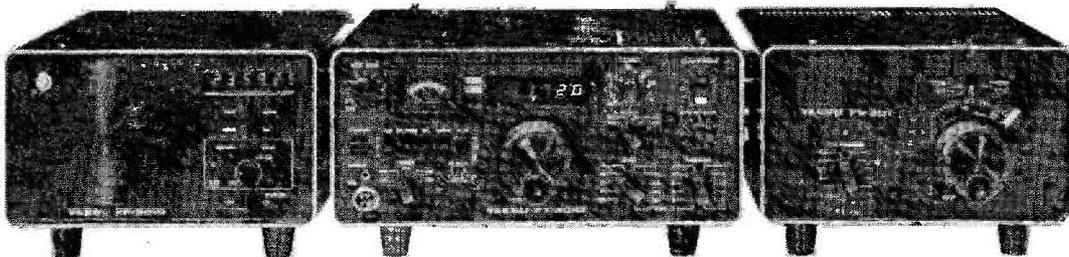
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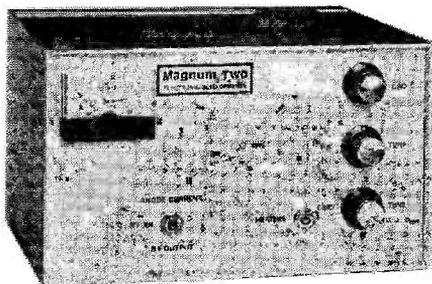
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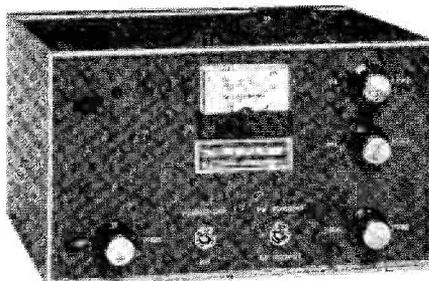
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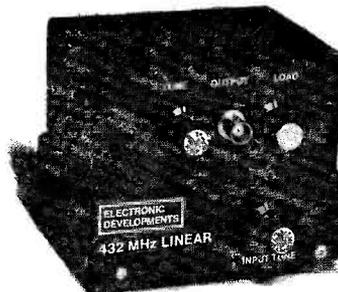
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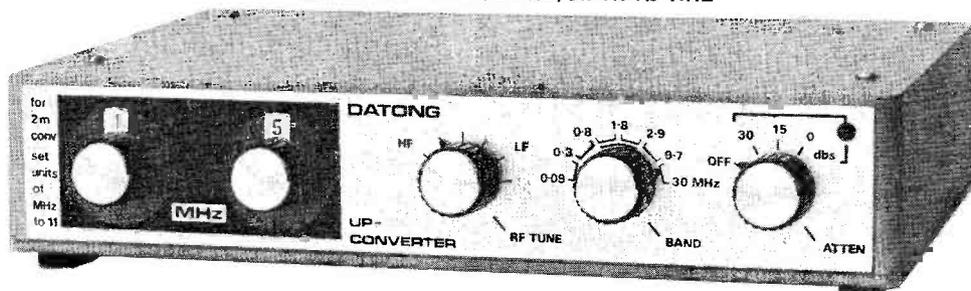
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- Two separate outputs are provided, one for 144-145 MHz and the other for 28-29 MHz receivers.
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Input frequency range : 90 kHz to 30 MHz (down to 60 kHz at reduced sensitivity) and 144-146 MHz

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0.8 - 30 MHz 0.5uV p.d. (1uV e.m.f.)

0.3 - 0.8 MHz 1uV p.d. (2uV e.m.f.)

90 - 300 kHz 2uV p.d. (4uV e.m.f.)

144 - 146 MHz 0.5uV p.d. (1uV e.m.f.)

Spurious responses : more than 60 dB below main response.

Rejection of 144-146 MHz feedthrough : more than 80 dB.

Rejection of 28-30 MHz feedthrough : more than 60 dB.

Internally generated spurious signals : harmonics of 1 MHz are equivalent to 4uV p.d.

Typical overall gains :

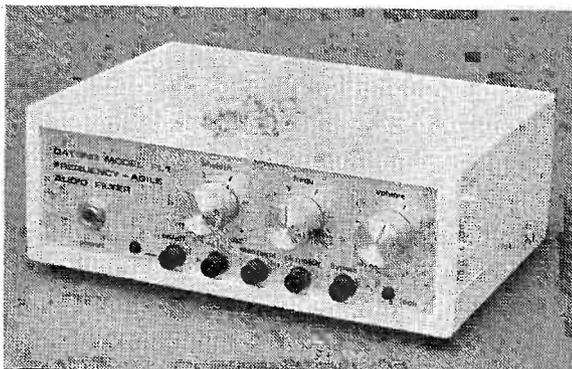
29 MHz input to 144 MHz output 2 dB

29 MHz input to 28 MHz output 15 dB

145 MHz input to 29 MHz output 15 dB

Power requirement : 120mA at 8 to 23 volts.

PRICE £97.50 plus 12½% VAT, Total £109.69 (including delivery in UK)



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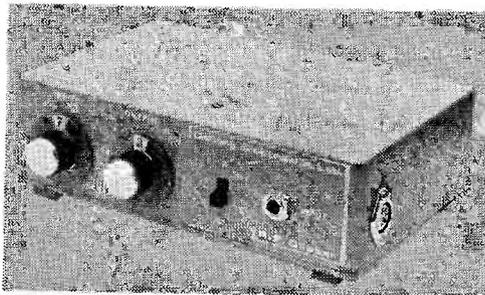
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*The*  
**SHORT WAVE**  
*Magazine*

★ CHRISTMAS ★

The writer of this piece offered his first Christmas message to readers of SHORT WAVE MAGAZINE in our issue for December 1938, nearly forty years ago.

It is a long time since then, and much has happened — but the message remains the same:

*To all who may see these lines — at  
home or abroad — Happiness for Christmas  
and Prosperity in the New Year*

*from*

*The Editor, Management and Staff of*  
SHORT WAVE MAGAZINE



*Austin Forsyth  
96FO*

## COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

LAST time round, we mentioned (that at the time of writing, the Geoff Watts' *DX News Sheet* appeared to be continuing on a U.K.-only basis; however, after a couple of issues, Geoff was unfortunate enough to have had a relapse, and to date no further issues have been received.

On the sunspot front, the week prior to commencing the writing of this piece showed days of "High Normal" conditions predicted—but, of course, Murphy's Law dictated that other things would have to take some priority, like, for example the salt-mine.

### Top Band

Which is where we dive straight in at the deep end with the *W1BB Bulletin*. We have missed one somewhere, as Stew has various references to the use of an *underwater* aerial for reception along lines suggested in his "previous bulletin" which we don't recall having read. Top Band news as seen from the station of W1BB is that Stew himself has made some changes, and now runs an inverted-Vee beam with 1/10 wavelength spacing, giving him the choice of firing either East or West at will, with up to 7 dB of gain in the selected direction.

As the result of a suggestion by GD4BEG, amended by W1BB, for this season there will be no formal Transatlantics or First-Time Tests this year; instead, the arrangement is to be that for the first ten minutes of every hour (when it is thought DX working may be possible, that is) over Saturdays and Sundays, the time will be designated for First-Timers, when all the old hands will be listening for your "CQ FT" especially, and some of the "regulars" will themselves call CQ FT and listen for calls from first-timers. Remember, when doing this, that Top Band operating is almost always split-frequency, U.K. stations on 1825-1827 kHz—above 1827 is not really practical these days due to Stateside SSB QRM—and listening around the bottom two or three kHz of the band for the W's, in general; however, it does no harm to have a listen on

your own frequency quickly before passing on to the other one, just in case you are getting a DX call there. Details and results, either to W1BB and/or this piece please.

Turning to the more mundane things, from November 1, it was possible to claim a *Top Band DXCC*; the summer Trans-Pacific were the subject of some super openings although the participation was a bit down; PY1RO has now a new tower and hilltop location operational, after months of back-breaking working carting all the raw materials up a couple of hundred feet to the top by hand or back; however, the noise level has dropped three S-points which augurs well for the winter.

W4DQD has dug up Footnote 194 to the ITU regulations, under which the granting of Top Band permission is discussed, pointing out that amateurs in "non-160 countries" have to persuade their Government to have their country's name added to footnote 194; and in addition, amateurs may request permission to carry on experimental work on the band. Makes it sound easy! But, seriously, many countries more could be using the band if their amateurs were to press for the privilege.

Not entirely unconnected, we note that OK2PGU is waiting for QSL's from stations signing UW3PAW and UB5SAA—indications, undercover ones or plain pirates?

Back to the domestic scene now, and of course lots of letters with the winding up scores from various Ladder addicts. First, G4BWP (Henlow) who has a nice hefty claim to make; his gear was a Valiant for AM/CW, with an AR88 on the receiving side, plus a "visiting" FT-101E for the odd SSB contact, in conjunction with a VS1AA at 30 feet, and another half-wave aerial also at 30 feet fed through a pi-coupler; it is interesting to note G4BWP's score was knocked about a bit by the loss of one of his poles for JOTA service; but it is going back up in time for the contest season and MCC.

G4EAX (Long Eaton) is a G-QRP Club man and proud of it—he puts in his final score and says that if we run it again he will be on with QRP—and to win!

Another note and score comes from G4EPL (Hucknall) who found things "dried up" for him towards the end, but still mounts a respectable scoring.

By far the highest countries-total is to the credit of GM3YOR (Kirkcaldy), but that wasn't enough to put Drew in top spot—one feels he is wasting that beautiful Top Band QTH on the HF bands! Twelve countries were raised during the *CQ WW* contest after returning from Leicester on the Saturday, all on Top Band.

In an aside, G4AEJ (Birmingham 25) mentions meeting G2NJ and his candlestick mike at the Peterborough Rally for a pleasant personal QSO; and Len is another to ask for the Ladder to be run again.

Long may it live! says G4CZE/A (Droitwich) who seems to have managed to come pretty near the top with his quarter-wave; and he breaks down the activity into counties scored by modes, which show that the least activity seems to have been up North, GI, the South-West, and, very surprisingly, Warwickshire, with which county he only made a single, SSB, contact!

Back to real DX again, in a letter from EI8H (Granard, Co. Longford) who mentions his results in the quest for the elusive ZL stations on the band; ZL3GQ and ZL4NH peaking 589 at 0700z, and ZL1HY also 589 a few minutes later, all on October 13; and the first two were also worked two-way SSB at, respectively 0707 and 0708z—which may well be the first EU-ZL contact on SSB. Another was ZL2BT worked on October 15 at 0658z, followed by a real surprise at 0726z on the same morning, when VR1AA was heard calling CQ at RST 589; EI8H didn't reply because of doubts about the signal strength, but instead put out a CQ himself to which VR1AA promptly came back to, signals by them being 569. But the time of his writing, EI8H, if all goes well,

G4BBA is owned and operated by Peter Chilcott, 258 Coneygree Road, Peterborough, who runs a K. W. Alanta, with accessories. He is chairman of the local Radio Club.



will have hooked JA3ONB, the frequencies being respectively 1826 kHz and 1909 kHz—if the local-net natters around 1910 kHz aren't too strong in Granard!

Which leads us to another plea: GD4BEG (Sulby), after entering a rather odd Ladder score of 54 countries and one county for a total of 55 score(!) follows this little hint up by mentioning that he too is on the JA trail; extensive tests are going on at JA sunrise time which will vary from 2100 to 2210z, and the JA's are *only allowed 1907.5 to 1912.5 kHz*; thus, will all the chaps who have their local nets, or any other forms of activity, on or near 1910 kHz, *please avoid operating there* during the coming month so that what is probably the most difficult possible DX path in Top Band can at last be conquered. No matter how poor you think your aerial to be, just recall that GD4BEG, EI8H and the rest will be able to hear you because they have such good sites and aerials. And, you see, it is no darn good these chaps putting a signal into JA-land, if they can't hear the JA's coming back through the "local" QRM, which might well indeed be *you*, dear reader! So, give 'em a chance; and don't forget, 'cos you won't hear the European end unless you just have a peep down around 1825-1830 kHz.

A final letter this time comes in

from G2HKU (Sheppey) who has at least restored vertical polarisation to his being, albeit the trip up to the shack via the loft ladder is still giving some trouble. So—with the conivance of the XYL Ted has now taken over a spare room as the shack, with the help of the XYL. Anyhow, it is nice to hear Ted around again with the QRO and all-band stuff and to know he has returned to work PAØPN on SSB, plus CW with G1JEX and GM3PFQ.

#### The Table(s)

Since everyone seems to want to keep the Top Band Table going, so be it; starting again from scratch, so everyone is level again. But, this time, for a change, let's have *two* scores—one for Top Band, and *one for Ten Metres* operating under the same rules exactly, the winner to be the operator who makes the highest *combined* score, being the sum of the score on Top Band and that on Ten. No cross-band contacts, although there is no objection to a contact on Top Band being followed by a QSY to Ten and a QSO there, as the object of the exercise is to occupy Top Band *and* Ten metres as much as possible on the one hand; and on the other to persuade more local contacts to be made on Ten while it is still quiet. And, it could be added, it's not so long ago that one recalls a G local net into which a certain W often used to call in!

And, don't be put off by a small aerial system—the winners of the Top Band Annual to date have all been users of what are often considered to be poor aerials and poor sites!

#### Ten Metres

G3CED/G3VFA (Broadstairs) demonstrated one of the nicer aspects of Ten at any time—it's unexpectedness. George has been heavily engaged at his saltmine, staggered into the shack for a quick sked, with G4DTA, on a "dead" band; while waiting for the sked time SM7HCW popped up right on frequency and George's 1.5 watts netted him a report of RS51! Other ten-metre contacts were made at the same power level, at various times of day, but on CW, all round Europe, including one with OZ3Y, who gave RST 119 and resulted in the log entry "You can't win 'em all!"

G3ZGC/MM wrote his letter from Capetown this time, and reports surprisingly good ten-metre conditions; at the start of October, when the ship was near PY, all South Americans and a few Europeans were heard; but the best was the period between ZD8 to near ZD7, when the band seemed to be wide open to Europe, and in particular to the London area; G4DYO was almost a daily QSO, sometimes up to strength nine; G3RGA, near Bishops Stortford, G3YJI and

G3WFM were all worked on the 10th, not to mention A9XBD.

G4EDG (Newton Abbot) seems to have got his aerial back together again, and took a few peeps at Ten, surprising it into openings to almost everywhere except the States; ZE1BL, ZC4AU, 9J2WR, 7P8AL, 9G1LZ, VK6CB, YV5ENI, VP2EMB and D2AFW.

G4BHE (Basingstoke) has been working on his aerial; he began with a Dexbeam, and then got hold of a TA32Jr; a little bit of combination and he has come up with a 15-foot boom having two elements on Twenty, and three for Ten and Fifteen—and, it works! During the RSGB 21/28 MHz contest, Barry ran up 21000 points with a barefoot HW-100, which was not at all bad for a first try at the game. Tent metres yielded D2AFW, EL2T, VP8HZ, ZE1JUM, ZE4JW, ZP5AO, ZS1HS/M, ZS1MO, ZS5TR, 5B4PW, 7P8AC, 9J2CB, 9J2WR and 9G1LZ.

Once again work prevented activity, complained G4EAN (Nottingham)—but just think what the "time in lieu" can be used for during December, was the additional thought, after working 5B4CY.

We must now hit the GW trial, first at GW4BLE (Newport, Gwent) who was largely off the air due to his gear being used for the GW4ENT group's *CQ Contest* event of which more anon. As usual, the band seemed far better in the contest than when Stephen got back on the air himself and there was no contest activity—but he worked D2ALB, plus some ZS's and Europeans nonetheless. In the interim he tried to fathom out just what had gone wrong with the previous month's report, where, it seems, we got all mixed-up in the translation from his two letters into the piece.

The GW4ENT contest report came in through the agency of GW4CXM, who indicates the activity was a share-out between himself, GW4BLE and GW3NWS, from Caerleon, with, on 3·5 and 14 MHz, at FT-401 plus linear; on 7, 21 and 28 MHz an FL-400 plus FR-400 and FL-2000B; while Top Band was operated with an FT-101B. Aerials were a TH2.Mk.III at 45 feet for the HF bands, a dipole for 7 MHz at 40 feet, another for Eighty at 50 feet, and 800 feet of longwire at

forty feet for Top Band. Quite a set-up! On Ten, the yield was; CT9AT, CX2AQ, CX3BH, D2AFW, GD5BTU/A, IG9PLN, LUID, PY2ELV, PY3AHS, UG6GAF, UA1-9, VP8PI, ZS1, ZS2, ZS5, 5B4AC, 5U7AG and 9H1EL, with an annoying gotaway in the form of VK6CF.

Finally on Ten, we must note the report from D. Whittaker of Harrogate on the Ten-Metre Activity Day. Some 40 reports came in, as against 55 back in the Spring, but from these it can be deduced that about 300 U.K. stations alone were operating on the band "on the day." Conditions were much as before, saving for an opening to Scandinavia around 1000z which varied in length around the country but seems to have been, on average, for about an hour. 27 SM's were worked, 11 Finns, plus some Russian stations in Latvia. In addition, two CT1's, an SP, a YU, an EA5 and a W were reported. In late afternoon some 9G1, ZE and ZS contacts were made, while an SWL heard 5V4AH working into the U.K. 9H1CH reported a band opening, starting around 1300z into Southern Africa; South America was noted during the late afternoon, and VP8NI also. ZC410 found a very quiet band, and had only CW QSO's with ZS6BPE, ZE3JO and 9M8HG, with a UL7 and a UK6 as gotaways. It sums up into a statement that Ten, even at this low stage in the sunspot cycle, suffers more from lack of activity than from conditions.

In view of the many requests, it is proposed that the first Sunday in each month, January to May, be designated Ten-Metre Activity Sun-

days, 1200-1800z—stick around 28·5-28·6 MHz SSB, or 28·0 to 28·1 MHz CW, January 2, February 6, March 6, April 3 and May 1. Send your notes and logs to D. A. Whitaker, Hillcourt, 57 Green Lane, Harrogate, and he will condense them into notes which can be presented in this piece—and, if there is interest, the May date could be made a contest, if anyone would care to offer a prize. Again, offers to SWL Whitaker.

### Fifteen

Naturally, with Ten showing, one would expect some activity on Fifteen; and equally, it is to be expected that the skilful will nobble the DX before the Heavy Gang roll up on the frequency. This is your scribe's statement, not that of G3CED, who reckons his QSO with JH7OXO/MM, when the latter was in the Muscat/Oman area was just luck, with 1·5 watts of RF to his Joystick; and he also made it to EA3YY, 9H1ED and WA2FUL, the latter giving him a report which indicated the QRP signal was peaking S9 in the States; some Europeans were also worked.

During the RSGB 21/28 MHz affair Drew, GM3YOR noted contacts with A9XBJ, UK9FER and 9G1LZ.

