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 (710-410 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 bandspread 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 µV for AM and 0.5 µV for SSB. For full details, contact the sole importers of the exciting TRIO range.

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YAESU proudly announces a new
Synthesized 2 metre FM transceiver
FT-227R

The world famous Yaesu state of the arts technique has brought computer theory into VHF communications.

What are the frequency splits for repeaters? Don’t worry! Yaesu has computerised it. In addition to a conventional ±600 kHz split, any transmitter offset frequency is memorised with a touch of a push-button.

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Why one knob to select a channel out of 800 channels? Yaesu utilises an “OPTICAL COUPLING” system to select each channel in 10 kHz steps and the channel may be offset 5 kHz higher with a touch of a push-button. Thus 800 fully synthesised channels are provided with one-knob and no rotary switches to get oxidised and noisy.

When will the FT-227R be available? October, 1977.

Many, many other features such as automatic encoder-decoder for tone guarded squelch (TGS) (optional). Tone burst accessed repeater operation, automatic final protection, busy channel indicator, high-low output selection, diecast front panel, and famous Yaesu quality throughout!

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FOR 144 MHZ SSB...

THE QUALITY TRANSVERTER FROM THE PEOPLE WHO KNOW!

As you may already know, we are now manufacturing a 144 MHz all mode solid-state linear transverter, MMT144/28, as pictured below.

This 144 MHz unit is fully compatible with any 28 MHz drive source, and provides 10 watts continuous power output from power transistors capable of withstanding severe mismatch.

An internal aerial changeover relay of the PIN diode type is incorporated which has a through-loss of less than 0.2 dB. The combination of a low distortion balanced transmit mixer incorporating protected dual gate MOSFETS, to produce a spurious-free linear signal, and a low noise receive converter, makes the unit ideal for all modes of transmission at 144 MHz, particularly where a high degree of stability, linearity and sensitivity are of prime importance.

The use of high Q circuitry throughout ensures an extremely good spurious rejection and selectivity.

The unit is housed in a highly durable black diecast case, and all circuitry is constructed on high quality glass-fibre printed circuit board. The high power linear amplifier stages are housed in a separate internal compartment, thus ensuring excellent electrical and thermal stability.

SPECIFICATION

Frequency range: 144-146 MHz
Input modes: SSB, FM, AM or CW
Input frequency range: 28-30 MHz
DC power requirements: 12 Volts nominal
Current consumption: 2.2 Amps peak

Power output: 10 watts continuous rating
Drive requirements at 28 MHz: 500 mW or 5 mW
Relative 116 MHz output: -45 dB
Other spurious outputs: -65 dB
Receive converter gain: 30 dB
Price: £88-88 inc. VAT

Receive converter noise figure: Better than 2.5 dB
Power connector: 5 pin DIN
RF input/output connectors: 50 ohm BNC
Size: 187 x 120 x 53 mm
Weight: 800 g

Any further information on this product and others from our extensive range may be obtained by contacting our sales department, who will be only too pleased to help.

Incidentally, we are now on telex, should you require any information urgently, our number appears below.

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12 Watts output.

23 channels (9 fitted).

4 Autoscan channels.

Receiver incremental tuning

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+ mic., brackets, power cord, etc.

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**UHF FM ?**

**MULTI—U11**

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Receiver incremental tuning

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**THE NUMBER ONE CHOICE!**

NOTE Receiver incremental tuning is an absolute must on 70 Cms.—Some transmitters are not quite as stable as the U-11!

FOR 70cms. FM

**MULTI-U11**

9 channels fitted £249

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Midland and North West distributors for the XCR30 unique crystal controlled receiver. This receiver is designed to provide precision frequency tuning over the full short wave spectrum up to 30 MHz with exceptional frequency stability for both AM and SSB. Separate tuned whip antenna.

£145.00 incl. VAT
XCR-30 FM Receiver with FM band 87.5 to 101 MHz.
£170.00 incl. VAT

CALLATTI
Introducing a new range of VHF mobile and static antennas. All these will be exhibited as the Leicestershire Exhibition.

5/8" Gutter mounted whip  ... £12.00
5/8" Wave standard mount  ... £15.00
5/8" Standard mobile base mount  ... £12.00
Base station ground plane 4 radials  ... £13.59
Professional antennas at an Amateur Price.

Accessories
Morse Keys  ... £8.50
Auto-Cq-Sender  ... (post free) £41.11
Drake Low Pass Filter  ... (post 50p) £18.00
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 26p metre. PL269 50p SO239 46p, Cable reducers 16p.

We carry a substantial stock of equipment and probably a larger variety of models than most dealers. Having established ourselves as the North West leading supplier of Amateur Radio equipment for over 11 years, we are a totally independent company and have no retail outlets through any agents or any other establishment in the North West. We can supply and mostly from stock, equipment from the worlds leading manufacturers. We import some items direct, and we export and manufacture equipment of our own design.


Send us a large S.A.E. for full information and Test Report.

CALTECH 5m. Linear Amplifier. Modes: SSB - CW - FM - AM
Input: Up to 15 watts SSB
Power output: Up to 50 watts FM
Receiver Pre-Amp 12-18dB. QXV06-40A. RF switching for easy control.
Price: £160-62 inc. VAT.

COMTEK 2m. Linear Amplifier.

SECONDHAND EQUIPMENT (in stock—going to press)

Telford TC10 Transmitter  ... £65.00
Linear 2 Transceiver  ... £125.00
Icom IC21 VHF/AM Transceiver & Rx VFO £140.00
STE AK20 VHF FM Transceiver  ... £140.00
Uniden 2030 VHF FM Transceiver  ... £130.00
STE ATAL 228 AM-FM VHF Transmitter & PSU  ... £115.00
Yaesu YC355 Frequency Counter  ... £80.00
Yaesu YC355D Frequency Counter  ... £110.00
Yaesu YO-100 Monitoroscope  ... £100.00
Drake RC4 with additional crystals £400.00
Drake MS4 Speaker  ... £13.00
Drake T4X with AC PSU  ... £490.00
Drake W4 Wave-meter  ... £15.00
FDK Multi 270 VHF Transceiver  ... £625.00
Yaesu FT200 Transceiver  ... £625.00
Yaesu FT221 Transceiver  ... £625.00
Yaesu FT224 Transceiver  ... £625.00
M/Modules 1296/128 Converter  ... £53.00
QM10 5w Amplifier  ... £40.00
Sentinel VHF Pre-Amp  ... £40.00
Technical Associates Audio Compressor £20.00
KWD2000 Transceiver  ... £110.00
ARAC 102 Receiver  ... £80.00

As you can see we have a substantial turn over in secondhand equipment. If you require a specific model let us know and we will inform you when we have it available.
**S.T.E. MILAN VHF EQUIPMENT**

**ASP 154**  
**ATAL 228**  
**ARAC 102**

**SEE THE ENTIRE S.T.E. RANGE AT THE AMATEUR RADIO RETAILERS' ASSOCIATION EXHIBITION, GRANBY HALLS, LEICESTER, OCTOBER 27-28-29th, (1977) 10 a.m. to 6 p.m. daily.**

<table>
<thead>
<tr>
<th>Price List (including postage)</th>
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<tbody>
<tr>
<td>AK20 FM Transceiver</td>
<td>£170.00</td>
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<tr>
<td>ARAC 102 Receiver</td>
<td>£100.00</td>
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<tr>
<td>Atal 228 Transmitter</td>
<td>£126.00</td>
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<tr>
<td>ASAP 154 AC PSU with speaker</td>
<td>£35.00</td>
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<td>AR10 Receiver Module</td>
<td>£27.50</td>
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<tr>
<td>AAI Audio Amplifier</td>
<td>£4.10</td>
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<tr>
<td>AD4 FM Discriminator</td>
<td>£5.00</td>
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<tr>
<td>AL8 Linear Amplifier</td>
<td>£27.00</td>
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<tr>
<td>AT222 Transmitter</td>
<td>£50.00</td>
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<tr>
<td>AR20 C.C. Receiver</td>
<td>£45.00</td>
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<tr>
<td>AT23 C.C. Transmitter</td>
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<tr>
<td>AS 15 Stabilised PSU D.C.</td>
<td>£10.00</td>
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<tr>
<td>AG 10 Tone Generator</td>
<td>£4.50</td>
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<tr>
<td>AC2A Converter 28-30 MHz</td>
<td>£20.00</td>
</tr>
<tr>
<td>AK20 Transceiver Kit</td>
<td>£110.00</td>
</tr>
</tbody>
</table>

**STEPHENS-JAMES LTD.**

**47 WARRINGTON ROAD, LEIGH, LANCs. WN7 3EA**

Please note new telephone number 0942 - 676790
YES! Back in stock again is the well-known STANDARD C146A hand-portable transceiver for 2 metres; and price is only £99 inclusive of VAT (carriage free). Supplied complete with leather case, crystals on S20 and S22 and automatic tone-burst unit. Base charger unit available for nicads (see illustration right) and crystals for extra channels at £5.29 inc. post and VAT (per channel) or £5.06 if ordered with transceiver. UNBEATABLE VALUE—DON'T DELAY—as this offer cannot last for ever!

★165 GETS 828

Yet another super WESTERN offer on STANDARD's C828M 10 watt 12-channel mobile transceiver. Only £165 including VAT (carriage free) for this pint-sized, lion-hearted rig. Price includes quick-release mobile mounting bracket, speaker/microphone, automatic tone-burst and 10 CHANNELS FITTED (S0, S20 to S23 inclusive, R3 to R7 inclusive). S24 and S32 crystals available at £3.04 inc. post and VAT (per channel) or £2.81 if ordered with transceiver. FEW ONLY AT THIS RIDICULOUS PRICE —

ALSO...
The FCB-011J carrying case for the C828 is now in stock. Complete with CAT-17 flexible quarter-wave whip antenna, battery carrier and earphone. Not a soft PVC case, but one with thick, stiff walls for maximum protection of your 828 (or C430) and ease of portability. Takes C-size nicads (10) or HP-11 dry-cells (8).

Price: £27.56 inc. VAT

★165 GETS 223

If you prefer YAESU MUSEN for VHF, why not sample the new FT223 at WESTERN's special price of £165 including VAT (carriage free). Yes—as little as this for a brand-new, full-specification 23-channel 2-metre FM transceiver. 10 watts or 1 watt output, automatic tone-burst and 11 CHANNELS FITTED! YOUR CHANCE TO GET ON 2M. FM AT BARGAIN RATES. ALSO—FROM YAESU'S ACCESSORY LIST...

QTR24 World Clock, batt. operated £15.75
YH55 Communications headphones £9.56

PRICES INCLUDE CARRIAGE AND VAT

336.37 STILL GETS 221R

PRICE UNCHANGED FOR THE MULTIMODE 2M. RIG
NEW!  POWER and SWR MEASUREMENT TO 450 MHz!
WITH THE
OSKER
SWR-300

All the facilities of the long-established and well-known Osker SWR-200, but now with optional add-on couplers for accurate (10%) power and SWR measurements in the 2 metre and 70 centimetre bands. Basic instrument for HF—add couplers for VHF and/or UHF.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Freq. range (MHz)</th>
<th>Power range (W)</th>
<th>Accuracy (FS)</th>
<th>Impedance</th>
<th>Connectors</th>
<th>Dimensions (mm)</th>
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<tbody>
<tr>
<td>SWR-300</td>
<td>3.5-30</td>
<td>0-20 ; 0-200</td>
<td>±15% FS</td>
<td>50</td>
<td>SO-239</td>
<td>95 x 220 x 115</td>
</tr>
<tr>
<td>SPC-2B</td>
<td>144-148</td>
<td>0-20 ; 0-200</td>
<td>±10% FS</td>
<td>50</td>
<td>SO-239</td>
<td>40 x 110 x 66</td>
</tr>
<tr>
<td>SPC-07A</td>
<td>420-450</td>
<td>0-2 ; 0-200</td>
<td>±10% FS</td>
<td>50</td>
<td>Type N</td>
<td>50 x 85 x 70</td>
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</table>

**PRICES**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Description</th>
<th>Price (£)</th>
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<tr>
<td>SWR 300</td>
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<td>£43.20</td>
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<tr>
<td>SPC-2B</td>
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<td>£15.12</td>
</tr>
<tr>
<td>SPC-07A</td>
<td></td>
<td>£19.98</td>
</tr>
</tbody>
</table>

*OCTOBER SPECIALS — THE OLD FAVOURITE — SWR200 at £38.88*

**ANTENNAS**

- 5% OFF — all Newtronics “Hustler” mobile antennas (HF and VHF)
- Newtronics 48TV and RM80S (10-80m. base station vertical) — £63.00

**SUNDRIES**

- SP400/401 speakers (for FT401 etc.) — £11.25
- SS303M SSTV Monitor — £199.00
- Unica URIA gen. coverage receiver — £66.00
- Unica UR2A gen. coverage receiver — £99.00
- **ALL PRICES INCLUDE CARRIAGE AND VAT**

**PAYMENT**

Cash or cheque, ACCESS (Mastercharge), VISA (Barclaycard) GIRO TRANSFER (A/c. 288 6154) HP and Credit Sale arranged.

**SEE YOU AT THE LEICESTER SHOW — STAND NUMBER 14**
THE SHORT WAVE MAGAZINE
October, 1977

ELECTRONIC DEVELOPMENTS
Professional Quality for the Amateur

NEW PRODUCT

VHF/UHF SWR BRIDGE

This VHF/UHF Standing Wave Radio Indicator is intended for use with high power transmitters in the 144 MHz and 432 MHz Amateur Bands. It features a state of the art micro-stripline technique to produce an accurate forward and reflected power indication. Unlike many cheaper versions it does not give misleading reading when used at high power levels. Each bridge is calibrated and tested at 500 watts on 432 MHz to ensure accuracy. If you run high power then you need this S.W.R. Bridge. Using this instrument you can make S.W.R. measurements at high power when strange things can happen to coaxial cable and aerial systems. This VHF/UHF S.W.R. Bridge makes a perfect companion to our range of high power VHF and UHF transverters and lines.

<table>
<thead>
<tr>
<th>IMPEDENCE</th>
<th>50 Ω</th>
</tr>
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<tbody>
<tr>
<td>FREQUENCY RANGE</td>
<td>50–500 MHz</td>
</tr>
<tr>
<td>POWER HANDLING</td>
<td>144 MHz - 1000 watts</td>
</tr>
<tr>
<td></td>
<td>432 MHz - 500 watts</td>
</tr>
<tr>
<td>SENSITIVITY</td>
<td>144 MHz - 15 watts</td>
</tr>
<tr>
<td></td>
<td>432 MHz - 5 watts</td>
</tr>
<tr>
<td>INSERTION LOSS</td>
<td>Less than 0.5dB</td>
</tr>
<tr>
<td>CONNECTORS</td>
<td>&quot;N&quot; Type UG 58 a/u</td>
</tr>
<tr>
<td>SIZE</td>
<td>6&quot; x 3&quot; x 3&quot; (15.2cm. x 7.6cm. x 7.6cm.)</td>
</tr>
<tr>
<td>PRICE</td>
<td>£44.95 inc. VAT</td>
</tr>
</tbody>
</table>

This 432 MHz Linear is operated in grounded grid configuration and exhibits a gain of typically 10dB. With a drive input of 5 watts its output power is in the order of 50 watts which is more than adequate for OSCAR 7. Power requirements are 6-12v. AC and H.T. 400-1000v. DC. Fitted with BNC connectors.

| PRICE           | £56.25 (inc. VAT) |

Your orders, enquiries and technical queries will be dealt with both personally and quickly.

POLAR ELECTRONIC DEVELOPMENTS LTD.
DOMVILLE ROAD, LIVERPOOL, L13 4AT Telephone No. 051-220 6666
at this point it would be appropriate to hum or whistle a few bars from the Entry of the Gladiators!

NOT the bearded lady BUT:—
THE RECEIVER WITH A 26ft. DIAL!

NOT the Siamese twins BUT
THE H.F. BANDS TRANSCEIVER THAT MAKES EVEN 40 MTRS. SOUND QUIET
—That is until you find the station that YOU want.

NOT the two headed donkey BUT
THE TWO METER TRANSCEIVER WITH NO X TALS! — NO SWITCH!! —
NO DIAL... Did you say, "What has it got then?"
EIGHT HUNDRED SYNTHESISED, PHOTOELECTRICALLY SELECTED
CHANNELS, COMPUTERISED MEMORY, FITTED TONE BURST, 600 kHz shift
PLUS ANY OTHER required up/down SHIFT — (you can now transvert to 70 cms.
and use the repeaters !) ALL FOR AROUND £200 + V.A.T.

WHAT ARE THEY?...

... SEE THESE AND MANY OTHERS ON OUR STAND AT THE A.R.R.A.
EXHIBITION, GRANBY HALLS, LEICESTER . . . 27th, 28th, 29th OCTOBER

If you can't make it to the show then call in to Alum Rock, or your LOCAL man.
Directions etc. as per our previous advertisements where you will receive prompt,
courteous attention and full demonstration facilities ... away from the hustle and bustle.