The 15-metre band has been quite good at times, says G4DMN (Wirral), who mentions five or six afternoons when all W call areas were heard in an hour or two, while his actual SSB contacts included FG0MM, HI8, HR3JJR, IG9PLN, K5DX, K0BJW (N. Dakota), KP4, OX3VO, PY, TU2GA, UI8LAG, UL7, VP2G, VP2KAA, all W call areas saving W6, VP9's, W7JZU

### TOP BAND COUNTIES/COUNTRIES

Starting date, November 1, 1975

| Call   | AM | CW  | SSB | Countries | Total |
|--------|----|-----|-----|-----------|-------|
| G4CBQ  | 88 | 96  | 94  | 20        | 298   |
| G4CZE  | 90 | 86  | 77  | 11        | 264   |
| G4EAX  | 60 | 74  | 85  | 10        | 229   |
| G4BWP  | 95 | 108 | 1   | 13        | 217   |
| GM3YOR | 2  | 134 | 26  | 30        | 192   |
| G4AEJ  | 68 | 70  | 41  | 10        | 189   |
| G4EPL  | 36 | 46  | 83  | 12        | 177   |
| GW3WMY | 71 | 80  | —   | 10        | 161   |
| G4AYS  | 43 | 92  | —   | 8         | 143   |
| GD4BEG | —  | —   | 1   | 55        | 55    |

Ladder terminated October 31, 1976. See text for 1976/77 Table, to start November 1, 1976.

(Wyoming), WA7YRP (Arizona), ZE, ZS and 9J2.

G4DJY (St. Annes-on-Sea) has made the 100 countries with his Joystick and about 100 watts input; but as yet only 61 of the cards are to hand so the struggle continues. Peter looked at 21 MHz on three days. First, the CQ WW SSB leg, on October 30, which gave a whole string of W's, naturally, plus EP2SV, OX3VO, 4J9B, UI8LAG, 4J3AM, WIHFB/VP9 and VE2UN; the following day there were UK7GAL and UL7GAA to enter in the log, while the previous week the preferred CW mode was used for an hour to raise WB2AUW, W2DXL and AC2GT.

G4EDG has a good take-off in the JA direction, which resulted in his learning what it is like to try and wrinkle out DX from under; and on several evenings W6-W9 were being heard as late as 2000z. It came out to QSO's with AP2KS, DU1DBT, FG0MM/FS7, FK8AB, FM7AQ, HP1NC, HZ1SH, JA's, KA6YL, K7RDG (Arizona), W7ABV (Montana), W6's, WB0BCZ (N. Dakota), W0DYM (South Dakota), other W7's, OX3VO, PY0ZAE, PJ2LA, VE4MP, VE5YE, VE6MJ, VP2G, VP2KAA, VP1FOC, VS5MC/AM3 near VS6, 7P8AR, 9Y4AB, TD76GI, ZL3RB, WB6EWH/VQP, thus bringing the 1976 score for the band to 136 countries worked.

G4EAN, as has already been indicated, is living in hopes of more time to operate, but meantime he managed to record four W4's, plus a gotaway in the shape of VU2LQA.

Fifteen for G4BHE was not so entrancing as Ten, on which band he is now up to 76 countries for 1976; nonetheless, 21 MHz had its moments, bringing in four new ones, among A4XGR, DU1EJ/3, FG7AS, FG0MM, FL8CB, FM7AV, HI8JAM/KP4, PJ0A, PYOZAE (Trindade Is.), UG6, UL7, VP5AH, VP8PI, VQ9DF, WA6EGL/VQ9 (Chagos), ZE1DM, ZP9AC, SU7AG, VP2KF, VP8ON and lots of W's.

Out of the few days when operation was possible for GW4BLE we notice on Fifteen: EA8JJ, FY0BHI, HI8MOG, HP7XJS, KZ5RL, LX1BW, VP2KAA, VP8HA, VP8PC, YN1KG, XT2AG,

ZD8JAM, 5Z4WL, 9G1LZ and so on.

By way of GW4CXM we hear that the GW4ENT contest effort did quite nicely on 21 MHz, with contacts to CT3AF, CW3BR, CX2XC/P, CX4BD, EA8JJ, EL2R, EL2T, EP2SV, FG0MM, HC2YL, HI8MOG, HK4DF, JH6WOA, KZ5AS, LU6DIN, OA8CG, PJ0A, PY's, ST2SA, VK1RK, VK2XT, VK2AVZ, VK5MF, VK6JJ, VK6NE, VP2G, VP5M, VP8ON, VP8PI, VU2ARC, VP9A, VQ9R, all W call areas, WA6EWH/VQ9 (Chagos), YB0ACH, YN1RWG, YV2AMM, YV6ZR, ZE1BL, ZE3JY, ZS's, ZP5WO, 5Z4LW, 6W8A, 9J2CB, 9J2CJ, 9K2EH, TA1ZB/2, TG0AA, TI2CF, TU2EF and TU2GA. Not a bad weekend's work, at that!

### Twenty

The higher bands may have overshadowed Twenty this time, but it still carries the bulk of the load in the logs of the most DX stations, and so it will for many years yet.

G3RJV (Calverton) has various odd snippets of information for us, of which the 20m. prize is that with his five watts input G3NEO up in Todwick managed to add both ZL2LA and HI8MOG to his log, with quite decent reports—it never ceases to amaze G3RJV just what the QRP Club members can do with their low power. George also, putting on his other hat as hon. secretary of the G-QRP Club, tells us that the controversy over DSB operation continues; the Home Office now have written to G3YUQ and reversed, yet again, their stance; they are now on record as saying that they have reconsidered the matter and are prepared to permit DSB, the permission for which will be written into the new licence that will come into force on January 1, 1977.

It must have been quite a pleasure for G2HKU to have his Big Rig accessible once again, if only in that it would have enabled him to restart his ZL skeds. This has in fact been done, with ZL1VN and ZL3SE, although signals are not yet up to normal and some mornings the North Island is stronger than the South Island.

G4EVO continues his cautious QRP investigation into each band,

and used Twenty quite a bit more this month. Coverage was well round the European scene, plus the odd Stateside contact, and, for the second month running right up to the Asian border but not quite over it; must be somewhat frustrating. An amusing comment concerns the guy with an Argonaut who gave G4EVO a report of RST 309! However can you read a signal which you have just said isn't there?

A note now from the Gibraltar Club, saying that they are setting up a net for all the ZB2 stations, both current and ex-ZB2, which will run from 1200z on the first Saturday in each month on 14120 kHz, the first session being down for December 4.

The Poltava Pestilence has not been on quite so often, says G4DMN, which was possibly one of the reasons why he could manage contacts with FG7, FP8DX, HK, HI8, JA1SJK, KP4, OA4AHA, PJ0A, TD76GI, TI2CF, VP5A, VP5M, VP2S, VE5, VE7, all W call areas, ZF1AK, VP9, 4X4, 6Y5, 8P0A and PZ4NP. (Are the Russians giving up their attempt to contact Outer Space? ! Editor).

G4DJY seems to have had a whale of a time in the contests, but of course his main forte is CW working. Peter worked his way into north and south America, KZ5FR, VE3GWP, 8P6AE, VP5CW, VP9, FP8DX, HI8MOG, VE's assorted, VO1HH, K2IZN/4X, FY7AK, EP2SV, for quite a nice crop.

G3CED's log, with QRP shows that he spent most of his time on Eighty and Fifteen, although he did make time for a few looks at Twenty, working a brace of W's all among lots of Europeans, near and far.

Twenty seems to have been doing its best, opines G4EDG, although he is a little troubled to find that a low dipole can often outdo the groundplane on this band in the westerly direction. For Steve there wasn't all that much to book in as completed, but noises were exchanged both ways with 3D2RM, VP2GLE, DU1OR, VP5CW, VK5GQ, PJ2VD, JA's and KH6IJ.

A most interesting thought occurred to Ian, G4EAN; he worked some Europeans on Twenty one whom was signing "4L1RO"—he wonders whether this is a station to

commemorate the setting up of the Russian "thing" on the band?

This QRM nonsense is hard on the ears, says G4BHE, he having only recently graduated thence from his more usual stamping-grounds. Nevertheless, Barry made it over to FY7AK, F6BJY/KP4, KP4EGV, P29KE, TD76GI, VP9HS, YN1KG and YS1BW.

GW4BLE didn't have his typewriter on which to write his report, and one can begin now to understand why he prefers to use the typewriter! Legpulling apart, Stephen managed to use his SSB to work EA9EO, EL7F, FL8BL, HP1EI, HP1MU, LU6FEP, OA4MQ, TU2GA, VP2KAA, VP2SG, WA6GLE/VQ9, ZL2ANB, ZF1WW and 8P7FU.

The GW4ENT contest group, writes GW4CXM, played all bands during the CQ WW SSB effort, and in proof he sends in a long log of 20-metre stuff worked—so long indeed that it will have to be cut and pruned. Contacts were made with CX7BV, EL2T, EP's, FB8DX, FR7BI, FY7AK, HC1BU, HK1CMX, HR3JJR, JH1CNT, KC4, KG4, KL7, KV4, KZ5LU, OX3JUL, PJ0A, assorted PY's, PY0ZAE, VE1ZN/SU, TA1ZB/2, TD76GI, UJ8, all UA's VE1-7, VK's, VP1PTL, VP9GR, all W call areas, WB2QFB/HR2, WB5LSU/TI2, XE2MX, XE3LK, YS's, YV, ZF1RE, ZP5KB, ZS, 4Z4, 5W1AU, 6W8A and 9L1BH.

#### Bit of Real DX

VP8PJ (G4EEL) writes that he will be on Adelaide Is., Antarctica, until April next, running a kilowatt into various inverted-Vees and rhombics, on 14050 and 21050 kHz, CW and SSB. QSL by direct airmail only, to: A. Cheshire, VP8PJ, British Antarctic Survey, Port Stanley, Falkland Islands—and allow for the fact that, in the nature of things, there are long delays in the despatch and delivery of mails. The service ship is the well-known *John Biscoe* (ZDLB), operating between Southampton and the Falklands.

#### Eighty and Forty

Suffice it to say that in the last month most people had things going for them on Forty, and the real test

was one of skill—if you can work DX consistently on Forty then you can consider yourself a good receiver-operator. The folk who say they never can hear DX on this band are those who don't know how to get the best of their receivers, using them as glorified BC sets. But—those who know can find the stuff there, 'most always, and if you can find it, you have a chance of working it.

Turning to Eighty, we must first look at the CW end of the band; this is one area where you can *rely* on finding QRP stations with good signals, and it is also true that it is a disgrace in the number of Fatuous Fone stations who prefer to operate in the CW portion of the band, during the daytime when there are wide open spaces in the Phone section available to them. At night, of course, DX appears on the band, and, on CW at least, is subject to the normal hazards of the game. But—when we come to Eighty Phone DX, the mouth is a little inclined to froth! For example there is the clown who, with a U.K. call mumbles on about "all DL's being members of the Hitler Youth" on top of any DX that happens to be about. Apart from making the others think the G's are a nation of mentally-deficient idiots, which the rest of us at least aren't, this moronic individual prompts the question as to why the Home Office have not put him off the air, when they are quite prepared to do so for relatively minor technical licence infringements—surely they are in clear breach of their duty? Additionally, one wonders whether in fact this station's "operator" should not have been locked up in a mental home for his own benefit. The writer had a little to do with Hitler's War himself, come to think of it, as indeed most of the *Magazine* people, for that matter. What about the D/F merchants? If the Home Office won't act, can't some of the D/F ops. get on to him, and five minutes work with a pair of side-cutters should be enough to stop the rot.

All of which is not to say that DX isn't to be found, or that it isn't being worked—it is, most definitely, throughout the dark hours, as such as G3RJV, G2BJY, G2NJ and

umpteen others prove, month after month.

#### Miscellany

Brief notes, we fear. Details of the CQ WW DX Contest came in after the Phone leg had been played off; but we can tell you the CW weekend dates are November 27-28, for the full 48 hours. Logs should already have gone off for the Phone leg, while the CW end ones should be postmarked not later than January 15, to CQ WW Contest Committee, 14 Vanderverter Avenue, Port Washington, L.I., N.Y., U.S.A. 11050.

Verulam have a Club contest on December 12 on Top Band—details for this one can be obtained from G4BOU, QTHR.

The Wessex chaps intend to set up a commemorative station at the Haven Hotel, Sandbanks, Poole, from which place Marconi made his first try; the station will be in the correct part of the building, and there will also be an exhibition of items used by Marconi at the hotel, at which he carried out his experiments from 1898 till 1926. Visitors welcome; and for those listening, they will be signing G3FVU.

Amendments to the U.S. amateur licence come into force on November 26, as part of the campaign to reduce restrictions; basically, the bit that concerns us in that a /P or /M operator is not specifically required to indicate so as part of his call sign—thanks W4WFL for this bit of information.

#### Vale

We have news of the sudden death on October 4, of J. V. Beavan, G3GBL, of Cheshunt, who was in his early fifties, and whose main activities were operating on Twenty and Ten, apart from being an R.A.E. course lecturer, and for many years chairman of the Cheshunt group. He will be sadly missed indeed.

#### For Next Time

Send us it all in in time for **December 11**, addressed as ever to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Have a Happy Holiday, and lots of sun-spots in 1977!

## DIGITAL SWITCHING INDICATOR

ADDING SOPHISTICATION TO HOME-CONSTRUCTED EQUIPMENT

G. C. DOBBS (G3RJV)

CYNICS, of whom there are not a few, may say that Amateur Radio has become a matter of attractive cases and gimmicks. Not wishing to provoke this line of thought, it is sufficient to say that there is a lot of attractively-presented commercial gear in present day Amateur Radio equipment. The circuit herewith can go towards adding a touch of sophistication to home constructed equipment. It also serves another purpose. Remember those computer panels you bought at a Rally a couple of years ago? Here, at last, is a use for all the short-lead silicon switching diodes.

Digital readout is becoming a "prestige addition" to a lot of commercial equipment; several transmitters and receivers now have direct digital readout of operating frequency. On a much simpler level, some equipment offers digital indication of multi-way switching. A flick through most American magazines will show that one of the popular extras on Citizen's Band (. . . it would be) equipment is "Digital Channel Indication" in which the number of the channel is displayed. This circuit provides simply that—the channel or band in use is indicated by a digital readout number. A lot of trouble for the result? Perhaps—but the circuit is quite easy, reasonably inexpensive, and can serve as a useful introduction to the use of 7-segment L.E.D. Numeric Displays.

The Numeric Display used in this circuit is the MAN3M GaAsP unit. It was chosen because it is the cheapest commonly available display and its small size enables it to be mounted in a variety of situations on equipment front panels. The MAN3M has seven bar shaped segments, each one being a Gallium Arsenide Phosphide LED with a grid patterned electrode for brighter light output. The display is encapsulated in a red epoxy resin which aids optical transmission. The red capsule has thin copper strip leadouts, bend down at differing lengths for identification. The characteristic shape of these leads has given this display the nickname "The Claw."

Seven segment numeric displays, as the name infers, use 7 individual segments to make up the number 0 to 9. Anyone who has used a calculator, or any other digital display equipment, will be familiar with the method of display. The method of obtaining the numbers 1 to 5 is illustrated in Fig. 1. This diagram also shows the letter coding used for the complete seven segments of the display. It is easy to see that by illuminating chosen segments, any of the required numbers can be displayed. The only ambiguous display is the number 1, but it is conventional to display this as BC rather than FE.

The MAN3M is a common-cathode display, that is, the cathode of all seven LED's come to a common connection and the choice of LED segments is made with the seven remaining anode connections. The physical appearance of the MAN3M is shown in Fig. 1. The common anode is the longest lead on the bottom row

of connections, and the letter coding for the anode leads is also shown. If you wish to check the lighting of the LED segments by applying a voltage between the common cathode and each anode in turn, do not *directly* connect a battery across the LED. Like all LED's, the seven segments have a maximum current and voltage rating. The DC forward current per segment should be 10 milliamps or less, and the reverse breakdown voltage is 3 volts min. To test the LED's with a 9 volt battery, introduce a series resistor of about 1K. The MAN3M is rugged—why spoil the 250,000 hours (nearly 30 years) estimated life of the device?

### Circuit

The circuit of the display indicator is shown in Fig. 2. The indicator requires a spare set of switch contacts on the change to be indicated. If the circuit is being used with amateur-built equipment, it is easy to allow for an extra set of contacts. But even in commercial equipment, it is quite common to have a spare set of contacts on a bank of wafer switches. The spare contacts are shown as S1. It will be noticed that five positions have been included in the circuit. Five is probably the most common number of positions used on a bandswitch for Amateur Radio receivers, transmitters or transceivers. It is quite simple to modify the circuit for more or less switch positions—although the number of diodes in the circuit becomes greater, the more positions required.

The spare switch contacts, S1, switch a 9 volt positive line to the required anodes of the LED numeric display via a diode matrix. Why the matrix? Direct switching of the LED anodes would cause "back paths" which would make extra segments light on most switch positions. Following the diode paths through from 1, 2, 3, 4, 5, to a, b, c, d, e, f, g will show the sequence of number switching. The logically minded are going to enquire about ways of reducing the number of diodes in the matrix by path sharing. This appears quite possible in theory. For example the BC of number 1, could be used in numbers 3 and 4. Instead of two diodes to both B and C in these numbers, why not connect just one diode to the whole number 1 line? In practice it was found that the current to each segment had to be kept relatively equal for an accurate display. The use of diodes in series really requires independent limiting resistors on

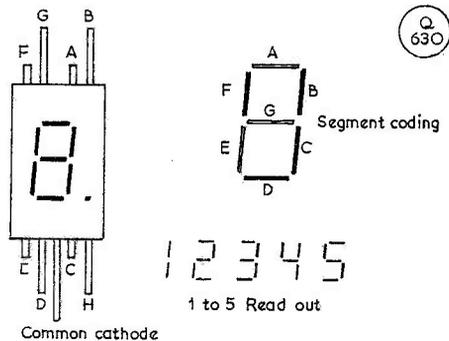


Fig. 1 MAN 3M 7 segment display with leads and readout

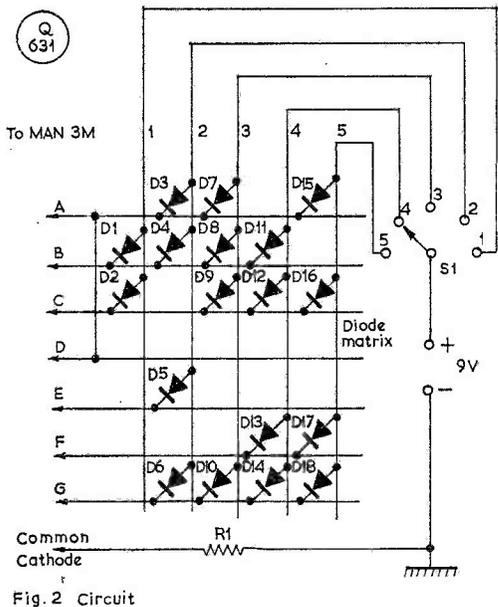


Fig. 2. Values for this circuit can be: R1, 680 ohms; D1-D18, silicon switching diodes; seven segment indicator, MAN3M (see text); mounting on 0.15in. Veroboard as matrix, holes 10 x 10.

each lead. However, one short-cut has been used in the circuit. A glance at the coding for the numbers 1 to 5 shows that whenever A segment is used, so also is D segment, so their anodes can be connected together, saving extra diodes for D. The series resistor R1 is a compromise value, chosen so that a single resistor could be used in the negative line from the common cathode.

### Construction

The diode matrix is one of those rare, but pleasing, examples of a circuit diagram which can translate directly into the actual constructional layout. The layout for the matrix is shown in Fig. 3. The prototype was built up on a piece of 0.15in. spaced Veroboard with the strips used for the horizontal connections on the diagram for the LED anodes A to G. This involves seven of the Veroboard copper strips, the other three being removed from the 10 x 10 hole board—one across the top and two along the bottom. Although the Veroboard bonding is firm, it is possible to remove complete strips by peeling back one end with a sharp knife and pulling along the whole strip.

The vertical strips for the switch positions 1 to 5 were made from busbars of stout copper wire. These five wires cross the board about 1 cm. above the surface, the ends being bent at right angles and inserted into the holes at each end of the required length. Extra wire should be left at the ends which are inserted into the holes at the top of the diagram so that the surplus can be bent back over that edge of the board to hold the wire in place. A spare row of empty holes remains at the bottom of the board for mounting the series resistor R1,

the leads of which are bent back to the board for firm mounting and connection.

The diodes are mounted as shown in Fig. 3. The easiest way to solder them into place was to mount a line at a time, bending a small u-shape to hook the top lead of the diode over the wire. A real word of caution here—take care to ensure that the polarity of each diode is correct—double check to avoid difficult later correction. Also, it is easy to miss out the link wire from A to D, which can be inserted between any row. Five leads are connected between the top of the wire strips and the switch positions, and eight leads to the A to G vero strips and R1 to the Numeric Display. These leads are

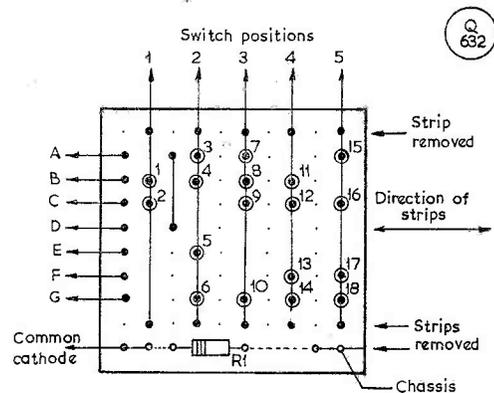


Fig. 3 Diode Matrix layout (see text)

best made with the thinnest PVC covered connection wire available. The leads may be soldered directly on to the MAN3M connectors. This can be a fiddly process. In practice it was found easier to wire the leads to the MAN3M first, check the leads in turn to see which segment lights and then wire that lead to the correct A-to-G strip.

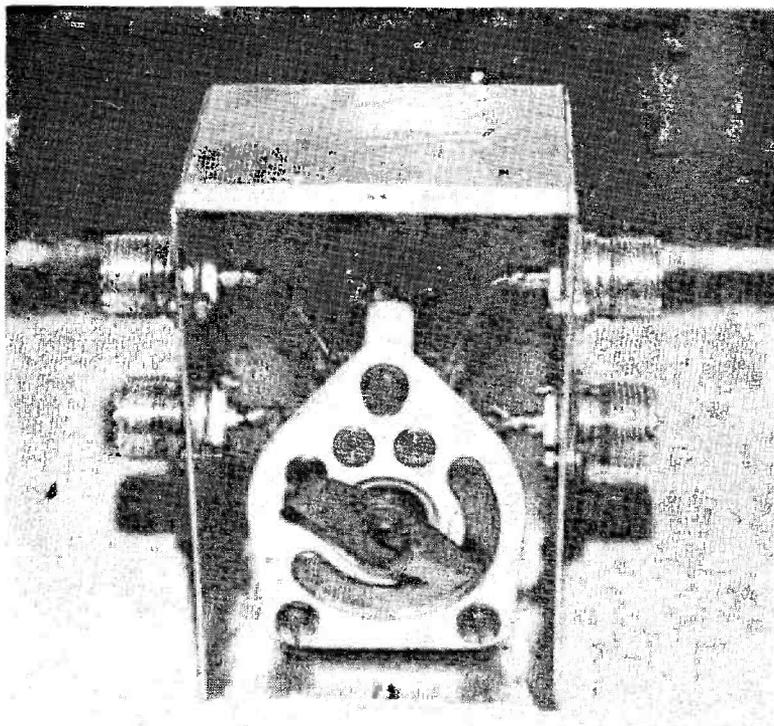
When wired the circuit can be checked by connecting the leads 1 to 5 to a 9-volt battery in turn, to ensure the correct number is indicated. As mentioned above, there are variations of this circuit. Less than five switch positions can be indicated with a simplified matrix, or more than five with a larger matrix. Also some letters can be made with a MAN3M display—these are A, C, E, F, H, L, O, P, S, U, and Y in upper case, and b, d, g, h and t in lower case. A very simple application could be to indicate "high" and "low" switched states by indicating H and L, and so on.

### Fitting

The completed circuit leaves the small MAN3M display on the end of its leads. This compact unit can be placed in many positions on a front panel. Probably the most difficult method is to make a hole in the panel for the indicator. It is much easier to insert it into a tuning scale, or even—with care—into a panel meter. The leads of the display can be masked from view by careful placing of strips of PVC tape, white or black,

to merge into the background. Although the display is small it gives a clear indication which is bright enough to read clearly in all but the brightest background light. If a larger display is required another, larger, numeric display can be used. But one would have to ensure that

the display is common cathode, or reverse the matrix and supply, and that R1 gives a suitable current level for the LED's. The display circuit can be used with a 12-volt supply and in such a case R1 should be changed to 1K or slightly more.



## AERIAL SELECTOR SWITCH

ROBUST CONSTRUCTION

P. BURNETT (G4BLL)

**T**HIS little unit is one of the most useful adjuncts to the average radio amateur station accessories, permitting rapid selection of different aeriels when changing bands or for comparison purposes and for quickly switching in a dummy load for tune-up.

The number of aeriels which may be selected depends upon the switch positions available, *e.g.*, the writer required to switch between an HQI minibeam for 10, 15 and 20, a 137ft. long wire tuned *via* an ATU for all bands and a 50 ohm dummy load, as a minimum requirement.

The first step was to see what was available commercially to determine minimum electrical and mechanical requirements. Ideas about the price of these units precluded purchase as a serious consideration. It was found that a standard H-type ceramic rotary switch was used

but it was resolved to locate something a little more substantial for the home-built unit. The old TU5 tuners immediately came to mind as a possible source for a suitable switch. Eventually an American "Bendix Radio" tuning unit was unearthed (literally) in such a state of decay that it was very nearly returned to its place of rest, but, having got this far, a hammer and

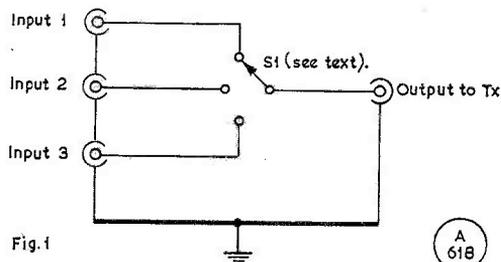


Fig. 1

A  
618

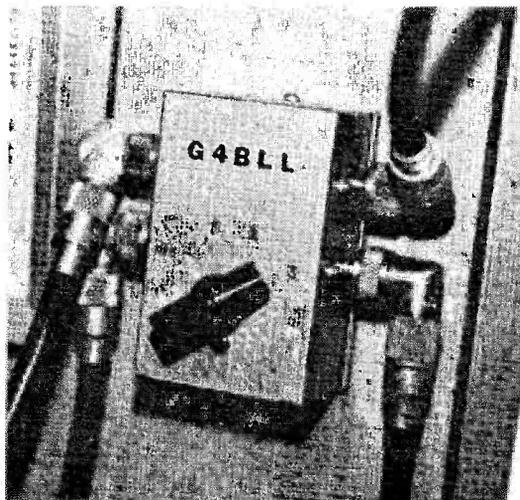
Circuit of the Selector Switch.

### Construction and mounting of the Aerial Selector Switch.

chisel were taken to persuade it to reveal its contents!

In spite of the grime a suitable switch was recognised which was stripped down and simply cleaned in washing-up liquid and the contacts treated with a proprietary fluid—on reassembly the switch looked like new! The moral of this story is: Don't be put off by something which on the surface appears to be "past-it"—they were built in an age when things were made to last!

The switch was mounted in a standard aluminium box size: 4 x 2½ x 2 in. with lid and four SO259 sockets, as shown in the photograph. The exact size of case required depends, of course, on the size of the switch eventually located. The electrical diagram is shown in Fig. 1. Try making up this little unit—you'll wonder how you previously managed without it!



## TERMINAL UNIT FOR RTTY

### VERSATILE T.U. FOR TELEPRINTER OPERATION

L. J. SMITH (G3HJF)

**T**HERE must be hundreds of teleprinters in stations around the country which are gathering dust for want of effort to get them going. The Creed Model 7 variants are the most common and, in the author's opinion, are by far the most suitable for amateur use.

To judge from the scarcity of U.K. station RTTY signals on the bands, it can reasonably be assumed that what is required is a simple terminal unit which almost anyone could build with parts readily obtainable if not already to hand.

#### RTTY Reception

Assuming that a good Model 7 teleprinter is in the shack, to receive RTTY, one needs:—

- (1) A receiver, stable enough to stay on tune to within 100 Hz or so for at least five minutes at a time. The provision of an adequate CW filter about 500 Hz or so wide would be ideal.
- (2) The teleprinter to run at the correct speed.
- (3) An effective terminal unit. The one to be described takes the two-tone output from the receiver and energises the printer magnet such that its armature is pulled one way for the low audio tones (*mark*) and the opposite way for the high tone (*space*). This is double-current or polar keying, and is the method most suitable for the Creed teleprinter.

#### Amateur Standards—Speed

This controversial question has finally settled on 45-45 bauds. There is still some amateur activity using

50 bauds but the 45-baud standard is now by far the most common.

#### Shift

RTTY can be transmitted in either of two general ways:—

- (1) By transmitting a steady carrier for *mark* and shifting it a small amount for *space*.
- (2) By generating an audio tone for *mark* and shifting it for *space*. These tones are then fed into a normal AM or FM transmitter.

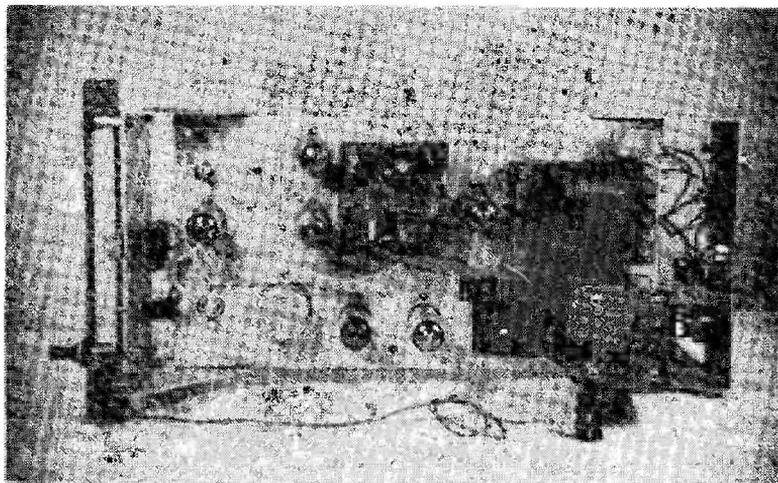
In the first case, the transmission is known as Frequency Shift Keying (FSK) and in the second case as Audio Frequency Shift Keying (AFSK). FSK is by far the most efficient form of transmission and is used exclusively on the HF bands and frequently on the VHF bands. AFSK is used only on the VHF bands.

The amount of shift has now standardised on 170 Hz (Narrow Shift). Previously the accepted shift was 850 Hz (Wide Shift) but due to its wide bandwidth and its susceptibility to interference, the narrow shift is now preferred.

#### Other "Standards"

On the HF bands and for FSK transmission on any band, the transmitted carrier is high for *mark* and is moved 170 Hz lower for *space*. This signal is always received as lower sideband so that the audio output is low for *mark* and high for *space*. The standard audio tones are 2125 Hz *mark*, 2295 Hz *space*. These are international standards. But to make life more interesting the last IARU Conference at Warsaw recommended that new "low" tones be used. These are 1275 Hz *space* and 1445 Hz *mark*. It will be noted that the *mark* and *space* tones are reversed. However, the so-called Warsaw Tones, though having technical justification for AFSK, are of little significance for FSK working. Indeed, there is no need for any laid down tones for FSK as the receiver BFO can be set to give any tones convenient to the operator. However, because of receiving difficulties

Upper-chassis view of the RTTY Terminal Unit, showing general construction of the prototype.



it is best to arrange the *mark* and *space* tones so that they are not harmonically related. For this reason, the 2125/2295 Hz tones are used.

One last note on standards: The foregoing are international standards which have been adopted by amateurs. They are not the only ones, though. Tuning around the short-wave bands one comes across RTTY sounding signals which cannot be resolved. This is due to other services using signalling codes other than the normal 5 unit Murray code; a different signalling speed (56, 75 or 110 bauds); signal inversion (*mark* above *space*) or a different shift of 400, 425, 850 or 1000 Hz; or any combination of these four! And so for first efforts at RTTY, stick to the amateur bands at the top 10 kHz or so of the CW sub-bands.

### Receiver

A receiver which does an adequate job on SSB will be satisfactory for RTTY. If there is a narrow CW filter that will be even better, since a 45-baud 170 Hz shift FSK signal is accommodated easily in a 400 Hz passband. The BFO may not give the correct tones, though, and may need to be shifted so that the signal, centred in the passband, is rendered in the right tones and in the right sense. This means that the BFO must be set 2210 Hz higher than the centre IF. If the BFO is crystal controlled then this is obviously going to be a problem. Especially so, if a transceiver is used as the BFO is often also used as the carrier generator. A solution is to receive the signal as for the lower sideband and use an audio filter to sort out the wanted tones.

### Teleprinter

If the teleprinter is already in good condition and the motor speed is correct, then there will be no problem other than ensuring that the right connections are made to the machine.

### Testing a Teleprinter

Probably the best teleprinter for amateur purposes is the Creed Model 7, in any of its variants. It is easy to service, very tolerant of maladjustment, there is plenty

of information available and they are on the market in abundant quantities. This teleprinter was primarily intended to work from a  $\pm 80v$ . signalling supply.

Connect the  $\pm 80v$  volt supply to the signalling contacts on the transmitter unit, positive to the *mark* terminal. This is the one upon which the transmitter tongue normally rests. Fig. 2 shows the connections. The magnet should now be held in the *mark* condition. Switch on the teleprinter. Typing on the keyboard should now give print on the page. If it does not, clean the contacts carefully.

Although the machine gives good local copy the speed may be wrong since the printer will always follow its keyboard due to the common motor. To set the speed, first set the governor for 50 bauds by pressing the run-out key (if fitted) or by pressing a key and holding the keyboard clutch detent out so that the keyboard continues to run and repeat the letter. A line of 60 letters should be produced in 9 seconds. A fine adjustment to 3000 r.p.m. can be made by painting out all but two opposite spots on the governor cover and checking with a neon lamp from the 50 Hz AC mains. Once set to 3000 r.p.m., a very good approximation of the 2737 r.p.m. needed for 45-baud operation can be made by turning the governor screw in the -ve direction  $7\frac{1}{2}$  turns.

### Interference

The teleprinter motor is most often the 230-250 volt universal type with a centrifugal governor. The "hash" caused as this spins round can blot out all but the strongest signals. Treat the machine accordingly by earthing the frame and by shielding all the signal wiring. Disc ceramic capacitors of 0.01  $\mu F$ , rated 1000/1500 volt, wired right on to the motor brushes will kill most of the trouble. A proprietary make of arc suppressor is very effective and saves a lot of wear and tear on the governor contacts.

Creed 7 machines can also have other types of motor ranging from 24 volt DC to 50 Hz induction types. The latter, while giving no interference problems, causes headaches when trying to get them to run at slower speeds. A lot of ingenuity is needed. (Over)

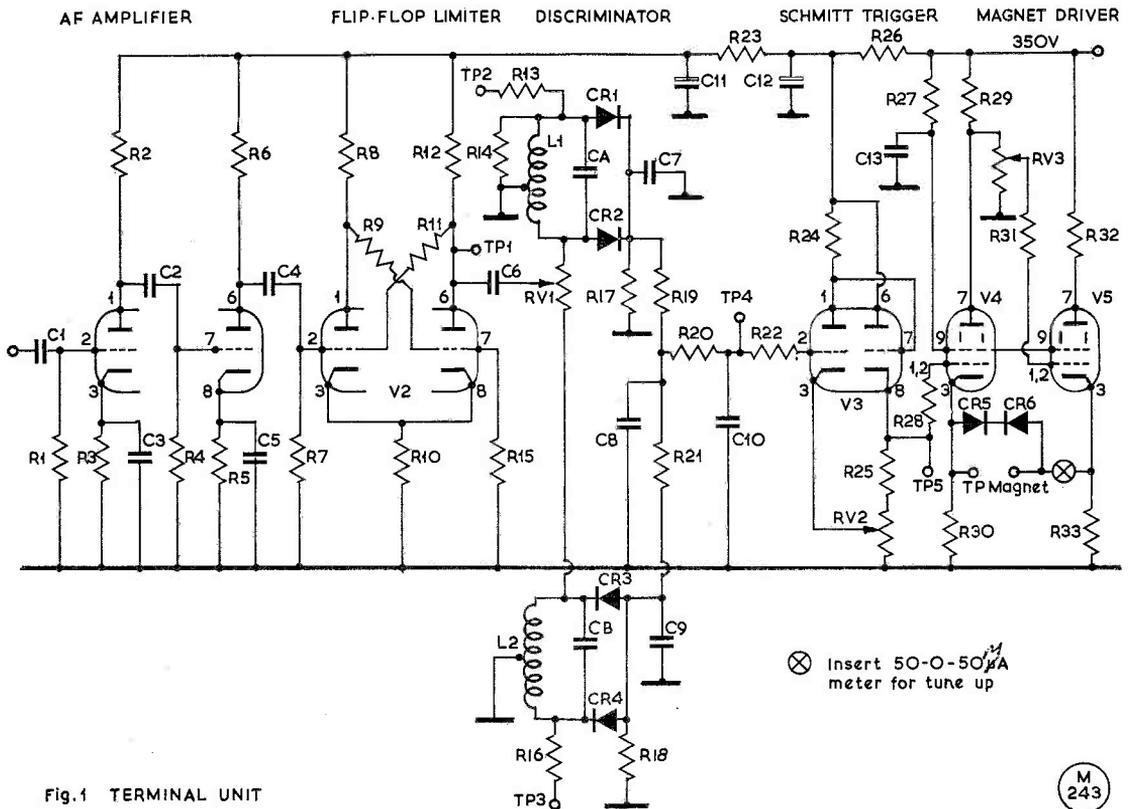


Fig. 1. TERMINAL UNIT

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Fig. 1. Circuit of the G3HJF TU for RTTY

|                                      |                              |
|--------------------------------------|------------------------------|
| C1 = 0.1 $\mu$ F                     | R19, R20,                    |
| C2, C4 = .005 $\mu$ F                | R21 = 5,600 ohms             |
| C3, C5 = 4 $\mu$ F, elect, 12v.      | R24 = 4.7 megohms            |
| C6, C13 = 0.1 $\mu$ F                | R23 = 1,500 ohms, 2w.        |
| C7, C8,                              | R26 = 10,000 ohms, 2w.       |
| C9, C10 = .01 $\mu$ F, disc          | R27 = 22,000 ohms, 5w.,      |
| C11, C12 = 16 $\mu$ F, elect., 450v. | w/wound                      |
| Ca = 0.66 $\mu$ F (target            | R28 = 470,000 ohms           |
| value 0.63)                          | R29, R32 = 1,200 ohms, 5w.,  |
| Cb = 0.56 $\mu$ F (target            | w/wound                      |
| value 0.54)                          | R30, R33 = 3,300 ohms, 10w., |
| L1, L2 = 88 mH toroid                | RV1 = 25,000 ohms, PCB       |
| (see text)                           | mounting                     |
| R1 = 2,200 ohms                      | RV2 = 5,000 ohms, multi      |
| R2, R4,                              | twin, w/wound                |
| R15 = 220,000 ohms                   | RV3 = 0.5 megohm,            |
| R3 = 1,500 ohms                      | w/wound                      |
| R6, E25,                             | V1 = 12AX7, ECC83            |
| R31 = 100,000 ohms                   | V2 = 12AU7, ECC82            |
| R7 = 330,000 ohms                    | V3 = 12AT7, ECC81            |
| R5, R12 = 15,000 ohms                | V4, V5 = EL84                |
| R9, R11,                             | CR1,                         |
| R22 = 1.5 megohm                     | CR2,                         |
| R10 = 4,700 ohms                     | CR3,                         |
| R13, R16 = 1 megohm                  | CR4,                         |
| R14 = 27,000 ohms                    | CR5, CR6 = 18v. 1w. zener    |
| R17, R18,                            |                              |

### The G3HJF Terminal Unit

Once it is determined that the receiver and teleprinter are as required, then all that is necessary for reception is a suitable tone demodulator or Terminal Unit to convert the audio tones into operating voltages to the printer magnet.