STOP PRESS: New models now in from Swan!
A NEW 240??
AND STILL
£198 inc. VAT

The IC–240 from Thanet has had a bit of a face change. Gone is the tone button, which doesn’t do anything anyway, and in its place is a crafty little switch which gives simplex in the centre position, normal duplex at DUP A and reverse repeat (on Rx AND Tx) at duplex B. With the IC–240 it is the RECEIVER which is shifted when working Duplex and not the TRANSMITTER as with some other rigs we could mention. This means that you can listen on the input channel, or work reverse repeat, merely at the flick of a switch—you don’t have to re-tune the channel knob as you would otherwise.

The function of the LH switch has also altered as it now gives high power in the up position and LOW in the down, the centre being OFF. This, together, with the facility of easy channel change, clear channel indication and sheer rugged construction still puts the IC–240 at the top of the list.

Now that we have sold several hundred 240’s we can tell you that these little sets are extremely reliable. The number we have had back for repair under warranty is really very small and the initial teething problems have been ironed out long ago. By the way, should you be feeling a little upset that your nearly new IC–240 has been made out of date have no fear. Unlike a model change in cars, we can sell you a conversion kit for £3 to bring your set right up to date so that you can’t tell the difference. Please don’t all rush at once though as initial stocks of these are limited. There will be plenty available later.

Check off these points against that competitive rig:—

- Can it cover the whole 2m. band 144–146 ? ... YES NO
- Is it easy to qsy from say R7 to S20 without too much knob winding ? ... ... ... ... YES NO
- Is low power available ? ... ... ... ... YES NO
- Can you add extra channels, in the order you want them, without having to buy crystals ? ... ... ... YES NO
- Is the tone burst automatic ? ... ... ... ... YES NO
- Is a scanner available ? ... ... ... ... YES NO
- Is it relatively easy to add periferal bits and pieces ? ... ... ... YES NO

If the answer is YES to all these and its cheaper than an IC–240 it may well be worth buying.

SEE ONE AT LEICESTER — STAND 9

** At the moment this is a THANET mod. Until this is done in Japan you may not find it on all sets bought from other dealers, but we understand that some intend to fit it.

PLEASE NOTE THAT ALL MAIL ORDERS MUST BE SENT TO HERNE BAY AND NOT TO AGENTS.

All warranty and other repairs for sets bought from Thanet Agents and Shops must be referred to our Service Dept. in Herne Bay where we have a good range of test equipment and the technical skill to use it.

Sets from other dealers MUST be referred to that dealer.
ICOM

IC215
HANDY FM PORTABLE

15 channels 3 watts

Fitted with 7 channels (S20, S22, R3, R4, R5, R6, R7.)
£162.00 INC. VAT

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/L1 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.

HIRE PURCHASE TERMS AVAILABLE

See ICOM at your nearest agents by telephoned appointments:

LONDON—Terry, G8BA
01 556 9936

WALES—Tony, GW1FKO
0222 709986

MIDLANDS—Tony, GBAVH
021 329 2305

CHESHIRE—Gordon, G3LEQ
Knutsford 0565 4040

THANET NORTHERN
WOMBWELL, YORKS
0226 756229

SOUND SERVICE
BURNLEY, LANCS.
0282 38481

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

FOR ALL MAIL ORDER AND SOUTHERN SALES
AMATEUR RADIO RETAILERS' ASSOCIATION

JUBILEE YEAR EXHIBITION

at

THE GRANBY HALLS, LEICESTER.

THURSDAY, FRIDAY and SATURDAY,

OCTOBER 27th, 28th, 29th, 1977

NEW OPENING TIMES — 10 a.m. to 6 p.m. DAILY

NEW AND BETTER CATERING

NEW DAILY PRIZE DRAW FOR VOUCHER PRIZES

Continuous Film Shows — Technical, Cartoons, Etc.

Talk in on 2 metre FM by Leicester Radio Club

OVER FORTY TRADE STANDS


Where all the leading amateur radio dealers put on their own exhibition

ADMISSION 30 PENCE

MEET YOUR FRIENDS FROM ALL OVER THE BRITISH ISLES
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WILLIAM MUNRO (INVERGORDON) LIMITED
DISTRIBUTORS FOR NEC AMATEUR RADIO EQUIPMENT

CQ301  CQ110E  CQ201

**CQ110E Transceiver (ex stock), £645 plus VAT £80.63, total £725.63**
(Price includes Securicor Delivery)

Frequency Range
- 10M — 15M — 20M — 40M — 80M — 160M
- 11M and WWV 15 MHz on receive only.

Mode
- LSB — USB — CW — AM — FSK — FAX/SSTV.

Power Requirements
- 100/110/117/200/220/234 volts AC or 13.5 volts DC.

Input Power
- 280 watts PEP (240 watts on 28 MHz).

Digital Readout—Separate Crystal Filters for each of LSB, USB and CW.
AC and DC power units are built in. Switched metering for "S" meter, Relative Output, Plate Current and ALC for setting MIC Gain.

The following accessories are supplied with the Transceiver—Microphone, DC Power Cable, AC Power Cable 5 RCA Plugs, 2 Spare Fuses, 2 Jack Plugs, 2 Allen Keys and a 60-page instruction book. Built-in speaker with 3 watts output.

A hybrid design utilising the best features of valves and semiconductors is used to give a high performance. 7 Valves—49 Transistors—19 FETs—128 Diodes—25 ICs. The use of the RCA low noise beam deflection valve (7360) as receiver mixer gives the CQ110E high sensitivity combined with remarkable crossmodulation characteristics.

**CQ301 2kW Linear Amplifier—10 to 160M with built-in power supply and 2 EIMAC3-500Z Valves. (Ex stock) £760 plus VAT £95, total £855 (Price includes delivery)**

We also stock Antennas and Accessories—Microwave Modules—Modular Communication Systems—Solid State Modules—Antex Products—Components etc.

**SECONDHAND EQUIPMENT**

KW 2000B with AC PSU ... ... £180 (inc. VAT)
(this stock is always changing, please contact us for specific items.)

TELEPHONE 0349 852351  TELEX 75265

100 HIGH STREET, INVERGORDON
ROSS-SHIRE, IV18 0DN

ACCESS — BARCLAYCARD — HIRE PURCHASE — INSURANCE
Pollution again

Back in July, we mentioned the May 11 issue of the “Southern Evening Echo” and its paragraph on our hobby. Surprisingly we have only had a reaction from one reader, apart from the chaps most involved in the effort to sort out the underlying problem. In fact Mrs. Pockley had latched on to the very important fact that if the Post Office or the licensee cannot cure the problem and the equipment-maker can’t be bothered, there isn’t a solution, short of a miracle. In this particular case, the miracle occurred, in that G3GVM and G3PLX tackled the problem; the magnitude of the undertaking being that at one time the Post Office had a file of fifty outstanding cases! G3PLX and G3GVM, by a rare combination of social nous and engineering know-how have managed to get to the position where the station concerned has no unacceptable TVI. Were that in itself not enough, they have enlisted the aid of Mrs. Pockley, with the result that Fareham council have referred the problem to their national organisation, with a view to legislation; and the RSGB have also circulated the members of this organisation with the relevant facts.

Mrs. Pockley is seen in a far better, and the newspaper reportage in a far worse, light than at first seemed to be the case; but above all, the efforts of G3GVM and G3PLX are beyond all praise.
COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

AGAIN the word is that there hasn't been anything to really get the old adrenalin going; but the odd behaviour of the sunspots has been diverting much attention. There has been some Spor-E about and some very odd times when, with apparently all in favour, the bands haven't been as well as they should have been—the reason no doubt being geomagnetic. We commented last time that at long last the invisible wire had been detected, and that it would doubtless have to come down; it didn't get taken down, but for the first time in daylight a bird flew into it. It was a rather big bird which did a sort of ground-loop in mid-air and was quite definitely a bit puzzled by these involuntary aerobatics. When we had stopped laughing and wiped our eyes, we noted we hadn't got an aerial any more!

As for the bands, there have been many good reasons why the writer hasn't been quite as active an SWL as usual, let alone getting on the air himself; but when he has had a turn round the bands everything from summer static on Top Band through charged rain on Twenty (the biggest snag with a vertical aerial, one feels) has been noticed, right through to good DX conditions. So—there will have been something of interest for all but the hyper-critical.

Contests

We have a letter from Illinois advising us of an activity called "Hunting Lions in the Air," which, it would appear is being sponsored by the Lions Club of Rio de Janeiro (Arpoador), Brazil, which takes place on January 14, 1978 starting at noon GMT for twenty-four hours. Details from the above address, and logs also, postmarked not later than thirty days after the Contest.

October should be pretty active for the contesters, with the RSGB 21/28 MHz Phone contest on October 9, the ARCI QRP Contest the same weekend (even if they do call 100 watts input QRP!); for this one the CW contesters should be looking at 40 kHz up from the LF band-edge, save for Twenty where they will be around 14065 kHz; SSB frequencies 3855, 7260, 14260, 21300 and 28600 kHz, and the Novices will be on 3720, 7120, 21120 and 28040 kHz. Logs to W5TVW.

If you want to play in a real one, the CQ WW DX Contest has its Phone section October 29-30, and the CW leg November 26-27. The time is the usual 48 hours, 0001 GMT Saturday to 2359 Sunday. Single operator stations can be entered as all-band or single band, and it is to be noted that the use of a DX net, or any form of "alerting" assistance puts you straight into the multi-operator class. The multi-operator entries divide as usual into single transmitter and multi-transmitter sections. Exchange RS(T) plus two digits indicating your CQ Zone. Contacts with stations on different continents rate three points each, ones with stations outside your own country but on the same continent rate one point a throw. Your own country may be worked for a multiplier but does not rate any QSO points. The multiplier will be one for each CQ Zone contacted, and one for each country contacted on each band; a station may contact its own country and Zone for multiplier credit. Add the Zone multiplier to the country multiplier, and use the number so found to multiply the total QSO points. To be eligible for an award a single-operator entry must have completed twelve hours of operation as a minimum, while the multi-operator categories require 24 hours of operation at least to rate for an award. If a log contains entries for more than one band it will be counted as an all-band entry unless otherwise notified; and there are no less than 38 trophies at stake. For the logs, all times are to be GMT, and indicate each zone or country multiplier the first time it is worked. Logs to be checked for duplicate contacts, and for each one found by the contest committee three points will be deducted. Use cross-check (dupe) sheets for each band on which 200 or more contacts are made; and preferably do so with smaller entries. Forty contacts to the page on 8½ x 11 inch paper. For Phone the postmark deadline is December 1, 1977, and for CW January 15, 1978. Address as ever CQ WW Contest Committee, 14 Vander-venter Avenue, Port Washington, L.I., N.Y. USA 11050.

Another one to recall is the RSGB 7 MHz contest—Phone on October 15-16, CW November 5-6—both this and the previously mentioned 21/28 MHz efforts will all help to keep the bands in use, and so discourage both the intruders and those who would like to pinch our space.

"CDXN" deadlines for the next three months—

November issue—October 6th
December issue—November 3rd
January issue—December 1st

Please be sure to note these dates!

The Bands

Perhaps the best place to make a start is Ten. G2BHY (Walsall) mentions a QSO with PY1AZE on 28035 kHz and adds that this brings up 26 countries worked on the band in the past couple of months.

G3NOF (Yeovil) doesn't seem to have picked the right times; he heard lots of Europeans, but reckons that a lot of listening is required to work DX on Ten at the present state of the sunspot cycle.

G2ADZ (Chessington) missed reporting his July results and was on holiday for half of August. July was not so exciting as June, but was nevertheless quite good. Every day produced short-skip to Europe, with a surprising variation from first thing in the morning to late at night; 11 days produced real DX, and on July 6 there was an opening to the States. July's CW contacts included KV4KE, ZP5EC, KV4CI, FG7AM, UA9SEQ, LU8AHW,
Thus the 21 MHz score was JA8UI/ on the other—we know the feeling! the one hand and an excess of work been plagued with a chirpy note on single SSB contact with JA1PIG/PZ. UK9SAY and EA9EO, knows—when. CW was used to work a move from a tied and tossing out the junk than in heaven—knows—where. Operating, as he is getting ready for occupied with packing up the gear periods to let the transmitter cool off for a Joystick; there was a half— of a BC—221; and more recently the output of which was passed to a 1946 Pye domestic receiver, of a 7 MHz. This set-up still had some shortcomings when tied on Twenty, but is still in use after three months. On 14 MHz reception was improved by the use of a 1946 Pye domestic receiver, the output of which was passed to a Ferguson domestic receiver for a little extra audio gain; BFO injection is at the front-end by courtesy of a BC-221; and more recently the shack has had a TCS-12 receiver added to enable Top Band to be looked at. Now, to results on 14 MHz: all W call areas with the exception of W7 and WØ, up to U9A's UL71BD, KV4AA, IE9DMK, EA8BF and CY3AKG—the CY is a special from VE-land. This is the real stuff of amateur radio—perhaps Neil will give us a photograph to demonstrate to these people who complain about how expensive the hobby is just how simply one can achieve world-wide communication.

21 MHz

Our first reporter this time is G4CCQ (Lamberhurst) who is more occupied with packing up the gear and tossing out the junk than in operating, as he is getting ready for a move from a tied house, to heaven-knows-where and heaven-knows-when. CW was used to work UK9SAY and EA9EO, plus a single SSB contact with JA1PIG/PZ.

G4DJY (St. Annes-on-Sea) has been plagued with a chirpy note on the one hand and an excess of work on the other—we know the feeling! Thus the 21 MHz score was JA8UI/PZ, ZP5NW, and some W/VE stuff, in between switching off for periods to let the transmitter cool down when the chirp crept in.

Now to G4EVO (Broadstairs), with his five watts input maximum to a Joystick; there was a half—contact with HA3KMK which seems to have caused G4EVO a bit of puzzlement, then DL7CY, DK2QE, YU1FD, HA7KLL, UA3BF, SM4HOD, G4FDO, DK9NH, YU1NOM, HA7KPD, YU2GJ, OH2PA, UP2CY, YU2CEJ, HB9BOY, YU2KY, F6EWW, YU4FRS, EA1JG, 11XWI, YU2KDE, YU3FS. G2HKKU (Sheppley) tried out his HW-8 on 21 MHz, and hooked up with HA9RI just to prove the beast worked properly.

Twenty

Business on this band has been quite brisk at times, as the reports all indicate. However there has been quite a lot of one-hop European and genuine short—skip conditions—handy if you want to work G's on Twenty!

It seems reasonable to make a start by mentioning two new boys in every sense. G4GIE (Gl. Moulton) has been a member of the G-QRP Club for a while and in due course got his licence. He has 420 milli—watts out on Fo:ty and 240 milli—watts out on Twenty; and at the time of his letter he had just about completed one week on the air. His very first QSO on 14 MHz with this QRP and a Joystick was with UA1ACE in Leningrad—a distance of over 1200 miles which must have been very heartening indeed, and it has been this sort of report that has filled the log on both 7 and 14 MHz. And, praise be, John says that if they don't come back to his QRP, he puts this down to his own in—experience, which is making him learn all about how to do it properly.

G4FUP (Horsham) got his ticket in February, but took a month to get on the air, the start being 3—5 MHz CW with a 62 Set picked up from the Club Junk sale for £1.60. This had a bit of a rough note so a week later a Panda Cub was added to transmit while the 62 Set remained in use for reception, and so a start was made on 7 MHz. This set-up still had some shortcomings when tied on Twenty, but is still in use after three months. On 14 MHz reception was improved by the use of a 1946 Pye domestic receiver, the output of which was passed to a Ferguson domestic receiver for a little extra audio gain; BFO injection is at the front-end by courtesy of a BC-221; and more recently the shack has had a TCS-12 receiver added to enable Top Band to be looked at. Now, to results on 14 MHz: all W call areas with the exception of W7 and WØ, up to U9A's UL71BD, KV4AA, IE9DMK, EA8BF and CY3AKG—the CY is a special from VE-land. This is the real stuff of amateur radio—perhaps Neil will give us a photograph to demonstrate to these people who complain about how expensive the hobby is just how simply one can achieve world-wide communication.

GM4CXM (Glasgow) now has added a director to his dipole, so it now becomes a two—element fixed beam aimed at the Caribbean, resulting, of course in the stations working being mainly in a westerly direction. 14 MHz CW thus yielded H18MOG, HK3HY, KP4AWM who had just five watts, KV4AA, N6VE, N7RM (Oregon), U60A, UH8BAX, UJ8JCA, WA4ZVP who had two watts, W7WN (Arizona), W7DPW (Washington), YS10, and 4J4A. On the SSB front, Ray has been going great guns and has offered quite the longest list for one band that we have ever received, so we'll have to summarise: CE's, CP's, CT3/4LI, CX5, EA8GN and EI8AU, FG7s, GU2FZC, HP1's, H18's, HR3JJR, IJ7EX, JY3ZH, K5OYE, L7U's, OA6CV, OF1AJ/OJ10, PY, PZ, SV, TF's, TIZCAP, various Russians in Asia, VE8CF, VP2SN, VP8HZ, VP8JB, other VP8's, VP9A/M, W's, XP1AB in OX-land, X01FG, YP's, ZB2FX, ZL, ZP5's, 6Y5's, 8P6's, 8R1Q, 8RIX, and a crop of 9Y's.