There are many Terminal Unit designs, mostly of

Fig. 1. Circuit of the G3HJF Terminal Unit for RTTY.

American or European origin, which are often rather complex and have features which appeal more to the experienced RTTY operator than the beginner. Bearing in mind that most people have a well stocked "junk box" and that there are many who still think better in terms of valves rather than "op-amps," the author set himself the task of building a Terminal Unit with a performance comparable with the best existing designs, using only what was already available. For the beginner the only special items are the toroids. These are available from advertisers in SHORT WAVE MAGAZINE.

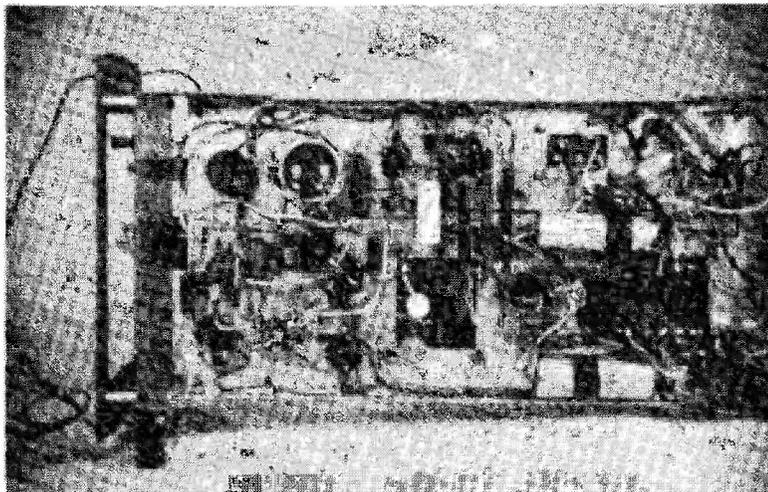
### Circuit Description

Fig. 2 gives the circuit diagram. AF voltage from the receiver is taken from a headphone or speaker socket, or preferably a 600-ohm point. Many common transceivers have a 600-ohm tapping on the AF output transformer.

This AF voltage is fed to V1 which is a high gain AF amplifier with a response tailored to the 2.0 kHz region. V2 is an astable multivibrator used as a limiter. This is a very sensitive circuit requiring only a small fraction of a volt input to trigger it from one state to the other. When fed with an AF voltage it produces a train of square waves of textbook quality. This limiter ensures



Underside view of the G3HJF RTTY Terminal Unit described in the text.



Local Copy especially if the unit is to be used for transmitting. The simplest system is that shown which uses a  $\pm 80$  volt supply. The printer is switched from remote to local by a relay RLA. This can be controlled by a front panel switch, S1, and/or a closing pair on the main transmitter relay. Most transceivers have such contacts available. It is also useful to provide a push-button control for this relay right at the teleprinter keyboard where the operator can reset speedily the machine when signal distortion causes loss of incoming CR, LF or LTRS signals.

#### Transmit Drive

Modern practice of generating FSK is to feed AF tones 170 Hz apart into the microphone socket of an SSB transceiver. The resulting output is FSK. This being so, it is simple to obtain a sample of the  $\pm 80$  volts present on the tongue of the teleprinter transmitter and drive a transistor, Tr1, as a switch for a separate AFSK oscillator. A suitable design for such an oscillator has appeared in the *ARRL Handbook*.

#### Setting Up

Getting an RTTY station on the air for the first time requires a little patience and a clear idea of what is required.

Remember:—

- A low tone (2125 Hz) OR no signal should hold the printer magnet in the *mark* condition.
- Only a high tone (2295 Hz) shifts the magnet to *space*.
- On local copy the magnet rests in the *mark* condition.
- All incoming signals must be treated as though lower sideband even on those bands where USB is normal.

#### Test Equipment

A small oscilloscope, preferably double-beam, is so useful as to be a necessity. The receiver with its internal crystal calibrator to simulate a signal is the best source of AF voltage. If a frequency counter is available so much the better. Also required are a multimeter and a 50-0-50 mA meter.

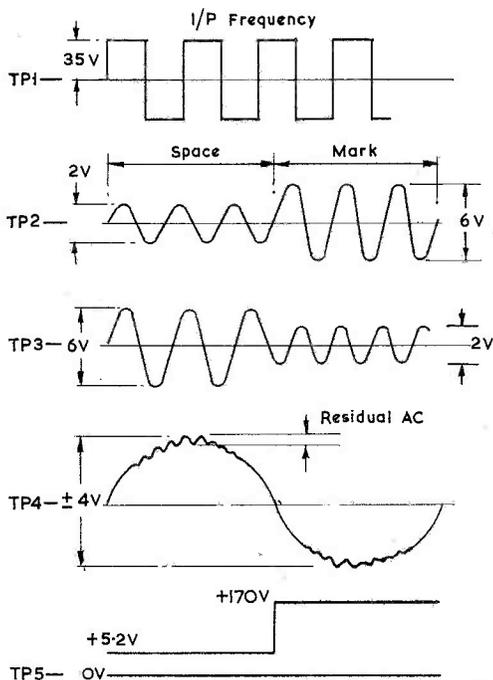


Fig. 3

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Fig. 3. Wave-forms at the test points (TP) in the diagram.

#### Procedure

- Inject a 2125 Hz signal at 25 mV or so, to C1, and check that square waves are produced at TP1.
- Set RV1 to mid travel. Connect the scope to TP2, adjust the value of a Ca to give maximum deflection at 2125 Hz.

- (3) Repeat with the scope connected to TP3 and the input frequency changed to 2295 Hz. Adjust Cb. Use only high quality capacitors in position Ca and Cb.
- (4) Insert a 50-0-50 mA meter in series with the teleprinter magnet, as shown. A 200-ohm resistor across the magnet terminals will simulate the magnet for test purposes. Vary RV2 and observe the current reversal through the meter. Adjust RV3 so that the forward and reverse currents are equal.
- (5) Remove the AF input and set RV2 to the point where the magnet is just held steadily in the *mark* condition. This is a delicate adjustment and use of a multi-turn wire-wound pot. at RV2 helps to obtain a precise setting.
- (6) With the double-beam scope at TP2 and TP3, inject an AF voltage of alternately 2125 and 2295 Hz. Set RV1 for equal response at the two resonant frequencies. The response of the two LC circuits should be equal at the centre frequency of 2210 Hz. Varying the input frequency either side of this should cause the magnet to go from one condition to the other.

Go over these adjustments several times to ensure that everything is right and to get the "feel" of the unit. When set up correctly, the magnet will snap over smartly when the input signal is shifted only a few Hz either side of the centre frequency.

### Constructional Notes

None of the wiring is critical since the highest frequency involved is that of the 2295 Hz *space* tone. Tag board construction would be neater than the point to point wiring of the prototype. Wire-wound resistors around V4 and V5 get rather warm and so should have ample ventilation, as should the valves. In the prototype all the power supplies were built on the T.U. It might help with versatility of station wiring if the 80-volt supplies and the local copy circuits were made part of a central control panel. It is advisable to make the discriminator circuit as a separate module which helps when changing circuit valves. In the prototype this was built on a piece of matrix board. Beyond this, the constructor has perfect freedom to try his own layout in the certain knowledge that if the wiring is accurate then the unit will work.

### Tuning Indication

It is very useful to have some visual indication of when the signal is centred in the discriminator passband. A double-beam scope permanently connected to TP's 2 and 3 is an excellent though expensive solution. Otherwise, a small 'scope unit having its Y-plates taken to TP1 and the X plates to TP2 gives a cross display which is easy to interpret. Much more cheaper would be a couple of cathode ray tuning indicators, as in the DL6EQ design.

The performance of this T.U. has been a very pleasant surprise to the author. It is comparable to the best solid-state designs in terms of shift sensitivity and stability. It is almost immune to excessive input, yet will limit with only 5mA applied. Much heavier demands are made upon power supplies, of course, but there is little likelihood of the erratic operation and even catastro-

phic failure so common with solid-state devices when they are operated in close proximity to a powerful transmitter. Although the EL84's are operated slightly in excess of the manufacturer's ratings they have shown no sign of distress.

The prototype was used in the cut-and-thrust of the last RTTY Contest on 20 metres when it performed excellently and made the experience a pleasure for the author, who is no Contest operator! The advantages of the simple control system were made very obvious.

Unlike most T.U.'s, plenty of scope is afforded to the avid experimenter. Few of the circuit values are critical and so the builder has ample chance to try out whatever is to hand.

### HIGHER POWER SOLID-STATE TRANSPOSERS

The IBA has recently brought into use at some of its UHF local relay transmitting stations all-solid-state transposers up to a maximum transmitter power of 50 watts peak sync.

These enable effective radiated powers of from about 200 watts to more than 500 watts to be provided, depending on type of aerial used. This is a five-fold increase on the maximum power previously available from all-solid-state transposers used by the IBA and the new transposers are believed to be among the highest power all-solid-state equipments used operationally for UHF television broadcasting anywhere in the world.

Two years ago, in June 1974, the IBA began installing all-solid-state UHF transposers at its lowest power relay stations, requiring transmitter power levels up to 10 watts peak sync. During the past two years more than 60 stations have been commissioned using these units and many more are planned.

Until recently all stations with transmitter power levels in excess of 10 watts have required the use of a thermionic-valve power amplifier with a comparatively short valve life of typically 5,000 hours. Advances in UHF power transistor technology now make it possible to achieve the power level of 50 watts by combining the outputs of 8 transistors by means of 3 dB couplers, using a series of identical power amplifier modules driven from the basic 1-watt transposer unit.

The modules are so connected that failure of a power transistor does not result in total loss of output. This high level of redundancy and the very long life of the transistors specially developed for this application mean that reserve equipment need not be installed at these stations and the reliability of the service is improved.

The new modular equipment has been designed to an IBA specification that requires all active modules to be broad-band and all frequency-determining elements to be passive. All the broad-band modules, except the power amplifier modules, cover Bands IV and V without adjustment. The power amplifier modules are made in two versions, covering the upper and lower portions of the UHF band respectively. This technique results in a considerable reduction in the number of replacement modules that need to be carried by mobile maintenance teams.

To obtain high standards of linearity performance, UHF correction techniques are used in the transposer. The corrector is broad-band and compensates automatically for level variations.

## SHACK LV POWER UNIT

A PSU able to deliver up to one amp, at zero to 30v., has considerable utility in operating modern receivers and all sorts of other equipment, and can even do duty as a low-current charger. There is no shortage of fully-regulated PSU circuits, but few are as simple, or have as wide a latitude in components, as this one. It is readily assembled on a couple of tagboards, plus a panel and baseboard (the wood allows Tr1 sink to be mounted without further insulation).

A few points about the circuit will show where other components can be used. It is in two main parts—the actual power supply, consisting of full-wave rectifier, C1, R1, C2 and Tr1; and the reference or controlling voltage for Tr1, obtained *via* D1, Vr1, Tr2 and associated items.

### Power Section

The transformer is the readily available multi-tap type, giving 19, 25, 33, 40 and 50v. By using the 50v. end as 0v., 17, and 31v. can be selected by S2. By switching S2 to 17v. for outputs of up to above 15v., dissipation in Tr1 is enormously reduced, thereby easing heat sink needs here. For higher outputs, S2 is switched to the 31v. tap.

For rectification, you can fit four 1N4002 diodes or a 100v. PIV 1A bridge. C1 and C2 are 50v. or higher rating, and 1,000  $\mu$ F to 2,000  $\mu$ F. R6 and M1 form a voltmeter. M1 was 30mA, so R6 is 1000 ohm 1w. If M1 is an instrument taking low current, say 1mA, R6 is adjusted to suit (30,000 ohm) and in such cases a resistor should be put from Tr1 emitter to negative line, and 470-ohm 2w. is suitable. S3 is open until the PSU output has been set to the correct voltage, as shown by the meter. Closing S3 applies power to the equipment to be run.

The whole circuit "floats" relative to earth, so that a lead can be put from either positive or negative to earth terminal E, to suit positive or negative earth-line equipment, as required.

The transformer and other items could be modified to provide for other voltages, such as 0-12v., or possibly

to use items to hand.

### Control Supply

D1 has surge limiter R2, and smoothing by C3, R3 and C4. R4 drops this to give a suitable current for the 1w. 33v. Zener ZD1, and VR1 allows any wanted voltage to be taken to the base of Tr2. Tr2 emitter controls the base of Tr1, and hence the output voltage. C5 and C6 provide electronic smoothing—that is, holding the base of Tr1 free of ripple so that output is more nearly pure DC than is the supply across C2. Unless you are modifying to make a 12v. or similar supply, Tr2 must be a fairly high voltage type.

The capacitor values given are not essential, but about 55v. appears across C3, and 45v. across C4, so the voltage rating must be watched.

An initial test should show that VR1 controls the voltage from zero to 30v., and that closing S3 to put a load on causes only a minute fall in voltage compared with the no-load condition. Remember to use the first half-rotation of VR1 and 17v. tap for lower voltages, and the second half and 31v. tap for higher voltages, as this saves Tr1 having to "waste" a lot of power in terms of voltage drop, as mentioned.

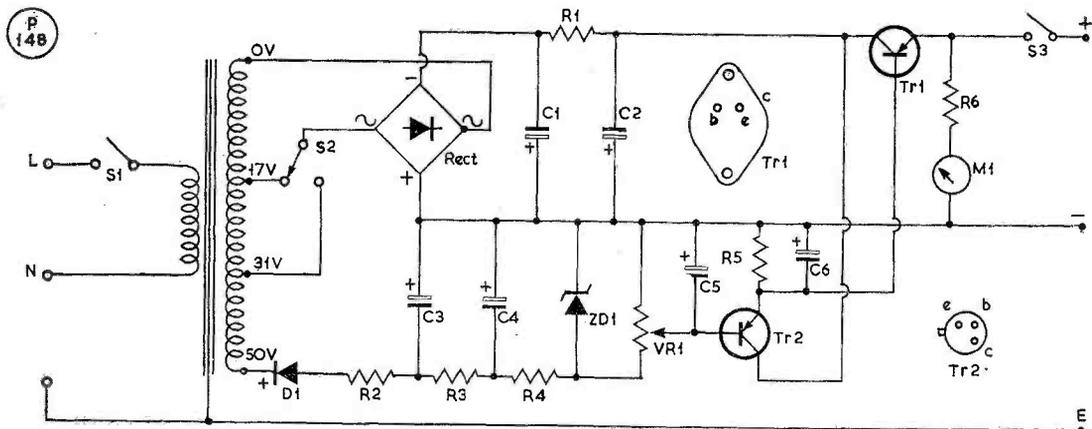
### Construction

That used was based on a panel about 6½ x 10½in. fitting a case to hand. The transformer, tagboards, and heat sink for Tr1 are screwed to a baseboard about

#### Circuit of 30v. 1A Power Supply

|  |                               |
|--|-------------------------------|
| C1 = 1000 $\mu$ F, 100v.                       | R1 = 4.7 ohm, 6w.             |
| C2 = 2000 $\mu$ F, 70v.                        | R2 = 100 ohm, 5% 1w.          |
| C3 = 250 $\mu$ F 60v.                          | R3 = 470 ohm, 5% 1w.          |
| C4 = 250 $\mu$ F 50v.                          | R4 = 470 ohm, 5% 1w.          |
| C5 = 140 $\mu$ F 40v.                          | R5 = 3300 ohm 5% 1w.          |
| C6 = 140 $\mu$ F 40v.                          | R6 = 1000 ohm 2% 1w.          |
| VR1 = 2000-ohm linear<br>pot, 1w., w/<br>wound | M1 = 30mA calibrated<br>30v.  |
| TR1 = OC29                                     | Rect. = 1A 100 PIV bridge     |
| TR2 = ACY39                                    | ZD1 = 33v. 1w. Zener<br>diode |
| D1 = 1N4002                                    |                               |

240v. transformer with 1A tapped secondary.

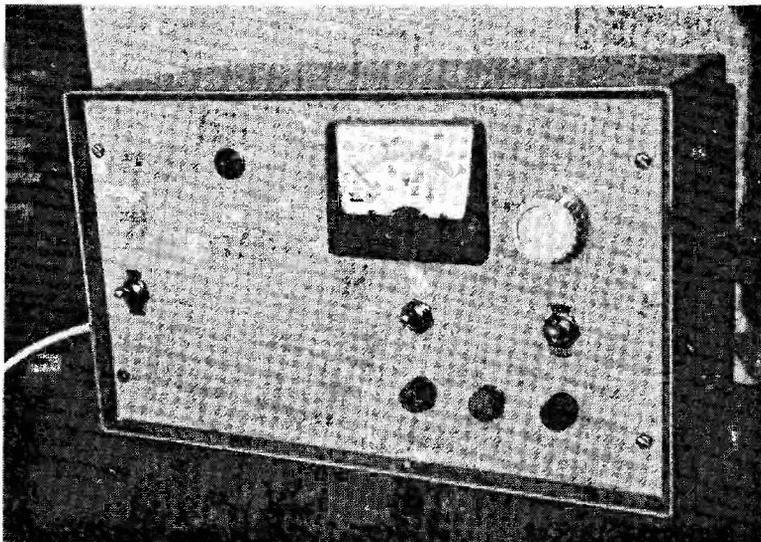


Circuit of the Low-Voltage PSU, discussed in the text, rated 30 volts at one amp.

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The completed Power Supply Unit,  
as described by G3OGR.

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5 x 10 and  $\frac{1}{2}$  in thick. The sink is a finned type as used for audio amplifiers, about  $2\frac{1}{2}$  x 4 in., and is common to Tr1 collector when these items are bolted together.

In the picture, S1 is to the left, S2 under the meter, and S3 to the right. A neon indicator is to the left of the meter, and VR1 to the right, with the positive, earth and negative terminals below. With a somewhat similar unit made later, the panel itself was used as heat sink for Tr1, by fitting it about level with S1, under the neon. Electrical isolation of Tr1 from the panel is then essential. Its position was drawn, and paint carefully scraped away over this area (to improve thermal conduction). It was then mounted with the insulation set (mica washer and

bushes) used for this purpose, with thermal conductive compound on panel and transistor surfaces.

Mains current is drawn from a 13A type plug with 2A or 3A fuse. The metal panel makes insulating washers and bushes necessary for the output terminals. Unlike RF circuits, the layout probably has no effect at all on working.

A p.n.p. power type for Tr1 is probably most likely to be found in the spares box. If n.p.n. types were to be used, they should be of similar or better rating to those quoted. With the n.p.n. transistors, it would be necessary to reverse the polarity of the power rectifier, diodes, capacitors, and meter.

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General view of the main hall during the recent ARRA Exhibition at Leicester, at which the total attendance was up on last year, with considerable congestion at times. The Amateur Radio Retailers Association, led by Tom Darn, G3FGY, spent over £2,000 on advertising and say it was worth every penny. It establishes Leicester as the centre to which thousands of radio amateurs and SWL's will come every year.

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# VHF BANDS

NORMAN FITCH, G3FPK

## VHFCC Awards

VHFCC certificate No. 271 for 2m. goes to John Coate, G8GFC, from Mansfield. Like so many of us, he started as an SWL using a one-valve Rx, later supplanted by an HRO. Although the R.A.E. was passed in 1958, it was not until 1972 that the licence was obtained. The first set-up was a 5-watt AM *Micro-wave Modules* Tx, "LGK" converter feeding the HRO, with a 4-ele. beam at 12ft. The station was then moved out of the garage and an FM rig acquired, followed by a *Liner 2* with an 8-ele. beam on a 30ft. *Telomast*. The HRO has been supplemented by a *Trio* JR-599 and the main rig is now a *Yaesu* FT-220 with an FT-200 HF bands transceiver for when the G4 ticket is obtained.

Geoff Austin, G8CIA, from Hatfield Peverel in Essex, has won 2m. certificate No. 272. He passed the R.A.E. way back in 1951 but it was not until 1969 that G8CIA first appeared on the band. Most of the 100 stations were worked using only 10 watts, but the station now runs 45 watts with a home brewed 8-ele. Yagi. Geoff holds the call G6AMI/T but is "receive only" at present. He hopes to pass the Morse test this winter.

## Beacon News

Another beacon is now operating on 23 cm. Situated at Andover in Hampshire, GB3AND is on 1296.87 MHz. From G3COJ, we have received information that CT2BS n the Azores Islands, has a beacon on 144.805 MHz: rather a strange QRG but could be very useful next summer, in the *E's* season. Brian also says that the QRG of the Lerwick beacon, GB3LER, will be 144.965 MHz to avoid possible interference to the proposed F5THF beacon.

The Tyne-Wear Repeater Group has taken over as keeper for the Durham beacon. John Thexton, G3URE, is the Group's secretary and confirms that the new, three-letter call of the beacon will be GB3NEE (North East England) since two-letter calls are now issued for repeaters. As of November 1, site clearance forms have been sent to the Home Office and the Tx has now been returned by *Pye Telecommunications*. It now has high VSWR protection. The old aerials were in a sorry state; the north one was found to be open circuit whilst the south array was severely bent by wind and ice. These factors combined to give a 5:1 SWR and a spurious emission. Although the QRG of 144.935 MHz is but 190 kHz from the receiving frequency of the GB3TW repeater, the latter's aerial will be 400ft. above those of the beacon so it is hoped there will not be any problem. No date has been divulged for the recommissioning of this beacon.

In the October feature, reference was made to more Cornish beacons. The Home Office has now licensed them. The 70 cm. one will be on 432.970 MHz and the 4-metre on 70.675 MHz. Both will use the call GB3CTC but as yet there is no indication when either might appear.

## Repeater News

"GB3NA has been re-born" is how Tony Oakley, G8IWA, puts it now that the Barnsley repeater on R3 is on from its new site. Operation recommenced on October 17 and coverage to the north and east seems to be vastly improved. QSO's are now possible from most locations in Hull. GB3WW, located at Carmel in Dyfed (XL30a) is now operational on R7. The only other 2m. repeater news to hand comes from G3URE who advises that all information on the Tyne-Wear group's GB3TW has been supplied to the Home Office and that all technical obstacles have been overcome. As of Nov. 1, G3URE states, "The licence is awaited daily and the repeater will be capable of being operated in a beacon mode immediately, as the aerials are installed at the approved heights on the IBA Burnhope mast, for which we have received approval."

On the 70 cm. band, GB3LV

should be on from Cheshunt (ZL30g) on RB2. G3NPZ is the secretary of the Portsdown Hill Repeater Group whose GB3PH has been licensed for operation on RB2. It will be sited at Portsdown Hill (ZK15a) overlooking Portsmouth with the aerial at 340ft. a.s.l. The only commercial item will be the UHF, 6 dB co-linear aerial, everything else being made by group members. It sounds as if GB3PH will be one of the simpler repeaters to use. A 1750 Hz tone will turn it on and it will remain on till the last station has finished with it. No "time-outs" or "K" signals, just a short "pip" immediately following the ends of a transmission.

## The Mediterranean Scene

Our regular correspondent from Malta, Henry Souchet, 9H1CD, has sent a very interesting account of activity in southern Europe. In 1973, when he first operated on 2m. the band was used by a handful of AM stations. The next year, Henry and Paul, 9H1BT, went onto FM and the IT9's followed suit. In 1975, they both built SSB transmitters and again the Sicilians did the same. Both the IT9's and the stations in southern Sardinia were very impressed with the DX that Henry and Paul were working. Now, other Mediterranean amateurs are alive to the possibilities of *real* DX and some seem to be being weaned off the repeaters.

On August 12, 9H1BT worked into Israel through a 4Z4 repeater. The next day, Henry kept his aerials towards Israel. Whilst Paul monitored 20m. 9H1CD heard 4Z4MQ on 144.3 MHz and both 9H1BT and 9H1CD jointly made the first Malta/Israel two-metre QSO at 1418 GMT. The QRB works out at 1914 km. and 4Z4MQ was using an *IC-202* at 3-watts p.e.p. to a *vertically* polarised, 5-ele. Yagi!

On August 18, there was some fine tropo. into Israel when *twelve* Israeli stations were worked, most of whom were on FM with vertical aerials using powers between 3 and 50 watts. The Haifa repeater on R3 was very successfully accessed with 18 watts of FM to a *horizontal* array. Henry remarks that usually, cross polarised QSO's on line-of-sight paths show marked attenuation. However, he writes, "It appears

that there must have been a considerable amount of refractions and reflections along the way in order to render the polarisation of the signal to a seemingly circular mode."

The Mediterranean Contest was on August 21 and produced some good tropo. contacts to the west. Four EA3's and three EA6's were logged whilst Italian stations in GB, GC and GV squares came through in superb fashion. There was an 86 minute E's session on August 22 which provided three more squares to bring Henry's total for 2m. to 110. 9H1CD is now QRV on 70 cm. using a *Trio TS-515* and *Microwave Modules MMT432/28* transverter, the aerial being a 48-ele. *Multi-beam* mounted with a 10-ele. *Wisi* for 145 MHz for satellite use, both being az-el mounted. Up to October 25, Henry had made two direct QSO's on 70 cm. SV1KH (KX17d) on Aug. 29 and IT9ZWV (HX64d) on Sept. 28, both being "firsts." It is most encouraging to learn of such VHF/UHF activity. The more occupancy we amateurs can prove, the better fight we should be able to make to retain our bands at WARC 1979.

**Meteor Scatter**

MS enthusiasts are betting ready for the reliable *Geminids* meteor shower in the second week of December. In a recent 2m. QSO G4DGU told your scribe that he plans to assemble a portable station for MS work the idea being to activate some of the rarer QTH squares. Chris mentioned XJ and XL as early possibilities. Regarding squares worked, G3SEK says that SM7AED now has 256 to his credit and doubtless that total has been achieved through a fair number of MS QSO's. The attraction of MS work is that excellent DX can be worked at times when tropo. conditions are at rock bottom.

**Ten Gigahertz**

Shortage of space last month precluded mention of 3 cm. activity by GM3OLK and GM3YOR during their recent trip to Ulster. Two contacts were made into Scotland from GI, with GM30XX/P and GM3DXJ/P who were near Ballantrae in Strathclyde region. Dave, GI3OLK/P, was near Larne in Co. Antrim. The QSO's were over a

| QTH LOCATOR SQUARES TABLE |        |       |      |       |         |   |           |
|---------------------------|--------|-------|------|-------|---------|---|-----------|
| Station                   | 23 cm. | 70 m. | 2 m. | T,tal |         |   |           |
| G8FUF                     | 1      | 76    | 163  | 240   | G8JAH   | — | 1 35 36   |
| G3JXN                     | 16     | 50    | 66   | 132   | G8LLG   | — | 1 24 25   |
| G3COJ                     | 15     | 49    | 63   | 127   | G4CIK/A | — | 1 23 24   |
| G8EOP                     | 8      | 36    | 38   | 82    | G3POI   | — | — 158 158 |
| G2AXI                     | 1      | 34    | 57   | 92    | G3CHN   | — | — 125 125 |
| G8GML                     | 1      | 33    | 74   | 108   | G3FPK   | — | — 122 122 |
| G4BAH                     | —      | 32    | 92   | 124   | G4CDF   | — | — 109 109 |
| G3OHC                     | —      | 26    | 89   | 111   | G6UW    | — | — 85 85   |
| GD2HDZ                    | 8      | 24    | 45   | 77    | G8HHI   | — | — 69 69   |
| G3FIJ                     | —      | 24    | 53   | 77    | G8JJR   | — | — 63 63   |
| G4BWG                     | —      | 22    | 108  | 130   | G4CIK   | — | — 62 62   |
| G3BW                      | —      | 21    | 47   | 68    | G8HAF   | — | — 60 60   |
| GM4CXP                    | —      | 20    | 103  | 123   | G8KPU   | — | — 60 60   |
| G8IWA                     | —      | 17    | 74   | 91    | G8KSP   | — | — 60 60   |
| G4DKX                     | 2      | 16    | 66   | 84    | G8KKX   | — | — 55 55   |
| G4AEZ                     | —      | 15    | 44   | 59    | OZ9IY   | — | — 53 53   |
| G8IFT                     | 5      | 15    | 34   | 54    | GD3YEO  | — | — 52 52   |
| G3XCS                     | —      | 11    | 75   | 86    | G8LHT   | — | — 48 48   |
| G8GII                     | —      | 11    | 62   | 73    | GW8HVP  | — | — 48 48   |
| GC8AAZ                    | —      | 11    | 54   | 65    | G4EYL   | — | — 41 41   |
| G8HVY                     | —      | 10    | 91   | 101   | G8JEF   | — | — 40 40   |
| G8BKR                     | 1      | 6     | 78   | 85    | G8JEF/A | — | — 38 38   |
| 9H1CD                     | —      | 2     | 110  | 112   | G8JAJ   | — | — 24 24   |
| G8KLN                     | —      | 1     | 62   | 63    | G8JKA   | — | — 21 21   |
| G8ITS                     | —      | 1     | 43   | 44    |         |   |           |

Starting Date January 1, 1975. No satellite or repeater QSO's. "Band of the Month" is 70 cm.

67 km. path on Aug. 28 and are believed to have been the first GI/GM contacts on 10 GHz. The gear at the Irish end ran 10 mW. to a 4ft. dish.

**Twenty-Three Centimetres**

In the October column, mention was made of G4DKX's problems in obtaining reliable 1152 MHz power for local oscillator use. G3JXN has passed on a suggestion from G8DKK that the 432 MHz power amplifier design by DJIEE, which appeared in *VHF Communications* for May, 1972, can be very easily adapted for 384 MHz after which a *varactor* tripler can be used to give a few watts of LO power at 1152 MHz.

**Seventy Centimetres**

Not a great deal of news this time. G3OHC (Sutton Coldfield) reckoned that conditions during the UHF

contest on Oct. 2/3 were average. Graham mentions portables G3WIR, G4BRA and GW3UBX as doing quite well and that G3PMH/A was very strong and scoring well. G3OHC says that the *Cumulatives* seem to be very popular this year, the first two sessions producing 36 contacts, best DX being G8AGU/P in Devon. The third period on Oct. 27 started off well with good signals from the south but then a belt of rain soon brought things back to normal! G4BYP (Liverpool) also mentions the fine signal from GW3UBX/P in the contest. Alan's station comprises an *FT-101B* plus *Microwave Modules* transverter running 9 watts p.e.p. to a 46-ele. *Multi-beam* at 46ft.

GD2HDZ (Laxey) felt it hardly worth bothering to write. Arthur's only bit of DX was a good QSO on Oct. 10 with PA0VV. GM4CXP (Borders) caught the tropo. lift on

the 10th but only heard PAØJVY at RST 519 on peaks. During the UHF contest, Derrick only managed two QSO's. May we have some details of how you did in the *Cumulatives*, for next time?

### Two Metres

At G3FPK, conditions have been very poor with all the "standard" U.K. signals well down. G3OHC found things just the same. The hoped for lift in conditions, which has occurred in October in six of the previous seven years according to GD2HDZ, did not materialise. G8BKR (Bristol) worked a few Dutch stations on Oct. 10, all in CM square. The only other Continental heard was a very weak ON, but John heard GW8CFQ working a DJ and calling for DM stations. It's an ill wind . . . On the 17th, G8BKR had a 25-minute SSB contact with EI9BG (VM27c) on a dead band, signal strengths being 6 to 7, during which it transpired that EIØCL is QRV on the band from Clarinbridge in Co. Galway, in VN square.

GM4CXP raised five PA's and a DL during the mini-lift on the 10th and Derrick remarks that the opening lasted from 1900-2400z the barometric pressure falling from 1006 to 998 mB. The weather was overcast with some rain and a light breeze and it seems that GD, GI, EI and stations in north east GM were beneficiaries of this lift. There was an *Aurora* on Oct. 31 which lasted from 1600-1612 with GM4CXP. GM8FFX (Aberdeen) mentions 30 minutes. Derrick's only contact was GM3ZBE, but he heard LA3EQ, SK4MPI, SM5FVN and SK6AB. GM3ZBE is reported to have worked about ten SM/LA stations. Signals peaked at 45° to 50° and there was no second or third phase. It seems that the GM's heard GB3VHF aurorally but there were no G stations logged at all.

### Four Metres

Only two reports this month. G3OHC's main activity has been on 4m. now that the 4-ele. Yagi is up at 25ft. again. Graham went on in the Fixed contest on Oct. 24, ". . . to give a few points away . . ." However, he found himself to be so popular that he took it more

seriously, ending up with 46 contacts in 27 counties and three countries. The best DX was G3XCS (Cnwl.), GC3HFN and GD2HDZ. Other high scoring stations included G3OHH, G3XBY and G4ASR. In his usual concise report from Saltash, G3XCS found that conditions were "rock bottom" in this event.

### Contests

No results are to hand this time. Your scribe took part in the 2m. CW event on Nov. 6 and found conditions poor. No QSO's worth more than 11 points were made and the five-hour session resulted in but 42 contacts. GM4CXP was called at 2340 but was only RST 219. There was a 24 hour, European CW event on as well and stations were heard working DF4KP/P.

The last contest of the year is the 144 MHz Fixed on December 5, and 8-hour affair commencing at 0900 GMT.

### News from The Channel Islands

Lawrence Woolf, GC8AAZ, is now using an 8 X-Y aerial on 2m. and a 12 X-Y on 70 cm., both az-el mounted. He has also raised his 10m. *Quad*. Both the Yagis are phased for circular polarisation which has made a vast improvement when copying mobiles and working through the GB3NC repeater. Other new gear includes an FT-101D and a preamplifier for the FT-220. Some more solid-state power ampli-

fication is envisaged on 2m. and 70 cm.

Syd Smith, GC6AOA/T and GC8EZA, has been using a *Plessey* SL-640 IC as a video modulator into his *Modular Electronics* transverter and has been radiating some good 625-line pictures. GC8AAZ hopes to do the same soon.

### Satellite News

*Oscar 6* celebrated its fourth birthday on Oct. 15 and on that day, the telemetry channel on *Oscar 7* was sending:—"Hi hi de *Oscar 7*. Happy 4th birthday *Oscar 6*. AMSAT wishes users enjoy *Oscar* for many more years." On Nov. 15, 0-7 will have been aloft for two years. So much for the anniversaries.

The success of the QRP days on 0-7 mode "B" has prompted AMSAT to extend the experiment to 0-6. Starting with Wednesday, January 5, 1977, this satellite will be available for QRP stations and users are requested to limit their e.r.p. to ten watts only. This will enable those with low power transceivers to have a chance to use this satellite. For example, a *TS-700* feeding crossed dipoles should be sufficient, particularly for the nearer passes. For the present, however, the 0-6 operating schedule remains ascending orbits on Monday, Thursday and Saturday and descending ones on Sunday. The QRP days for 0-7 in December will be on the 13th and 27th on mode "B."

*Oscar 8* is due to be launched

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with the last ITOS satellite from the Western Test Range, Lampoc, California in June 1977. The orbit will be similar to those of 0-6 and 0-7. AMSAT now advises that the JAMSAT transponder's uplink band will be 145-90-145-95 MHz with an inverted downlink band 435-15-435-10 MHz, giving four watts p.e.p. The second transponder will be similar to 0-7A, viz; 145-85-145-95 uplink and 29-40-29-50 MHz downlink.

The first Phase 3 satellite has been accepted for launch on the second ARIANE mission from the site at Kourou in French Guiana, in December, 1979. This satellite will be the first amateur one to have a small motor on board, necessary to place the device into the desired, highly elliptical orbit. The latest information from AMSAT gives the target perigee as 932 miles and apogee, 24249 miles. If achieved, this will provide a minimum apogee time of 4-5 hours. It will have two transponders on board, both with a 150 kHz bandwidth; 435/145 and 145/435.