G3RCA (Wigan) is a Twenty—metre addict, sticking to SSB most of the time, and he again has a list as long as your arm from which we must select—and we could comment that the mere fact that we are having to pick and choose from the correspondents lists is the surest indication of improved conditions that one can imagine—it is all of three years since conditions were good enough for us to have long lists coming in. To revert to G3RCA, his operating times have been afternoon and evening in the main, with the odd early—morning session. In the mornings we notice OF1AJ/OJ10, KM6FF, FK8CR, plus A51RG snapped up around 1130. At or just after lunch—time we see P29JS, YB6ACV, VS5DM and VS5MS, with KA6HF for "affters"; as it were. Mid—afternoon showed with K9PNT/DU2, VK8GU, 9VlSN, YB0AR; later on there are QSO's on record with such as J28AN, 9M2DW, 9Q5FL, VP2EQ, A2CZV, 5H3KS, K4T/8RI, VP1WS, VP1CYL, K5CO/5A, WA6ICQ/9Q5, CE0AE, HZ1BS, HZ1TC, VP2MH and SU1JA.

G3NOF's morning sessions of late have given him the impression that the morning VK/FL/Pacific opening has been generally a bit later than in past years. On the other hand the East Coast W's are often in as early as 0900 and staying in until the small hours—up to 18 hours a day at G3KFE. Don found 1500 was a time when there were openings for quite strong signals from South East Asia. SSB contacts were noted with A51RG, AP2MQ, AP5HQ, C31JR, C31MJ, EP2SV, EP2TY, FM7WS, FP0CG,
HSØSEA, IL7DMK, IM0RYC, K5CO/5A, K5HC1, K6ND, K7FF/6, K7NN, K9PNT/DU, K76JCW, KL71AK, KL71VO, KL71WM, KL71YL, KM6FF, OF1AJOJ0, TJ1BB, VE4CN, VE6BEF, VP2MH, VS5DM, VU2LQA, WBN6JW, WB7ANH, XP1AB, YB2SV, YB0RS, ZP5YW, 9M2AP, 9M2DW, 9M2EE, 9M2FK, 9M2MT, 9V1RD and 9V1SW.

G2HKU dragged out his trusty old KW-2000 with which to work CW to H18MOG, K35GB, PY2FFA and UJ8JC.

For G4EVO, his five watts of CW managed to take him all round Europe, a V/K, and then lots more Europeans.

G4DJV is a strictly CW man, and his 100 watts is put into a Joystick. This last month Peter has been rather busier than he would like, so instead of a log he has just picked out the best; PY4CZ, KV4CI/MM near VP7, PY1NEW, 4M4CET from YV-land, PY2FFA, C5AAD (Gambia), JA1PIG/PZ, VP2MBC, W7IR, H18MOG, PJ2VD, OX3OA, CT3BQ, LU8DQ, plus the usual crop of \( W/V/E/\) USSR stuff.

It was CW also at G4CCQ, where 4J4A, UW0AF, C31GL, HB0BLC, OH6NO/SU, EP2YK, and VK3MR, plus a lone SSB contact with OF1AJOJ0.

Here and There

One knows not the reason, but there seems to be less chit-chat and witty comment this month—maybe it's the weather getting everyone down!

Anyone who worked IIDFS/IA5 can QSL to 11FNX, Luca Fontana, Pizza S. Domenico 49, 19100 La Spezia, Italy, says our old friend W4WFL, who seems to be making a good show with \( CQ \) Magazine if our other friend on that side, WIWY, is anything to go by. One guesses that Morgan sent it across not just as an item of news but for its savour—the station concerned was an expedition to Formica Island!

So now we know where all that stuff the XYL's demand should be put on their kitchen furniture comes from!

If you are only SSB, you won't find much activity from Outer Mongolia—according to UK9AAN there are only two SSB stations operating from there, the calls being JT1AN and JT1KAA; on the CW side if you hang about at 14020 kHz you might just find a crop of JT's. UK9AAN himself will, as usual, well away in the CQ WW contest in October, with a full-scale multi-op and multi-Tx arrangement and in there to win.

By the time this comes to be read, the chances are pretty good that you will have latched on to the Galapagos Is. DX-pedition, which is on Santa Cruz island, where H8CN owns the Hotel Galapagos. Although they will have a multitude of individuals calling the group call will be HD8CD, the suffix being in commemoration of Charles Darwin. It seems that it was around the area of the Galapagos Is. that he first got the glimmer of the idea of Evolution. Talking of evolution reminds us that among other things the group are going to dish out a special award for the first QSO with them by way of Oscar 7; and the plans therefore cover from 18 MHz right through to 144 MHz. In among the various gear, we notice that the group use a KW-2000B and the linears on the other bands are from the same stable—the other rigs are Trio, Collins, Drake, Heath, and Atlas, while on the ariels side there will be a brace of tri-band beams, plus a five-element Yagi and KLM Multi-2700 for the Oscar activity.

Last time round someone was querying 5T4AKL—G3NOF points out that this one was OA4AKL with a "special" call. This is also, Don says, the case with VC9UM who would normally be VE9UM but that VE9's haven't been issued for experimental purposes for some time, which makes it rather more likely that the operator was either VE6UM or VE8UM.

Forty

There was this bloke, you see... said he could never find any DX on Forty Phone... after a bit we could stand it no longer and just had to find out why. That old saw about "if you can't hear 'em you can't work 'em" is as true at his QTH as at G3KFE's. So, we ended up teaching him how to drive his receiver and what the use of an attenuator was, not to mention whipping out his pre-selector box! But, seriously, there are many who come to this hobby of ours straight from R.A.E., and it is up to us old hands to teach these chaps how careful handling can make such an enormous difference. We could also add, maybe, that if the receiver was vintage late nineteen-fifties he would stand a better chance than with some of the more modern boxes, even though it might take a sight longer, up to an hour, before it settled down in frequency.

Talking of those old times brings us to our first reporter, G6TC, who last wrote in to this piece some twenty years ago (when it was in the capable hands of GB6QB, Howard Thomas); Ted still keeps up his interest in DX, and is still mainly CW. Indeed, the writer seems to recall, back around the days when he first started into the hobby, seeing a picture of G6TC with a BC348 receiver and a CW rig. Ted usually spends about 3/4 hour on the band before he goes to work in the morning, giving him 0615 to 0700z. Since early May this has led him to some 100 QSO's with 41 different VK's, they being led of course by the redoubtable Snow VK3MR, not to mention VK3VJ, Alf, VK3XB, Ivor, and VK2BFJ Fred. There are also ZL's, notably ZL4IE and ZL2UV, while there have in addition been WC, YV, PY, L4, and so on. G6TC reckons he is "just one of the small fry" on Forty in the mornings, as he hears faintly other G's doing their stuff of working the DX.

Some time now since we last heard of G3PKS (Wells) who has been away on holiday; since returning the rig has been fired up between 0630 and 0730z and a number of VK's were heard on the band but not called because they were on SSB.

We have already remarked on QRP enthusiast G4GIE, and his first 14 MHz QSO; he seems to have been having rather similar results on 7 MHz, all round Europe and through the evening QRM.

G4FUP and his simple rig also have been mentioned elsewhere, but he also used the Thing on 7 MHz, to work all round Europe and have lots of nice ragchews.

Forty for G4CQQ was quite a good band, with such as J4JA, YVINX, DL2RL/YV6, 4M5AMT,
and PY2BW—the 4M5 chappie was not hanging around passing out information, but the prefix list would place him as being in Venezuela.

At G2HKU there was the interesting contrast between the QRP rig and the KW-2000; QRP worked through to DJ1PK, DK7JI, DK6EZ, DM5VH, K3EST who gave him 599, and UA2FCZ. This can be compared against the big rig which came up with KV4AA, UJ8AQ, UI8LAG, UL7VAI and UV9AX.

At G4EVO it is always QRP of course, and it managed to get him all round Europe, although by the proportion of his QSO's on 7 MHz to the total it is quite clear that Forty is not a favoured band at G4EVO.

Eighty
What can one say? Most of the band is covered with ragchews, and yet there is SSB and CW DX there for the taking by those with the nous to do so; and Eighty among the non-DX types is quite the most ill-mannered band below 144 MHz.

The QRP chaps like this band, and many of them come on around the noon period; and it’s quite surprising what they can do, with such simple gear and low power. G2HKU for instance, trying out his HW-8, worked DJ5GW and GW5TW on CW.

For a change G2NJ (Peterborough) finds he has been working the “oblique stroke” call signs assortment; picking out at random from the log one finds DL1GK/HB “in the mountains,” G3SET/M using CW from Brighton, G2CAS/P a couple of miles from Snowden, and also worked from Ilkley, GW4ETS/A near Monmouth, and LA9ZL/MM in the Bay of Biscay.

Eight watts of CW are still getting round well enough on 3·5 MHz CW, says G4FJU—and your conductor recalls that this figure used to be almost de rigeur in the days when he started, by way of a basically Top Band rig made to double on to Eighty as one's first station.

For Ben there were plenty of U.K. QSO's plus EA7XQ, UK5WBT, SP5BLI, F6BQF, PAOCYW, UA4PU, to give a dash of variety.

What a pity people can't send us details of events in good time! We hear that at the time of writing, G18EWM, G14FVM, G13UHL, G14DOM and G14EIZ are on their way to Rathlin Island (weather of course permitting), which lies some seven miles from Ballycastle in a northerly direction, covering all bands from 3·5 MHz right through to VHF, which should give quite a lot of G's something new to snap up. Apart from its Marconi connection, Rathlin is noted as the site of the cave in which Robert the Bruce saw the proverbial spider.

One would guess that they would have doubled their “customers” had the word gone round a little earlier so that it could appear in last month's column; still, one has to remember that expeditions which depend on a small boat are—and can only be—finalised when they know the weather and the tides will serve.

To get on Eighty and Top Band, G4EDG uses his 7 MHz vertical; the system is to mount a 7 MHz trap at the top of the existing vertical, to take a horizontal wire some thirty feet to a 3·5 MHz trap, from which again there is another 45 feet of wire which in its turn brings the system to resonance at 1·825 MHz. Steve doesn't say whether he worked much on Eighty, but if his Top Band results are anything to go by, it should perform quite well.

G3PKS used the band with his little crystal-controlled rig in the car on his holiday tour, along with its homodyne receiver; the whip is a home-brew one on the roof, and Jack reckons an e.r.p. of around 0·1 watts allowing for the losses in the aerial. This power, used from Bala Lake worked G3YLJ, G3EJW and G8LN; while the last two were worked again from a lay-by some forty miles north-west of Aberdeen. Near Stranraer there was a Gotaway when PA0JSS called Jack, but no complete QSO followed. G3OTK/A was at the G3PKS home QTH, and G3FRN were both worked from Wigtown area, and another quite successful effort was from near Kenilworth.

Elsewhere we have mentioned G4GIE; he has tried Eighty but at the time of writing he hadn't made a QSO, although the RF appeared to be getting out and the signals were certainly coming in.

Another one who seems largely to have deserted Eighty is G4EVO—his log contains the odd QSO but nothing very much and it is clear he prefers to work on Twenty and Fifteen.

Top Band

Doesn't get a lot of mention anyway at this time of year; G4FJU has updated his Table entry after a chat with G4AEJ as to what was needed, while G4EDG has been, as mentioned elsewhere, trying out the multi-banding of a 7 MHz ground plane. The matter of “how well does it work?” was very quickly solved by an idle tune across the band; PY1RO was calling CQ, and QSX 28; a quick calibration and a call brought ROL back with RST 359. Other calls were made, one of which brought back PT2CW, and on a different date VE1ZZ was being worked, while PY, LU, and K2ONC were all heard. We guess Steve is waiting for the “season” to start!

Finally, what about some more entries for the Ladder? If we go on like this, about all we shall have left after WARC 79 will be the memory!

Finale

As normally of late, the deadlines for the next few months will be found in a “box” in the body of the piece, the current one being October 6 to arrive, addressed CDXN, 34 High Street, Welwyn, Herts. AL6 9EQ.
A FOUR-BAND VERSATILE VERTICAL

BECOMING THE SIX BAND "RHAPSODIC RADIATOR"

B. A. M. HERBERT, G2WI

THE writer's QTH is such that whilst two 30-ft. masts could be erected to raise the aerial they were only 67 feet apart and the consequent aerial orientation NNE-SSW.

The initial set-up in these circumstances was, and still is, a K.W. trapped dipole; the end sections have to be folded down close to the masts, the whole configuration being a variety of inverted "U."

This arrangement functions admirably on all bands but on 21 and 28 MHz there are respectively five and seven half-waves in the "top" which gives mainly "end-fire" radiation on these frequencies; bearing the antenna orientation in mind it will be seen that the RF radiated on 21 and 28 MHz largely just contributes to the warming-up of the Polar wastes!

Despite the fact that Ten will be of little account for sometime to come, it was desired to evolve an efficient radiator that would put out a good omni-directional signal on this band and on fifteen metres—hence, much thinking! The fact that an arrangement appears to have been arrived at which radiates equally well on four bands (and later, six!) with an inherently low SWR may be considered as a bonus for the Industry!

Of course, it would have been quite simple to go out and buy an "XYZ Vertical" and have done with it, but it has always been axiomatic with the writer that "if you can't build it you shouldn't buy it." In any case it was necessary to determine whether a Vertical antenna would provide the results desired and that this should be achieved inexpensively.

A study of commercial verticals speedily revealed complicated traps and mechanical details which were deemed to be beyond the writer's constructional capabilities—so other means had to be sought. Vague memories of suggestions for using "stubs" in place of traps as the isolating elements in multiband antennas drifted through the memory, and eventually pencil and paper produced a layout for which logical voltage and current distributions could be projected.

As will be seen from Fig. 1, the antenna starts as a 7 MHz "quarter-wave over ground" vertical, fed at the base with 75-ohm co-ax, the outer of which is grounded (a good solid earth spike, please!); prune from the original 33ft. 9in. to get the minimum SWR—it comes quite easily to 1:1 at the chosen frequency of 7050 kHz. The choice of 75 ohms was a compromise between the base impedance at 1-wave and 1-wave, and does seem to work.

Once this is achieved join 16ft. 9in. of wire to the top end of the antenna and run it down parallel to the main wire, 2-in. spacers will be needed and these were made up from 3-in. Perspex rod and applied every two feet (holes were drilled through the rod and the requisite spacers threaded on—also as for the first eight feet or so there was to be another parallel wire on the other side of the main wire, these spacers were made 4in. long and drilled in readiness). These spacers are simply secured in place by crimping the wire above and below them. This method gives a very light assembly which is strong.

When the 16ft. 9in. wire is in place (forming the 14 MHz "stub") erect and energise the antenna with 14 MHz RF; choose your own optimum frequency—mine was 14.2 MHz. Trim the stub wire an inch or less at a time until the SWR is minimal—about 1.2:1.

Fig 1. Physical details of the 'Wigwam Vertical'
The other stub wire (8ft. 6in.) is now attached and passed through its spacers and the antenna energised with 28 MHz RF. The stub wire must be trimmed very carefully to achieve the best SWR (use a nail file); choose your own optimum frequency—mine was 28.55 and the SWR 1.1. It will be appreciated that 21 MHz will be a function of the full 7 MHz wire and as such has no adjustment of its own, the SWR proved to be 1.1 at 21.25 MHz.

Having assembled and adjusted the antenna and stubs it should be hoisted into position and the SWR checked again. It may be necessary to do a little more “pruning”—as to which way (i.e. longer or shorter) can be determined by tuning the Tx for best SWR and observing whether high or low of the chosen frequency, once this is known a little thought will indicate the appropriate action.

Although the original intention was for a direct earth on the outer of the co-axial cable this, in fact, could not be achieved immediately as the antenna was erected between buildings and over a concrete backyard. To simulate the ground connection two radials were utilised; they were not insulated and were nailed to the fence!

One was 16ft. 6in. long and the other 9ft. 6in.—if these are used they may need a little pruning to achieve the minimum SWR. A direct earth was soon achieved and the investigation continued.

The assumed current distributions are shown in Fig. 2; it will be seen that the antenna functions as a ¼-wave against ground on 7 MHz, ditto on 14 MHz—the upper half being cancelled out by the 16ft. 9in. stub wire. On 21 MHz it works as a ¼-wave over ground and on 28 MHz the 8ft. 6in. stub reduces the effective length to a ¼-wave for this band.

In use the antenna needs no ATU, but plugs direct into the SWR meter; there is no TVI on domestic TV’s.

The SWR figures (measured by two “homebrew” meters and on a professional example) are given in the Table.

Results to date are highly satisfactory: using 200 watts p.e.p. SSB on 7 MHz all Europe etc. is covered at S9, on 14 and 21 MHz JA, VK, ZL1, and KL7 have all been contacted with good reports. On 28 MHz a solitary ground-wave over a 30-mile path gave a solemn S1 both ways.

Obviously a rotary beam or quad could be better, but for those set about with space and location problems this antenna is an easy answer at low cost, which can be hung up almost anywhere—it’s not even fussy about being perfectly vertical.

**Transformation Scene: “Versatile Vertical” to “Rhapsodic Radiator”**

Having established the “Versatile Vertical” as an efficient, all-round four-band radiator, the promptings of other interested amateurs, amongst whom G2BSQ was prominent, caused the writer to consider extending the performance to cover six Bands. This presented certain problems since no mast or other “sky-hook” 132 feet high offered itself.

The matter was resolved by keeping to the original “Versatile Vertical” and adding to it extensions to cover 160 and 80 metres. These additions to be horizontal, thus giving an inverted “L” outline. The open wire construction as used in the original was thought to be cumbersome
for these extensions, rather too obvious (to the neighbours) and also somewhat heavy.