On the administrative front, the AMSAT-UK chairman, Pat Gowen, G3IOR, has been elected to the Board of Directors of AMSAT-USA. However, as of the end of October, AMSAT-UK was suffering from a lack of candidates for the posts of membership secretary, treasurer and a printer for *Oscar News*. Now, at G3FPK, we hear several G stations during many daytime passes which would suggest there are some users with time on their hands. Perhaps they would consider helping?

9H1CD is now on Mode "B" and doing well, although Henry confesses he gets no thrill out of satellite QSO's. 6W8AK is now on 0-6, downlink 29520 kHz, and 0-7 mode "A" on 29470 kHz with 12 watts.

### Final Miscellany

The Farnborough and District Radio Society advises of an "Activity Day" on Dec. 12 to promote its *Blackwater Valley Award*, details of which can be obtained from G8ATK (QTHR). The sessions are from 1000-1200 and 1400-1600 on

### THREE BAND ANNUAL VHF TABLE

January to December 1976

| Station | FOUR METRES |           | TWO METRES |           | 70 CENTIMETRES |           | TOTAL Points |
|---------|-------------|-----------|------------|-----------|----------------|-----------|--------------|
|         | Counties    | Countries | Counties   | Countries | Counties       | Countries |              |
| G3BW    | 62          | 7         | 65         | 14        | 40             | 6         | 194          |
| G2AXI   | 49          | 7         | 61         | 15        | 42             | 8         | 182          |
| GD2HDZ  | 52          | 6         | 60         | 12        | 43             | 7         | 180          |
| G3FIJ   | 51          | 7         | 58         | 14        | 34             | 10        | 174          |
| G3OHC   | 40          | 5         | 57         | 12        | 47             | 9         | 170          |
| G5DF    | 43          | 5         | 63         | 13        | 30             | 9         | 163          |
| G4BWG   | 44          | 6         | 64         | 21        | 19             | 5         | 159          |
| G3XCS   | 43          | 7         | 59         | 17        | 18             | 5         | 149          |
| GM4CXP  | 16          | 4         | 70         | 19        | 20             | 9         | 138          |
| G4BYP   | 41          | 7         | 58         | 9         | 18             | 5         | 138          |
| G8HBQ   | —           | —         | 69         | 13        | 43             | 8         | 133          |
| G3BOC   | 52          | 7         | 60         | 13        | —              | —         | 132          |
| G8GML   | —           | —         | 61         | 13        | 38             | 10        | 122          |
| G4AEZ   | 32          | 6         | 46         | 12        | 13             | 3         | 112          |
| G8GII   | —           | —         | 54         | 16        | 25             | 6         | 101          |
| G3FPK   | —           | —         | 75         | 21        | —              | —         | 96           |
| G8BKR   | —           | —         | 72         | 13        | 6              | 2         | 93           |
| G3ILO   | —           | —         | 61         | 18        | 6              | 2         | 87           |
| G4DKX   | 14          | 2         | 45         | 13        | 4              | 7         | 85           |
| GD3YEO  | 9           | 6         | 57         | 13        | —              | —         | 85           |
| G8EOP   | —           | —         | 28         | 8         | 35             | 9         | 80           |
| G8KLN   | —           | —         | 53         | 16        | 1              | 1         | 71           |
| G8HHI   | —           | —         | 54         | 13        | —              | —         | 67           |
| G8ITS   | —           | —         | 48         | 13        | —              | —         | 61           |
| G8KKX   | —           | —         | 45         | 13        | —              | —         | 58           |
| G8KSP   | —           | —         | 47         | 11        | —              | —         | 58           |
| G8HAF   | —           | —         | 46         | 10        | —              | —         | 56           |
| GC8AAZ  | —           | —         | 26         | 10        | 10             | 5         | 51           |
| G8IFT   | —           | —         | 20         | 5         | 12             | 4         | 41           |
| G8JAJ   | —           | —         | 31         | 6         | —              | —         | 37           |
| G8GLS   | —           | —         | 18         | 4         | —              | —         | 22           |
| G8LGZ   | —           | —         | 9          | 3         | 2              | 1         | 15           |

S22 FM and 144.28 MHz SSB, and 1900-2100 on S22 and 144.26 MHz SSB.

G3ZNZ informs that he has won a 1st class *UKW Europa-Diploma* from DARC, the first such award to a British station. Details from DK50D.

### Deadlines

Please send everything for the January issue by Dec. 10 and for the February piece by Jan. 7 to: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. 73 de G3FPK es Happy Christmas!

This space is for the publication of the addresses of holders of new call signs, or changes of address, in EI, G, GC, GD, GI, GM and GW of stations not already listed. All addresses published here will appear in the U.K. section of the American "CALL BOOK" in preparation. Please write clearly and address on a separate slip to QTH Section. Be sure to give correct County designation and post-code. In the case of direct subscribers needing Change of Address, please state for card index adjustment. Address items for this space to: "New QTH Page," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ.

## NEW QTH's

EIIDA, H. H. C. Graepel, Kinsale (72292), Cork, Eire.

EI6DA, P. Mooney, 19 Beechmount Avenue Balreask, Navan, Co. Meath, Eire.

EI7CW (Mrs.) C. F. Dixon, The Point, Crosshaven, Co. Cork, Eire.

EI9AB, K. E. Dixon, The Point, Crosshaven, Co. Cork, Eire.

EI9DA, K. Dalby, Granarogue, Carrickmacross P.O., Co. Monaghan, Eire. (042 61026.)

GW3GXY, L. J. Lester, 16 Pill Lane, Milford Haven (3215), Dyfed, SA73 22B. (re-issue.)

G3IBH, D. G. K. Guy, 12 Broadmead, Hitchin, Herts., SG4 9LU. (re-issue.)

G4FAS, G. Royle, 56 Branksome Drive, Cheadle, Cheshire, SK8 3AJ. (061-437 7784.)

G4FBC, R. M. Heron (ex-G8KVH), Mire House, Whitehaven (5041), Cumbria, CA28 9RH.

GM4FDM, T. Wylie, 38 Rosedale Avenue, Paisley, PA2 0RR.

G4FEG, J. S. Shaw, 24 Sally Close, Wickhamford, Evesham (831200), Worcs., WR11 6RX.

G4FEU, T. Southwell, 12 Chequer Lane, Upholland (0695 622006.) Lancs., WN8 0DE.

G4FHX, R. Smith, 37 Colburn Avenue, Hatch End, Pinner, Middlesex, HA5 4PG.

G4FIJ, A. C. Thompson (ex-G8LLO), 13 Rosewood Drive, Clews Hill, Enfield, Middlesex, EN2 9BT. (01-363 5638.)

GM4FIW, S. D. McNaughton, The Haining, Ormiston Hall, Ormiston, East Lothian, EH35 5NJ. (0875 340319.)

G4FJI, R. Allison, 6 Harpur Avenue, Littleover, Derby, DE3 7EJ.

G4FJJ, D. Bayliss, 69 Buckingham Road, Rowley Regis, Warley, West Midlands, B65 9LE.

G4FJY, A. L. Ward, 488 Earham Road, Norwich (55687), Norfolk, NR4 7HP.

G4FKC, L. West, 107 Marlborough Road, Langley, Slough, Berks., SL3 7JS.

G4FKH, G. Williams, 120 Linnett Drive Chelmsford, Essex, CM2 8AG.

G4FKI, D. Thorpe, 161 Tomswood Hill, Hainault, Ilford, Essex, IG6 2HR.

G4FKJ, S. J. H. Cotton, Little Manhay, Manhay, Helston, Cornwall. (03265 2044.)

G4FKV, P. J. Bone, 2 Stanley Road, Cliftonville, Margate, Kent, CT9 2DL.

G4FLE, R. Anderson, 27 Bannard Road, Tittle Row, Maidenhead, Berks, SL6 4NP. (0628 25764.)

G4FLF, W. Collins, 14 Moss Valley, Leeds (0532 675656), West Yorkshire, LS17 N5.

G4FLK, A. E. Phelps, 2 Cecil Close, Corfe Mullen, Dorset.

GW4FLZ, D. Fennah, 14 Highfield, Hawarden, Deeside, Clwyd, CH5 3LR.

G4FMD, M. Connah (ex-G8IMF), 135 Sevenfields, Highworth, Swindon, Wilts., SN6 7NQ.

G4FMM, T. Walsh, 106 Westgate, Elland (75449), West Yorks.

G4FMN, J. L. W. Smith, 42 Westfield Avenue, Ashchurch, Tewkesbury (294454), Glos.

G4FMO, C. Palmer, 124 Woodside, Ashby-de-la-Zouch, Leics.

G8LVE, B. J. Salt, 135 Kingsland, Harlow (0279 20478), Essex, CM18 6XW.

G8LXZ, A. R. Bellfield, 195 Covington Way, Streatham, London, SW16 3BY.

G8LZK, M. J. Ball, 46 Garns gate Road, Long Sutton, Nr. Spalding, Lincs., PE12 9BT.

G8MDQ, V. R. T. Peake, 25 Neafes Close, Harbury (613237), Nr. Leamington, Warks., CV33 9JQ.

G8MFV, R. Hickmott, 24 Rom Crescent, Romford, Essex, RM7 0PP.

G8MFX, P. L. King, 32 Trenchard Park, Bordon, Hants., GU35 0JY.

G8MHT, G. Dallaway, 108 Valiant Road, Albrighton, Wolverhampton, West Midlands, WV7 3NN.

G8MHX, F. E. Mance, 2 Shortheath Crest, Farnham (3642), Surrey, GU9 8SA.

G8MIC, M. P. Williams, 53 Highpoint, North Hill, Highgate, London, N6 4AZ.

G8MIG, J. Gray, 9 New Road, Hextable, Nr. Swanley, Kent, BR8 7LS.

G8MJZ, M. Taylor, 99 Upsdell Avenue, Palmers Green, London, N13 6JJ. (01-889 1787.)

GI8MOA, J. Mitchell, 26 Argyle Street, Londonderry, BT48 7JG, Northern Ireland.

GW8MOZ, G. T. Elliott, 44 Nash Grove, Liswerry, Newport (271001), Gwent, NPT 0NN.

G8MPN, J. H. Watt, 19 Princes Garden, Codsall, Wolverhampton, West Midlands, WV8 2DH.

G3CIM, S. A. Denney, 35 Friars Quay, Norwich, Norfolk, NR3 1ES.

G3CWI, R. Newstead, 13 Valentine Road, Leicester (415301), LE5 2GH.

G3FWE, V. G. Scambell, 52 Freshwater Road, Cosham, Hants.

G31WE, A. M. H. Wyse, 26 Parkland Close, Appleton Thorn, Warrington, Ches., WA4 4RH.

G3JLZ, V. J. Ludlow, 19 Chelswood Avenue, Milton, Weston-s-Mare, Avon, BS22 8QP.

G3KNJ, R. J. Wyatt, 8 Millbrook Road, Bushey, Herts., WD2 2BU.

G3OIN, J. G. Nicholas (ex-GW3OIN), 72 Yew Tree Lane, Pannal Ash, Harrogate, North Yorkshire.

G3OQC, J. W. Woods, 158 Parkwood, Walters Ash, High Wycombe, Bucks.

G3POP, A. W. Leaman, 51 Coniston Avenue, Nethercourt, Ramsgate, Kent.

G3PTJ, A. Robinson, 35 Farrow Road, Leeds, West Yorkshire, LS12 3TB.

G3XFH, D. E. A. Watts, 29 Pensford Court, Craydon Road, Stockwood, Bristol, Avon, BS14 8EQ.

G3YLL, R. F. Brooks, 2 Windsor Close, Carterton, Oxon., OX8 3PQ.

G3YMM, T. F. Campbell Davis (EI4BY), London House, Mecklenburg Square, London, WC1B 2AB.

G4BLP, S. Wootton, Stavros, Southam Lane, Southam, Cheltenham, Glos., GL52 3NY.

G4BYY, K. Plumridge, 13 Grosvenor Gardens, Southampton, Hants., SO3 3BP.

GM4CXF, J. Thompson, 20 Gradlon Place Falkirk, Stirlingshire, FK1 1QR.

G4DCV, P. Whatton, 21 High Street, Dover (0304 202265), Kent, CT16 1EB.

G4EBW, G. W. Sutton, 8 St. Michael's Road, Stramshall, Utttoxeter (9941 2821), Staffs.

G4EMN, Col. G. D. Cole, 6 St. Anthony's Road, Bournemouth (20027), Dorset, BH2 6PD.

G4FEA, C. J. Beezley, 152 West Heath Road, Cove, Farnborough, Hants., GU14 8PL.

G8APX, W. H. Jarvis (ex-GM8APX), Salewheel House, Ribchester, Preston, Lancs., PR3 3XU.

G8CZH, S. H. Clarke, 33 Southend Crescent, Eltham, London, SE9 2SG.

G8DZC, P. J. Makosz, 5 Cricket Field Grove, Crowthorne (71859), Berks., RG11 7EJ.

G8HUY, J. C. Hill (D4ABA), 172 Clothierholme Park, Ripon, North Yorkshire, NG4 2HR.

GM8HXM, P. Brown, 17 Links View, Port Seton, Prestonpans, East Lothian, EH32 0EY.

G8JAW, B. S. Heed, 295 Rutland Avenue, High Wycombe, Bucks.

GM8JPT, K. W. Turner, 31 Duddington Park South, Edinburgh, EH15 3NZ. (031-669 3363.)

GM8KDF, D. M. McNaughton, B.Sc., M.P.S., 50 High Street, Trantest, East Lothian, EH33 1HQ.

GW8LXA, W. A. Griffiths, 3 Garreglwyd Park, South Stack Road, Holyhead, Anglesey.

G8MFV, R. Hickmott, 24 Rom Crescent, Romford, Essex, RM7 0PP.

### CHANGE OF ADDRESS

EI4BY, T. F. Campbell Davis, The Manse, College Road, Sligo, Eire. (QSL via G3YMM.)

G3ABJ, E. R. Coleman, Highfure, Billingshurst, West Sussex, RH14 9EL.

## THE MONTH WITH THE CLUBS

By "*Club Secretary*"

(Deadline for January issue: December 11)

THE very first thing is to remind you all about MCC, the rules for which were given in full last time out on p.551, November—see you on Top Band on those evenings of December 4 and 5.

Having had several enquiries on the point, this is to confirm that, as in previous years, Clubs may enter separate A, B, C, stations if they so wish. Some of the larger Clubs, or those with sufficient operators able and wishing to take part, often pick a "first team" and also run B and C stations to give Contest experience to those who have not previously taken part in MCC or similar events. This also makes the Club's participation more interesting and finds more for the SWL's to do in the back-up role.

### The Mail

At first, quite an alarmingly large pile it seemed to be but, as usual, once we got it all opened and flattened out, it began to look more normal.

Top of the pile is **Derby**, where they have every Wednesday evening booked at 119 Green Lane, at 7.30; December 1, is a Surplus Sale, and there is a Constructor's Contest on the 8th. A film or video show is down for December 15, and on the 22nd there is the Christmas Party, which leaves December 29, when under the Title of "All our Yesterdays" there will be a slide show of the Club events through the past year.

**Milton Keynes** will be delving into the mysteries of Microprocessors, led by G8MGW, at Lovat Hall, Newport Pagnell, on December 13; as they meet monthly, we are able to give forward dates of January 10, and February 14.

Now to **Swindon**, who confine themselves to saying that the programme is "as previously notified" but that any intending visitors should contact the Secretary—the amended address appears in the Panel—for details of the meeting-place for any particular meeting.

**Bournemouth/Poole (Wessex ARG)** base their activities around a monthly session at the Portman Hotel, Ashley Road, Boscombe; the change of venue from the old Hq. has brought in its wake a rise in membership. They also have a Club project going for which they have a gathering around the middle of the month, the date being given at the previous main meeting; and there are nets on Four, Two, and Eighty on different evenings each week, not to mention another one proposed for Sunday mornings. On November 3, there will be a Bring-and-Buy Junk Sale, followed by a discussion and progress report on their Marconi Event over December 10-12, for which we refer you to "Communications and DX News" elsewhere in this issue, for details both of the station itself and the accompanying exhibition.

Back to **Derby** again now, this time to the **Nunsfield House** chaps, who, as their name implies, are based at Nunsfield House Community Association, Boulton Lane, Alvaston, where they can be found every Friday evening. G4CTZ takes the stand on December 3, to

talk about Motor Vehicle Suppression, whilst on the 10th the speaker is to be G3TVU, subject not specified. December 17 is down for a look at the year in Retrospect in words and pictures, while the Christmas Eve date is cancelled: but on New Year's Eve they are back in business with a Night on the Air.

**Cheltenham RSGB** is only one of several groups in the area, but it is by far the most regular reporter by way of a monthly copy of the *Newsletter*, from which we gather that on December 2 it is hoped to have a film show. The venue nowadays is the Old Bakery, Chester Walk, behind the Public Library in Clarence Street, and for future reference, always the first Thursday in the month.

Down West now, to **Cornish**, who are to be found at the SWEB Clubroom, Pool, Camborne, on December 2, for a Social Evening and a Quiz, the latter arranged by G3VWK. And, as a hint to those Club secretaries who complain as to their remoteness and consequent disability to get members for this reason, the *Cornish Link* this time runs a list of paid-up members—over 150 of them in the main list and eight in the group of new members welcomed!

This time we have from **Northern Heights** both a letter from the secretary and a *Newsletter*. From G3MDW we get it—make a note, you other Club secretaries!—that the WIBB tape-and-slide lecture is still available to other Clubs for no more charge than the postage. The members are to be found at the Peat Pitts Inn, Ogden, Halifax, on alternate Wednesdays, which gives us December 15, for a talk on Radio Control, by G3UGF, and December 29 for an Open evening.

It isn't very often that we hear from **Oxford**, but we understand they are now getting together regularly on the second and fourth Wednesday of each month at the Civil Service Social Club, Marston Road, with a winter programme being formulated at the time of their letter; and a large interest in this Club is D/F, in which they are quite active.

Urgent news! **Harrow** had a Hq. problem, and the Club committee moved with commendable promptitude to resolve the difficulty; hence they are now based on Roxeth Community Centre, where they continue to assemble every Friday. However, it should be noted that they won't be in on November 26, as this is their 30th anniversary dinner, neither will they be available on Christmas Eve or New Year's Eve. Thus we are left with December 3, for a Practical Evening, with R.A.E. revision thrown in, and on the 10th a Discussion on the current Citizens Band agitation; while on December 17, G4CRG and G4CRJ combine forces to unravel some of the mysteries of MORVID.

Over the water now, to **Bangor** in GI-land, where they have Hq. at the Redcliff Hotel; on December 3, the previously announced October talk on Aerials will be given. Another time to find them is by going to the Club shack—at the same place, Redcliff Hotel—on Tuesday or Saturday evenings for the nets on VHF.

December in **Peterborough** is down for a Social evening at the Scout Hut, Occupation Road, on December 10, the start being at 7.30 p.m.

For **Cray Valley**, the dates are, as always, the first and third Thursdays in the month, and the venue the Eltham United Reformed Church Hall, 1 Court Road, London

S.E.9. As for the programme, they always have something "set" for the first meeting, and the other one is often an informal affair; but no doubt G3YWO could bring you right up-to-date if you are thinking of a visit.

The York crew seem to manage to attract interesting speakers, a recent one being HC1RT, Roger Stubbe, who gave them a mouth-watering description of an aerial farm covering 100 acres and using 400-foot towers! Another "high-flyer" speaker was the local RSGB R.R., who discussed his results from 500 feet up on the Humber Bridge with an AT5 transmitter; these two talks in successive weeks give some idea of the sort of thing that happen each Friday evening (except the third one) in the month at the British Legion Club, 61 Micklegate.

Oddly enough, Bishops Stortford also have Hq, at the local British Legion, where, on December 20, G3XJE will be coming down from Cambridge to give his talk on "LDE's—the UFO's of Radio," complete with slides and recordings. LDE's, of course, are Long Delayed Echoes—signals that are heard seconds or even minutes after they have been transmitted, and a subject of intense interest scientifically, both here and in the U.S. Visitors, and other groups, are specially invited to this one, but please give the Secretary a ring or drop him a line first, lest the group end up "on the night" without enough seating!

Now over to Echelford where a problem has arisen over dates; thus it should be noted that the talk on Repeaters is now being given by G8AAI on December 6, at St. Martins Court, Kingston Crescent, Ashford, Middlesex, while the session on December 30 is to be held at The Links Hotel in Ashford.

The front page of the Royal Navy Club newsletter this time shows a picture of Concorde 02 on the ground at Yeovilton, where she is now on display, with the last airworthy Swordfish flying over her in salute. This is the one for anyone who has an R.N. or M.N. connection.

Our note from White Rose this time mentions the Christmas dinner dance on December 23 and also the White Rose Rally date of April 3, 1977, on which they are already working hard. As for the normal routine, they have a weekly session in their own place in which they have a shack, a main meeting-room, tea-brewing facilities and a pub next door—for more details, contact G4DZI at the address in the Panel.

Any readers who are, or have been, ZB2 types should take note that on the first Saturday in each month, on a frequency of 14120 kHz at noon GMT, there will be a net meeting of all past and present ZB2's. For more details on the Gibraltar Club itself, get in touch with the Secretary—see Panel.

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 WORCESTER: D. Cowden, G4DXE, 20 Constance Road, Worcester WR3 7NF.  
 YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

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Another echo of summer — some members of the Plymouth Radio Club at their mobile picnic held locally, when they took gear out into the sunshine. In the picture are G3LMG, G3SCW, G3ZZS, G3PYQ and G8LAK.

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The **Surrey** group meet at *T.S. Terra Nova* on the first and third Wednesday in each month, the first date normally being the "main" one with lecture or whatever, and the second the informal—more details from G3FWR, as in the Panel.

On the **Royal Air Force**, by way of their Newsletter, *QRV*—if you are in or ever served in the R.A.F., you ought to be a member—there is so much of interest in the *Newsletter*, quite apart from the other benefits.

**Nottingham** are, as usual, getting together every week in December; a Forum on December 2, Activity Nights on the 16th and 30th, a Social Evening and Slide Show, the latter by ex-VP8NO, on the 9th, and finally a new departure for the group, by way of a Brains Trust on December 23, to stimulate the brain cells before Christmas! All, saving for the "do" on December 9, are at Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham; as for the 9th, please get in touch with G4EKW for more details.

The **Axe Vale** membership is scattered over quite a large area, but that does not stop 'em from having the first Thursday in each month booked at St. John's Hall, Colyford Road, Seaton; the December session is on Speech Processing, by G4BZE.

Back to the Metropolis, by way of **Acton, Brentford and Chiswick**, who have their Hq. at the Chiswick Trades and Social Club, 66 High Road, Chiswick, where, on December 21, they foregather to listen to G3CCD talking about his Versatower in Operational Use.

Tacked on to the tail of a Change of Address note, we get in that **Farnborough** are booked for December 8 for the new chairman's Evening and the 22nd for a Christmas Social, at which you are required to bring your own mistletoe! For more details, contact the Secretary, as Panel.

G3FPK, apart from being the compiler of *Mobile News*, is also a vice-president of *Amateur Radio News Service*; this is largely for the poor boobs who are shot-

gunned into being a Club news-sheet producer, and, apart from lots of useful material to quote, there are some articles on the How-to-Do-It side which can save the newcomer to Newsletter work lots of headaches. If you want to know more, get in touch with G3FPK at the address in the Panel.

**B.A.R.T.G.** is the group covering the RTTY field of activity; the committee types are now flogging their way through all the queries left on their stand at Leicester, while they also have 32 new members to process from the same show; and of course the members made themselves known to each other also during the Show by using the stand as a venue. If you have any interest in RTTY, either as SWL or transmitting amateur, this group is a must for you.

Up North now to **Glenrothes**, where they have just had their AGM, and elected that well-known DX pair GM3OLK and GM3YOR as chairman and secretary respectively. They have informals every Wednesday, and the formal one on the first Sunday in the month, all at the Club Room, Provosts Land, Douglas Road, Leslie.

**North Staffs.** are based on the Harold Clowes Community Centre, Bentilee, Bucknall, Stoke-on-Trent, where they are booked in every Monday evening; the first and third one in each month is given over to lectures and similar items, while the remaining weeks are used for natter sessions, Raynet and operating the Club call G4BEM.

A Junk Sale is down for December at **Crystal Palace**, where the venue is the Church Hall, Emmanuel Church, Barry Road, London, S.E.22. The date is always the first Saturday in the month.

Now we press on to **Sutton & Cheam** where the normal routine is to assemble at the Sutton College of Liberal Arts, Cheam Road, Sutton on the third Thursday in each month. However, we notice that for *December* only they have a Junk Sale at Ray's Social Club on *Wednesday*, December 16; for more details and con-

firmation, get in touch with G4BOX at the address in the Panel.

**Hinckley** get together fortnightly at the Westfield Activity Centre, Rosemary Way, Hinckley, which we calculate to mean December 8 and 22—but it would be wise to check with G4EPN (*see* Panel) for the dates, as we are extrapolating from his November data, which missed the deadline last time.

**North Kent** have their place at St. Mary's Institute, 2 North Cray Road, Bexley, on the second and fourth Thursdays of each month; unfortunately we do not have any details of what is set up for the December dates, for which we must refer you to the Secretary.

The new cover for the **Mid-Sussex** newsletter is quite eye-catching, and the standard of presentation inside is good too; all the required information about the Club, and some interesting articles, too, not to mention the best half-tone pictures we have come across in a Club Newsletter. From it we learn that they are still based at Marle Place, Burgess Hill—by the look of the cover picture you should find it easily enough just be looking out for the aerial arrays, with a trapped tri-band beam above the tower, a VHF array above that, and also some LF-band aerials in evidence. December 2 is set aside for Frank Templeton to talk about Meters—Principle, Condition and Care, while on the 16th they have a Christmas Party.

The **Southgate Newsletter** is always a bit "out of phase" with us in that it is geared to their monthly programme, for which it serves as a reminder. However, we can say that it is the Scout Hut, Wilson Street, just off Winchmore Hill Green, which is the Hq.; and we can also add to that the routine is to have the second Thursday; and from another paragraph on a different page we see that though they have been having some difficulty getting speakers of late, the situation has improved to the point where they have firm bookings into the New Year.

**Stourbridge** also produce a nice *Newsletter*; and of more than usual interest in that it was (more years ago than we care to think of!) this Club which first introduced your conductor to the idea of being a member of *any* Club, and the benefits a beginner can obtain from contact with those of more experience who just *like* helping others on. They have the formal meetings these days at Longlands School, Brook Street, Stourbridge, while the informals are at the "Shrubbery Cottage" in Heath Lane. As for dates, we see the annual dinner on December 6, followed on 7th by the informal meeting, after which they wait for December 20 and the Annual Junk Sale.

The **Bury** Secretary apologises for missing the last few months, due to his salt-mine pressures; but he comes back in fine style, with all the relevant gen set out at a glance. The venue is the Mosses Community Centre, Cecil Street, Bury, where they have a booking every Tuesday, with the *second* one in each month being the "main" one. For December this will be the all-important AGM, on the 14th.

It looks like every Monday evening for **Wolverhampton**, at Neachells Cottage, Danescourt Road, Stockwell End; with the proviso that the December 20 date is shifted to the Anchor Inn, Coven, and the one on

the 27th is missed altogether. That leaves us with December 6 for a Junk Sale, and a "Natter Nite" on December 13.

Another group who have heard the talk by HC1RT is **Verulam**, who reported it as a memorable evening. For December, on 23rd there is the AGM, followed by a Film Show—all members please note and attend! The informal session is on December 9 at the R.A.F.A. Hq., while the AGM previously mentioned is at the Market Hall, St. Albans.

After nine years in office the treasurer at **Southdown** has signified his desire to step down at the AGM on December 6, as he is moving away; but the lads felt strongly enough about it to record a vote of thanks for services rendered over such a long period. The Hq. address is the Victoria Hotel, Latimer Road, Eastbourne.

At **Worcester**, they have a place at the Old Pheasant Inn, New Street, where they can be found on December 6 and 18; however, the *Newsletter* we have does not show the programme details as far ahead as this, which means that if you want the very latest, we have to recommend you to get in touch with G4DXE, *see* Panel.

The **Spalding** December is dominated by the Christmas get-together at the Ship Albion, Albion Street; admission 15p, a grand raffle, refreshments, and a trade stand by J. Birkett are among the attractions of this one, which seems to go from strength to strength as the years go on. This is the lot for Spalding's southern area, but the northern area of the group have a date on December 16 at the William Lovell Secondard School, Stickney, on the A16.

Back up north again, to **Scarborough**, where they are to be found at the Technical College in Scalby Road, every Friday evening; and if the phrases used to describe the welcome given to both SWL's and licensed types are anything to go by this is one group that does not discriminate between the two categories.

**Edgware** start their letter by indicating their support for MCC—that's the spirit! December 9 is down for the pre-Christmas Junk Sale, and January 13 is the AGM—members to please note! For the rest, we are to refer you to G4BZY, *see* Panel.

From **Chiltern**, we have the latest copy of their *Chiltern Carrier*, a useful one-sheet compilation, from which we get it that their Wednesday-evening meetings are at 42 Castle Street, High Wycombe, start at 8.0 p.m.—but there is nothing more till January 26, which is the AGM, when a new chairman is to be elected. For the February meeting, they are running an event called "I built it Myself," which should be interesting.

The **Guildford** report mentions the much-lamented passing of Eric Rawlings, G5RS, who was a founder-member and president of this Society; he was an Old Timer, licensed in the early days. Their construction contest attracted no less than 14 projects, and recently they had an interesting visit to the Oscar Control Centre, located at the University of Surrey, with G3YJO in charge. Their next scheduled meeting is for December 10, on Keyers.

At **Hereford**, the meeting on December 3 will deal with Pulse Code Modulation, by G4BBR. They meet at the County Control centre, Civil Defence Hq., in Gaol Street, and have their own callsign, G3YDD. They

hope to be heard in MCC.

The R.A.I.B.C. continues its fine work, and goes from strength to strength, with the finances in very sound condition. Those who work for this group devote their energies to helping the blind and/or disabled members of the Amateur Radio fraternity and they have built up a strong and effective organisation. But they require both help and money and as R.A.I.B.C. can be regarded as a genuine Amateur Radio undertaking, to be commended for the work it does for our less-favoured brethren—well, you get the message?

Down at **Torquay**, they have two newly-licensed G4/3's and their total membership is now at the hundred mark. Their next event is a Christmas party on December 11, at the Club-room, Bath Lane, 94 Belgrave Road.

### Signing

This being the last "Month with the Clubs" for 1976, it is time to wish all the readers and the Club scribes, secretaries and Newsletter writers who produce the material from which this piece is made each month, a Merry Christmas and a Happy New Year.

Now, for the January issue the deadline will be to arrive by first post on **December 11**, addressed as always to "Club Secretary," **SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ**. It's tight, we know; but this time we have the Christmas postal delays to contend with to make things even more difficult!

## Short Report

### SCIENCE RESEARCH COUNCIL

#### ASTRONOMY, SPACE AND RADIO

**T**HE year has been one of outstanding scientific results, both observational and theoretical. Highlights included unique work on pulsars, important theoretical work on "black holes" and the continuing success of experiments using the X-ray satellite *Ariel V*.

In radio astronomy the systematic mapping of radio sources using the 5km telescope at the Mullard Radio Astronomy Observatory, Cambridge, has revealed structural detail giving important clues to the energy supply mechanism in these sources. New and important work on the proper motion of pulsars carried out at the Nuffield Radio Astronomy Laboratory, Jodrell Bank, has shown that one of these objects has a velocity of approximately 100 km. per second and a pulsar distribution thickness of 800 light years which implies a lower pulsar age than is generally assumed.

The continuing success of the *Ariel V* satellite has made 1975 an even more outstanding year for X-ray astronomy than 1974. Improved location of one faint source has led to its possible identification with a rich cluster of galaxies, at a distance of 3,000 million light years, whose luminosity is second only to that of the quasar 3C273. Another discovery was a transient source in the Milky Way which became the strongest cosmic X-ray source ever located; the early detection of this optical nova allowed subsequent world wide observation at ultra-violet, infra-red and radio wavelengths. An important result, entirely unexpected by theoreticians,

was the discovery of slow pulsars with periods of minutes associated with both transient and ordinary X-ray sources. Another *Ariel V* experiment is providing the most direct evidence so far obtained that the general view regarding the production of heavy elements in the cores of massive stars is in fact correct.

Good progress is reported on the construction of a 3.8m. infra-red telescope on Mauna Kea, Hawaii, which will provide U.K. astronomers with the largest purpose-built infra-red telescope in the world. Meanwhile observations of the Large Magellanic Cloud using the Anglo-Australian telescope have located the first stars in an external galaxy to show infra-red excess due to a dust envelope. This 3.9m. optical telescope was brought into regular scheduled operation in June 1975. The telescope is located at Siding Springs in Australia on the same site as the Science Research Council's 1.22m. Schmidt telescope. Many important results using these and other optical telescopes have been obtained during the year, including the detailed study of a spectacular galaxy dubbed the "Cartwheel," which was probably formed some 300 million years ago as a result of a collision between galaxies; it is estimated that the supernova rate in the Cartwheel may be as high as one per year. Another outstanding result is the discovery of extensive new nebulosities and structure in the Magellanic Clouds, supernovae remnants and elsewhere.

Analysis of data from the ESA satellite TD-1A at University College, London, has revealed the presence of a strong ultra-violet absorption band in a nebula ejected from a hot object originally thought to be a supernova remnant. This result is very surprising and poses serious problems for existing theories as to its origin.

Theoretical work, which could prove to be one of the most important contributions to science for some years, has continued at Cambridge on developing the thesis that "black holes" radiate by a quantum mechanical process of particle (pair) creation and on the extension of this work to the process of pair creation in the early stages of the expanding universe.

#### Upper Atmosphere Research

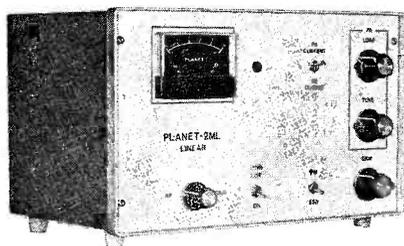
The study of the complex physics of the magnetosphere, the ionosphere and the atmosphere has continued using a wide range of satellite, rocket and ground-based methods. Measurements using a series of rockets have shown a marked variation of electron and NO<sup>+</sup> concentrations over the height range 70-90km.; the results confirm that enhanced electron concentrations are caused by large increases in nitric oxide concentration at mesospheric altitudes, indicating dramatically the importance and variability of transient phenomena in the so-called Winter Anomaly.

The Royal Greenwich Observatory is collaborating with the US Naval Research Laboratory on a project to compare time-scales of countries in all parts of the world. Improvements of a factor of 2 compared with the Loran-C system have already been achieved and further improvements are expected.

Finally, the Report mentions some of the possible new projects under consideration by the Board but the funds available will severely restrict the projects reaching fruition to a small fraction of those proposed.

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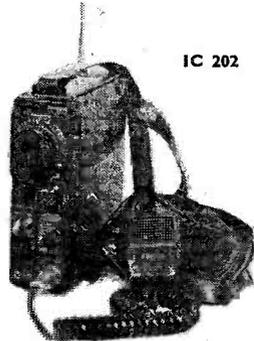
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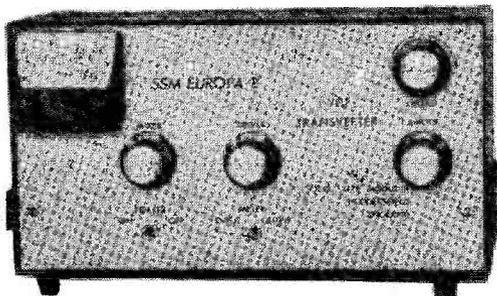
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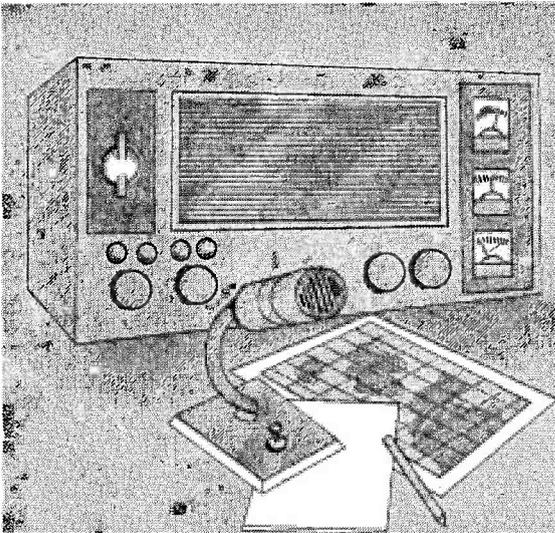
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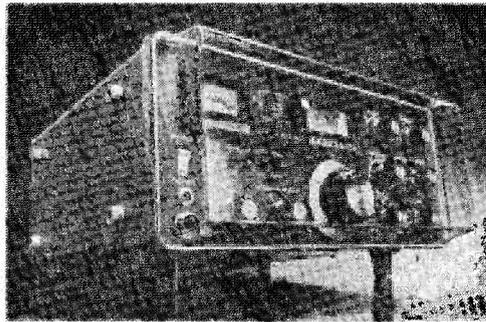
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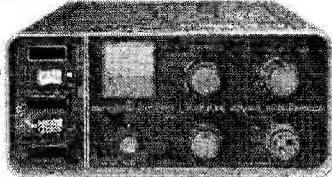
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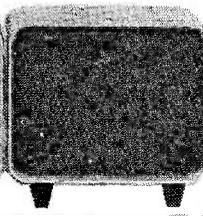
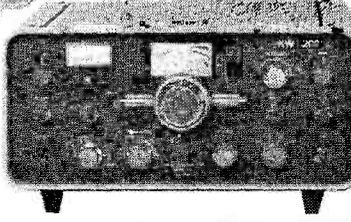
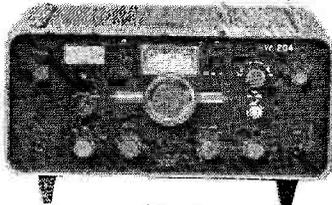