Consideration was given to using flat-twin ribbon feeder and work proceeded with this material. At first it was thought that, with a little rearrangement of the stub sections the whole Vertical might be fabricated in the "ribbon" material; this was in fact achieved but then the snag appeared. The ribbon Vertical worked well enough—until it rained! Then everything went "widdershins"—the SWR soared up and it became sadly clear that the ribbon was too affected to be suitable in that place. So, back to the original "V.V." which is virtually unaffected by weather.

It was surmised that at the lower frequencies, and hung up in the clear where it would drain well, the ribbon might not be so unusable; accordingly a 34ft. length of ribbon was cut and one wire soldered to the top of the Vertical, this is referred to as the "main" wire, the other being the "stub" wire. The antenna was now energised with RF at 3.7 MHz and the far end of the "main" wire trimmed back until the SWR was 1.2:1; the "stub" wire was trimmed to match but only to keep things looking tidy.

The SWR on the 7 and 21 MHz bands was now wildly adrift, as might have been expected! The "stub" wire in the 80-metre extension now had to be brought into use to form the stub which would restore the Vertical to its correct operation. This is where the Velocity Factor of the flat twin wire comes into the picture: if we joined the free wire to the "main" wire at its far end then the stub would resonate at too low a frequency.

If the Velocity Factor of the ribbon is known or can be determined, then as a starting point one multiplies the length of the 80-metre extension (after trimming) by the VF, this gives the length of the required stub measured from the top of the Vertical towards the free end. Having determined this point a sharp awl is used to pierce the plastic of both wires and a stout safety pin used to short them together (checking on the 7, 14, 21, and 28 MHz SWR will show if this is correct—if not, trial and error each side of the initial spot will eventually find the exact position at which main and stub wires need to be shorted. This is achieved by soldering. The remaining stub wire need not be removed from the ribbon but six inches or so should be cut off from the extreme end where the 160-metre extension is about to be added.

The 160-metre extension is formed in exactly the same way as the one for 80 metres; a 66ft. length of ribbon is cut and one wire soldered onto the "main" wire, the overall length trimmed for a low SWR at, say, 1-9 MHz. A ratio of 1:3:1 is acceptable, though quite a substantial length (2 or 3 feet or more) may have to be removed to get this result. Calculate, as before the length of stub required to cancel out the 160-metre addition, and measuring from the junction of the 80- and 160-metre extensions find the approximate point for shorting up. Locate the exact spot as before and effect the short.

Your antenna is now a six-band "Rhapsodic Radiator" using no ATU, allowing instant QSY from band to band, with low SWR—all factors calculated to induce Rhapsody in the average operator! Fig. 3 gives general aspect.

Some Practical Details
1. As surmised, it was found that the 160/80-metre additions were very little affected by rain and damp.
2. Some ribbon feeder is of very light construction and was thought likely to stretch when about 90ft. of it was hung up in the horizontal mode. To obviate this the web of plastic was punched every 8-10 inches, when this was completed a nylon string was threaded through and attached securely to the ends of the ribbon; the nylon string does not stretch but carries the weight and the ribbon lies along it. Fig. 4 shows the idea. No detectable change in results or figures have been found to be caused by this modification to the ribbon.
3. If all the 160-metre extension cannot be hung-up it has been found that it can be brought down to fence level and laid out with no impairment of operation. The "Versatile Vertical" has now become the "Rhapsodic Radiator," operating over six bands, and retaining all the original advantages.

Its Cost? Minimal! Mainly in time and patience in adjustment.

Its Results? Excellent—at least equal to any random length of wire using an ATU and on the higher frequencies very superior!

One last thought: plan and site the Vertical portion first—if you change the physical position of the Vertical after the horizontal section has been trimmed and raised you may find that due to different interactions all the SWR's have gone astray. You have been warned!
THE POLDHU STORY—FACT OR FICTION?
G. R. M. GARRATT, G5CS

Many people disbelieve Marconi's claim to have heard those "S"s from Poldhu on the 12th December 1901. Claiming that the whole thing was a technical impossibility, the story has been described by many competent to judge as a "hoary old myth" and, certainly, when one examines the undoubted facts, Marconi's claim does seem to be quite incredible. A spark transmitter with an output of perhaps 2-3kW, a non-resonant non-directional aerial, a wavelength of between 600 and 1,000 metres, daylight all the way from Cornwall to Newfoundland, an untuned receiver with no amplification and a detector which, at best, could only be regarded as a very inefficient diode. Come off it—the whole thing was quite impossible!

And yet, in spite of the apparent impossibility, many have continued for many years to believe that Marconi did hear those signals as he always claimed to have done. Marconi's integrity is indisputable, he had nothing whatever to gain by deceit and the utter consistency with which he adhered to his claim throughout his life seems to carry conviction. He never wavered in his account and he refused completely to admit of the possibility that he might have been mistaken.

I have always believed that Marconi did hear those "S"s but, some years ago, I found myself challenged to justify my belief by explaining how the feat might have been accomplished with the equipment Marconi is known to have used. Fair enough—so, for what it is worth, here is the theory I put forward. It divides broadly into three headings, Waveform, Power and Frequency, though all three are inter-related.

Dealing firstly with the question of waveform, it is possible that we are far too conditioned by our knowledge and experience with ordinary CW transmitters to realise sufficiently that a spark transmitter was a very different "kettle of fish." Whereas a CW transmitter, as its name implies, radiates a continuous succession of waves of constant amplitude, a spark transmitter radiates only a very brief burst of oscillations which die away exceedingly rapidly and which are followed by a long period of silence until the next discharge initiates a further brief train of oscillations.

That much is common knowledge but we need to look at the spark transmitter rather more closely and ask the questions—"how brief is the 'brief train of oscillations' and how long is the interval between successive trains?". The answers to these questions—and the consequences which flow from them—provide some truly staggering figures.

In the highly damped conditions of a spark transmitter, each burst of oscillation dies away completely in only three or four cycles. The first half-cycle is of tremendous amplitude, the second is much smaller and by the time we reach the forth or fifth cycle the amplitude has become negligible. Suppose that we are dealing with a fundamental wavelength of 500 metres (0.6 MHz), each complete cycle occupies just over 1½ microseconds, the whole brief train only about five microseconds and since it is only the first two cycles which are of any significance we can see that, effectively, nearly all the energy is packed into 2½ or three microseconds.

Now let us consider the interval between successive spark discharges. Obviously this depends upon the type and adjustment of the interruptor or its equivalent but if we assume the not unreasonable figure of 20 sparks per second we have a time interval between spark discharges of 1/20th second—or 50,000 microseconds. We thus have the extraordinary situation where we have nearly all the energy being radiated within a brief time of 2½ microseconds to be followed by a "waiting period" of 50,000 microseconds before the arrival of the next "pulse." This leads one to the even more surprising situation where the average power radiated in each "pulse" is 20,000 times the mean power output of the transmitter so that, if the mean power output is, say, 2kW, the peak power output of the pulses is of the order of 40,000kW—40 megawatts!

Turning now to the wavelength—or frequency—of the Poldhu transmitter, we are immediately confronted with the difficulty that nobody really knows what wavelength was used! The fact is that in 1901 the pioneers, and even Marconi himself, did not appreciate the significance of wavelength and, even had they done so, they had no means of measuring it. Even Marconi's co-designer, Professor J. A. Fleming, did not know the answer when he wrote in 1921—"the wavelength was never measured but it may have been about 1,000 metres". G. S. Kemp, Marconi's original assistant, was accustomed in later years to say that the wavelength used was about 2,000 metres but W. S. Entwistle, another of Marconi's contemporary engineers, wrote in 1922 that the wavelength "was probably about 700 or 800 metres." Pay your money and take your pick!—we just don't know the answer but recent calculations based on such facts
as we know of the tuning circuits at Poldhu leads us to believe that the fundamental wavelength was rather shorter than has previously been supposed and it is now thought more likely that it was between 350 and 400 metres—say between 0.75 and 0.85 MHz. This would in fact check up with Marconi’s statement in 1908 that the wavelength of Poldhu “was about 1,200 feet” but, quite frankly, he didn’t know and perhaps it doesn’t really matter because we can be quite certain that, whether it was 350 metres of 1,000—or anywhere in between—such waves would not have been capable of propagation across the Atlantic in daylight.

While the nominal wavelength of the Poldhu transmitter must remain an unsolved problem we can be quite certain that the radiated waveform was such as to be very rich indeed in high-frequency harmonics. With its very high decrement, Poldhu’s waveform was anything but a pure sine wave and, as was shown by the French mathematician Fourier, any such waveform can be analysed into pure sine waves having frequencies which are multiples of the fundamental. Without going into the complicated processes of mathematical analysis, it can be said with certainty that the waveform of any spark transmitter—even that of a motorcar ignition system!—is crammed full of higher harmonics. Indeed, a large part of the energy involved will be radiated in the form of harmonics.

As we saw earlier, the peak power of the Poldhu pulses may well have been of the order of 25-50 megawatts and it is not at all unreasonable to suppose that there would have been many hundreds of kilowatts distributed among the higher harmonics—say between 2 and 12 MHz, a proportion of which might have been capable of propagation across the Atlantic in daylight. It is probable—indeed it is certain—that the energy radiated on these higher frequencies would not have been confined to sharply defined frequencies in strict harmonic relation to the fundamental, whatever that may have been in theory. On the contrary, the HF energy would have been radiated over a very wide band and, far from being a handicap, the fact that Marconi’s receiver in Newfoundland was completely untuned was almost certainly its salvation! It would have been responsive to the energy in a very wide band of frequencies, whereas had it been sharply tuned much of the energy would have been eliminated and, in all probability, nothing whatever would have been received.

There, for what it is worth, is my theory. I believe that if you take into account the waveform of the Poldhu transmitter and the very long time-interval between successive “pulses,” it becomes evident that the power in the “pulses” was enormous; we cannot be sure, because so many relevant details are unknown, but it could have been anything between 10 and 100 megawatts. Allow for the high-power harmonics which must inevitably have been generated by a transmitter such as Marconi used at Poldhu and I believe you have a possible explanation of how those “S’s” got across to Newfoundland.

There can be no proof and I fear that no one will be able to write “Q.E.D.” after my theory—for if there is one thing which is certain, it is that no one will ever be able to undertake a full-scale repeat of Marconi’s experiment. Think of the TVI! If anyone can think of a better explanation I’d like to hear of it.
The tuning procedure used was to adjust $C_1$ for maximum received signal strength, then switch to transmit and adjust the transmitter output controls and $C_1$ to give maximum RF in the toroid.

**Suggested further experiments**

Owing to the writer having no suitable tree close to the shack all the above experiments had to be done at very low power in the open air and this proved to be a considerable handicap. Anyone who has a tree outside the shack window in a position to do some really useful work by coupling (say) 50 watts into the tree via a toroid and conducting regular experiments over a period of at least a year. This time period is necessary because the tree is a living organism with characteristics which vary with the seasons. In the simplest terms, during spring and early summer the tree is storing energy by extracting mineral salts from moisture drawn up through the root system: excess moisture is shed via the leaves. In late summer and winter these processes are shut down and the tree becomes much drier internally. This means that radiating efficiency, assuming that the tree is playing a major part, could vary considerably during a 12 month period. Incidentally the root fibre system of a large, mature tree would extend for tens of miles if the fibres were laid end-to-end, so the ground plane prospects are interesting! Another possibility which seems worth investigating is that of exciting trees at VHF, possibly via a small toroid tied around a low branch. Should it prove possible to use a tree as a vertical VHF radiator many wavelengths high the applications in areas such as search-and-rescue missions could be very important.

So, as can be seen, much more investigation is required in this field, but at least as far as can be ascertained the first amateur transmissions ever in this field can now be claimed by the U.K. Should any reader decide to take the work further the writer of this article will be delighted to hear from him.

**Table of Values — Fig. 1**

<table>
<thead>
<tr>
<th>$C_1$</th>
<th>200 pF</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 (14 MHz)</td>
<td>8 turns, tap at 2t</td>
</tr>
<tr>
<td>L1 (7 MHz)</td>
<td>18 turns, tap at 4t</td>
</tr>
<tr>
<td>L1 (3.5 MHz)</td>
<td>35 turns, tap at 6t</td>
</tr>
</tbody>
</table>

All approx. 3in. dia.

**Practical details**

The toroid coils were wound with 20 s.w.g. plastic covered wire, although the wire size is not critical provided it is sufficiently rigid. After winding, each coil was slid off its former and a two-foot length of nylon cord was passed through it and attached to the first turn; during transit the cord is tied round the coil to hold it flat. In use it is used to tie the coil around the trunk of the tree with the turns evenly spaced. Capacitor $C_1$ was mounted on a paxolin panel fitted with connecting terminals and having a webbing strap bolted onto it. The strap is used to attach the assembly to the tree trunk a few inches below the toroid. Plastic flex is used for the two connections to the transmitter/receiver: lead lengths used during the tests were between 3 and 7 feet. The tuning procedure used was to adjust $C_1$ for maximum

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**R.A.E. COURSES**

**London (Islington):** At De Beauvoir G.L.C. Evening Institute, Tottenham Road, Balls Pond Road, Islington N.1, Tuesday and Thursday evenings at 7.30 p.m. Senior tutor Fred Barns, G3AGP, from whom details may be obtained at the above address.

**London (Tottenham):** At the Tottenham Evening Institute, 567 Green Lanes, Tottenham, N.17. Full details from E. C. Palmer, G3FVC (Senior Lecturer) at the above address.

**Aldridge:** At the Adult Education Centre, Tynings Lane, Aldridge, Staffs., Tuesday evenings 7.30 p.m. Course tutor B. Price, G4DDF.

**Langley:** At the Langley College of Further Education, Station Road, Langley, Slough, Berks., Monday evenings (theory, Morse, also post-R.A.E. course). Full details from E. C. Palmer, G3FVC (Senior Tutor) at the above address.

**Sheffield:** At the King Edward VII Lower School, Darwin Lane, Sheffield 10, Wednesdays at 7.00 p.m. Details from G3JON, QTHR.
UNUSUAL DX

G. F. PAINTER, G3CFO

THE author has been interested for many years in frequency standard stations on most of the normal frequencies (2.5, 5.0, 10.0, 15.0, 20.0 and 25.0 MHz) especially WWV. These were used as background “music” to other activities in much the same way as some people use BBC Radio 2. Well, WWV has now moved from Maryland to Boulder Dam, some three thousand miles farther away and we are almost at the lowest level in the eleven year cycle so that when heard, this station almost ranks as DX. Activity is now confined more or less to 2.5 and 5.0 MHz.

Some while back the author noticed a peculiar double tick on the signals of a local frequency standard station and after some thought came up with the following idea. The ticks appeared to be separated very roughly by about 0.1 second; radio waves travel at 186,000 miles a second so 186,000 ÷ 0.1 = 18,600 miles, so the local and unknown stations were, again very roughly, 18,600 miles apart. In other words the unknown station must be round the other side of the globe. This sparked off a period of concentrated listening at odd hours of the day and night which eventually resulted in hearing and identifying JJY, the Japanese frequency standard station in Tokyo.

Continued intensive listening produced the stations listed as follows, these have been heard and identified on 50 MHz.

ATA New Delhi India JJY Tokyo Japan
BPV Peking China MSF Rugby England
FFH Paris France OMA Prague Czechoslovakia
IAM Rome Italy RWM Moscow U.S.S.R.
IBF Turin Italy WWV Boulder Dam U.S.A.
ZUO Olifontsfontein S. Africa

LOL Buenos Aires, Argentina, offered itself gratuitously while the writer was engaged on something else. The ticks appeared to be separated very roughly by about 0.1 second; radio waves travel at 186,000 miles a second so 186,000 ÷ 0.1 = 18,600 miles, so the local and unknown stations were, again very roughly, 18,600 miles apart. In other words the unknown station must be round the other side of the globe. This sparked off a period of concentrated listening at odd hours of the day and night which eventually resulted in hearing and identifying JJY, the Japanese frequency standard station in Tokyo. Continued intensive listening produced the stations listed as follows, these have been heard and identified on 50 MHz.

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<tbody>
<tr>
<td>1</td>
<td>GF</td>
<td>Eagle Isle Light House</td>
</tr>
<tr>
<td>22</td>
<td>OTW</td>
<td>W. Hinder Light Vessel</td>
</tr>
<tr>
<td>25</td>
<td>GU</td>
<td>Tongue Light Vessel</td>
</tr>
<tr>
<td>52a</td>
<td>AB</td>
<td>Akraberg Light Vessel</td>
</tr>
<tr>
<td>61</td>
<td>LG</td>
<td>Eilleen Glas Light Vessel</td>
</tr>
<tr>
<td>71</td>
<td>BR</td>
<td>Bar Light Vessel</td>
</tr>
<tr>
<td>108</td>
<td>GX</td>
<td>Bell Isle Light House</td>
</tr>
<tr>
<td>143</td>
<td>OF</td>
<td>Kattegat S. Light Vessel</td>
</tr>
<tr>
<td>326</td>
<td>GV</td>
<td>Genova Lantern</td>
</tr>
<tr>
<td>A27</td>
<td>BNY</td>
<td>Bunraty</td>
</tr>
<tr>
<td>D30</td>
<td>NIC</td>
<td>Nicosia</td>
</tr>
<tr>
<td>D50</td>
<td>LAT</td>
<td>Latina</td>
</tr>
<tr>
<td>E40</td>
<td>GN</td>
<td>Gamal Nasser</td>
</tr>
</tbody>
</table>

RAT and RAS have also been heard but apart from identifying the country by the first letter nothing is known of the location of these stations. Any information would be appreciated.

The author is now concentrating on a little known form of DX hunting. This consists of identifying marine and aeronautical beacons on frequencies between 250-0 and 400-0 kHz (yes kilo-hertz). This is the higher frequency end of the long wave band on my communications receiver.

Reeds Nautical Almanac, starting on page 370, provides full details of frequencies and geographical location in degrees longitude and latitude; but the accompanying maps, on page 376 and onwards, make it much easier for a landlubber to find the location of any beacon. Each beacon listed, in addition to frequency, transmission times, range in nautical miles, and callsign, is identifiable by its list number which also appears on the related map. Around U.K. coasts the beacons are numbered roughly in sequence starting on the Irish west coast, through the Channel (English and French coasts included) up the East coast to the Faroes and Shetlands, then down the West coast of Scotland and through the Irish Sea back to the Atlantic coast. Other groups will be found to run more or less numerically. Thus, callsign NR, 303.4 kHz is number 45 and is located at the N. Ronaldsay light house in the Orkney Islands, or GX, 303.4 kHz is number 107 and is the Isle de Groix light house on the French Atlantic coast in the Bay of Biscay. The range of NR is given as 100 nautical miles and that of GX 50 nautical miles but both have been clearly heard at the author’s QTH in N. Oxfordshire.

Do not expect R9 signals. With the BFO to on and centre RF gain to full and LF gain well up, the majority are about R2 to 3, with some at R4 to 5. The Table is a sample of what can be collected in a short period of listening.

The total at the moment, with more being heard frequently, is 99 marine beacons and 12 aeronautical beacons. An interesting exercise is to obtain a map of Europe and draw lines from the QTH to each beacon heard; distance rings drawn at 50, 100, 200 miles and so on, provide a handy reference.

It will be seen that while a great deal of interest lies in just general listening on these frequencies, it is much more interesting with the Almanac to hand and copies can probably be obtained at public libraries.

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<td>Off Ostend</td>
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<td></td>
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<td></td>
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<td>AB</td>
<td>Faroes</td>
<td>100</td>
<td></td>
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<td>30</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>BR</td>
<td>Liverpool Bay</td>
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<td>100</td>
<td></td>
</tr>
<tr>
<td>326</td>
<td>GV</td>
<td>S.E. French Coast</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>A27</td>
<td>BNY</td>
<td>Shannon</td>
<td>100</td>
<td>Aeronautical</td>
</tr>
<tr>
<td>D30</td>
<td>NIC</td>
<td>Cyprus</td>
<td>250</td>
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<td>D50</td>
<td>LAT</td>
<td>Italy</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>E40</td>
<td>GN</td>
<td>Tobruk</td>
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LOWE ELECTRONICS present
Your guide to the best stand at LEICESTER 1977.

In this brief guide, we are pleased to present a small selection of the new equipment from TRIO. As it is clearly impossible to show all the good things which will be on our stand at the exhibition, why not come along and see it all. The Leicester ARRA exhibition is the premier event in the amateur radio calendar and is not to be missed.

REMEMBER THE DATES. 27th, 28th and 29th OCTOBER. Opening times 10 a.m. to 6 p.m.

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NEW TS700S. 2 metre all mode transceiver

The TS700S is intended to be top of the line in 2 metre multi mode stations. Building on the solid foundation of the TS820 with its outstanding signal quality and unbeatable receiver dynamic range, TRIO have now incorporated all the facilities which customers have expressed a wish to see in the 700 series. Main new features are:

Digital readout
Built into the rig and using the same easy on the eye blue/green readout tube as the TS820. The counter is a complete frequency measuring system and incorporates the VFO and carrier oscillator frequencies to measure the CW transmit/receive shift as well as USB/LSB shift. The display reads to 100 Hz on SSB and CW but is automatically rounded off to the nearest 1 kHz on FM. However—if you insist on reading to 100 Hz, the touch of a switch restores this facility on FM also.

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Using the new dual ratio gearbox with flywheel action for fast band scanning. It is true to say that nothing compares with a real VFO backed up by first class mechanical engineering, when it comes to pin point accurate tuning of SSB and CW.

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The TS700S is fitted with a low noise receiver pre amplifier with carefully calculated gain figures to give that extra performance when digging into the noise for real DX. When signal levels are high, simply remove the pre amplifier at the touch of a front panel switch.

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And break in CW using the built in VOX system. Front panel gain and delay controls allow instant adjustment to suit every situation.

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A front panel button allows instant selection of high power or a nominal 1 watt low power transmitter output.

Split frequency working
Using the new external VFO unit VFO700S. The frequency of the external VFO is checked by the digital readout on the TS700S. A press switch on the VFO allows instant frequency checking at any time and any frequency split or full transceive operation can be carried out using the external VFO. A unique accessory for the VHF operator.

New standards of performance
On the samples which we have checked, the 10dB S/N ratio sensitivity is around 0.15 µV on SSB and the 20dB quieting level is less than 0.2 µV on FM. This gives the TS700S a real lead over any other rig around.

Plus of course all the features which make the 700 series so outstanding. Remember the signal quality resulting from the use of a high supply voltage on the PA and driver giving unbeaten linearity (TRIO patent). Remember the rugged, go anywhere construction which makes the 700 series so popular on expeditions and field days. Remember the all mode (AM, FM, USB, LSB, CW) operation—not all rigs have them. Remember the Simplex/Repeater/Reverse repeater operation available at the turn of a switch.

Finally, remember the combined reputations of TRIO and Lowe Electronics and you will agree with us that for the ultimate 2 metre all mode station is has to be the TS700S.

TS700S £542 inc. VAT. VFO70S £83 inc. VAT
The TR7500 will delight the 2-metre FM user with its combination of performance, reliability and unique features. It represents another major forward step in the Trio product line and is designed to give its owner the very best available in its class.

Features
- PLL: No crystals to buy—ever, since the operating frequency is generated by an advanced PLL system which gives 80 channels from 144.0 to 146.0 MHz. It's easy to tune under strong signal conditions when other, lower quality rigs fold up and die.
- Unique display: The easy-to-read LED channel number display shows 24—simple isn't it? Need R7? Turn the knob until the display shows 7. There's no need to wonder "did I programme R7 into channel 15 or channel 20?"

Repeater operation
Available at the turn of a front panel knob, as is full reverse repeater operation and simplex. Additional tone burst of course with 20 kHz operating frequencies generated by an advanced filter system with excellent adjacent channel rejection.

The new TS520S
The TS520S is the logical development of the TS520, the rig which has earned high praise from amateurs the world over. The TS520S keeps the main design features which made the TS520 such a success but has an uprated specification which includes full 100 MHz coverage, 15 MHz WWV and an auxiliary uncommitted band for possible future amateur frequency changes.

Outstanding receiver performance
Due to the use of a 3SK35 dual gate MOSFET RF amplifier, the TS520S has excellent cross modulation performance. The TS520S has a low noise figure (typically 3.5 dB) and high gain (typically 18 dB). The result is that the TS520S has a receiver sensitivity better than 0.2 μV for 10 dB S/N ratio on all bands.

New speech processor
The TS520S incorporates a new audio compression system for extra punch in the pile-up, and when the path is fading—and it does it without the distortion of clipping.

Vernier PA tuning
Slow motion tuning drive to the PA anode tuning control guarantees easy, accurate tuning at all times.

Effective noise blanker
The TS520S is fitted with an advanced noise blanker system for elimination of impulse and ignition interference. Just one of the deluxe features fitted as a standard item to the TS520S. The transceiver is also fitted with a 20 dB attenuator selected by a convenient front panel push button.

AC power supply
The TS520S is completely self contained with a built-in top quality AC power supply 100-240v, 15 MHz WWV and an auxiliary uncommitted band for possible future amateur frequency changes.

Available in kit form or fully assembled, the TS520S is supplied complete and ready to use with mobile mount, microphone, power leads, comprehensive manual, etc., etc. Nothing more to buy to own the best new FM mobile rig on the market.

See it soon!
A new matching power supply the PSU-S is available for operation from 100-240v ac mains. Output voltage 12.8 at 3.5 amps and including a built in speaker to take advantage of the well known high quality TRIO audio.

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Accessories
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The TS520S is supplied complete and ready to use with mobile mount, microphone, power leads, comprehensive manual, etc., etc. Nothing more to buy to own the best new FM mobile rig on the market.
**TS820**

The ultimate transceiver... TRIO's TS-820.

No matter what you own now, a move to the TS-820 is your best move. It offers a degree of quality and dependability second to none, and as the owner of this superb unit, you will have at your fingertips the combination of controls and features that even under the toughest operating conditions, make the TS-820 the leader that it is. Unprecedented in design plus the painstaking care. TRIO lavishes on each TS200 created an initial backlog of orders but happily we can now supply the TS820 from stock. Once you have operated the TS820, you will not be satisfied with anything else.

**Features**

**SPEECH PROCESSOR** An HF compressor provides quick time constant compression using a high LF compressor as opposed to an IF clipper. Amount of compression is adjustable to the desired level by a convenient front panel control. If Shift. The IF Shift control varies the IF passband without changing the receive frequency. Enables the operator to eliminate unwanted signals by moving them out of the passband of the receiver. This feature alone makes the TS-820 the passcette that it is.

PLL The TS-220 employs the latest phase lock loop circuitry. The single conversion receiver section performance offers superb protection against unwanted cross-modulation. And now, PLL allows the frequency to remain the same when switching sidebands (USB, LSB, CW) and eliminates having to recalibrate each time.

**Specifications**

**FREQUENCY RANGE:** 1.8-30 MHz (160-10 metres)

**MODES:** USB, LSB, CW, FSK

**INPUT POWER:** 200W PE on SSB

**160W DC on CW**

**AN EXPANDER:** 50-75 ohms, unbalanced

**CARRIER SUPPRESSION:** Better than 50dB.

**SPURIOUS RADIATION:** Greater than -60dB (Harmonics more than -40dB)

**RECEIVER SENSITIVITY:** Better than 0.25µV.

**RECEIVER SELECTIVITY**

50 1/2 kHz (-60dB)

4 0.5 kHz (-60dB)

I kHz (-60dB)

5 kHz (-60dB)

**SIDEBAND SUPPRESSION:**

-60dB (Harmonics more than -40dB)

**RECEIVER SELECTIVITY**

SSB 2 kHz (-60dB)

CW 0.5 kHz (-60dB)

**WITH OPTIONAL CW FILTER INSTALLED.**

**IMAGE RATIO:**

160-15 metres: Better than 60dB.

**10 metres:** Better than 50dB.

**IF REJECTION:** Better than 80dB.

**POWER REQUIREMENTS:**

120/240 v. AC, 50/60Hz, 13-8v, DC (with optional DS-1A DC-DC converter).

**POWER CONSUMPTION**: Transmit: 280W.

**Receive:** 26W (heaters off).

**DIMENSIONS:** 133/4" w. x 6" h. x 13 3/4" d.

**WEIGHT:** 35-2lb. (16kg.).

**REGISTRATION:**

DG-I, digital readout optional.

**TS820 £445 inc. VAT DG-I £127 inc. VAT**

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**The Portables**

TR2200GX. Represents the very best of TRIO design. It is the latest in the line of continuous progress from the first TR2200 and maintains the TRIO tradition of top quality at a reasonable price.

The TR2200GX has all the features that you could want—high output power; sensitive receiver; flexible use from internal batteries or external supplies using the power lead supplied; built-in removable telescopic antenna with flexible whip; available; built in metering of signal strength, transmit output and battery condition; fitted with twelve channels at low, low prices; in short, all that you could want. All operator controls are placed for maximum convenience on the top face of the rig and a protective carrying case is included in the price.

VB2200GX. This is the matching 10 Watt mobile amplifier for the TR2200GX (and all previous models). It is self contained and of very small size but produces well in excess of 10 Watts for 2 Watts of drive. It contains a regulated power supply for the TR2200GX and has positive SWR protection for the PA transistor. The amplifier may be switched out of circuit if required, but still supplies power for the TR2200GX.

TR3200. Not content with having the lead in 2 metre handhelds, TRIO have taken a step forward and produced the best 70 cm. portable rig to market.

The TR3200 is really terrific; over 2W output with switched reduction to 40 mW for local contacts, and a switched speech response with a new limiting amplifier and new microphone give you a high quality voice. Excellent receiver performance with double IF filtering at 10-7 MHz and 455 kHz with no less than five limiters to guarantee noise free performance on even the weakest signals.

D12 channel capability with three channels factory fitted with crystals for SUB, 18 and 20. Supplied with all accessories as the TR2200GX and including a new high gain S/B wave antenna. Don't forget, the following accessories are provided with the TR2200GX and TR3200—

Removable antenna

Battery charger

External power lead prices including 12% VAT

Battery charger

Tr2200gx £139 (3 channels)

VB2200gx £169 (12 channels)

TR1300 £82

M16 £97

NiCad pack £97-2

---

LOWE in Glasgow 19 Ellismuir Road, Baillieston, Nr. Glasgow. Tel. 041-771 0364
TR8300

NEW TR8300 70cm FM mobile

The TR8300 is a marriage of the established TR7200G and offers top mobile fixed station FM performance in the 70cm band. Capable of taking up to 33 channels, the TR8300 is supplied with four fitted. The crystals are identical to those used in the already popular 3200 70cm. portable so changing between rigs is easy.

Features

The TR8300 is housed in the standard Trio rugged splash proof case and fits the Trio quick release mobile mount (supplied with set). All the top quality Trio design refinements are incorporated, including the LED indicators to automatically show which channels are fitted with crystals, high/low power switching, automatic tone burst and a new monitor facility for checking your own modulation.

Top performance

The receiver section utilise six section helical filter at signal frequency followed by crystal filtering at 10.7 MHz and final selectivity determined by a 455 kHZ multiple section ladder filter. The receiver sensitivity is better than 0.4 µV for 20dB quieting and the adjacent channel selectivity is very good indeed. Squelch sensitivity is better than 0.3µV so you will not miss any weak signals at all.

The transmitter employs a rugged Motorola transisator in the PA stage which guarantees output power in excess of 10 watts. The Trio variable power SWR protection system is included of course, and high/low power switching is by front panel push button. A top quality coaxial antenna change over relay is used so as to minimise losses both on transmit and receive.

A total of 40 transistors, 26 diodes and two integrated circuits are employed in the TR8300 to give top performance and unparalleled reliability.

Complete and ready to go

All the normal Trio accessories are provided with the TR8300 including the patented quick release mobile mount, microphone, power leads, comprehensive manual and the special stand used when operating from home.

TR8300 £227 inc. VAT
A SIMPLE HF/VHF/UHF GATE DIP OSCILLATOR AND WAVEMETER

C. W. HARLOW, G8BTK

This instrument, which covers frequencies to an excess of 450 MHz, whilst not claiming in any way to be original, has not, as far as the writer is aware, been published before in this form nor have the higher range of frequencies capable with this unit been covered.

The circuit is shown in Fig. 1 and a components list is given. Apart from the UHF FET, the components, all of which come from the writer's junk box, are not critical and ±10% or so should make very little difference.

![Fig. 1](image)

**Components List**

- VC1, VC2 = 2-gang, 75 or 100 pF
- C1, C2, C3, C6 = 680 pF miniature ceramic plate
- C4, C5 = 0.001 μF, small disc
- C7, C8 = 0.1 μF, small tubular
- R1 = 120K
- R2 = 2.2K
- R3 = 1K
- VR1 = 100 ohm
- LI = to suit range or ranges required
- M = 500 micro-amp.
- FET = BF256S or equivalent

Switches S1 and S2 are ganged, and in the OFF position give use as an absorption wavemeter and station monitor. When in the ON position, the instrument may be used as a GDO, a CW signal generator and when an audio source is connected to the socket—a modulated signal generator giving a partially FM modulated AM signal.

The lay-out, Fig. 2, with particular reference to the coil socket, VC1/2, C1, C2 and the FET, which is a BF256S or equivalent, is very critical if the highest frequencies are to be achieved, otherwise it is quite straightforward. The components should be mounted with the shortest practical lead lengths and the coil socket should be "braid" connected with the shortest lengths possible, the braids being obtained from an old piece of co-axial cable and slipped over the two pins of the coil socket and taken directly to each of the fixed sections of VC1/2. For UHF use only, the "strip" line coil may be permanently soldered in place. All components should be rigidly mounted to aid stability and reliability. It will be seen that this GDO has facilities for use as a modulated signal generator and an absorption wavemeter, all for the price of one unit.

When used as a signal generator, an AM/FM signal is produced; that is to say, the modulation is amplitude and part frequency modulated. The GDO can also provide a CW signal. If phones are plugged in at the socket indicated and with the unit used as an absorption wavemeter, it may be used as a station monitor.

The unit should be constructed in a rigid metal box and calibration can be made via a communications receiver with the addition of a 2-metre and 70 cm. converter. The home TV may also be used for the higher frequencies.