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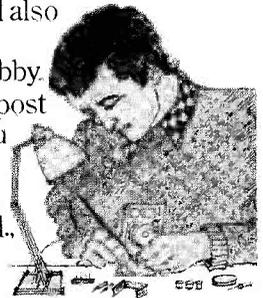
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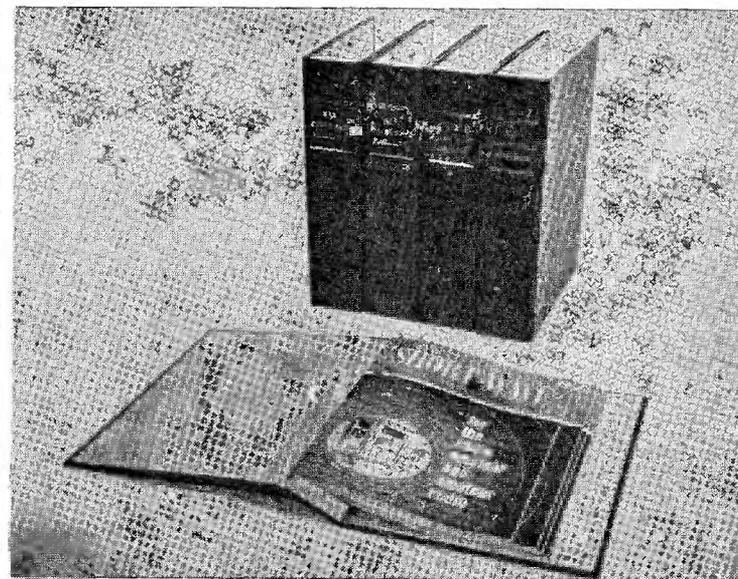
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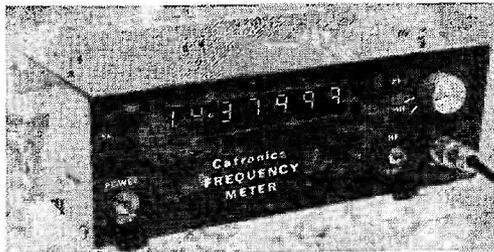
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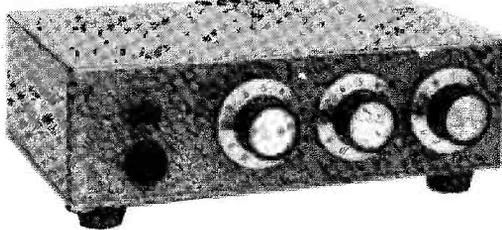
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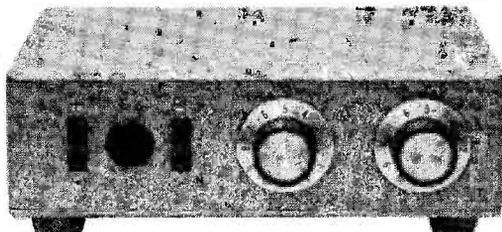
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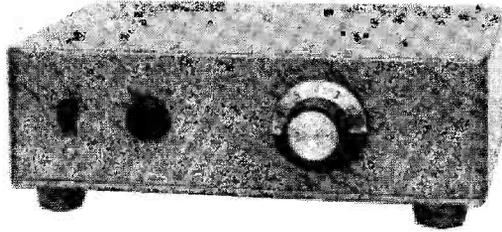
**AUDIO COMPRESSOR** ★ Suitable for SSB/AM/FM ★ pure compression, no clipping! ★ 24 to 26dBs of compression, with less than 1% distortion ★ variable decay time, on front panel ★ variable noise gate on front panel prevents ambient noise level tripping vox or being tx in pauses in speech ★ all functions routed to output in "off" position ★ goes between mic and tx no mode involved ★ these compressors have been tested alongside commercial rf clippers, the only difference at the receiving end was superior audio quality, £21.00 + VAT (12½%) + 50p P. & P.

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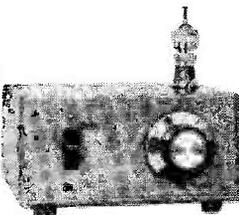
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**RX BAND PASS FILTER** ★ 9 integrated circuits ★ 1 watt O/P stage ★ headphone socket ★ 8 switched positions of filter ★ high pass—2.5 kHz-2.00 kHz-1.5 kHz-200 Hz-110Hz-80Hz ★ Bandwidths selected for optimum readability on AM, SSB, FM, CW ★ giving the operator total control over bandwidth and QRM conditions ★ makes the poor RX superb and the superb RX better ★ runs from internal PP9 battery or any supply from 9v. to 15v., £23.00 + VAT (12½%) + 50p P. & P.

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For sale: P.E. Minisonic synthesiser, complete and in case, not yet aligned, with keyboard and plans etc., £20. — Ring Gaunt, Leeds (0532) 675735.

Wanted: Heathkit HW-12 and HP-23 AC power supply.—Hayes, G3JBU, QTHR. (Tel: Northampton (0604) 43020).

For sale: Yaesu FRG-7 general coverage Rx, with front cover, new in October, in maker's box, £140. — Ring Clark, Bourne End 20047, Berks.

Wanted: Pair of brand new, boxed, 3-500Z's. Price required, please. — Barnett, Post Box 10, Evesham, Worcs.

Wanted: Compact 40/50-watt CW/AM Tx for 80-40-20 metres. Must be stable and have clean keying, preferably with antenna c/o facilities. Reasonable price paid. Details and price please. — Derrick, G3LYX, QTHR.

Sale: FT-101 transceiver, 160-10m., 230/12v., spare PA valves, £285. Europa transverter with spare set of valves, £60. Both as new. Datong RF clipper, unused, £30. Microwave Modules 2m. Rx and Tx, four crystals, with mic. and speaker in compact cabinet, ideal for /M/P, 12v., £40. Heathkit DX-40 and VFO, £25. Pyramid linear amp., 800w., h/b, fully metered, unused, £35. Collins mains transformer, sec: 1125-0-1125v. at 565 mA., £10. Stolle rotator Type 2010, £25. 18-AVT/WB, £35. Crystal calibrator, £10. FT-101 fan, unopened, £6. — Brailsford, G3PAF, QTHR. (Tel: Doncaster 55626).

Selling: Drake SPR-4 receiver, new and boxed, with additional crystals, £315. — Condon, 33 Kimbolton Green, Borehamwood, Herts.

Sale: Trio 9R-59DS with matching SP-5DS speaker and manual, little used, mint, £55. — Fisher, 14 Colindeep Lane, Sprowston, Norwich. (Tel: 0603-692795, office hours).

Selling: Drake TR4-C transceiver, complete with AC-4 PSU/speaker unit, as new, £400. — Arnold, G3XNP, 251 Appleby Street, Cheshunt, Herts. (Tel: Waltham Cross 32434).

For sale: Eddystone 5770U UHF receiver, coverage 150-500 MHz, £82.50. — Huges, 11 Henley Road, Ludlow, Salop.

Selling: BC-221Q, mains version, with charts, £25. Ex-computer constant voltage power-pack, 25v., 8A., as new, with circuit blueprints, £12. T/R supply unit rectifier No. 26, output 480v. at 175mA. twice, 350v. at 225mA., 6.5v. at 5A. thrice, as new, £10. TF-1267 transmission test set, includes VTVM, VFO 50 Hz-500 kHz, transmission measuring set, with copy manual, £20. Signal generator 1.6-60 MHz with copy manual, £8. Signal generator 0-300 MHz, £8. Marconi VF bridge (mark/space), £8. Timing signal generator, pulse output 50/100/500/1000, £7. Diversity aerial switch unit, £6. Carriage extra, or by arrangement. — Barnes, G4DVH, QTHR. (Tel: 051-966 2393 day, St. Helens 53018 evenings).

Wanted: Buy or borrow circuit/manual for boot-mounted Pye Ranger Model 2107V. — Birt, G3ZNG, QTHR.

Selling: Brand new Eagle multirange testmeter Type G.21, £10. Type 234 AC mains power unit, will drive R.1392 and R.1132 VHF receivers, £5. Type 51 waveform generator, £8. Type 2 monitor indicator (several time bases), £10. Mobile Pye Cambridge VHF radio transmitter (two-metre band), complete with mic., £40. BCC VHF base station transmitter, £10. Hudson control unit/amplifier for VHF transmitter, £6. AC mains stabilised PSU, will drive many ex-Govt. equipments, £1.50. Carriage extra, s.a.e. with enquiries. — Hayward, Sunnyfields, Lighthouse Road, St. Margarets Bay, Dover, Kent.

**For sale:** Belcom FS-1007P 16-ch. auto-scan base transceiver, with 5 repeater and 6 popular simplex, tone burst, narrow filter fitted by importers, as new, £160. — Ring Moscrop, G4EMG, 01-534 3460.

**Selling:** FT-75 with AC/DC supplies, VFO, microphone, 13 crystals, bracket and manual, £130. Eddystone 888A receiver, £65. — Grievson, 6 Spinney Bank, Kings Sutton, Oxon. OX17 3RL.

**For sale:** Collins KWM-2, AC/PSU, in good condition, £400. — Ring Kendrick, G3RDW, 021-353 7427.

**Sale:** Eddystone 940 with matching speaker and phones, very good condition, £140. FR-50B with crystal calibrator, first class condition, £65. Very near offers considered. Inspect and collect anytime. — Bartlett, Brindwell, Cheriton Fitzpaine, Devon. (Tel: 03636-391).

**Sale:** NR-56 FM 2-metre Rx, with VFO, R5, S20 crystals, mint condition, excellent in car/boat/caravan/home (cost £60), bargain £45. Class-D wavemeter, converted mains, £7. Vintage electrical test equipment, s.a.e. list. — House, 10 Leagh Close, Kenilworth, Warks.

**Wanted:** K.W. Vanguard or similar Tx, must be in very good condition and reasonably priced. — Walker, G3BLS, QTHR. (Tel: Oxford 47311).

**Wanted:** Drake T4-X or T4X-B, good price paid depending on condition. Will collect. Spot cash. — Box No. 5543, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

**Selling:** Eddystone 840C general coverage Rx, very good order with SSB reception, updated, manual, £45. Looking for Mohican or Airmec C.864. — Ring Handy, 0203-22201 (Coventry).

**Wanted:** General coverage receiver GC-1U, HA-600, 9R-59DS, or similar. Also speech processor. Details and price please. — Ring Hawkins, 01-699 8071.

**Sale:** Panda Cub Tx, works CW on three bands, £10. Wavemeters: Class-D, £4; BC-221, £18. RAE course (31 lessons), £18. — Burton, G4CZD, QTHR. (Tel: Gravesend 61252).

**Selling:** Creed teleprinter 75RO synchronous or governed motor (Murrey), £20. Creed tape reader (triple), £10. Creed high-speed electric tape winder, £5. AR88 receiver, £35.  $\frac{1}{2}$ in. computer magnetic tape, £1. Grundig four-channel audio mixer, £3. BCC-312 four-metre base Tx (QQV03-20A), £10. Pye 704 two-metre base Tx (QQV03-20A), £10. Petrol generator B.S.A./Dale, four-stroke, 500W at 240v AC, £45. STC-445/LQU/914A crystal filter, £2. CRT 3-JPI, £2. 5FP7, £6. **Wanted:** Icom PL-V1 VFO. — Watson, G3WMQ, QTHR. (Tel: 01-903 4363).

**For sale:** 'Pair of VHF/UHF sockets and chimneys' for 4CX250B, brand new; offers? Also Europa converter with pre-amp. and Amphenol co-ax. relay, £65. Trio 9R-59DS, £45. BC-221AH frequency meter, with charts and PSU, £22. — Gilmour, GM4DQX, QTHR. (Tel: 041-638 3386).

**For sale:** Trio TS-700G transceiver, purchased July 1976 and un-used (very genuine reason for sale), £295; prefer buyer collects, but can despatch by Securicor at cost. Also Solartron CD-1212 'scope with 40 MHz single trace plug-in, very clean condition and working, dual-trace unit supplied but requires attention, £75. Buyer must collect. — Ring Swale, G8ETS, Scarborough (0723) 62832 after 7 p.m.

**Sell or exchange:** KW-202 Rx in very good condition, £125. Or will exchange for general coverage Rx of similar cost and condition. — Ring John, Plymouth 773223.

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**Wanted:** UHF receiver covering 150-500 MHz. Also HRO handbook, diagram and valves.—Otley, Ffosycrydd, Peterston-S-Ely, Cardiff CF5 6NE.

**Sale:** R.216 and PSU, £35. R.210 with mechanical filter, £30. Eddystone 730/1A, £70. B.40 SSB with miniature valves and S-meter, £30. BC-221AE, £15. Solartron CD-568 'scope, £25. DM-2 digital multi-meter, £50. 4-EPI 'scope tube, new, £8. CV-1596 d/b tube, new, £3.50. Old modified BC-348, £10. All buyer-collect. (South London).—Ring Smith, 01-778 3217 after 7 p.m.

**Sale:** FT-220 with pre-amp., £230. Liner-2 with pre-amp. and extra coverage 144.100-144.530 and 145.800-146.00, offers around £120. Cambridge FM Tx on 145 and 145.5 MHz, Rx AM with no xtals, £25 or near offer.—Kessell, G8LKF, 180 Victoria Street, Hartshill, Stoke-on-Trent, Staffs.

**Selling:** Solid State Modules Z-Match ATU, 80-10 metres, £18. "Wire Antennas" by William I. Orr, £1. Both items unmarked and as new. Carriage paid.—Whately, G2BY, QTHR. (Tel: Ventnor 852150).

**Wanted:** Radiovision (Leicester) Ltd. expander for V55R (R.1155), also any gen on this conversion.—Hill, 82b Winding Way, Salisbury, Wilts.

**Selling:** Liner-2, with pre-amp., extended range and mains PSU, £115. Carriage extra.—Dixon, G8CGK. (Tel: 0989-2715).

**Offering:** Sony CRF-5090 "Earth Orbiter", with operating instructions, as new condition, delivered in original packing by registered post. Offers?—Beadles, 78 Tithebarn Road, Southport, Lans.

**Wanted:** FR-DX400 in good condition.—Holmes, 418 Kingsbury Road, Birmingham B24 9NQ. (Tel: 021-373 5250).

**For sale:** Drake SSR-1 general coverage receiver, as new, £160 cash. Buyer collects.—Ring Culling, Dereham 2790 (Norfolk).

**Exchange or sell:** Complete "G3ZVC" Tx/Rx unit, built into cabinet 9 x 5 x 5, added units are 898 drive plus LM-380 audio unit, requires RF pre-selector and PA, £40. Or Exchange for good ex-Govt. Rx.—Gray, GM3PLO, Decca Station, Lerwick, Shetland.

**Wanted:** FT-75 mobile transceiver; Two-metre FM Rx (Lowe, or others); HF amateur receiver; TR-2200G transceiver. Parcels to friends' address in Dover.—Vanden Bussche, ON6WR, 8 Van Iseghemlaan, 8400 Ostend, Belgium.

**Wanted:** SP-600 receiver, or similar general coverage Rx. **Sale:** Grundig 3005 transistor receiver, 150 kHz to 108 MHz, AM/FM, mint, £65.—Boushear, 8 Buxton Close, Atherton, Manchester.

**Wanted:** Trio TX-599, must be 'FB' condition; also suitable dummy load. Details and price please.—Pryse, G3WXT, QTHR.

**Selling:** Trio 9R-59DS receiver with voltage regulator, mint condition, few hours use only, £55 or near offer.—Nimmo, Gowan Park, Cupar, Fife, Scotland. (Tel: Cupar 3290, evenings).

**For sale:** Racal 117E communications receiver and manual, in new condition, dust free, £390 or near offer. Buyer collects.—Hawkins, Edendore, Talland Hill, Polperro (515), Cornwall.

**Selling:** Drake T4-XC and Drake R4-C receiver, less than one year old, little used. Offers? — Holmes, G3GA, Cherry Trees, Old Hill, Flyford Flavell, Worcester.

**For sale:** Venus SSTV monitor SS-2, £120. Creed 7B teleprinter, £10. Creed 6S6 auto, £5. Creed 7TR3, £15. Buyers collect.—Hare, 19 Main Road, Leadenham, Lincoln.

**Sale:** Lowe 2-metre tunable Rx. with S20 xtal Type NV56 (cost £56), £30.—Simmonds, 50 Sunray Avenue, London S.E.24.

**Sale:** Creed 54 teleprinter with reperforator 7P/N4 keyboard perforator, 6S/6M auto tape transmitter, S3910 control box and power supplies, £50 the lot.—Ring Pickard, Trowbridge (Wilts.) 2864.

**Selling:** EC-10, battery and mains operation, as new, £60. Class-D wavemeter, £5. Multi-range test meter, £10 or near offer. Also transistors, valves etc.—Ring Swan, 01-460 8864.

**YL now XYL:** Therefore selling Heathkit HW-202 FM 2m. rig, with S0, S20, S22, Heath aligned and tested, few hours use on air, complete with original accessories, £100 inc. p/p and insurance.—GM8KOF, 50 High Street, Tranent, East Lothian. (Tel: 0875-610321).

**Selling:** Eddystone EB-35 communications receiver, VHF/LW/MW/SW, mains and battery, mint condition, with instruction manual, £90. Buyer collects.—Ring McGeary, Crayford 527908 (Kent).

**Offering:** R.C.A. 8516L receiver, triple conversion, mint condition, in original case, no interior modifications to wiring, with handbook, £180 or near offer.—Draper, 115 Haynes Road, Hornchurch (43676), Essex.

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**Selling:** Eddystone EC-10 Mk. II, £125. Eddystone EC-10 Mk. I, £50. Both mint condition.—Bell, G3SKQ, The Cottage, Hall Garage, East Raynham, Norfolk. (Tel: Fakenham 2283).

**Selling:** 144 MHz FM amp., 2 watts input, 30 watts output, complete, £40. Datong RF speech clipper, very effective!, £17.50.—Selman, 55 Nant Road, London N.W.2.

**Wanted:** Cossor Commando CC-300, CC-302 or CC-303 high-band equipment. Rx front-end board Type 80362/1 for same. Also one-inch CRT Type 1CPI or 1CP31.—Rycroft, 31 Baker Avenue, Benson, Oxon. (Tel: Wallingford 39022).

**For sale:** Trio 7200G with AC power unit/digital clock. Pye Cambridge low-band, £23, Pye MF5AM low-band, £40. BC1031A panoramic display, 450 kHz IF, £30. Tektronix 535A 'scope; offers? Buyer collect.—Jenkins, GW3HXX, QTHR. (Tel: Llantrisant 224071).

**For sale:** Trio JR-500S amateur bands Rx, with Model RS-1 Global speaker, excellent condition, £90 carriage paid. (North Humberside).—Box No. 5540, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ. (Ring G4FID, 04012 3205, North Humberside).

**Sale:** IC-202 with 25w. PA, Rx pre-amp., mint, £175; prefer to swap HF. Two-metre Tx/Rx, bits all working, 135-137 MHz, VFO, or sell £20. 'G3ZUC' board, £20. Dial, box and controls for same, £7.—Wearing, GM8GIQ, 3 Speedwell Square, Kincaidston, Ayr. KA7 3YQ.

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