![Fig. 2](image)

Amongst the uses for a GDO which are perhaps less known are:

1. Aerial resonance which may be determined by connecting a coupling coil to the end of the feeder and finding the "dip" point which indicates resonance.
2. Band setting a newly constructed or badly misaligned receiver, this being helped considerably by the audio modulation facility provided in the unit here described.
3. Determining the resonance of toroidal inductors. The method is to link the GDO to the toroid by a coupling loop as shown in Fig. 3 and via a further coupling loop at the other end of the co-axial cable to the GDO.

Many more uses are possible for this type of instrument, most of which will come to the mind of the experimenter as and when the need arises.

![Fig. 3](image)
VHF BANDS

NORMAN FITCH, G3FPK

VHFCC Awards

Two readers have been awarded their VHF Century Club certificates this month, both for 2m. operation. No. 286 goes to Leonard Kenyon, G8KNR, from Great Bardfield in Essex. He only took up amateur radio at the age of 63 studying for the R.A.E. at the Mid Essex Technical College in Chelmsford. Leonard passed at the first attempt. First licensed in August, 1975, the first station comprised a Trio TS-520 transceiver with transformer running 10 watts to a 5-over-5 aerial at 35ft. In December, 1975, a Versatower was installed and the aerial is now at 70ft. A year ago, a Trio TS-700G was acquired for 2m. operation whilst the TS-520 awaits an airing on the LF/HF bands when the CW test is passed.

Paul Melbourne, G8GML, from Cambridge receives award no. 287. He was first licensed in August, 1972 and had to use a series of simple aerials due to “local difficulties.” Paul’s first rig was a Yaesu FT2F-B to an indoor 2-ele. Quad and later to a 6-ele. vertical colinear. Having decided that FM was a dead loss, he progressed to a Belcom Liner-2 to a 6-ele. Yagi at 25ft.

A 40ft. tilt-over pole was built at Easter in 1975 and the aerial changed to a 10-ele. long Yagi but the current station now comprises an Icom IC-202 and 30 watts linear amplifier to a 5-over-5 aerial. The QTH is only 40ft. a.s.l. the only clear take-off being between north and east. Paul is now active on 23cm. and 70cm. and is doing well in our tables.

Some readers have asked about the rules for the VHFCC so to recap, they are available for 4m., 2m. and 70cm. All QSO’s must have been made from the same QTH by direct means; i.e. no repeater or satellite QSO’s. When you have accumulated 100 confirmations from different stations just send a list to your scribe who will choose six at random to be submitted for verification. When sending in a claim, please include a brief history of your amateur radio career and details of past and present equipment. We do not issue any claim forms by the way.

Beacons

Alec Allan, GM3ZBE, and Graham Knight, GM8FFX, installed the new Lerwick beacon at the Magnetic Observatory site on August 28. The QTH locator is ZU65f and the frequency is 144.965 MHz. The transmitter runs 10 watts into two 8-ele. Yagis one firing south, the other to the north-east for auroral warnings. So far, conditions have not been good enough for it to be received in the south of England but Derrick Dance, GM4CPX (Borders) reports hearing it first on August 30, the QRB being 530 km. The callsign is GB3LER.

The comments about the GB3NEE beacon in the September column brought a long telephone call from its keeper Roger Jones, G3YMK, who stated that the transmitter has only been off the air recently when the tower was being painted. He discovered that part of the coaxial cable feeder is ordinary TV downlead of unknown age and condition so it is uncertain what losses occur between the 18 watts at the output of the Tx and the aerials. Both the beacon and the Tyne-Wear repeater installations were due for maintenance checks on September 11.

Roger was rather upset that the remarks were made without reference to him. He says he checks both GB3TW and GB3NEE each day and, if there is anything unusual it is reported to the RSGB in accordance with licence requirements. However, your scribe was merely trying to put over the opinions of many readers that the signal from GB3NEE is nothing like as consistent and reliable as it used to be when on 145.975 MHz as GB3DM in past years. Then it was most unusual not to hear it at G3FPK whereas now it is undetectable for about 50% of the time.

It must be appreciated that there are dozens of VHF/UHF beacons of interest to readers and it is quite impractical for “VHF Bands” to contact every keeper on a regular basis. G3COJ keeps us informed about the U.K. situation as far as he himself is kept in the picture by the numerous beacon keepers.

A new UHF beacon is now operating from France in the 70 cm. band. Its call is FX4UHF and the QRG is 432-870 MHz. The QTH locator is ZD52c in the Pyrénées-Atlantiques, Dept. 64, at La Rhune, right on the Spanish border and the a.s.l. is 904 metres. The power output is 10 watts to two 10-ele. Yagis beamed towards Paris, i.e. at 23° bearing. Reception reports to F1FG. From G3DME via G3USF, news of a beacon on 50-146 MHz in Cyprus, callsign 5B4CY. More details later.

The Satellite Programme

For the scientifically minded, some rather precise information concerning the launch of A-O-D scheduled still for Feb. 23 next, along with a further LANDSAT satellite. A-O-D would be released 4381 seconds after launch and after another 739-29 secs. it would be at 78-964°N and 22-270°W at an inclination of 99-00491°. If successful, this vehicle will become Oscar 8.

Oscar 7 seems to be continuing to provide reliable communication on both modes but it is worth reminding casual users that every Monday is a QRP day with a maximum e.r.p. of 10 watts. The idea of QRP operation is to allow stations running the many low power transceivers to communicate through 0-7, something they are less likely to be able to do if the QRO vandals monopolise the satellite. At other times, 100 watts e.r.p. is the maximum desirable power; say 10 watts to a 10-ele. beam.

Some stations reported worked on Mode “A” include EA8IZ (29-488 MHz), PJ2CW (29-493), VE7IO (29-470/485), 5T5CJ (29-440) and CS4AP in The Gambia. An interesting one worked from G3FPK on August 7 was TF4F, an Icelandic operation from one of those new islands which appeared during a huge volcanic eruption of a few years ago. KV4FZ was another new one for your conductor on Aug. 23 on 29-475 MHz down link.

For a long time there has been...
much cursing at G3FPK due to a strong signal on 29-476 MHz at certain times of the day which has often masked the weaker Oscar signals. A bit of detective work by listening to the programme content and noting times has pinpointed the transmitter responsible and, at the time of writing, it is being investigated.

Hugh Rylands, TU2EF, wrote about his Oscar activities from the Ivory Coast and complained bitterly about the selfish QRO types whose big signals depress the satellite receiver’s AVC so much that they push the weak DX signals they are presumably anxious to work into the noise level. He cites the case of the signals on Mode “B” from his Echo-70 (Liner-430) whose 10 watts invariably goes unheard in Europe. Hugh also makes the sensible suggestion that those who have already worked a DX station do not call them on many subsequent occasions so that others may have a chance. He has 62 countries worked now via satellites with five continents confirmed.

TU2EF reports that ZS6BNT has worked into Italy and ZS1BI into Malta. 5Z4JJ is back in Europe, as is 9J2PH. 5X5FS and 9X5SP “... seem to have disappeared now.” ZE7JX is active on Mode “A” on descending node.

Contests

Results: There were three sections in the RSGB Region 1 VHF Contest on August 14. The Multi-operator part was won by the Wulfrun Contest Grp. (Nth.) with 5133 points, the Bury Radio Society second with 3602 pts. and the Isle of Man ARS in third spot with 3487 pts. The winner of the Single Operator section was G4CZP who scored 2240 points, followed by G3JZP/P with 203 and G8JTP/P with 202. The section for operators outside of Region 1 was won by G3FJE/P with 5111 pts. followed by G3JZP/P with 259 and G8JTP/P with 203. The section for operators outside of Region 1 was won by G3FJE/P with 5111 pts. followed by G3JZP/P with 259 and G8JTP/P with 203.

Coming Events: Publications week-end sees the UHF Contests, the RSGB and IARU Region 1 coinciding events, on October 1/2 from 1600-1600 GMT. The bands are 432 MHz to 2.3 GHz. The 1977 series of 70 cm. Cumulatives begin on October 8, then further sessions on the 16th and 24th, plus Nov. 9, 17 and 25, all 2000-2230 GMT. The 70 MHz Fixed Contest is scheduled for Oct. 23, presumably 0900-1500 GMT.

The 144 MHz Open Contest

Your conductor tends to avoid contests mainly because it is quite impractical to devote more than a few hours to them. However, short periods of listening prove quite interesting and reveal enough about conditions to enable a report to be compiled.

At the start of the event, conditions seemed rather flat with much weaker than usual signals from the Welsh portables. Propagation to the north, a good direction from the Welsh portables. The Multi-operator section was G4CZP who scored 2240 points, followed by G3JZP/P with 203 and G8JTP/P with 202. The Multi-operator section was G4CZP who scored 2240 points, followed by G3JZP/P with 203 and G8JTP/P with 202. The Multi-operator section was G4CZP who scored 2240 points, followed by G3JZP/P with 203 and G8JTP/P with 202.
hours of /P from the Midlands achieving 60 contacts, best DX being YP square. He heard G3D3FLH but reckons that conditions were very much up-and-down.

Bob Nash, G4GEE, wrote on behalf of the Coventry Technical College ARS who made their first /P effort in the contest using the call G3UVW/P. They operated from ZM72h making just over 320 contacts with the TS-700 and 8-8 over 8 Yagis. Notable contacts included G3OUR/P (WJ09j), GM4BWT/P (YP44h), ON4YZ (CK63a), F1DPX (ZH02a), DC8RAA (DJ26a), DF5FG/LX/P and G18KIA (XO21b) Bob asked, "We wondered if there is need for all the power being run."

Richard Diamond, G4CVI, and John Regnault, G8FQO, operated /P from near Cromer in Norfolk (AM07f) and managed 382 QSO's worth about 4,600 points. They lost 34 hours and found conditions rather poor even having a struggle to work GM8FFX in Aberdeen over an "easy" sea path. The contest gave Bryn Llewellyn, G4DEZ (Oxon.) an opportunity to try out his newly acquired NAG 144XL amplifier, albeit with a 4CX250B valve as the 4CX350F did not arrive in time. Ian White, G3SEK, operated from Bryn's for a while and 329 QSO's resulted, 61 of which were non-G. The elimination of the QTH-swopping information was much appreciated.

John Tindle, G3JXN, operated from London W5 for 12 hours and made 327 contacts, originally intending not to participate at all seriously. Ian Gordon, G8FIT, and Martin Fulda, G8IQL, operated the University of Kent ARC call, G8KUC from Canterbury and made 411 QSO's, 203 of which were non-UK. They wondered if many of the G stations were working in the SSB Field Day. Best DX came at the end with DM2GPL/P in GL square.

Expeditions

The Oxford University group operated from the Scillies as planned but do not appear to have enjoyed other than average conditions. It is hoped to have an authentic report from them for the next issue but your scribe was told that the 70 cm. K2RIW linear had misbehaved initially due to a fault with one of the 4CX250B valves. On 2m., they were not particularly loud in the London area whenever G3FPK was QRV.

Meteor Scatter

The Perseids shower around Aug. 10 to 13 was very good with some incredibly long bursts. S.w.l. Mike Allmark, Leeds, noted some up to 50 seconds and he added three new countries to his score, viz; CT1, OH and OH0, but missed out on C3 and OY. Best DX was on the 12th and 13th and included OH5NW (NU), SM2HDF (JY34a), I4XCC (GD03d), SM3COL (IW16f), SM3FGL (IV53g), IW6MBK (HC42g), CT1WW (WB63b) and DB5NA/0H0 Mike reports that Dennis Boniface, G4DSC, worked CT1WW and OH5NW, the latter also worked by G4CMV and G8HDR.

Clive Penna, G3POI (Kent) submits a mouth-watering list:-I3LGP (GF24), I6CXD/6, IW6MBK, LA3WU (DU61a), OE5UAL, OH3AZW (LV39e), DB5NA/0H0 (KU61f), OK1BMW/P (HK52b), SK6JF/OY (WU77e), SM3BIU (HX18j), SM3COL (IW06f), SM3AZV (IX79d), UA1WW (OR12b) and UK2BAB (MO19a).

C310X in AC square was another new MS country bringing Clive's total to 40. Dave Price, GW4CQT, also worked UK2BAB on random and UP2BBC (LP07j).

Keith Naylor, G8UFU (Essex) a very experienced MS practitioner, reckons this year's Perseids to have been one of the best displays he has seen. At the peak around 1100 GMT on the 12th, he had continuous bursts for over a minute and exchanged RS 59 reports with DB5NA/0H0 during an E's type 44 second burst.

John Nelson (G4FRX) brought his TS-700 and home built 400 watts amplifier to G3FPK's QTH during the Perseids and was astounded at the SSB DX heard. Unfortunately several SSB skeds set up by letter with FICYB in Corsica produced not one ping so we assumed Edouard did not get the note about QRV's in time.

It is obvious that in future major showers, the calling procedure for random SSB MS working can be revised to enable QSO's to be concluded very quickly during a longish burst. To this end, Ian White, G3SEK, and Clive Penna, G3POI, are thrashing out a suitable proposal for discussion at the next IARU meeting in Hungary.

The next notable shower will be the Orionids, peaking around Oct. 20/21.

The Gigahertz Bands

Don Hayter went to Alderney for the Aug. 21 leg of the 10 GHz Cumulatives operating as GU3JHM/P. He worked G4CNV/P and G3VPF/P, 8 km. south of Dorchester and G8BCO/P and G8ALO/P 7 km. north of Chichester and G3KSU/P on the Isle of Wight. On the 28th, he worked F5ZA over a short 16 km. path for the first GU/F 3 cm. QSO. Glen Ross, G8MWR (Coventry) reports that G8AIM is building gear for 10 GHz and also for 2.3 GHz.

Bill Jarvis, G8APX, writes that he will shortly have some spare Microwave Associates Inc. varactor tuned "Gunnplexer" transceivers complete with the horn antenna with 17 dB gain. Anyone interested should contact Bill at Salewheel House, Salesbury Hall Road, Ribchester, Preston, PR3 3XU. For an s.a.e. he will send you a "Xerox" of the full gen.

Two Metres

G2AXI (Hants.) found conditions very average over the month. Syd added G8EZDA and GU3JHM/P (Alderney) to his 1977 tally plus G3OUR/P (Scillies) on Sept. 3. Gerry Ilbury, G3MMW, (Hants.) writing on Aug. 13 complains of the sad lack of CW activity generally as typified by his seven QSO's over the preceding thirty days! Although his site is not ideal, he notes that both GB3CTC and FX3THF are always audible with GB3NEE popping in and out of the noise. Even so, numerous CQ calls fall on deaf ears with perhaps just a few regulars to be heard.

G4ERX reckons it was a poor month for him. At Sept. 6, Ray has not managed to work G3OUR/P but did have a QSO with G8APZ/P in Devon. "Gremlins" in the transverter during the "Open" precluded his working DF5FG/LX/P at 0300 GMT. John Woodham, G8BK (Bristol) had a brief contact with E17BA in Co. Limerick in VM square. He quite often hears EI9BG
Chris Baker, G8JGK (Essex) was another who worked DF5FG/LX/P in the Open Contest and he thinks the 6-ele. Quad at 50ft. on the new tower is paying off. Martin Green, G8KW (Warks.) has worked GM at last thanks to GM8LHT/P in YP76h, and on the E's front, I4EAT (FE60) was contacted on Aug. 6.

Alister Simpson, GM8NCM (Fife) records generally poor conditions except for Aug. 17 and 18 when propagation to LA was good with LA6HL worked each day and the Bergen repeater accessible. The new rig, a Yaesu FT-221R with the 8-over-8 aerial is working well.

At G3FPK on Aug. 9, G4JZ (Glos.) was heard working some GI's and a QSO with G18KIA ensued. Shortly after, G18FLQ in Co. Down (XO32b) was worked. 24 hours later, a long awaited QSO with Shetland was concluded thanks to John Aitken, GM8NFG (YS07g) who was a very steady signal with his FT-221R and 8-ele. Yagi. Propagation to the far north was extremely good late on the 10th and into the early hours of the 11th. On Sept. 4, F1EKU/P in Dept. 63 (BF29c) was a tremendous signal all evening; with 5 kW e.r.p. from a site 5,000ft. a.s.l. hardly surprising!

For once, a major spell of good tropo. conditions occurred at a weekend. September 10/11 saw excellent propagation into northern Spain and the Pyrénées, plus lots of stations from central France and later from Switzerland, Luxembourg and the low countries. At least, the southern stations "scored" but those only a few miles north of London seemed to miss out. EA1CR, one of many stations in Gijon (XD32) was inundated with callers as he was the only SSB station heard. EA1CP was worked on CW on the 10th and EA1AB, another Santander station in YD41b, at 1450 GMT on the 11th. A missing square was provided by F6CHT/P in Dept. 56 on the Ile de Groix (YH23e) and several new departments were also worked, way down in the south of France. As these notes are being completed, the barometric pressure is 1038 millibars in London, so hopefully there should be another good spell of tropo. as the high pressure declines.

**Deadlines**

All your notes, claims, etc. for the next issue by October 6, and for the December column by November 3, to:- "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ. 73 de G3FPK.
THE MONTH WITH THE CLUBS

By "Club Secretary"

BY the time this issue gets to you, the club will be well into its winter programme; so now is the time to give you the Rules for MCC—the thirty-second MCC, and the first one in which there will be no G6FO among the monitor stations.

You will have plenty of time between now and November 5 to organise something; don’t forget the value of such contests in training for bigger and better efforts; which could be taken to mean that if a chap is interested in contest operating, he could well ask his committee to let him enter on their behalf. Certainly the invigilators have never had cause to complain when we hear a station operating slowly but steadily, and one can as well use MCC for “self-training in communication by Wireless Telegraphy,” as the licence has it, as go into there with the hell-for-leather win or bust outlook. Either way, it’s been traditionally a good clean effort with anywhere up to 100 Clubs, not to mention the other chaps who come on to add to the fun.

And for the SWL’s—we would be only too pleased to have your check log, to help the invigilators keep tabs on all that goes on. If there are enough of them we will make a separate list of their names, but if not, we will certainly make our acknowledgement in the piece for the help.

The Mail

And, with so many club scribes on holiday, and the piece being written on Bank Holiday weekend, it will be a thin clip, and no chance to “write in” the odd late arrival—but, as always, such late stuff is held on file for use the following month.

Our first stop is at South Birmingham, mourning the death of two of their founder members G3OMG and G3PDS. Both had served the club well, taking office and responsibility, and taking part in the Top Band net regularly. G3OMG in addition was ever ready to help the SWL or newly licensed chap with that vital bit of encouragement at the right time.

As for the club, they foregather at Hamstead House, Fairfax Road, West Heath. Birmingham 31, this being the West Heath Community Association establishment.

This is probably the last time that Cheltenham RSGB will be writing in, as they are in the throes of an amalgamation with the Cheltenham Radio Society; the subtle change in name will be that the new group will call itself Cheltenham Radio Club. It appears as if the new group will be based on the RSGB group venue, the Old Bakery, Chester Walk, behind the library. October 6 is the date, and it rather looks as though November 3 is going to be the first gathering of the new formation.

At Peterborough Radio and Electronics Society (there is another group in the district) we have it that the Hq. address is the Scout Hut, Occupation Road, and the date October 21. The subject is “to be arranged”—and we guess that it will have been settled by the time this reaches you.

On we go to Chiltern who have their place at 42 Castle Street, High Wycombe. Their date is October 26, and for further details we have to refer you to the Hon. Sec. His name and address, as ever, will be found in the Hon. Sec’s. Panel on p.490.

If you know of anyone, blind or invalid, who is not yet a member, get them into RAIBC by way of the Hon. Sec. at the address in the Panel . . . and, while you’re at it, you might consider joining as a “supporter” or a “rep.”—either of which activities will be found to be very rewarding indeed.

It’s the AGM to kick off October at Wolverhampton, where they foregather each week at Neachells Cottage, Stockwell End, Tettenhall. October 3 is AGM, and on 17th there will be a members slide evening; Natternites occur on 10th and 31st, while October 24 is given as a committee meeting.

Just too late for inclusion in the list, we have a note that there will be an R.A.E. class in the Burgess Hill area, the venue being Marle Place, Leylands Road, Burgess Hill—which is the Hq. of Mid-Sussex. G6YJ is the R.A.E. class man, but for the details of the club itself we turn to the Newsletter. In this, we see October 6 as down to G3RXJ to talk about the Hardware of Microwaves, and on 20th there will be “Mid-Sussex Discs” based on the radio programme Desert Island Discs. Anyone with tape or disc for the occasion is asked to get in touch with G8KMP.

The Melton Mowbray group had their AGM last month; they have Hq. at the St. John Ambulance Hall, Asfordby Hill, Melton Mowbray, and we believe that the “third Friday” routine applies. However, the Hon. Sec. will no doubt be pleased to fill you in should get in touch—see Panel for his address.

Another AGM falls to be mentioned, this one being at Horndean, on October 13, at the usual Merchistoun Hall Hq.

For Cray Valley, their normal home is Eltham United Reformed Church Hall, 1 Court Road, London SE9. As the Newsletter we have to hand is not the current edition, we don’t have the full list of dates, but on October 20 there is the Annual Construction Competition.

Nice to hear again from Arthur, G3MDW, writing in on behalf of Northern Heights; he has noticed an absence of the group’s news, later, and this of course is because (as we have said before) we find it impossible to carry “block bookings” without some quite serious mistakes creeping in for which, inevitably, we get blamed! Thus, our rule is quite simple, that when we receive a letter (or a news-sheet) from a club, we mention them in this piece at the first opportunity, and then file. In this case, sure, we get the Newsletter on a while, but not every month. Anyway, it’s certainly not G3MDW’s fault. The gang are still at the Peat Pitts Inn, Ogden on each Wednesday. October 5 is set aside for G4ECM to talk about Ceefax and Oracle, the Teletext services available on TV, and on October 19 there will be a Slide Show.

Down West now, to Saltash, where they get together at Burraton Toc H Hall, which lies at the junction of Warraton Road, and Oaklands Drive, on the first and third Fridays of each month. Thus October 7 is for G3WKC to give a semi-technical film show to the
members while October 21 is a "home" quiz engagement against the members of Plymouth club.

Back up North now, to a fairly young group, Ormskirk who at the moment have to get together at each others' homes on Wednesday evenings, which immediately says that if you want to make a first contact with them it is but common courtesy to get in touch first—see the Panel for the name and address of the Hon. Sec. There is as yet no firm programme, but we guess that they are working on it. Having seen many clubs in the same situation, we know just how difficult it is to fix up anything definite.

Hereford send us in a Newsletter each month, and from the one we have to hand we read that the building in which they have Hq. is being renovated, so we can sympathise with the disruption and dirt; however it'll soon be over and the benefits felt. They seem to gather at the County Control, Civil Defence Hq., Gaol Street, Hereford, on the first and third Fridays.

It is the first Wednesday in the month as a rule for Surrey, but there doesn't seem to be a forward programme in the Newsletter issue to hand, although we do know that the Hq. is at TS Terra Nova, 34 The Waldrons. The one we just mentioned is normally the prime meeting, with a less formal "do" at the same address on the third Wednesday.

We were indeed sorry to read the Editorial in the Wirral Newsletter, in which the Editor bewails the low number of attenders and then says that this is the reason why they can't ask "foreign" speakers to give a talk. We felt sad, not just because we can recall when Wirral were one of the biggest and liveliest clubs in the country, but also because the Editor has got it backwards, having turned cause into effect and effect into cause. However, why not go along on the first and third Wednesday in each month, to the Sports Centre, Grange Road West, Birkenhead, and see for yourself—we're sure they would be glad to meet you.

Stowmarket are next in the pile, and the letter from the Hon. Sec. there shows no sign of defeatism—a talk by Decca last month, and this time a talk on TVI by G3YWM; the first Monday in the month it is, in the Red Cross Building near Stowmarket Station.

At Echelford they are a bit cross because the turnout for VHF NFD was so good they could have afforded to have a station on 23 centimetres to further boost the score—which is the right sort of thing to be cross about! They also nearly scrapped off the 70 MHz station, but that was probably something they would not have done had a certain member been able to attend the planning meeting. Hard luck, but just one of those things. The group get together at the Hall, St. Martins Court, Kingston Crescent, Ashford, Middlesex, on the second Monday and the last Thursday of each month. Doubtless by now the Hon. Sec. will have something organised—if you want to find out before going, his address is in the Panel.

The Market Hall, St. Albans is the place for the formal meetings of Verulam, while the winter informals are based on the R.A.F. Association Hq. in Victoria Street. For October, the formal would be on October 27; nothing given in the way of programme but as there is something down for November and December, doubtless there'll be something fixed up. The pattern is to have the

MCC—THIRTY-SECOND

TOP BAND CLUB TRANSMITTING CONTEST

RULES

1. Object: Clubs to work one another.

2. Dates: Saturday and Sunday, November 5 and 6, 1700-2100z (8 hours in all).

3. Band, Power and Mode: 1.8-2.0 MHz, ten watts DC input, CW only.

4. Callsign and Identification: Clubs are to use their own callsign, or that of a paid-up member, and to identify themselves as a Club, e.g. "G3ASR Club" in all QSO's. Counties in which a station is located are to be indicated by a three-letter abbreviation, e.g. HMB for Humberside, WMD for West Midlands, etc.

5. Scoring: Count three points for each Club worked in your own country, six points for a Club in another country, one point for a non-Club station. (Countries include G, GC, GI, etc.).

6. Multiplier: One multiplier point for each U.K. or Eire county worked, one multiplier point for each country worked, once only during the whole contest. A non-Club contact can be claimed as a multiplier, if it meets these conditions.

7. Logs: To include (a) Date; (b) Time, GMT; (c) RST sent; (d) RST received; (e) County abbreviation received, plus "Club" or "non-Club." (f) QSO Points claimed. Each contact claimed for multiplier credit under Rule 6 to be underlined. At foot of each page, note total QSO points claimed on that page. Each page to be legibly set out as above, using one side of the sheet only. Head of each sheet, clearly indicate Club name and sheet number. Pre-printed log sheets will be accepted, provided they meet the above requirements; alternatively, A4 size sheets suitably ruled may be used.

8. Disqualification: A bad note, over-driving of a transceiver resulting in a wide spread of spurious, use of excessive power, key-clicks, deliberate interference with another station, or operation judged by the invigilators as being not in the spirit of the Contest, may result in disqualification, at the sole discretion of the invigilators.

9. Contest Call: "CQ MCC," Use of callsigns during a QSO must be within the terms of the licence.

10. Final Tabulation: On the last sheet indicate total QSO points claimed, total multiplier claimed, and final score, being QSO points times Multiplier. On a separate sheet, include a declaration that the station has been operated within the rules of the Contest and of the licence; in addition, details of equipment and aerials used. A general statement of the reaction to the Contest—experiences, comments, criticisms, anecdotes, suggestions.

11. Entries: Address MCC, "Club Secretary," SHORT WAVE MAGAZINE, 34 HIGH STREET, WELWYN, HERTS. AL6 9EQ, and to be posted to arrive not later than November 22. Results in full will appear in the January 1978 issue of the SHORT WAVE MAGAZINE. The Editor's decision is final on all matters affecting the Contest.
informals on the second Thursday in each month, followed by the main meeting on the fourth Thursday.

We know of two clubs serving the Derby area; it is the Nunsfield House lot we mention here, they being based on Nunsfield House Community Association, Boulton Lane, Alvaston, where they can be found in Room 7 every Friday evening. October 7 is down for G3LOV to give a talk about the hobby as it is in U.S.A., and on 14th there is a technical film Show. G8MAZ has October 21, and his theme will be the selection of components and aerials for mobile use—a topic which, despite its importance, the writer cannot recall ever having been mentioned as a topic for a lecture. Finally, on October 28, Bob Lewin will be talking about lasers and their application.

Oddly enough the same dates apply for South Manchester, although the topics are a little different. They have a planned RTTY talk on October 7, while on 14th G2AKR will recount some more reminiscences—memories which have clearly interested the gang in the past. G2JT has October 21, and his theme is “Radio Noises” while the month is rounded off by a discussion on the future of our hobby. In addition to all this, of course, there are still the Monday evening sessions each week in the club shack, for the address of which we refer you to the Hon. Sec.—see Panel.

It’s the Annual General Meeting for Midland on October 18, the venue being the University of Aston; it’s a bit of luck we received this particular notice, as it was addressed to 55 Victoria Street which we left a long, long time ago!

Discussions seem to be popular with the members of Acton, Brentford & Chiswick; they have one set down for October 18, the topic being “144 MHz aerials.” The Hq. address is at Chiswick Trades and Social Club, on 14th G2AKR will recount some more reminiscences—and on 14th there is a technical film Show. G8MAZ has October 21, and his theme will be the selection of components and aerials for mobile use—a topic which, despite its importance, the writer cannot recall ever having been mentioned as a topic for a lecture. Finally, on October 28, Bob Lewin will be talking about lasers and their application.

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Mike Rhys, G8KTC, a member of the Torbay A.R.S. turned up at their Mobile Rally, at Haldon racecourse on August 28th, with this unusual 2m. mobile rig. With 5 watts FM, he can operate on the move as he has a mic. and phones built into his helmet and a send/receive switch on the handlebars.

On to Dartford Heath D/F who seem to have lost their "only D/F club in the country" tag now that there is one formed for the Mid-Thames area—this should build up some friendly rivalry. The club Hq. is at The Scout House, Broomhill Road, Dartford, Kent, October 23 is the date, and it is down for a D/F Hunt on two metres—details from the Hon. Sec., at the address in the Panel.

The Reigate programme is quite crowded for October, but if we extract just the meetings, we find October 4 for a Natter Nite at the Marquis of Granby, while on 18th there will be a Members Evening at the upstairs room of the Constitutional Centre; both these venues being in Redhill rather than Reigate.

On the first Monday in each month, at the Chaseley Home, South Cliff, Eastbourne, the Southdown group are in session. This gives up October 3, and the event is one of their famous Junk Sales at which, it is claimed over £200 changes hands.

For Crystal Palace we can't give you any current details, as their short Newsletter is entirely given over to August and September data and a temporary change of date, at the expense of their usual little note of all the doings at the bottom of the sheet; so, we must ask you to contact the Hon. Sec.—see Panel.

Bournemouth (Wessex ARG) are now an active and large group with over eighty members, and Hq. to suit at the Dolphin Hotel, Holdenhurst Road, Bournemouth. October 7 sees the Annual General Meeting, and on October 21, we see that they will be having a report on VHF NFD results, plus a report on the RSGB meeting in Bournemouth the previous evening.

Just as its name implies, Sussex Repeater Group is an organisation devoted to the idea of a repeater on VHF in the county—this is a return to the original idea after their combined effort with the Sussex Coast group to get UHF repeaters going. For more details on either group, we suggest that you contact the Hon. Sec.—see Panel.

Now we go on to Maidstone YMCA where the club scribe is complaining about our deadlines: so do we, chum—we make it so late that most of the weekend after the deadline is spent in writing the piece ready for Monday! To revert to the club, they have probably one of the best equipped places in the country, where they are to be found on all the Fridays in each month; this paragon of a place is the Y Sportscentre, Melrose Close, Cripple Street, Loose, Maidstone, with a programme to match in full swing by the time you receive this. In essence, they set aside the first and third Fridays in each month especially for beginners, and something is usually organised for everyone on the other dates.

October 6 is the date for Cornish and the venue as usual at the SWEB Clubroom, Pool, Camborne. The subject will be the new 70 centimetre-band repeater, and the speaker G3TDJ.

Finale

Once again we have reached the bottom of the pile, and it is time to ask you to send in your news in time for the dates shown in the box. For any given issue you should send us the dates following the publication day of that issue; if you stick to this simple rule as regards the dates, the deadlines can be noted and met without confusion. The letters or whatever should have a note of dates, venue(s), and the Hon. Sec. name, address and telephone number, and be sent to arrive by first post on the deadline day, addressed to "Club Secretary," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

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G4FWE, Mrs. M. E. Fraser Milner, 26 Bayham Road, Mitcheldean, Glos. GL17 0JR.


G4GBK, C. D. Appleton (ex-G8/KKK), 249 Devonshire Road, Atherton, Greater Manchester M29 9QB.

G4GMR, Dr. P. B. Parbny, "Fern Bank," Wetheral Pasture, Carlisle, Cumbria CA4 0HR.

G4GCK, K. Morrison, 7 Braeside, Sunderland, Tyne and Wear SR2 7QH.

G4GCO, R. H. Thomas (ex-G8/KKK), 7 Sandringham Close, Rushden, Northants NN10 9ER. (Tel. Rushden 55645)

G4GCT, North Bristol Amateur Radio Club, Lockleaze Community Association' Romney Avenue, Bristol 7.

G4GCU, Z. Kowalczyk, 20 Chapel Street, Laxenby, Middleborough, Cleveland.

G4GDL, M. Ellis, 17 Turnberry Grove, Alvwoodley, Leeds 17.

G4GDM, J. S. Owens (ex-G8/LPE), "Norbury," 51 Borrowdale Road, Bellington, Wirral, Merseyside L63 3AP. (Tel. 051-334 1819)

G4GDO, R. H. E. Found, 54 Lincoln Road, North Hykeham, Lincoln LN6 8HB. (Tel. 0522-63456)


G4GFR, R. Johnston (ex-G8/MIL), 13 Byron Close, Knottingley, West Yorkshire WF11 8QG.

G4GFS, H. R. Jones, Hafod-Y-Grug, Mynytho, Pwllheli, Gwynedd LL53 7RH.

G4GGD, Royal Corps of Transport Amateur Radio Society, Signals Division, Army School of Mechanical Transport, Normandy Barracks, Leconfield, N. Humberside.

G4GGP, J. H. Saynor (ex-G8/HGM), 28 Lune Road, Norton, Stockton-on-Tees, Cleveland.

G4GHG, L. Barrett, 9 Henbury Close, Branshill Road, Torquay, Devon. (Tel. 0893-37050)

G5CAH, M. A. Carlson (ex-KL7JSQ), 15 Baker Avenue, Potton, Sandy, Beds. SG19 2PJ.

G8MUP, W. Bailey, 6 Girtone Close, Northolt, Middlesex UB5 3SY. (Tel. 01-422 7018)


G8NLL, T. J. Perrin, Flat No. 2, 201 Honor Oak Road, Forest Hill, London SE23 3RP.

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E1IDE, M. O'Rourke (G3JTX), Kiltanna, Knockaderry, Co. Limerick.

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G2AUD, H. H. Oak-Rhind, "South View," The Green, Brinkworth, Chippenham, Wilts. SN15 5AA. (Tel. Brinkworth 497)


G3AHE, G. James (ex-ZL1AGM), 56 Overhill Road, Stratton, Cirencester, Glos. GL7 2LP.

G3FVU, Wessex Amateur Radio Group, c/o G. D. Cole, G4EMN, 6 St. Anthony's Road, Bournemouth BH2 6PD.

G3HBU, F. A. Hall, "Pines Fell," 78 Reading Road, Finchampstead, Berks. RG11 4RA.

G3HQU, J. G. Jackson, 243 Rawlinson Street, Barrow-in-Furness, Cumbria LA14 1DW.

G3JBU, B. Hayes, 32 Debdale Road, The Headlands, Northampton NN3 2TR. (Tel. 0604-43037)


G3RJV, Rev. G. C. Dobbs, 131A Mansfield Road, Nottingham. (Tel. 0602-411546)

G3SAX, J. R. Robinson, Plasmadoc Cottage, Bishops Castle, Salop SY9 5JJ.

G3MSSB, D. K. McDermott, 5 Rannoch Close, Stewarton, Kilmarnock, Ayrshire KA3 3HS.

G3SYM, D. R. Colhart, "Clanglers," 55 Ash Church Road, Ash, Aldershot, Hants. GU12 6LU.

G3TGW, E. Wilders, 8 Dodgington Drive, Longthorpe, Peterborough PE3 6NN.

G3UFX, H. Julian (VP8IH/MM, 3B8CW), The Cottage, St. Buryan, Penzance, Cornwall TR19 6DX.

G3UK, C. V. Whittaker, "Fir Bank," Manor Road, Whitchurch, Reading RG8 7EW.

G3UPB, H. N. Storey, Fountain Lane, Blydon-on-Tyne, Co. Durham. (Tel. Blydon-on-Tyne 3321)

G3ZYE, R. Bellerby, 20 Cromwell Road, Hove, East Sussex BN3 3EB.

G4BBH, R. C. Fryeramy, 8 Marine Parade, Dovercourt, Harwich, Essex CO12 3JX.


G4CJIK, N. S. Houl, 33/34 Lower Park Street, Cambridge CB5 5AR.

G4MCKP, W. M. C. MacDonald, 81 Juniper Drive, Milton of Campsie, Stirlingshire.

G4DII, A. A. Excell, 37 Beech Road, Fareham, Hants. PO15 5DL.

G4DJL, J. Craig, 96 St. Leonards Road, Molecroft, Beverley, N. Humberside.

G4EHK, D. J. Goulbourne, 6 Grovewood Drive, Appleby Bridge, Wigan, Greater Manchester.

G4FUM, Dr. D. Hutchinson, 14 Norwood Park, Belmont, Belfast BT4 2DY.

G8BDT, F. N. Bedwell, "Little Patch," Teddington, Twickenham, Glos. GL20 8J A. (Tel. Alderson 422)

G8EWN, D. L. Edmonds, "Woodlands," Savile Road, Hebden Bridge, W. Yorkshire HX7 6BY.

G8HRS, M. W. Savage, 13 Battle Road, Hailsham, Sussex.

G8IBY, J. H. Duncan, 21 Montgomery Drive, Old Bilton, Rugby, Warks.

G8JKN, W. L. Barnes-Rickers, 4 Castle Road, Kenilworth, Warks CV8 1NG.

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<tr>
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<th>Price</th>
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<tr>
<td>TRIO GR666 Receiver</td>
<td>£120-00 (£3-00)</td>
</tr>
<tr>
<td>TRIO JR310 B.S. Receiver</td>
<td>£60-00 (£6-00)</td>
</tr>
<tr>
<td>EDDYSTONE EC10 MK1 Receiver</td>
<td>£30-00 (£3-00)</td>
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<tr>
<td>TRIO JR599B B.S. Receiver</td>
<td>£160-00 (£3-00)</td>
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<tr>
<td>HAMMARLUND HQ170A B.S. Receiver</td>
<td>£180-00 (£4-00)</td>
</tr>
<tr>
<td>R.C.A. AR8516L Receiver</td>
<td>£240-00 (£4-50)</td>
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<tr>
<td>KW201 B.S. Receiver</td>
<td>£130-00 (£4-50)</td>
</tr>
<tr>
<td>HAMMERLUND HQ490A</td>
<td>£180-00 (£4-00)</td>
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<tr>
<td>HAMMERLUND SP600JX</td>
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<tr>
<td>EDDYSTONE EA11</td>
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Radio Amateurs Examination City & Guilds. Pass this important Examination and obtain your G8 Licence with an RRC Home-Study Course. For details of this and other Courses (GCE, professional examinations etc.) write or phone: The Rapid Results College, Dept. JV/1, Tuition House, London SW19 4DS. Careers Advisory Service, 01-947 7272 or ring 01-946 1102 for prospectus only (24-hour answering service).

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READERS’ ADVERTISEMENTS

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Selling: Trio 9R-59D with loudspeaker, £45. — Ring Adams, 01-888 8521 after 6.30 p.m.

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These are the best — forget the rest!

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Compare these prices up to 20% Discount

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For Sale: FT-221, £290 or near offer.—Seymour G4CPJ, QTHR. (Tel: 0636-892301).

For Sale: Pye Bantam FM high-band, £30. Wanted:
Pye Cambridge or similar 2m. rig.—Tomlinson, 9
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Sell or exchange: FR-400SDX, 2/6/160m., all extra
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Hallicrafters R-274/FRR (SX-73), or similar Rx. Will
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Hallicrafters R-274/FRR (SX-73), or similar Rx. Will
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Offering: Well maintained B.40 with S-meter and full
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—Ring Cooper, Chapel End 393035 after 7 p.m.

For Sale: FT-221, £290 or near offer.—Seymour G4CPJ, QTHR. (Tel: 0636-892301).

Offering: Decca Type 62 true-motion radar display
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after 5 p.m.

Selling: Eddystone 730, 0-5-30 MHz, with manual and
valves. Hamgear ATU. Two-metre converter. £120
the lot.—Ring Clark, Bourne-End 20047.

Wanted: KW-2000. Details and price please.—Ring
Cavender, 0632-28457 daytime.

Selling: FRG-7 with headphones, immaculate, 6 months
old, little used, under guarantee, original packing
(emigrating), £130.—Davies, 37 Nicholls Avenue,
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Lagbeer Model E.5188 portable TV signal strength
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Selling: VCR-139A cathode ray tube, £5. Type 51
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For sale: G-Whip multi-mobile antenna with extra coils for 80/160m. and two whips for coils, unused, £20. Trio 9R-59DS, £50. Propeller pitch rotor and 12V 8A power supply, chain drive to geared in 2in. pole (will turn almost any antenna system), £25. Mosley Mustang 3-6e beam, £45. 11580-0-11585v. 350mA oil-filled transformer with bank of five 400 micro-farad 35v. electrolytics mounted on perspex, £15. All “or near offer.” -- Gilmour, GM4DQX, QTHR. (Tel: 041-638 3386, evenings).


Sale: Eddystone EC-10 Mk. II communications receiver, mint, with new long-life batteries, £100 -- Ring Leighton, Guildford 66543.


Wanted: Honda generator; ST5/6 RTTY T/U. Details please. Have for part-exchange (if interested) or sale Selectomarine wind generator, AC alternator, Aerocharge 3 with rectifier for 12v. battery, new, value £45. -- Scott, 38 The Gardens, Whitley Bay, Tyne and Wear NE25 8BG.

Sale: BRT-400 communication Rx, all bands, £35. Buyer collects. -- Wanted: 70cm converter; dish antenna; ATU. -- Robert, 71 Gibbons Road, Selby Oak, Birmingham.

Wanted: Standard 1 watt marine hand-held portable, must be in top class condition. Offering £140, or £110 for a good-only set but which must be in sound condition; cash waiting. Details and price please. -- Mansi, 5 Elder Green, Gorleston-on-Sea, Great Yarmouth, Norfolk NR3 1RA.

Selling: Crystals for Trio 7200G (bought a VFO): Tx/Rx crystals for channels SO, SI4, S15, S16, S17, S18, S19, R4, R5, R7; also reverse repeater receiver crystals for R3, R4, R7. Asking £5 per channel and £2.50 per reverse repeater receiver crystal (which will accept £50 for the lot if offer made quickly). Sent by return of post for Postal Orders. -- Gorman, 1 Bramble Close, Macclesfield, Cheshire. (Tel: 0625-27790).

For Sale: Sharp Model FV-1800A portable multi-band radio, ACC/battery, 0-15-26 MHz FM, as new, £57-50. -- Ring Burger, Marlow 4569 (Bucks.).

Sale: Eddystone 730/4 general coverage receiver with crystal calibrator, audio filer, variable selectivity and aerial tuning unit, £125 for both, or will separate. -- Clarke, 5 Cherry Tree Road, Kingswinford (6526). Staffs.

For sale: Eddystone EC-10 Mk. II with Type 924 mains PSU, mint condition, £120. Codar PR-40 preselector, £7. Carriage extra. -- Wanted: Manual for Heathkit GC-1U Mohican Rx, and Hitachi 6AR5 or equivalent value. -- Taylor, 70 Hillcrest Road, Yeovil, Somerset.

Selling: FT-220, recently checked by main agent, £210. Astronics Model KCR-101 visual Morse reader, displays CW at speeds variable from 5 to 50 w.p.m., £120. -- Ring Moll, G4GGV, Maidenhead 20651.
THE SHORT WAVE MAGAZINE

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With Integral 600 ohm d.c. attenuators, £8.50. Waveguide Assemblies consisting elbows, tees, fixed and variable attenuators, £6.00. All above Post and Carriage included.


For Sale: Drake TR4-C, with 34-PNB blanker, AC-4 power supply, RV-4C VFO, all new and boxed (list price over £700), £580. MN-2000, brand new, £140. Two-metre FT-221, as new, boxed, £275. Trio 9R-59DS, good condition, £45.—Ring Taylor, Bournemouth 50400.

WANTED: R.209 Mk. II; late UK-manufactured No. 19 Set Mk. III or Mk. II/T; RF amplifier No. 2 Mk. II; C12 transceiver. Details and price please.—Ring Taylor, G3UCT, Fleet 6998.

WANTED: K.W. Atlanta with AC/PSU and external VFO, £170. KW-2000A with AC/PSU and speaker, £160. Both in excellent condition throughout, and with manuals. (Bed).—Box No. 5608, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

WANTED: K.W. E-Zee Match. AT-5 with AC/PSU. FT-401 transceiver. Details and price please (Berk.).—Box No. 5606, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Selling: Two-metre converter, IF 4-6 MHz, unused; J-Beam 4-6 aerial. Both together, £16. Exchange: Lens assembly and two vidicons for good Morse key.—Jenkins, 15 Tilstone Avenue, Eton Wick, Bucks.

Selling: Drake R4-A, with 34-PNB blanker, AC-4 power supply, RV-4C VFO, all new and boxed (list price over £700), £580. MN-2000, brand new, £140. Two-metre FT-221, as new, boxed, £275. Trio 9R-59DS, good condition, £45.—Ring Taylor, Bournemouth 50400.

Selling: Pye Pocketfone battery charger with three pairs of batteries and one PFI, Rx only, £22. Pair of 1 watt walkie-talkies (cost £95), £50.—Mansi, 5 Elder Green, Gorleston-on-Sea, Great Yarmouth, Norfolk NR31 8RA.

Selling: HRO receiver only, any condition but must be complete for spares.—De Courcy, 27 High Avenue, Eccleston, St. Helens (53018), Lancs. Wanted: HRO receiver only, any condition but must be complete for spares.—De Courcy, 27 High Avenue, Eccleston, St. Helens (53018), Lancs.
For Sale: AR88D general coverage communication receiver, good condition, £65 or near offer.—Ring Boaler, Lye: 3894.

Wanted: Manual or information or WRL Galaxy 300 transceiver. Also BCC Type 69D VHF LB transceiver. Any expense refunded.—Leaver, G4ECB, QTHR. (Tel: 0282-867990, Colne).

For Sale: FR-DX400 Rx, all options and matching speaker; FL-DX400 Tx, with mic. and station inter-connections. Both mint, £350.—Ring Pritchard, Hereford 65092.

Must Sell: Complete shack and electronic workshop prior to going abroad: SB-102 transceiver; HP-23A power supply; SB-600 speaker; SB-220 2kW linear; HM-2103 RF load wattmeter; HM-15 SWR bridge; HM-102 RF power meter; HF FM transceiver; 70cm. FM VHF transceiver; CMOS xtal calibrator, 1 MHz to 1 Hz; audio processing and filter unit; Heath desk mic.; two hand mics.; ATU with high voltage components; OS-2 oscilloscope; AW-1U audio wattmeter; IM-18D VVM with all probes to 30kV; RF-1U signal generator; transistor multimeter; Avo meter; 18-AVT/ WB antenna; 40ft. Telomast. All with circuits and manuals, host of test leads, all shack furniture, thousands of components. Must have £1,000, first offer collects.—Corper, G3ZOJ, 3 Stanton Place, Chalkstone, Haverhill, Suffolk. (Call after 8 p.m., or Sunday afternoons).

Selling: TR2200, with xtal for 144-48, 145-00, 145-50, 145-55, R5, helical, auto tone-burst, 50 second time-out LED, brand new nicads, mobile mount (with all original accessories: built-in charger, mic., etc.), plus VB-2200 10w. afterburner and pre-amp. (which works), all for £120. Clean Liner-2 with pre-amp, and Pye insert mic., otherwise unmodified, £100. Both rigs treated with loving care and in excellent condition.—Russell, G8FW, QTHR. (Tel: 021-472 2284).

Sale: Heathkit HW-100 Tx/Rx with HP-23 power supply (110v. AC input), matching speaker, mic., cables and manuals, £220 or near offer secures.—Ring Pearce, G4EFK, Burnham-on-Sea (0278) 785788.

Going HF: FT-221R, £265. Electronic Developments linear, 100 watts p.e.p. on 2-metres, £110. Microwave Modules MMT/432-144 transverter, £120. Liner-2 with PSU, £110. 10-ele 2-metre beam, £13; 8-ele 2-metre beam, £8; 46-ele multi 70cm., £13; Parabeam 18-ele, 70cm., £11; all with cable. All equipment approx. 6 months old.—Ring Trevett, G8LZC, Broadstone 696929 (Dorset).

Selling: Trio 9R-59D Rx, good condition with manual and packing, £30. Two metre home-built VFO and Tx. £15.—Fitzherbert, G8KWW, QTHR.

Wanted: Top Band mobile rig complete, prepared to pay reasonable price for reasonable rig. Details and price please.—Ring Gorman, Macclesfield (0625) 27790 evenings only.

Sale: Hammerlund HQ-100A Rx, 550 kHz to 30 MHz, bandspread 80-10m., £58. Lafayette HE-73 preselector converter, 80-10m., IF 3-5 MHz, £18. Wanted: SX-122 Rx. Pye Compact PFI case, Rx board, set for spares. —Perrin, G4AFY, QTHR. (Tel: Kidderminster 63358).

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<tr>
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<th>Description</th>
<th>Price</th>
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<tr>
<td>Mustang</td>
<td>3 elements, 10, 15 and 20 metres</td>
<td>£108.00</td>
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<tr>
<td>TA-33 Jr.</td>
<td>High Power model incl. Balun</td>
<td>£89.50</td>
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<tr>
<td>TA-33 Jr.</td>
<td>3 elements, 10, 15 and 20 metres</td>
<td>£85.00</td>
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<td>TA32 Jr.</td>
<td>2 elements, 10 and 15 metres</td>
<td>£69.00</td>
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<tr>
<td>TA31 Jr.</td>
<td>Rotary dipole, 10, 15 and 20 metres</td>
<td>£36.00</td>
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<tr>
<td>ELSN</td>
<td>12 elements, 10, 15, 20 and 40 metres</td>
<td>£125.50</td>
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<tr>
<td>TR-2</td>
<td>Trap Dipole 40 and 80 metres</td>
<td>£23.50</td>
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<tr>
<td>TCD-2</td>
<td>Trap Dipole 40 and 80 metres</td>
<td>£13.50</td>
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<tr>
<td>V-3 Jr.</td>
<td>Trap Vertical 10, 15 and 20 metres</td>
<td>£26.50</td>
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<tr>
<td>Atlas</td>
<td>Trap Vertical 10, 15 and 20 metres</td>
<td>£48.00</td>
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SWL ANTENNAS

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<th>Antenna Type</th>
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<tr>
<td>SWL-7</td>
<td>Dipole 13, 16, 19, 25, 31 and 49 metres</td>
<td>£25.00</td>
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<tr>
<td>RD-5</td>
<td>Dipole 10, 15, 20, 40 and 80 metres</td>
<td>£25.00</td>
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<tr>
<td>Orbit</td>
<td>Vertical 13, 16, 19, 25 and 31 metres</td>
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<th>FUNDAMENTALS</th>
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<tr>
<td>1</td>
<td>0.030 to 0.099 MHz</td>
</tr>
<tr>
<td>2</td>
<td>0.100 to 0.369 MHz</td>
</tr>
<tr>
<td>3</td>
<td>0.400 to 0.700 MHz</td>
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<tr>
<td>4</td>
<td>0.730 to 0.999 MHz</td>
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<td>5</td>
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<td>10</td>
<td>6.000 to 12.999 MHz</td>
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<td>11</td>
<td>13.00 to 25.999 MHz</td>
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<tr>
<td>12</td>
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